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Journal of Urban Management

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## Research Article

# Participatory evaluation of cultural heritage adaptive reuse interventions in the circular economy perspective: A case study of historic buildings in Salerno (Italy)

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## ARTICLE INFO

## Keywords:

Adaptive reuse

Cultural heritage

Circular economy

Multi-criteria decision analysis (MCDA)

## ABSTRACT

Adaptive reuse of cultural heritage can be a valid strategy to recover heritage buildings in a state of abandonment or underuse, as well as to implement the circular economy model in cities and regions, contributing to the achievement of climate objectives, to social cohesion, wellbeing and quality of life, making cities more attractive, safe, sustainable and resilient. The aim of this paper is to develop and test an ex-ante evaluation methodology to support participatory decision-making processes for the adaptive reuse of cultural heritage according to the circular economy perspective. A multidimensional and multicriteria evaluation framework was experimented in the city of Salerno, Italy, to assess alternative solutions for the adaptive reuse of four large historic buildings in abandonment, and identify a satisfying solution based on interactions with local stakeholders. The TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) multi-criteria evaluation method was used to compare adaptive reuse project alternatives including stakeholder objectives and preferences. Starting from 14 adaptive reuse proposals, the participative evaluation methodology supported stakeholders in the identification of 4 preferable solutions further developed and co-designed, as well as in the search of a final satisfying solution engaging diverse stakeholders groups. Moreover, operational circularity criteria for the adaptive reuse of cultural heritage were identified. The results of the study show the potential of Multi-Criteria Decision Analysis (MCDA) mixed with participative methods for co-design and co-evaluation to support inclusive decision-making processes for circular adaptive reuse of cultural heritage.

Abbreviations<sup>1</sup>

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<sup>1</sup> [MCDA] Multi-Criteria Decision Analysis [TOPSIS] Technique for Order Preference by Similarity to Ideal Solution

<https://doi.org/10.1016/j.jum.2023.12.002>

Received 1 August 2023; Received in revised form 8 December 2023; Accepted 15 December 2023

Available online xxxx

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Please cite this article as: Gravagnuolo, A. et al., Participatory evaluation of cultural heritage adaptive reuse interventions in the circular economy perspective: A case study of historic buildings in Salerno (Italy), Journal of Urban Management, <https://doi.org/10.1016/j.jum.2023.12.002>

## 1. Introduction

Many cultural heritage<sup>2</sup> assets lay in a state of abandonment and underuse in European countries (European Commission, 2014, 2015). Adaptive reuse of heritage buildings and sites could represent a viable strategy for the implementation of urban circular economy, regenerating territorial resources (Gravagnuolo & De Lucia, 2019; Foster, 2020). The circular economy aims at enhancing the value of products and materials through processes of reuse, to reduce wastes, energy and materials consumption (Ellen MacArthur Foundation, 2015). Adaptive reuse can be defined as “any building work and intervention aimed at changing its capacity, function or performance to adjust, reuse or upgrade a building to suit new conditions or requirements” (Douglas, 2006). The concept and techniques of adaptive reuse allow the use of an abandoned or underused buildings, changing/improving their functions and adapting them to new needs (Bullen, 2007; Bullen & Love, 2010; Bullen & Love, 2011; Plevoets & Van Cleempoel, 2011). Adaptive reuse comprises refurbishment,<sup>3</sup> rehabilitation,<sup>4</sup> renovation,<sup>5</sup> retrofit<sup>6</sup> or restoration<sup>7</sup> (Vardopoulos, 2019), not necessarily changing uses. Adaptive reuse implies complex choices regarding the parts of the building to be preserved, as well as the more suitable uses of the spaces according to the specific aims of the reuse. Thus, evaluation tools can be particularly relevant to support decision makers to take effective choices in adaptive reuse of buildings (Langston, 2012; Langston et al., 2018). Scholars have explored diverse approaches to valuation of buildings adaptive reuse, from a user experience perspective (Günçe & Mısırlısoy, 2019; Vardopoulos, 2023; Vardopoulos, 2022), climate perspective (Conejos, 2013), comparing and combining diverse evaluation tools (Conejos et al., 2014; Vardopoulos et al., 2021; Chen et al., 2018; Parpas & Savvides, 2018) including multi-criteria analysis (Parpas & Savvides, 2018).

Adaptive reuse can be applied to cultural heritage buildings, ensuring that cultural values are not compromised by adaptation (Arfa et al., 2022; Gaballo et al., 2021). The adaptive reuse of cultural heritage in the circular economy perspective aims at achieving multiple objectives, such as the conservation of cultural value, economic-financial viability, environmental regeneration, social cohesion, community wellbeing and local economic development; therefore, its implementation should be supported by adequate evaluation tools (Gravagnuolo et al., 2017). Diverse case types of cultural heritage adaptive reuse can be identified based on heritage typologies (e.g. residential buildings, commercial, industrial, religious, civic). Exemplary case studies have been analysed by international research projects such as CLIC, ROCK, OpenHeritage, HERSUS, RETOU.

A brief review of the circular economy concept and strategies is needed to identify specific circularity criteria to be applied in the evaluation of cultural heritage adaptive reuse projects. In recent years, more than 100 definitions of circular economy were proposed by scholars (Kirchherr et al., 2017), identifying the circular economy model as the ‘new sustainability paradigm’ (Geissdoerfer et al., 2017). The circular economy represents a pathway to sustainability, able to promote a development model that ‘decouples growth from resource constraints’ (Ellen MacArthur Foundation, 2015), internalising negative environmental and social externalities, or reducing them through innovative production-consumption and business models. A circular development model is ‘regenerative’ as it is capable of not only reducing negative externalities, but also generating positive environmental, social and cultural impacts (Wijkman & Skånberg, 2015).

Scientific literature and studies highlight that the circular economy implementation requires a multi-level and multi-scale global approach for developing innovation in policies, governance, business models and financing systems (Schröder et al., 2020). Many studies identify three levels to implement circular economy. The ‘macro’ level is related to national and regional policies, for which is deemed necessary to define appropriate governmental action (laws, regulations, taxes and incentives) (European Commission, 2015). The ‘micro’ level refers to the scale of individual actors and enterprises adopting circular business models. The ‘meso’ level refers to the relationships between actors, especially related to collaborative enterprises in industrial ecology and industrial symbiosis studies (Chertow, 2000; Van Berkel et al., 2009) and eco-industrial parks (Shi et al., 2010; Yu et al., 2015), while in other studies it is linked to the city or territory level, considering the relationships and synergies between different actors (Chen et al., 2012).

The circular economy aims at generating positive impacts in the social, cultural, institutional, business and financing sectors. As shown by industrial symbiosis experiences, the circular economy is based on the capacity of actors in a territorial cluster to cooperate and collaborate within circular value chains in which every waste becomes a resource for new production processes. The circular economy model can thus be capable of stimulating the activation of partnerships.

The circular economy can include adaptive reuse of abandoned and underused cultural heritage resources as an effective strategy for its implementation in cities and regions. Cultural heritage adaptive reuse contributes to the recovery of existing buildings, avoiding new materials extraction and soil consumption; however, as cultural resources, the regeneration of cultural values represents an additional and relevant benefit in a broad circularity perspective. Moreover, cultural heritage adaptive reuse generates social and economic

<sup>2</sup> Cultural heritage is defined by UNESCO as “Cultural heritage includes artefacts, monuments, a group of buildings and sites, museums that have a diversity of values including symbolic, historic, artistic, aesthetic, ethnological or anthropological, scientific and social significance. It includes tangible heritage (movable, immobile and underwater), intangible cultural heritage (ICH) embedded into cultural, and natural heritage artefacts, sites or monuments. The definition excludes ICH related to other cultural domains such as festivals, celebration etc. It covers industrial heritage and cave paintings.” (source: UNESCO Institute for Statistics, 2009 UNESCO Framework for Cultural Statistics). In this article, according to UNESCO, historic buildings are defined as cultural heritage buildings which entail historic value.

<sup>3</sup> Refurbishment: a process of improvement by cleaning, decorating, and re-equipping. It may include elements of retrofitting.

<sup>4</sup> Rehabilitation: building recycling both involving new construction and restoration works.

<sup>5</sup> Renovation: construction works intended to modify a building so that all standards and codes in force are satisfied. Does not necessarily involve changes of use.

<sup>6</sup> Retrofit: adding to the building a component or feature not fitted during initial construction.

<sup>7</sup> Restoration: construction works intended to reinstate a building to its original condition.

positive impacts linked to the enhancement of cities attractiveness, job creation and social cohesion. A set of ‘circularity’ criteria for adaptive reuse of cultural heritage has been identified by Gravagnuolo et al. (2017), Bosone et al. (2021).

Based on previous studies, the aim of this paper is to propose and test an ex-ante evaluation methodology to support participatory decision-making processes for the adaptive reuse of cultural heritage according to the circular economy perspective, taking into account multiple evaluation criteria.

The paper is organised in the following sections. Section 2 presents an extensive review of scientific literature on the role and use of evaluation tools to support the adaptive reuse of cultural heritage. Section 3 introduces the case study in the city of Salerno. Section 4 presents the study methodology, focusing on the subsequential phases of the dynamic evaluation process proposed (Section 4.1) and the TOPSIS multicriteria evaluation tool. In Section 5 the results of the evaluation are presented, Section 6 discusses the results and Section 7 open questions for further research.

## 2. The role of evaluation to support cultural heritage adaptive reuse processes

The adaptive reuse of cultural heritage, when properly evaluated and implemented, can contribute to economic growth, social welfare and environmental regeneration, supporting the sustainable development of cities and regions (European Commission, 2014). However, the lack of comprehensive impact assessments often leads to an underestimation of the true value of cultural heritage in sustainable development.

Effective decision-making processes for cultural heritage require the use of appropriate tools. In this context, evaluation can therefore be considered relevant to build choices, to recognize values, interests and needs, and to explore the various factors that can influence decisions (Cerreta & De Toro, 2012).

In this paragraph a literature review has been developed with the aim of investigating which multi-criteria evaluation methods are most widely used in adaptive reuse projects for cultural heritage.

Therefore, we selected some scientific papers about this topic published in the past 10 years.

Based on the concept that cultural heritage deals with multiple criteria and that a multicriteria approach should be adopted, the review considered the following keywords “multicriteria evaluation tools”, “cultural heritage”, “circular economy” and “adaptive reuse”, with the aim of identifying those papers related to our research topic. Additionally, a grey literature analysis was carried out from institutional sources such as European Commission, UNESCO, the CHCfE Consortium, Historic England, etc.

From these analyses emerges that there are some papers focused on impact assessment in urban and territorial contexts, addressing, in particular, evaluation methods for urban transformation and the historic centres regeneration. Most of the papers belonging in this cluster emphasize the importance of involving stakeholders and local communities in decision-making processes to ensure the alignment of choices with their preferences and needs (Bottero et al., 2016; Cerreta & De Toro, 2012; Gravagnuolo et al., 2017; Munda, 1995; Nocca & Angrisano, 2022). Various research works have demonstrated the effectiveness of Multi-Criteria Decision Analysis (MCDA) for urban transformation, offering decision support tools (MAUT, AHP, Evamix, ELECTRE III, Regime, NAIADE) that take into account multiple objectives (economic, environmental, societal, technical, and aesthetic objectives), diverse data types and stakeholder engagement (Bentivegna, 1995; Bottero et al., 2016; De Montis et al., 2004; Lootsma, 1999; Munda, 1995). In the context of urban regeneration processes, decision issues are often characterized by a levels of uncertainty for the presence of multiple actors and different territorial problems (Bottero et al., 2016).

Other scientific papers are focused on evaluation tools for assessing impacts of cultural heritage adaptive reuse. Gravagnuolo et al. (2017) state that the balance between development and conservation of historical and cultural assets could present some difficulties, which can be addressed through appropriate evaluation techniques. While some comprehensive approaches were developed to assess the multifaceted impacts of heritage preservation (CHCfE Consortium, 2015; Nijkamp, 1989; Fusco Girard, 1987; Fusco Girard & Nijkamp, 2004; Fusco Girard & Nijkamp, 1997; Bottero & Lerda, 2019; Rypkema & Cheong, 2011), many studies focused on the economic impacts within specific sectors (Historic England, 2016b; Ost, 2018; Gustafsson, 2019; Labadi, 2011), while others emphasized the societal benefits of heritage conservation (Historic England, 2016a; Fusco Girard & Nijkamp, 2004; Cerreta & Giovane di Girasole, 2020). However, less emphasis on exploring the complex interrelationships among culture, economy, society and the environment was attributed. Other studies proposed specific indicators to assess the impacts of adaptive reuse projects for cultural heritage, which are capable of capturing the direct, indirect, and induced effects resulting from investments in cultural heritage (UNESCO Institute for Statistics, 2022; Della Spina, 2020; Guzmán et al., 2017; Elsorady, 2014; Stanik et al., 2018; Fusco Girard et al., 2015; Fusco Girard & Gravagnuolo, 2017; Labadi, 2011; Rypkema & Cheong, 2011; UNESCO, 2019).

Nocca et al. (2021) proposed an adaptation of Level(s) indicators, proposed by European Commission (European Commission, 2017), to evaluate the impacts of reuse of cultural heritage in a circular economy perspective. They also suggested modifying the Level(s) tool with a set of indicators for integrating the humanistic component with the ecological, economic, technological, and social aspects (Nocca & Angrisano, 2022). Dabbene et al. (2022) proposed a set of indicators to evaluate the quality of the adaptive reuse interventions for cultural heritage, in terms of improved well-being and the need to design interventions on existing architecture in line with restoration theory guidelines.

Finally, we investigated the topic of innovative technologies for the adaptive reuse of cultural heritage. Some researchers highlighted the environmental benefits of the successful adaptation and building’s retrofit, in terms of significant reductions in energy consumption and related greenhouse gas emissions through the use of innovative technologies and materials (Foster & Kreinin, 2020). In this sector, Life Cycle Assessment (LCA) is the most used evaluation tool able to consider, among other impacts, CO<sub>2</sub> and other Greenhouse Gas (GHG) emissions in the whole life cycle of a product (Assefa & Ambler, 2017). Other scientific papers focus on the ‘design support tools’, which are used to project interventions for the reuse of cultural heritage, such as Geographic Information Systems (GIS), geo-heritage

and geo-conservation (De Toro et al., 2020). Gordon and Crofts (2018) assert that these tools are fundamental to map cultural and landscape heritage and their integration in cultural heritage conservation is considered fundamental to planning and management of protected areas (IUCN, 2013). The Green Building Council (GBC) protocol has emerged as a means of evaluating and certifying the sustainability of heritage reuse projects (Green Building Council Italia, 2021). This protocol assesses the performance of buildings holistically, considering their entire life cycle, including the design phase of interventions and subsequent operational phase.

However, the analysis of methods and tools for assessing impacts in cultural heritage adaptive reuse projects reveals that only a limited number of studies and methods focus on holistic criteria and indicators related to sustainability and circular economy. These indicators encompass waste management, raw materials, recycling rates, economic performance of circular businesses, energy, toxicity, and clean material cycles (Moraga et al., 2019; Parchomenko et al., 2019). Furthermore, the implementation of circular economy principles through the adaptive reuse of heritage buildings and sites is rarely considered, as the concept has gained prominence only in recent years. Indicators associated with circular cultural heritage preservation often concentrate only on the environmental aspect, lacking integrated and multidimensional approaches (Bosone et al., 2021).

Some studies, that establish a connection between cultural heritage and the circular economy, refer to assessment frameworks that evaluate the performance of ecosystem services, with the aim of identifying and developing an indicator-based framework composed by indicators related to historic land uses (Costanza et al., 2014; Fusco Girard, 2021b; Stanik et al., 2018; Stanik et al., 2018; TEEB, 2010; Zhang et al., 2006).

Other studies focus on individual aspects such as circular tourism, cultural and creative sectors, sustainability, and well-being (Asmelash & Kumar, 2019; Gravagnuolo et al., 2017).

The decision-making processes concerning cultural heritage demand particular attention and cannot neglect the use of appropriate evaluation tools. In this context, Cerreta and De Toro underlined that evaluation can be considered a relevant instrument for making choices, acknowledging values, interests, and needs, and exploring the diverse aspects that can influence decisions (Cerreta & De Toro, 2012).

After analysing the evaluation tools currently available, this paper presents a proposal for a participatory evaluation methodology for decision-making in adaptive reuse processes of cultural heritage in the perspective of the circular economy, an under-explored field, especially from the valuation point of view (as highlighted in Bosone et al., 2021). The methodology was developed and tested in the Horizon 2020 research project *CLIC – Circular models Leveraging Investments in Cultural heritage adaptive reuse*.<sup>8</sup>

### 3. The case study of abandoned historic buildings in Salerno, Italy

Salerno is an Italian municipality of 127,186 inhabitants (ISTAT, 2023), in the south of Italy, and the second largest municipality in the Campania region by number of inhabitants.

The city lies on a gulf area in the Tyrrhenian Sea. Thanks to its geographical position, Salerno is at the centre of important maritime exchanges (Municipality of Salerno, 2020a) and thus a place where different cultures converge, favouring the development of the medical tradition inspired by the Greek Hippocrates, so that it is called *Urbs graeca* or *Hippocratica civitas*. Salerno was also home of the Salerno Medical School, which was Europe's first and most important medical institution in the Middle Ages (Trecani, 2005), and as such is considered a forerunner of modern universities.

In the heart of the city's historic centre is conserved the 'Garden of Minerva', where medicinal plants were cultivated since the beginning of the 14th century, a forerunner of all future botanical gardens in Europe (Giardino della Minerva, 2000). This space of extraordinary cultural value (Municipality of Salerno, 2020a) fulfilled the dual function of both a botanical garden and a place of education, to show students the names and properties of the plants cultivated there. The city's current development strategy is focusing on the enhancement of these identity elements: the Garden of Minerva has received numerous international awards and has set up the first network of historic therapeutic botanical gardens. Moreover, the Department of Pharmacy of the University of Salerno has set up the *Plantae Medicinales Mediterraneae* UNESCO Chair; and finally, the Municipality of Salerno is pursuing the candidacy of the Salerno Medical School as a UNESCO Intangible Heritage.

As per current planning and development strategies, the 2005 version of the Municipal Urban Plan (Bohigas & Puigdomenech, 2005) emphasized the need to act on the refurbishment and reuse of the built heritage as a key factor in improving the quality of life through three approaches: (1) reuse versus mere preservation; (2) the design of empty spaces versus the design of new properties; (3) creative impetus versus limiting regulation. The Urban Plan shows thus a clear vision towards heritage-led regeneration through circular and creative processes of adaptive reuse, especially in the historic city centre where many heritage assets still need to be recovered and lead to new life. The decennial review of the Municipal Urban Plan in 2018 reaffirmed the guiding principles including: (a) environmental and landscape sustainability to be combined with development objectives and the transformation of the territory; (b) the need to preserve the 'structure' of the plan and its equalization mechanism; (c) the incorporation of regulatory innovations; (d) the administrative and procedural simplification; (e) the enhancement of municipal real estate.

The historic cultural values of the city and the vision and strategy for its future development represented an important starting point for the co-development and co-evaluation of alternative adaptive reuse scenarios in this study.

The specific case study identified was the adaptive reuse of the so-called 'Edificio Mondo', a complex of four large abandoned historic buildings in the historic city centre of Salerno: the San Massimo Palace, the ex-Convent of San Francesco, the ex-Convent of San Pietro a Maiella and San Giacomo, and the ex-Convent of Santa Maria della Consolazione, altogether measuring about 20,000 square metres.

<sup>8</sup> <https://www.clicproject.eu/>



The Edifici Mondo complex came into being in 1810 when, by Napoleonic decree, all religious orders in the Kingdom of the Two Sicilies were suppressed and all the old convent structures were used for new functions. The old convents of San Francesco and San Giacomo and San Pietro a Maiella were used as men's prisons, while the monastery of Santa Maria della Consolazione, located a little further up, was used as a women's prison, a function they held until the mid-1980s, when the new Fuorni prison was inaugurated. Since then, the structures were abandoned until 1997, when the City of Salerno announced an international competition of ideas for the recovery of the 'Edifici Mondo', so called because of their size and complexity.<sup>9</sup>

The competition saw two groups of professionals as winners. The first was the SANAA studio of Japanese architects Sejima and Nishizawa (SAANA, 2000), winner of the Pritzker Prize in 2010, who were responsible for the design of the public spaces. The second was the Milanese architect Antonio Monestiroli (Monestiroli Architetti Associati, 1998) and the Roman Antonio Las Casas, who were responsible for the restoration of the buildings.

Due to a lack of financial resources, however, the project was not continued, determining the current state of abandonment.

Palazzo San Massimo, also known as Palazzo Maiuri, is a building with a history dating back thousands of years, although from the constituent elements of the façade it appears to be an 18th-century palace. The building is located in the Plaium Montis area, the highest and oldest part of Salerno's historical centre. It was founded by the Lombard prince Guaferio as a residence for the princes of Salerno, and a church, the church of San Massimo, founded between 861 and 865, and an important monastery were attached to it. It became the property of the Municipality of Salerno and was used as a secondary school in the 1930s, only to fall into neglect after the war.

The Convent of S. Pietro a Maiella and S. Giacomo was founded in the 14th century, in 1332 to be exact, and enlarged in 1774 with the construction of a new church, in 1808 it suffered the same fate as the neighbouring convent of San Francesco with which, following widespread transformation works, it formed a single complex connected by an external staircase and perimetered by high enclosure walls surmounted by sentry boxes.

According to some historians, the construction of the convent of San Francesco dates back to the first half of the 13th century. In 1238 there certainly existed the church next to which an initial conventual nucleus was probably already built. In 1412, the entire complex was enlarged thanks to the generosity of Queen Margaret of Durazzo, mother of King Ladislaus, to whom her son dedicated a funerary monument in the monastery church (visible today in the left aisle of the cathedral). The complex passed to the Conventual friars in 1575, after having belonged to the Friars Minor for three centuries. In 1808, the order was suppressed and the building used as the seat of the men's prison, together with the nearby convent of San Pietro a Maiella and San Giacomo (used as the prison infirmary).

The convent of Santa Maria della Consolazione was founded around 1560 by the Capuchin Fathers on the coast of Mount Bonadies, in the north-eastern part of Plaium Montis; it borders the road leading to the Arechi Castle, and boasts an excellent view of the Gulf of Salerno, in the place where there probably already existed a church dedicated to Santa Maria. The land was granted by a noble family from Salerno, the Marchesi Capograssi, and the building complex was building was constructed with money collected from the alms of the people. By the end of the 16th century, the monastery had acquired great importance, becoming the seat of the province monastic province of Basilicata-Salerno, a role it maintained until 1866.

From that year, when the religious orders were suppressed by Napoleonic decree, the building was destined to house a women's prison. Currently, the building has been disused since the mid-1980s following the transfer of the prison to its new location in Fuorni.

Actually the historical buildings suffer a high state of decay despite their strategic position in the city centre (Figs. 1 and 2).

The 'Edifici Mondo' historic buildings are currently owned by the National Agency of Public Properties and lay in a state of abandonment for 30 years. In the last decades, financial barriers and lack of social acceptance limited the implementation of alternative



**Fig. 1.** On the left, Google maps view of 'Edifici Mondo' in the historical centre of Salerno (Google Earth Image 2022©); on the right, 3D model of 'Edifici Mondo' (credits: Irene Antonelli and Giovanni Mazzanti).

<sup>9</sup> All the information concerning the Edifici Mondo was provided to the research team by the Municipality of Salerno, in particular by the Planning and Design Offices of the Building Transformations Sector and the Community Resources and Management Control Sector, drawing from the documentation deposited in their archives.



Fig. 2. State of decay of 'Edifici Mondo' (Credits: Mariarosaria Angrisano, Martina Bosone, Antonia Gravagnuolo).

adaptive reuse proposals elaborated to regenerate the urban area and the buildings (Lupacchini & Gravagnuolo, 2019). Recently, an agreement between the National Agency of Public Properties and the Municipality, transferred the ownership to the Municipality at the condition of realising a socially inclusive adaptive reuse and urban regeneration project. This clear orientation for the adaptive reuse of the historic buildings was taken into careful consideration when developing and evaluating the adaptive reuse proposals within the present study.

Salerno represents one of the four Pilots of the CLIC project, together with Pakhuis de Zwijger (Amsterdam, The Netherlands), Rijeka (Croatia) and Västra Götaland Region (Sweden) (Wildman et al., 2021). Edifici Mondo are selected as case study as they represent an opportunity to test the CLIC methodological approach in an ex-ante phase, i.e. in a phase in which a reuse project has not yet been developed for the examined cultural heritage and assuming that it could be a regenerative process not only for the buildings but also for the entire context. This assumption is based on the empirical evidence derived by the analysis of 126 projects of cultural heritage adaptive reuse (Gravagnuolo & De Lucia, 2019), which demonstrated the benefits of cultural heritage adaptive reuse in turning abandoned heritage/landscape assets into a resource for new jobs, wellbeing, health, social cohesion, regional competitiveness and environmental regeneration – as advocated by all international policy documents and scientific literature. The following section describes the study methodology and presents the reason for selecting the specific multicriteria evaluation method to support the adaptive reuse participatory process in Salerno.

#### 4. Methodology

The methodology proposed in this study was developed according to a participatory co-design and co-evaluation approach, considering multiple evaluation dimensions and criteria in the perspective of the circular economy. The evaluation process involved stakeholders in the diverse phases of the adaptive reuse, from the design phase to the more advanced feasibility studies to identify a satisfying solution.

The evaluation is here intended as a dynamic process, in which the 'ideal' solution (Carlsson & Zeleny, 1983) for the adaptive reuse of cultural heritage emerges through the elaboration and synthesis of diverse alternative solutions, developed according to the overarching objectives of circularity and sustainability, and the specific objectives related to the case study area.

The methodology applied in this study is based on the following phases (Fig. 3):

1. *Cultural mapping (October 2018 - June 2019)*: through the HIP1 perceptions mapping workshop, participants were asked to select the keywords they felt best identified the values and impacts of heritage in the historic centre area of Salerno. The different maps are intended to feed a strategic analysis likewise heritage values assessment of cultural heritage, or the collecting of raw figures on social and economic issues that are relevant for circular processes.
2. *Knowledge building (May 2018 - June 2019)*: collecting and analysing detailed information on the evaluation problem, including the specific case study and the urban context in which the adaptive reuse is carried out (the overall results of this phase were specified in the introductory section of this paper, including the presentation of the specific case study in Salerno).
3. *Definition of objectives and criteria (May 2019 - October 2019)*: based on the theoretical model of 'circular' adaptive reuse of cultural heritage, developed within the Horizon 2020 CLIC research, a set of overarching circularity objectives and specific objectives related to the case study area was defined. Then criteria related to the circularity objectives of cultural heritage adaptive reuse were identified, according to the three main dimensions explained in previous section 3 by the research team.
4. *Prioritization of objectives (October 2019 - November 2019)*: a process of stakeholder involvement was conducted to integrate their preferences and needs into the preferability ranking. Thus, objectives and linked criteria were weighted according to the preferences expressed by stakeholders through an ad-hoc questionnaire administered during the study.
5. *Development of project alternatives (March 2020 - April 2020)*: according to the stated objectives, a number of alternative adaptive reuse proposals was defined. In the specific case, project alternative solutions were co-developed through a 'Call for ideas' (Public Consultation) (see Appendix A) followed by participatory co-development workshops.
6. *Multicriteria evaluation (April 2020 - May 2020)*: using Multi-Criteria Decision Analysis (MCDA) and specifically the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method, quantitative and qualitative information for all proposals were

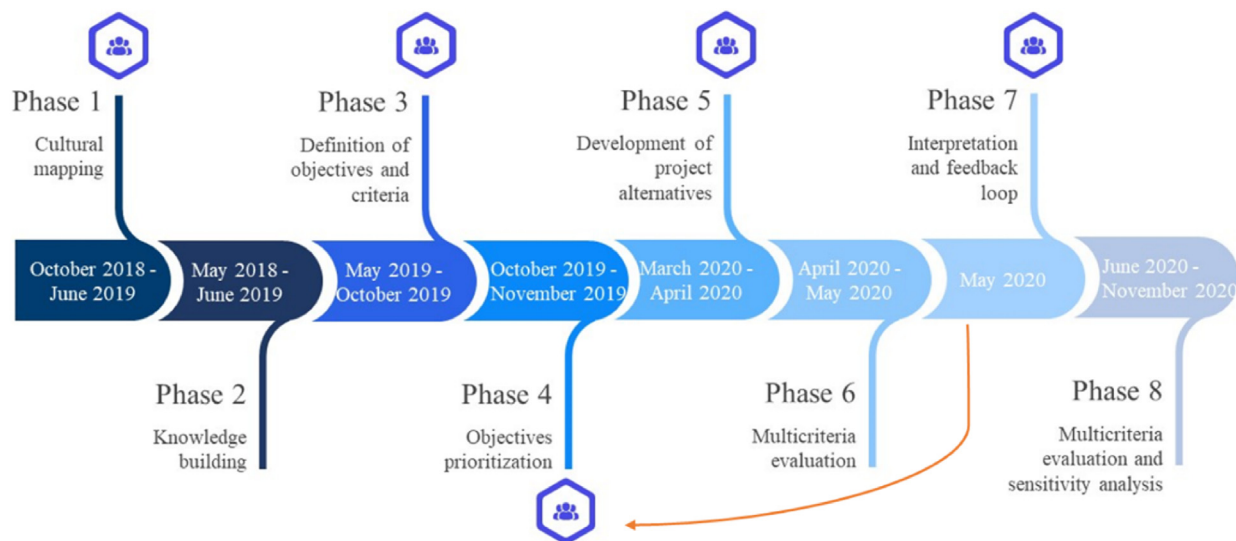


Fig. 3. CLIC methodology applied for the ex-ante evaluation of cultural heritage adaptive reuse projects.

analysed and compared according to a set of specific circularity criteria and indicators, resulting in the ranking of preferability of project alternative solutions.

7. *Interpretation and feedback loop (May 2020)*: through the participatory multicriteria analysis performed, designers and stakeholders had the possibility to re-assess their preferences at each subsequent co-design and co-evaluation stage, passing from a set of 14 general adaptive reuse ideas to 4 well-defined project solutions, leading to the choice of one final ‘satisfying’ solution which embedded elements and functions from the most relevant project proposals.
8. *Multicriteria evaluation of four proposals and sensitivity analysis (June 2020 - November 2020)*: after detailing and improving the four proposals, the TOPSIS method was used again to obtain a new ranking of preferability considering the four alternatives, evaluated according to the same weighted objectives, criteria and indicators. Finally, to test the robustness of the obtained results, a sensitivity analysis was carried out by altering the weight of certain objectives and observing the effects in terms of different ranking of preferability.

The dynamic and co-evolutive evaluation process proposed is conceived to be iterative and interactive, engaging stakeholders from the definition of objectives to the identification of a final adaptive reuse solution, and it is able to improve decision-making and co-design through continuous and circular feedback mechanisms, until the identification of a satisfying solution which represents the result of a collective reflection and co-design process supported by evaluation tools.

The methodology was tested in the case study of Edificio Mondo in Salerno. The evaluation process aimed at overcoming the barriers to the adaptive reuse of the historic buildings, supporting the development of financially and socially viable project alternatives, which would also preserve cultural values and regenerate environmental resources (multiple objectives and criteria).

To develop the project alternatives in Salerno, the research group activated a process of envisioning and community engagement inspired by the circular economy model, starting from the phase of cultural mapping and knowledge building and local stakeholder involvement (Gravagnuolo et al., 2021).

Through the HIP1 perceptions mapping workshop, participants were asked to select the keywords they felt best identified the values and impacts of heritage in the historic centre area of Salerno. The different maps are intended to feed a strategic analysis likewise heritage values assessment of cultural heritage, or the collecting of raw figures on social and economic issues that are relevant for circular processes. These maps depict how urban cultural assets both tangible and intangible are perceived by stakeholders. October and November 2018 were dedicated to the co-design process, the HIP1 perceptions mapping workshop. From December 2018 to June 2019 were dedicated to data processing and design, fine-tuning the visual impact and readability of the maps.

The knowledge phase foresees the description and analysis of the status quo of the urban area of historical centre of Salerno through the collection of data concerning both the individual buildings and the urban context in which they are located. For the urban context, urban planning instruments and programmes were consulted, such as the Strategic Orientation Document (Municipality of Salerno, 2009), the Municipal Urban Plan (Bohigas & Puigdomenech, 2005), the European Structural Investments Funds interventions (Municipality of Salerno, 2021), the Sustainable Energy Action Plan (Municipality of Salerno, 2020b), etc., in order to know the existing constraints on the project area and the urban framework provided by the Municipal Urban Plan. In addition, the consultation of the cadastre was useful to know the ownership structure of the properties.

After collecting the information regarding the target buildings, the research team, together with representatives of the Municipality of Salerno and involving local stakeholders, elaborated a set of objectives expressed in terms of three main ‘circularity dimensions’ according to Fusco Girard (2021):

- 1) *Regenerative capacity*: regeneration of cultural, natural, social and economic resources.
- 2) *Symbiotic capacity*: promotion of synergies/symbioses and cooperation.
- 3) *Generative capacity*: ability to generate net positive impacts in the territory, considering citizens' health and well-being and the social, environmental, cultural and economic impacts.

Starting from these three circularity dimensions, a set of 10 objectives and 18 criteria and 20 indicators was defined both to guide the alternative adaptive reuse proposals developed by local stakeholders and to evaluate them. These criteria were explained in the Call for ideas (Public Consultation), launched by the Municipality of Salerno to involve local stakeholders in the elaboration of alternative proposals for the adaptive reuse of Edifici Mondo. Building plans, pictures, and information on the state of conservation, as well as regulatory constraints as collected in phase 1 (knowledge building), were provided to participants in the public Call for ideas.

During the Public Consultation, the municipality representatives collected 14 alternative adaptive reuse proposals developed by heterogeneous teams of 2–4 members, made by professionals, students and active citizens, aged between 25 and 65 years old, all residents in the city of Salerno. Each team presented its adaptive reuse proposal through a general description of the design concept and, in some cases, an overall evaluation of investments, with an indication of possible sources of financing, costs and possible revenues during the operational phase. The initial phases (1–5) identified an overall preparatory stage which required around 6 months, including the collection and selection of project alternatives from participants to the public Call for ideas.

The 14 alternative proposals initially collected through the Call for ideas were further investigated through a series of participatory co-design workshops organised by the research team<sup>10</sup> (Saleh & Ost, 2023). The workshops aimed to better develop the adaptive reuse alternatives expressed through the Call for ideas, exploring their urban, technical and economic-financial feasibility. The initial evaluation of the 14 alternative adaptive reuse proposals was performed to identify an initial ranking of preferability. To this aim, the TOPSIS method was chosen. As the method required a weight attribution to the objectives (there is a more detailed explanation in the next sub-paragraph), a process of stakeholder involvement was conducted to integrate their perceptions, preferences and needs into the weight to be attributed to the objectives and to the linked criteria. An ad-hoc questionnaire (see Appendix B) was elaborated by the research group and it was administered to local community during the study.

Survey Monkey software was used to formulate the questionnaire, which was administered online in September 2020. 45 diverse categories of local stakeholders were involved: municipal officers, policy makers, representatives of citizens associations, residents in the area, experienced professionals. Through the questionnaire, stakeholders were asked to rank the 10 identified circularity objectives for the adaptive reuse proposals of Edifici Mondo. The stakeholders ranked the objectives from the most important to the least important, assigning a score from 10 to 1, where 10 identifies the most important objective and 1 the least important one.

In order to obtain the weight of each objective, the Simos (1990) approach was used. The highest weights were assigned to cultural objectives such as: Conservation, transmission and regeneration of cultural values (0.135), Enhancement of community awareness and knowledge of cultural heritage values (0.124), Accessibility improvement (0.112). The lowest weights were assigned by the stakeholders to Enhancement of cultural, creative and innovation ecosystem (0.083), Reduction of natural resources consumption (0.080), and Increasing of energy self-sufficiency (0.078). The weight of each objective was assigned also to the relative criteria and consequently to the indicators.

After the identification of a first ranking of preferability of 14 adaptive reuse proposals, a further reflection and co-assessment was activated, focused only on the first four best ranked ideas.

The 4 proposals for the Edifici Mondo were detailed and improved in the Circular Business Model Workshop organised by the research team<sup>11</sup> (Saleh et al., 2020) to better define their economic-financial feasibility. Multicriteria evaluation was performed again to obtain a new ranking of preferability. To further prove the robustness of the obtained results, a sensitivity analysis was carried out, identifying and assessing different 'scenarios': (1) Ecological-social scenario; (2) Ecological-economic scenario; (3) Balanced scenario. From each scenario a different ranking of preferability of projects was obtained. The comparison of all scenarios allowed the identification of crucial features for the success of the adaptive reuse solutions in terms of circularity performance and, consequently, which characteristics of the various alternatives are less vulnerable to change. These characteristics were relevant to co-design and propose a final synthetic project solution which embedded the key features of previously designed projects. This way, the selected adaptive reuse project solutions represent the result of an iterative participatory process including stakeholders in most of all phases (cultural mapping, definition of objectives, objectives prioritization, development of project alternatives and finally interpretation and feedback loop phase), which was able to lead to a satisfying solution and, additionally, to change the preferences and points of view of stakeholders, enabling a process of co-learning and exchange which can be valuable in the perspective of democratic participation and involvement in city development decisions (e.g. policy labs experiments).

The participatory co-design and co-evaluation approach here described was part of the whole Salerno Local Action Plan for the re-use of abandoned and under-utilised cultural heritage in the perspective of circular economy and circular city (Gravagnuolo et al., 2021). With the guidance of CNR-IRISS, the Municipality elaborated the Salerno Local Action Plan through a participatory action between October 2018 and June 20, 21.<sup>12</sup>

The Local Action Plan is a strategic document that contains the description of the current state of use and neglect of Salerno's cultural

<sup>10</sup> Specifically, Horizon 2020 CLIC partners ICHEC and CNR co-organised the co-design workshops in Salerno

<sup>11</sup> Specifically, Horizon 2020 CLIC partners ICHEC and CNR co-organised the co-design workshops in Salerno

<sup>12</sup> For more information see the Deliverable D5.5 "CLIC Pilot Local Action Plans: One Approach, Diverse Outcomes" available at: <https://www.clicproject.eu/wp-content/uploads/2021/05/CLIC-D5.5-CLIC-Pilot-Local-Action-Plans-One-Approach-Diverse-Outcomes.pdf>



heritage, strategic objectives for the adaptive re-use in the perspective of the circular economy and circular city, shared with administration and the local community, and the set of specific actions identified, accompanied by the definition of specific responsibilities, resources, timeframes and indicators for the monitoring, in order to realise the objectives shared by the actors involved in the short, medium and long term.

The Local Action Plan is implemented through a participative process of active involvement of the local community through a series of workshops and meetings initial meetings necessary to define the general framework of the problems and the state of the art of reuse of cultural heritage.

Subsequently, the following must be co-elaborated: the Objectives, specific Actions for the objectives, responsibilities, resources, timelines and monitoring indicators. The Local Action Plan also aims at developing a circular city through circular solutions for the built environment, energy efficiency actions and positive energy balance for both old and new buildings, green infrastructure, connecting the city-port and circular port area, and fostering circular startups and innovative business and financing models. In addition, the aim is to adopt the circular and human-centered city model by converting the underutilised or abandoned cultural assets into a “vital place”, bringing in new visitors and enterprises, and improving the quality of life for locals. Its goals are to create consensus on objectives and strategies, identify priorities for action/intervention, and activate public-private-social synergistic relations for cultural heritage adaptive reuse. It also aims to co-develop and plan concrete actions for the adaptive reuse of abandoned and underused cultural heritage. Actually, the Local Action Plan is already being implemented.

#### 4.1. The choice of TOPSIS method and the multidimensional evaluation framework

Based on the objectives of the evaluation and the type of data available in the diverse phases, the TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) evaluation method was used as it allows to compare alternatives using both quantitative and qualitative data. This aspect is relevant in the adaptive reuse process, as in many cases the initial phases of the evaluation and design can be not well-defined, based on general ‘idea’ which are not yet properly detailed projects. The more the project solutions are defined and quantified, the more quantitative data can be employed in the evaluation, estimating future impacts according to the detailed projects features. However, some impact criteria can remain on a qualitative and more ‘soft’ definition even in advanced design phases, for example considering criteria related to cultural values regeneration, which could include subjective and more ‘fuzzy’ considerations compared to other quantifiable criteria and indicators related to specific environmental impacts or economic performances.

TOPSIS is a MCDA method used in different fields of scientific research to support decision-makers between different alternatives of specific projects (Assari, 2012). There are five calculation steps that compose the TOPSIS method (Ishizaka & Nemery, 2013). After identifying the criteria of the evaluation framework (and possibly the indicators), the first stage consists of evaluating the performance of the alternatives according to the different criteria by assigning a numerical value to the criteria, which may express either quantitative or qualitative data. The second stage involves normalising this performance and assigning weights to each indicator. The matrix of weights is then normalised by multiplying the normalised scores by the corresponding weights to make the numerical values comparable on a common scale. In the fourth step, the distances to an ideal and anti-ideal point are calculated, using the Euclidean distance (Fig. 4). TOPSIS is based on the concept that the chosen alternative should have the shortest Euclidean distance from the positive ideal solution and the longest Euclidean distance from the negative ideal solution (Yoon, 1980). The positive ideal solution is defined as the sum of all the best values that can be reached for each attribute, while the negative ideal solution consists of all the worst values reached for any attribute (Rahim et al., 2017). Finally, the proximity coefficient of each action is calculated. It is always between 0 and 1, where 1 is the preferred action. If an action is closer to the ideal than to the anti-ideal, then the proximity coefficient approaches 1, vice versa it approaches 0. Based on the comparison of the relative distance, an alternative priority can be defined.

This method is used in the decision-making process because its concept is simple, easy to understand, efficient and can measure the relative performance of the alternatives through criteria and indicators (Kabir & Hasin, 2012).

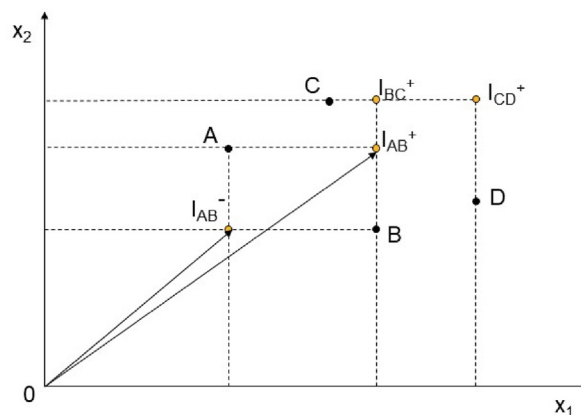


Figure-4. Euclidean distance both from the positive and the negative ideal solution. (Authors elaboration of Balioti et al., 2018).

Since 1983, [Carlsson and Zeleny \(1983\)](#) highlighted that TOPSIS is used for four main reasons about the rationality and the understandability of its logic, the simplicity of its calculation processes thanks to the use of matrices managed in excel sheets, the possibility of identifying the best alternatives for each criterion, represented in a simple mathematical form and, finally, the integration of weights in the comparison procedures. Furthermore, assuming the criteria defined in [De Montis et al. \(2004\)](#) to compare different MCDA methods, the TOPSIS method was chosen as it allows the assignment of cardinal weights, the procedure for finding the solution results in a comprehensive ranking, it allows stakeholder participation through the assignment of weights, it can be applied to different scales and it uses both qualitative and quantitative data. [Roszkowska \(2011\)](#) argues that an extension of the TOPSIS technique can be used to solve many real-world theoretical problems because it is not based on a complex algorithm. Recently, also [Pinzon Amorcho & Hartmann \(2022\)](#) highlighted the characteristic TOPSIS in keeping the number of steps unchanged regardless of the size of the problem. Particularly in the case of reuse projects, this is an advantage as new alternatives may arise to be integrated during the decision-making process.

In the first stage of the evaluation, criteria and indicators related to the circularity objectives of cultural heritage adaptive reuse were identified, according to the three main dimensions explained in previous section 3. The set of indicators for the specific case study of Edifici Mondo in Salerno was selected from the framework of indicators deduced from previous CLIC publications ([Bosone et al., 2021](#); [Gravagnuolo & Fusco Girard, 2021](#)) and was identified by the research team based on context specificity and data availability. In particular, for the evaluation of the Edifici Mondo reuse proposals the research team used only 20, selected on the basis of both the greater ease of retrieval of some data and evaluation of proposals compared to the information received during the consultation and design, and considering their significance for the assessment of impacts in the four dimensions (cultural, social, economic and environmental) and with reference to the three circularity dimensions of the tripod model (regenerative, generative and symbiotic capacity). Circularity objectives, criteria and indicators for cultural heritage adaptive reuse were further detailed and organised. The final operational framework consisted of 10 objectives, 18 criteria and 20 indicators ([Table 1](#)).

These indicators support a multidimensional analysis: economic-financial indicators are necessary to assess the financial viability and self-sustainability of the proposed adaptive reuse intervention, linking to the sustainable business model of the specific solutions assessed; environmental indicators are used to promote closed cycles of energy, materials, water in material cultural heritage, and avoid environmental costs such as soil consumption, biodiversity loss, pollution, greenhouse gases emission; social indicators set social goals and targets and estimate the social impacts of alternative interventions, such as citizens and people inclusion, new opportunities for cultural participation, access to social services, increased well-being and quality of life; cultural indicators are related to the conservation, regeneration and transmission of cultural heritage values, both tangible and intangible.

Selected indicators can be expressed also qualitatively, especially in the early stages of the adaptive reuse process, where 'ideas' are developed and evaluated. In this case, co-evaluation within participatory workshops/co-design environments can be extremely relevant as it stimulates reflection, adaptation and creativity of stakeholders and professionals co-developing innovative solutions, enhancing the initial ideas towards more defined adaptive reuse solutions which tend to better satisfy the evaluation criteria at each iteration. Thus, in this phase quantitative indicators can be less than qualitative ones, as they need to indicate a 'direction', instead than evaluating a well-defined project. The more the adaptive reuse process is advanced, the more quantitative indicators can be used, substituting initial qualitative judgements by means of more precise data. This process may require more time compared to traditional adaptive reuse processes implementation; however, it can potentially lead to higher acceptability of the resulting projects involving diverse stakeholders, especially in the case of complex interventions which impact the quality of life and emotions of citizens, linked to the specific cultural heritage site. This is the case of Edifici Mondo in Salerno, which are at the centre of public attention due to their particular significance in the citizens' imaginary. The identification of a solution able to satisfy all criteria as near as possible to the 'ideal' adaptive reuse project, and engaging different stakeholders in co-design and co-evaluation, can substantially support public and private owners to avoid processes of contestation because the proposed solutions come from a collective reflection and agreement on the new uses. Clearly, conflicts management needs to be addressed in any case, however the process of co-evaluation and integration of stakeholder preferences through weighted criteria can help to reduce risks related to social acceptance of the solutions. Moreover, the attention at environmental and financial viability since the start of the process can help to reduce other risks in the realisation and operation phase, ensuring long-term use of the recovered buildings.

## 5. Results

### 5.1. Evaluation of 14 project alternatives through TOPSIS method

After identifying the weights assigned to objectives, evaluation criteria and indicators, an initial evaluation and ranking of the 14 adaptive reuse proposals was carried out using the TOPSIS method.

The 14 proposals collected through the Call for ideas in Salerno were the following:

- A. *Hotel Complex 'Plajum Montis'*: hotel and accommodation facility that pursues the objectives of adaptive reuse of cultural heritage in the perspective of a circular economy.
- B. *SALERNO (re)STARTS*: widespread hotel to regenerate the historic centre for the development of tourism and youth entrepreneurship to overcome the tourism seasonality through activities such as residences and offices, co-working spaces and a student residence.
- C. *Reggia di Salerno*: cultural hub and museum capable of creating synergies with local stakeholders to develop a cultural and educational institution aimed at rediscovering the traditional values of handicrafts and typical local products.

**Table 1**

–The 10 objectives, 18 criteria and 20 indicators defined for the evaluation of the alternative projects for the adaptive reuse of the Edifici Mondo.

Dimensions	Objectives	Criteria	Indicators	Evaluation scales		
Regenerative dimension	1 Conservation, transmission and regeneration of cultural values	1.1 Adaptive reuse of cultural heritage	1.1.1 Degree of compatibility of the new uses with attributes and values of cultural heritage	Ordinal (five points scale)		
		1.2 Financial self-sustainability	1.2.1 Net Present Value	Cardinal (Euros)		
			1.2.2 Internal Rate of Return	Cardinal (percentage)		
	2 Enhancement of community awareness and knowledge of cultural heritage values	2.1 Engagement of local community		1.2.3 Payback period	Cardinal (no. of years)	
			2.1.1 Propensity to engage residents and visitors in awareness raising activities	Ordinal (five points scale)		
		3.1 Recovery and re-interpretation of local intangible cultural heritage	3.1.1 Capacity of implementing activities linked to the Salerno Medical School tradition			Ordinal (five points scale)
	4 Strengthening of social capital	4.1 Social inclusion	4.1.1 Degree of diversity of community groups involved as users	Cardinal (percentage)		
		4.2 Neighbourhood vibrancy	4.2.1 Level of integration of neighbourhood activities and proximity shops in the area	Ordinal (five points scale)		
			4.3 Stakeholder engagement	4.3.1 Degree of diversity of stakeholders involved as co-producers of services	Cardinal (percentage)	
Generative dimension	5 Enhancement of local entrepreneurial ecosystem	5.1 Job creation	5.1.1 Number of jobs directly generated by the new uses	Cardinal (no. of jobs)		
		5.2 Activation of local co-investments	5.2.1 Level of local co-investment leveraged	Ordinal (five points scale)		
	6 Enhancement of cultural, creative and innovation ecosystem	6.1 Cultural vibrancy and innovation ecosystem	6.1.1 Capacity of generating in the area new cultural, creative and innovative activities due to the adaptive reuse	Ordinal (five points scale)		
		6.2 Traditional skills	6.2.1 Propensity to involve artisans and craftsmen with traditional skills in the adaptive reuse works	Ordinal (five points scale)		
	7 Accessibility improvement	7.1 Accessibility of the urban area	7.1.1 Level of provision of public spaces recovered and made accessible	Ordinal (five points scale)		
	Symbiotic dimension	8 Increasing of energy self-sufficiency	8.1 Energy self-sufficiency	8.1.1 Degree of energy self-sufficiency through the use of renewable sources	Ordinal (five points scale)	
			9 Reduction of natural resources consumption	9.1 Freshwater efficiency	9.1.1 Propensity to the reduction of freshwater consumption through water recovery and reuse	Ordinal (five points scale)
9.2 Nature-based solutions		9.2.1 Surfaces covered with nature-based solutions		Cardinal (square metres)		
9.3 Construction and demolition wastes		9.3.1 Level of construction and demolition wastes avoided through the reuse of materials on site		Ordinal (five points scale)		
10 Natural capital regeneration		10.1 Urban biodiversity	9.4 Greenhouse gas emissions	9.4.1 Level of greenhouse gas emissions in the operation phase compared to the average emissions of the buildings in the same area	Ordinal (five points scale)	
	10.1.1 Surface of new and recovered green urban areas		Cardinal (square metres)			

D. *The identity between tradition and innovation*: integrated redevelopment of the buildings for cultural purposes through a research and vocational training centre for the management of cultural heritage and the enhancement of sustainable tourism, a museum centre, a centre for artistic and cultural activities, and a centre for the promotion of agrifood excellence linked to the Mediterranean Diet.

E. *Solidarity condominium*: a social housing project based on the culture of solidarity, brotherhood, and mutual respect with the aim of intensifying relations between the public and private sectors by strengthening the relationship with the neighbourhood.

F. *Hippocratica Hills Health Heritage Hub*: a centre of excellence dedicated to research and experimentation in the field of health and wellbeing in the tradition of the Salerno Medical School.

- G. *Academy ASSE3-T - Academy for the Environment and the Empathetic-Ethical-Ecological Economic Sustainable Development of the Territory*: a campus providing continuous training, work strategies, innovative and sustainable services for local stakeholders.
- H. *Tourism Learning Based*: experiential tourism centre based on a bottom-up regeneration process carried out by citizens and local businesses for the valorisation of typical products and traditional crafts.
- I. *School hotel*: advanced training project in tourism that promotes accommodation, educational, catering and territorial promotion activities in a school-hotel project.
- J. *Discreet interventions for the reactivation of 'Edifici Mondo'*: small-scale interventions that generate a new culture by setting up a socio-cultural centre with spaces for exhibitions, musical and artistic performances, workshops for handicrafts, student residences, and a botanical research centre.
- K. *The Awakening of the Senses*: an innovative and technological museum for the establishment of both an experiential archive of places and cultural exchanges.
- L. *The house of music*: the project aims at promoting strategies for the reuse of cultural, natural, social and economic resources by rethinking cultural heritage as a creative system where music is the main activity.
- M. *Water paths*: hub for the cultural, social and economic regeneration of Salerno historic centre. The project envisages a thermal centre powered by geothermal systems, an academy for architects with a student residence, a hotel, and green paths with botanical gardens providing also a sustainable mobility system.
- N. *Creative reuse of abandoned buildings under an artistic key*: a centre for artistic and cultural activities, training courses and workshops, artist residencies, events and music festivals.

Taking into account the general description of the design concept, the evaluation was based on qualitative scores which were assigned only to the evaluation criteria using a five-point scale (5 = very high performance; 4 = high performance; 3 = medium performance; 2 = low performance; 1 = very low performance). Using the TOPSIS method two opposite matrices were identified: the positive matrix and the negative matrix. These matrices are used to find, for each criterion, the minimum and the maximum value to minimise the Euclidean distance from the positive ideal solution and maximise the distance from the negative ideal solution. In this way, the ranking of preferability (Table 2) is obtained, in which the alternatives are ordered according to their relative proximity to the ideal solution. The alternative with the highest value is the preferable one as it has the greatest relative proximity to the ideal solution.

The ranking shows in first position the Water paths alternative with a relative closeness to the ideal solution of 0.880. In last position there is SALERNO (re)STARTS with a score of 0.224. This ranking is the result of the qualitative assessment with soft data processed on the three dimensions of circularity with the respective criteria and indicators.

## 5.2. Evaluation of four project solutions through the TOPSIS method and a new ranking of preferability

Starting from the first evaluation of the 14 alternatives, a further involvement of stakeholders was activated to discuss and analyse the results emerging from the ranking of preferability. As a result of this phase, the teams of Hippocratica Hills and Water paths considered that their proposals were very similar and complementary in several aspects and therefore decided to join in a single group.

Four synthetic projects were co-developed during the co-design workshops conducted in Salerno:

1. Water paths (merged with) Hippocratica Hills Health Heritage Hub.
2. Identity between tradition and innovation.
3. House of music.
4. Solidarity condominium Hippocratica Civitas.

After detailing and improving the four proposals, the TOPSIS method was used again to obtain a new ranking of preferability

**Table 2**  
Ranking of preferability of 14 adaptive reuse proposals through the TOPSIS method.

Alternative proposals	Value	Position
A. Hotel Complex 'Plajum Montis'	0.318	11
B. SALERNO (re)STARTS	0.224	14
C. Reggia di Salerno	0.376	10
D. The identity between tradition and innovation	0.752	3
E. Solidarity condominium	0.606	5
F. Hippocratica Hills Health Heritage Hub	0.849	2
G. Academy ASSE3-T - Academy for the Environment and the Empathetic-Ethical-Ecological-Economic Sustainable Development of the Territory	0.446	9
H. Tourism Learning Based	0.447	8
I. School hotel	0.231	13
J. Discreet interventions for the reactivation of 'Edifici Mondo'	0.498	6
K. The Awakening of the Senses	0.294	12
L. The house of music	0.644	4
M. Water paths	0.880	1
N. Creative reuse of abandoned buildings under an artistic key	0.481	7



considering the four alternatives, evaluated according to the same weighted objectives, criteria and indicators.

In this evaluation, thanks to the more detailed information provided through the co-design workshops, both qualitative and quantitative indicators were used (the data of the four proposals are fully reported in the [Appendix C](#)). Qualitative indicators were expressed using a five-point scale, while quantitative indicators were expressed through diverse units of measure.

In the same way of the initial evaluation of 14 proposals, also the ranking of preferability of the four alternatives ([Table 3](#)) was obtained considering their relative proximity to the ideal solution. The alternative with the greatest relative proximity (the highest value) to the ideal solution is preferred.

Hippocratica Hills and Water Paths resulted the preferable solution (value 0.764) as it was capable of attracting entrepreneurial, training and social activities in the medical, pharmaceutical and wellness sectors, enhancing the tangible and intangible cultural heritage of the Salerno ancient Medical School.

The identity between tradition and innovation was in second position (value 0.512), aimed at involving the productive fabric of the entire province of Salerno also in relation to agri-food and the Mediterranean Diet.

House of Music resulted the third preferable solution (value 0.347), as it aimed to stimulate local and international cultural productions and make Salerno a regional/national cultural attraction.

Finally, Solidarity Condominium promoted sociality, health and intergenerational well-being, however its contribution to the overall circularity objectives was lower (value 0.181).

As a final sensitiveness check of the results, the ranking obtained was further tested through a scenario evaluation based on a different weight of criteria and indicators according to predefined scenarios.

### 5.3. Scenario evaluation through TOPSIS method: sensitivity analysis

[Demir et al. \(2023\)](#) argue that sensitivity analysis is widely recognised as a fundamental component of Multi-Criteria Decision Methods as it is useful for assessing whether and how the outputs of a decision model are influenced by variations in input parameters due to various factors, such as, for example, subjective judgements, cognitive biases and measurement errors. Sensitivity analysis enables decision-makers to obtain more robust results as it allows them to identify the most influential variables, identifying aspects of model robustness or weakness.

Because it is problem-oriented and not model-oriented, it can provide different results for different impact assessments using different assumptions and data but the same models.

The European Commission, in its 'Better regulation' toolbox ([European Commission, 2023](#)), defines six basic steps to perform a comprehensive uncertainty and sensitivity analysis. The first is to define the variables of interest for the analysis that include the most relevant aspects for impact assessment. The second step is to identify which variables in the model are affected by uncertainty, possibly consulting experts and stakeholders. The third step is to assign a probability distribution for each selected input from all available information, based on objective data and expert opinion. In the fourth step, a sample is identified from the previously defined probability distributions. The sample is represented by a matrix that specifies the input values to be used each time the model is run. In the fifth step, the model run is repeated several times, recording the value of the output variables of interest for each run. Finally, the results are used to estimate the sensitivity indices and uncertainty of the model output.

In this study, to test the robustness of the obtained results, the sensitivity analysis was carried out by altering the weight of certain objectives and observing the effects in terms of different ranking of preferability. By modifying the weights attributed to the different project objectives, it is possible to assess different 'scenarios' and repeat the multi-criteria evaluation of the project alternatives for each of them.

For the case study of 'Edifici Mondo', three different scenarios were developed:

- 1) Ecological-social scenario (social objectives highly ranked)
- 2) Ecological-economic scenario (economic objectives highly ranked)
- 3) Balanced scenario (all objectives equally ranked)

A further and final evaluation by means of the TOPSIS tool was performed, varying the weights attributed to the objectives in order to elaborate three different orders of preference, outlining three respective project scenarios ([Fig. 5](#)).

In the Ecological-Social scenario, the greatest weight (70% of the total) was given to indicators characterised by a socio-cultural component, while the other more specifically economic criteria were given a lower score (30%). [Table 4](#) shows the values resulting from the evaluation and thus the preferability ranking of the four alternative proposals in the Ecological-Social scenario.

**Table 3**

Ranking of preferability of four proposals through the TOPSIS method.

RELATIVE PROXIMITY TO THE IDEAL SOLUTION			
Solidarity Condominium	The identity between tradition and innovation	House of Music	Hippocratica Hills and Water Paths
value	value	value	value
<b>0.181</b>	<b>0.512</b>	<b>0.347</b>	<b>0.764</b>
position	position	position	position
<b>5</b>	<b>2</b>	<b>3</b>	<b>1</b>

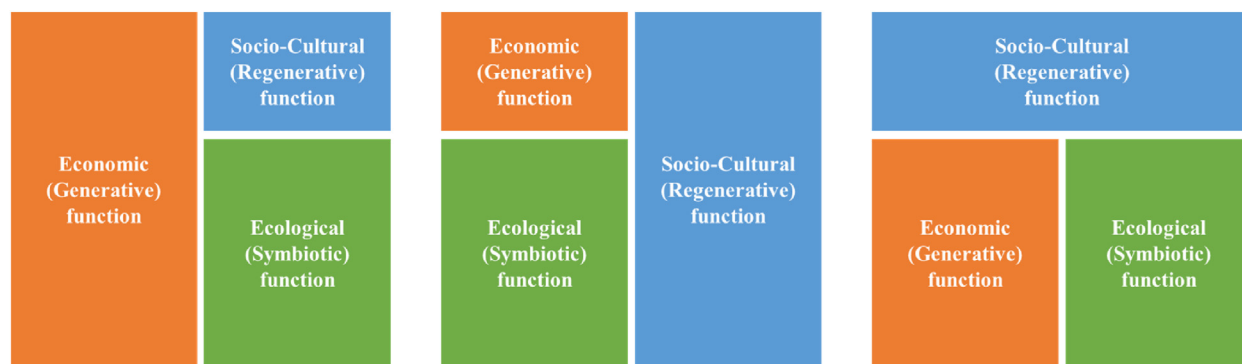


Fig. 5. Different weights in the three project scenarios.

Table 4

Preferability ranking of four proposals in the three project scenarios.

	RELATIVE PROXIMITY TO THE IDEAL SOLUTION					
	Ecological-Social scenario		Ecological-Economic scenario		Balanced scenario	
	Value	Position	Value	Position	Value	Position
Solidarity Condominium	0.145	4	0.190	4	0.176	4
The identity between tradition and innovation	0.416	2	0.426	2	0.527	2
House of Music	0.270	3	0.394	3	0.326	3
Hippocratica Hills and Water Paths	0.791	1	0.710	1	0.779	1

In the Ecological-Economic scenario, the highest score of 70% was given to the group of indicators characterised by an economic component, while those of a socio-cultural nature were given the lowest score of 30%.

Finally, in the Balanced scenario, equal weight was given to environmental, socio-cultural and economic indicators. In the balanced scenario, equal weight and therefore equal importance was given to all qualitative and quantitative indicators used in the evaluation of the project alternatives. All indicators were given a score of 0.1, as there were 10 objectives.

The results of the last evaluation based on simulated alternative scenarios showed that despite the change in the weights assigned to the indicators, the preferability ranking does not change. This demonstrates the consistency and robustness of the results. This confirms that, excluding the influence of the weights on the importance attributed to the various indicators, the preferable design alternatives present a heterogeneous but balanced functional mix, in which the new uses/functions are organized according to a systemic logic that guarantees their complementarity.

In Italy, with the approval of the National Recovery and Resilience Plan, several calls for tenders were published in 2021, by Ministries and Regions, to finance interventions consistent with the National Plan's programmatic lines.

Within these opportunities, the Municipality of Salerno participated in two public notices in order to find the necessary financial resources for the recovery and reconversion of Edificio Mondo.

The proposals were developed on the basis of the innovative ideas that emerged, as a contribution of active citizenship, from the Public Consultation and subsequent co-design workshop promoted by the Authority in collaboration with the CNR within the framework of the CLIC HORIZON 2020 project, and envisage, through an overall programme of enhancement of the convents, the implementation of socially relevant and complementary functions such as co-housing for the elderly, young couples and students, coworking, training, research and business incubator activities. Specifically, the organisation has applied to the National Innovative Programme for Housing Quality of the Ministry of Infrastructure and Transport, the project proposal for the renovation and enhancement of the Santa Maria della Consolazione convent. The proposal was considered suitable for funding amounting to 8 million euros.

The second call for bids in which the organisation took part concerned the Cohesion Agency's notice for the financing of site redevelopment projects for the creation of innovation ecosystems in southern Italy, for which the project proposal for the recovery and valorisation of the former Convent of San Francesco and the former Convent of San Pietro a Maiella and San Giacomo. The proposal was admitted to the second negotiated phase of the notice, but was not funded in the final phase.

At local level, the Edificio Mondo are included in the fundings provided in PICS – Integrated Sustainable City Programme.

The merit of the CLIC project was to systemise the human and social resources already existing in the area: in fact, some associations and non-profit organisations operated locally but autonomously and independently. Thanks to the awareness-raising, dissemination and co-designing activities carried out by the project, all these realities got to know each other, recognising common goals and visions and establishing a dialogue, at times even conflictual, that favoured the activation of a network. The CLIC project also played the important role of moderator between the interests of the institutions and those of the citizens, helping to improve their sense of trust in the institutions and fostering the activation of a dialogue based on transparent decision-making and confrontation. On the other hand, the

institutions recognised a role of responsibility for the research team, acknowledging the validity and importance of the proposed vision to make Salerno a circular city. This has fostered greater openness on the part of the institutions towards the activation of innovative initiatives aimed at listening to the needs of the local community, encouraging its broader participation in the decision-making process as a starting point for the elaboration of proposals for the regeneration and reuse of the local cultural heritage.

## 6. Discussion of the results

Results shows the potential of Multi-Criteria Decision Analysis (MCDA) to support decisions for circular adaptive reuse of the pilot case, leading to the development of a circular urban regeneration project based on the recovery of a unique tangible and intangible cultural heritage of the city. As supported by [Cerreta and De Toro \(2012\)](#), this work demonstrates how evaluation can be considered relevant to construct choices, to recognize values, interests and needs, and to explore the different factors that may influence decisions. The paper tests the validity of the method on a specific case study, the Mondo Buildings, selected through a participatory process within the area of the municipality of Salerno, partner of the CLIC project. This confirms the thesis of [De Montis et al. \(2004\)](#), involving stakeholders and local communities in decision-making processes to ensure that choices are aligned with their preferences and needs. The results of this process also demonstrate what was supported by [Bentivegna \(1995\)](#) on the need to promote transparency in decision-making through the involvement of different stakeholders.

By involving the community in the evaluation of the reuse of Mondo Buildings, it was possible to achieve a dynamic, co-evolutionary approach that considered the preferences of the stakeholders involved. In this way, the evaluation allowed to transform the abandoned cultural heritage into a driver of sustainable development because it was able to evaluate circular and sustainable choices that integrate the community with the regeneration of the territory and its urban voids. In fact, involving the community in the evaluation process from the perspective of the circular economy was how to stitch together a complex territorial context, rich in values, traditions, history and cultural identity, making the environmental, social and economic dimensions interact in a holistic and sustainable vision. The method used a system of criteria and indicators selected from previous studies ([Bosone et al., 2021](#)) that bring out the research gap. The adaptive reuse of cultural heritage can be a sustainable strategy for heritage conservation. However, heritage conservation requires large investments, while available resources are scarce and investment projects are subject to high uncertainties. Therefore, a careful assessment of impacts is needed to guide and steer adaptive reuse projects towards sustainability. Recent studies consider the adaptive reuse of abandoned buildings and sites as an effective circular economy strategy. However, there is a lack of evaluation tools to assess impacts and guide adaptive reuse interventions towards circularity. Although some indicators are available, many aspects of circularity are not considered in current studies on the impacts of heritage reuse. This paper instead tests an ex-ante evaluation methodology to support participatory decision-making processes for the adaptive reuse of cultural heritage according to the circular economy perspective, taking into account multiple evaluation criteria.

The results of the evaluation framework tested for the case of Salerno also show that sectoral frameworks referring only to a few, although significant, dimensions are not able to capture the complexity of reuse interventions from the perspective of circularity. This is why it is useful to consider the aspects underlined by [Dabbene et al. \(2022\)](#) who proposed a series of indicators to evaluate the quality of adaptive reuse interventions for cultural heritage, in terms of improved well-being and the need to design interventions on existing architecture in line with the guidelines of restoration theory. Or it is useful to consider the evidence of environmental benefits of building adaptation and retrofit, in terms of significant reductions in energy consumption and associated greenhouse gas emissions through the use of innovative technologies and materials as argued by [Foster and Kreinin \(2020\)](#). But all these sectoral aspects are brought together with the TOPSIS method in order to achieve a multi-criteria assessment that holds together multiple interconnected dimensions.

The method considers a framework of qualitative and quantitative indicators to assess the impacts of heritage reuse projects. A critical aspect that emerges from the results of the evaluation is that it is not easy to integrate some hard-to-find data such as CO<sub>2</sub>, greenhouse gas (GHG) emissions or energy self-sufficiency, which as pointed out by [Assefa and Ambler \(2017\)](#), can be assessed through the Life Cycle Assessment (LCA). This tool, however, is not integrated in the TOPSIS method. In this case, some environmental information was calculated using soft data. Therefore, it would be desirable to hybridise LCA in the circularity assessments of adaptive reuse projects. Furthermore, the Green Building Council (GBC) protocol has emerged as a means of assessing and certifying the sustainability of heritage reuse projects and could be an excellent tool to integrate into the circularity assessments of heritage reuse projects. In this way, the method would be enriched with tools for hard evaluation.

Finally, Munda's (1995) thesis that in multi-criteria problems, it is generally not possible to find a solution that optimises all criteria at the same time, leading to the need for compromise solutions, is confirmed. The TOPSIS method searches for the solution that comes closest to the ideal one but takes into account the preferences of the stakeholders involved in the evaluation process by assigning weights to the objectives. It optimises the results through the most satisfactory solution from the perspective of the circular economy for the interests of the community and all stakeholders involved.

## 7. Conclusion

This paper addresses the adaptive reuse of cultural heritage from a circular economy perspective, identifying and testing a participative methodology and specific multi-criteria assessment tools for the evaluation of alternative adaptive reuse solutions in the case study of four abandoned historic buildings in Salerno, Italy. By reviewing the existing literature on cultural heritage adaptive reuse in

relation with multi-criteria and participative evaluation tools, as well as with the circular economy, this work filled an existing gap in knowledge on operational evaluation tools for “circular” adaptive reuse of cultural heritage, identifying specific circularity criteria and indicators for the adaptive reuse of the four historic buildings in Salerno, and exploring how the multi-attribute utility theory can be integrated within a participative methodology to foster co-creation and co-evaluation processes. Considering that the adaptive reuse of cultural heritage impacts on communities' quality of life and wellbeing, this study explored how local communities can become active participants in the decision-making process, exploiting the specific TOPSIS evaluation method to identify the preferable solutions between diverse alternatives, according to stakeholders' preferences expressed through the evaluation of circularity criteria.

Differently from existing methodologies and tools, which are based on a single-stage, mostly top-down expert evaluation, the evaluation process proposed in this study was conceived as an iterative and interactive process in which the outcomes of each step are used as material for comparison and brainstorming with the stakeholders involved. Here, private sector, public sector and third sector are considered as main stakeholder categories to be involved in the evaluation of heritage projects, and the evaluation process proposed stressed the dynamic features of the adaptive reuse project: participatory, processual and co-evolutionary.

In addition to being the ‘producers of contents’, stakeholders are also the receivers of projects outcomes and are involved in their verification and validation. Therefore, this evaluation approach is not a single-stage process, that is limited to identification of the ‘satisfying solution’, but it is a dynamic process, in which continuous (‘circular’) feedback mechanisms allow the re-assessment of uncertainties and evolving preferences at successive stages of development, from idea to detailed solution development (Fig. 6).

Starting from the results of the first stages, and proceeding through iterative evaluations, it was possible to identify a mix of functions for the abandoned historic buildings capable of representing a ‘satisfying solution’, i.e the solution that is rated ‘good enough’ considering the available information and evolving goals at each stage of the evaluation process, rather than the solution able to optimise all pre-defined criteria (Simon, 1959). Through the scenario simulation, it was possible to classify and reorganise the project proposals, changing uses based on evaluation feedbacks.

The projects initially proposed were progressively reshaped according to their similarity, integrability and complementarity, in order to facilitate the elaboration of the synthetic final proposal. The evaluation process was iterative and interactive and was able to enhance decision-making and participatory co-design through continuous and circular feedback mechanisms.

The ‘ideal’ project of adaptive reuse, and thus the main goal of reuse and regeneration, is to transform a ‘dead’ site into a ‘living system’ (Fusco Girard, 2020), to be managed as a living organism, ‘capable of continuous adaptation to a changing/dynamic context, through learning, re-organizing, repairing, self-regulating, and therefore capable of resilience’.

In the case of Salerno historic buildings, the ‘ideal’ project of adaptive reuse was identified through an evolutionary approach able to combine and recombine intrinsic (non-instrumental) and instrumental values through participatory approaches.

This approach stimulates a process of capacity building in which the traditional cultural difference between the ‘educating’ subject and the ‘educated’ subject is overcome. Through the dynamic co-evaluation experimented, everyone contributed to increase his know-how through cultural exchange and open discussion. Thus, evaluation becomes a proactive process which engages all stakeholders involved, assuming an educational function not only because it improves their knowledge and increases their awareness, but also because it influences their willingness to adopt collaborative attitudes within a medium-long term vision. Moreover, the co-production of collective knowledge contributes to strengthening stakeholder awareness of their self-organisation capacities and the importance of their role in decision-making processes.

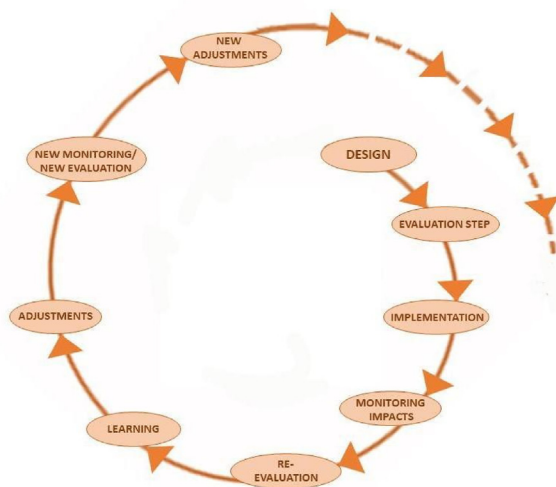


Fig. 6. The co-evaluation process for the identification of ‘satisfying solution’. Source (Fusco Girard, 2021a).



Therefore, rather than pursuing a final ‘perfect’ solution, this methodological proposal aims at actively engaging stakeholders and enhancing their knowledge, dialogue and collaboration capacity during the whole process. It was assumed a critical and evolutionary approach that always questions the type and importance (weight) of variables of the evaluation (criteria) according to the priorities established through feedback loops by the stakeholders involved.

Considering the state-of-the-art of evaluation methods and processes for cultural heritage adaptive reuse, the methodology proposed in this paper emphasises the dynamic and participatory evaluation that co-evolves with the emerging and evolving needs expressed by the actors involved in the process.

The novelty of this study is represented by the capacity of using multi-criteria evaluation tools within a participative methodology not only to choose the “best” alternative according to pre-defined criteria, but also to support a co-design process in which circularity criteria were discussed to guide and orient new creative adaptive reuse solutions, based on the dynamic co-evaluation phases. Limitations of this study need to be highlighted as the number and diversity of participants in the co-evaluation phases was limited due to timing and practical constraints. The representativeness of the sample of participants in the study remains limited, however the methodology and tools experimented can be considered valid in a real-setting test environment. It is plausible that, after an experimental phase, this method could potentially become a protocol and even a standard for reuse and regeneration of cultural heritage in the circularity perspective. Public and private owners and managers of cultural heritage buildings could implement the proposed methodology and evaluation tools to ensure public participation and social acceptability of the adaptive reuse solutions, reducing risks related to social conflict and diverging interests of stakeholders’ groups, as cultural heritage often represents a sensitive issue. However, the applicability could be limited due to the need of specific skills for the facilitation of participative processes and use of multi-criteria evaluation tools such as TOPSIS. This suggests the need of further research to validate the methodology in different contexts and with diverse heritage typologies, towards more specific policy recommendations to support engagement and inclusiveness in cultural heritage adaptive reuse within the circular economy perspective.

### Authors’ contribution

Conceptualisation, A.G. and L.F.G.; methodology, A.G. L.F.G.; and P.D.T.; formal analysis, M.B., F.B. and P.D.T; investigation, A.G. M.A., M.B., F.B. and P.D.T; resources, A.G. and M.B.; data curation, A.G., M.A., F.B. M.A. and P.D.T; writing—original draft preparation, A.G., M.A., M.B. and F.B. writing—review and editing, A.G. and M.B. and P.D.T; visualisation, A.G., P.D.T. and L.F.G.; supervision, A.G., P.D.T. and L.F.G.; project administration, L.F.G. and A.G.; funding acquisition, L.F.G. and A.G.; All authors have read and agreed to the published version of the manuscript.

### Funding

This research was funded under the framework of Horizon 2020 research project CLIC: Circular models Leveraging Investments in Cultural heritage adaptive reuse. This project received funding from the European Union’s Horizon 2020 research and innovation program under Grant Agreement No 776758.

### Informed consent statement

Not applicable.

### Data availability statement

Data sharing is not applicable to this article.

### Declaration of competing interest

None.

## APPENDIX A



Unione Europea



## CONSULTAZIONE PUBBLICA FINALIZZATA ALLA RACCOLTA DI PROPOSTE PER IL RIUSO ADATTIVO DEGLI “EDIFICI MONDO” NELLA PROSPETTIVA DELL’ECONOMIA CIRCOLARE

### Art. 1. – Oggetto

Gli “Edifici Mondo”, oggetto del presente avviso, sono rappresentati dai seguenti immobili:

1. Convento S. Pietro a Maiella e S. Giacomo, via S. Antonio
2. Convento Santa Maria della Consolazione, via S. Maria della Consolazione
3. Convento San Francesco, via S. Antonio
4. Palazzo San Massimo, via San Massimo

Il Comune di Salerno intende promuovere una consultazione pubblica al fine di coinvolgere tutti i soggetti interessati nell’individuazione delle attività di valorizzazione degli Edifici Mondo situati nel centro storico alto della città di Salerno (di seguito definiti anche come “intervento”), di proprietà del Comune (Palazzo S. Massimo) e dello Stato ( Convento S. Pietro a Maiella e S. Giacomo, Convento Santa Maria della Consolazione, Convento San Francesco), ad oggi inutilizzati.

La consultazione pubblica è intesa come sperimentazione operativa nell’ambito del progetto europeo di ricerca e innovazione Horizon 2020 “CLIC – Circular models Leveraging Investments in Cultural heritage adaptive reuse” ([www.clicproject.eu](http://www.clicproject.eu)).

Alla luce di quanto sopra, la consultazione pubblica contribuisce innanzitutto all’individuazione delle necessità percepite dalla comunità locale e fornisce l’occasione per esprimere idee, punti di vista, opinioni e proposte. La consultazione pubblica è occasione di ricerca con i soggetti interessati delle migliori proposte di riuso adattivo e quindi di valorizzazione dei beni pubblici. A tale scopo, la consultazione si inquadra come sperimentazione di un possibile strumento di governance da includere nel *Regolamento per la gestione condivisa del patrimonio culturale come “bene comune”*, attualmente in via di predisposizione nell’ambito del progetto Horizon 2020 CLIC – “Piano di Azione Locale per il riuso adattivo del patrimonio culturale nella prospettiva del modello di economia circolare e città circolare”, e che vedrà la possibilità di proposte di riuso da parte di soggetti singoli o associati, anche di tipo privato (imprese, fondazioni, cooperative, associazioni, singoli cittadini, ecc.).

### Art. 2. – Finalità

La presente consultazione è finalizzata ad avviare un confronto qualificato e costruttivo con tutti i Soggetti interessati ad intervenire o contribuire, direttamente o indirettamente, alla realizzazione dell’intervento in oggetto, acquisendo proposte di riuso adattivo che possano indirizzare la valorizzazione. La documentazione acquisita, la qualità, la quantità e l’articolazione delle ipotesi gestionali proposte potranno costituire elementi di orientamento per i successivi percorsi procedurali di valorizzazione.

Le proposte pervenute in conseguenza della presente consultazione pubblica non saranno in alcun modo vincolanti per il Comune di Salerno ed i Soggetti partecipanti non matureranno alcuna posizione di vantaggio, di prelazione o di altro tipo di diritto in relazione alle future scelte.

È prevista l'attribuzione di un punteggio al fine di definire un elenco di proposte idonee. La qualificazione di proposta idonea consentirà al Soggetto Proponente la presentazione della propria proposta al successivo Workshop di co-progettazione del progetto Horizon 2020 CLIC per l'individuazione di possibili modelli di riuso adattivo e gestione degli Edifici Mondo.

Si tenga conto che l'idea di riuso adattivo presentata dovrà necessariamente rispettare il modello di economia circolare così come definito nei successivi punti 2.1 (obiettivi del riuso circolare) e 2.2 (impatti del riuso circolare).

#### *2.1 – Obiettivi del riuso adattivo del patrimonio culturale nella prospettiva dell'economia circolare*

Il riuso adattivo del patrimonio culturale nella prospettiva dell'economia circolare è orientato verso la capacità di rigenerare le diverse forme di capitale (capitale manufatto, capitale naturale, capitale sociale, capitale umano, capitale economico-finanziario). Il riuso circolare è volto a trasformare i luoghi abbandonati in sistemi "viventi", e come tali rigenerativi. In questo modo è in grado di generare effetti positivi nel contesto e contribuire alla resilienza del sistema città/territorio nel tempo.

Il riuso circolare si configura come il riuso rigenerativo che contribuisce ad attuare la transizione verso un'economia locale de-carbonizzata (economia ecologica). Minimizza i rifiuti, gli impatti ambientali negativi e l'impronta ecologica; riutilizza/ricicla i rifiuti, trasformandoli in risorse per nuovi cicli produttivi. Deriva la maggior parte delle sue risorse dal territorio circostante: utilizza per quanto possibile energie rinnovabili; riutilizza le acque meteoriche e grigie; contribuisce a rigenerare i servizi ecosistemici da cui dipendono le attività umane e il benessere delle persone; promuove l'uso del verde e delle soluzioni "nature-based". Contribuisce a trasformare il metabolismo lineare (estrazione-produzione-consumo-rifiuto/emissioni) in circolare (riuso, recupero, riciclo...), imitando la sapienza della natura.

Inoltre, il riuso circolare è caratterizzato dalla ricerca della capacità di rigenerare le risorse finanziarie per il proprio funzionamento nel tempo, minimizzando le sovvenzioni provenienti da fonti pubbliche/private. Il riuso circolare è promotore di impatti economici in termini di localizzazione di nuove attività, generando anche nuovi posti di lavoro diretti, indiretti, indotti.

Dal punto di vista sociale, il riuso circolare è orientato a generare una comunità, una "comunità del patrimonio" (Convenzione di Faro, Consiglio d'Europa, 2005) che a sua volta si prende cura del patrimonio stesso, in un processo circolare virtuoso. Il riuso circolare è caratterizzato dalla ricerca di sinergie/simbiosi e attività cooperative tra i soggetti del territorio che aumentano la produttività complessiva dell'intervento.

Il riuso del patrimonio culturale ri-produce anche valori immateriali: i valori culturali. Il riuso del patrimonio culturale è in grado di rigenerare anche valori / significati / orizzonti culturali e di senso, generando nuovi significati contemporanei e nuovi valori collegati ai significati e al valore originario.

In sintesi, il riuso circolare del patrimonio culturale ha come obiettivo la rigenerazione delle risorse culturali tangibili e intangibili, naturali, sociali ed economiche del territorio, la promozione di sinergie/simbiosi e cooperazione tra i soggetti pubblici, privati e della società civile, e la generazione di impatti positivi netti di tipo economico, sociale, ambientale e culturale nel territorio.

#### *2.2 – Impatti del riuso adattivo circolare del patrimonio culturale*

L'idea di riuso dovrà essere descritta in maniera chiara e sintetica, evidenziando in particolare quali effetti positivi sono prevedibili, con riferimento ai seguenti criteri:

##### *2.2.1 – Rigenerazione delle risorse culturali, naturali, sociali ed economiche*

- Rigenerazione dei valori storico-culturali e della significatività culturale e sociale degli edifici come patrimonio culturale: in che modo i valori e il "significato" degli Edifici Mondo sono conservati e 'rigenerati' / re-interpretati grazie al progetto proposto?

- Rigenerazione delle risorse ambientali attraverso soluzioni tecniche e tecnologiche compatibili con il bene culturale, ed in particolare:
  - Generazione di energia da fonti rinnovabili;
  - Sistemi di recupero e riuso delle acque;
  - Riuso e riciclo dei materiali;
  - Soluzioni di bioarchitettura, green e “nature-based”;
  - Riduzione dei rifiuti di costruzione e in fase di gestione del bene.
- Rigenerazione delle risorse economiche e finanziarie attraverso la generazione a regime di flussi di cassa positivi

#### 2.2.2 – Promozione di sinergie / simbiosi e cooperazione

- Partnerships e network di collaborazione attivabili: quali stakeholder sarebbero coinvolti nel progetto di riuso? Chi sono i beneficiari del progetto?
- Contributo dell’idea di riuso all’implementazione della Strategia regionale di ricerca e innovazione per la specializzazione intelligente (RIS3 Campania) disponibile sul sito istituzionale della Regione Campania <http://innovazione.regione.campania.it/content/ris3-campania-strategia-regionale-di-ricerca-e-innovazione-la-specializzazione-intelligente>
- Aumento del capitale sociale attraverso la promozione di processi di cooperazione, collaborazione, mutuo supporto, anche individuando nuovi usi/funzioni attinenti all’economia civile e sharing economy
- Aumento del capitale umano attraverso il miglioramento delle competenze e capacità, innovazione, creatività, recupero delle conoscenze tradizionali

#### 2.2.3 – Capacità di generare impatti positivi netti nel territorio, considerando anche i costi sociali, ambientali, culturali ed economici dell’idea di riuso

- Generazione di posti di lavoro (occupazione diretta in fase di gestione)
- Contributo alla promozione di una micro-comunità locale (anche sulla base della gestione come “bene comune” del patrimonio) prevista dalla Convenzione di Faro) Consiglio d’Europa, 2005)
- Miglioramento della qualità del paesaggio storico urbano
- Contributo al miglioramento della qualità dell’aria e del microclima
- Miglioramento della vivacità culturale dell’area
- Localizzazione di imprese creative, culturali, innovative, arte e artigianato
- Aumento della capacità attrattiva di attività commerciali, turistiche, ricreative, residenziali
- Miglioramento della qualità della vita complessiva, della salute e del benessere dei residenti
- Aumento della conoscenza del valore culturale del patrimonio e co-creazione di nuovi valori culturali e sociali

#### 2.3 – Esempi di riuso adattivo del patrimonio culturale

Il progetto CLIC mette a disposizione un catalogo aperto, accessibile e dinamico di buone pratiche di riuso adattivo del patrimonio culturale realizzati in Europa, consultabili sulla piattaforma *CLIC Knowledge and Information Hub* ([www.clicplatform.eu](http://www.clicplatform.eu)).

#### Art. 3. – Destinatari

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(continued).



La presente iniziativa è rivolta a Soggetti - siano essi persone fisiche, ovvero imprese, società, associazioni, fondazioni, enti in forma singola o associata che - singolarmente se soggetti singoli, o nel loro complesso, se soggetti associati/raggruppati - abbiano interesse, diretto o indiretto, ad intervenire e/o contribuire alla valorizzazione dell'area, presentando proposte alla valorizzazione medesima.

#### **Art. 4. – Contenuti della manifestazione di interesse**

Le proposte dovranno essere il più possibile circostanziate e rappresentare ogni utile elemento volto a dimostrare la coerenza della proposta di riuso ipotizzata con il modello di economia circolare. In tal senso, le proposte potranno utilmente evidenziare le caratteristiche essenziali dello scenario di valorizzazione, in coerenza con le prescrizioni urbanistiche ed ambientali vigenti, indicando le principali grandezze economico-finanziarie (investimenti, costi, etc.), la tempistica ed ogni altra informazione ritenuta rilevante.

Nello specifico, le proposte dovranno essere presentate utilizzando il formulario di partecipazione allegato, riportante:

- 1) Una descrizione generale dell'idea progettuale con l'indicazione degli obiettivi della proposta di riuso adattivo in relazione al modello di economia circolare, indicando gli impatti prevedibili economici, sociali, culturali ed ambientali del progetto (max 3 pagine/ 10.000 caratteri).
- 2) Stima di massima degli investimenti, con indicazione delle possibili fonti di finanziamento, dei costi e degli eventuali ricavi in fase di gestione (max 1 pagina /3000 caratteri) (facoltativo).
- 3) Elaborati grafici di progetto (facoltativo).

Nel formulario i partecipanti avranno la possibilità di manifestare il loro interesse rispetto alla partecipazione al workshop di co-progettazione "Circular Business Model", della durata di 2,5 giorni, organizzato, nell'ambito del progetto Horizon 2020 CLIC, dal Comune di Salerno, ICHEC Business School Brussels e CNR IRISS, e che si terrà a Salerno dal 12 al 14 maggio 2020.

Il workshop si configura come un laboratorio di idee e un momento di formazione e co-progettazione durante il quale saranno individuate le possibili soluzioni per il riuso degli Edifici Mondo, promuovendo anche la combinazione creativa delle idee di riuso recepite attraverso il presente avviso. La fattibilità urbanistica, tecnica ed economico-finanziaria delle idee di riuso sarà approfondita attraverso il contributo di esperti internazionali e locali, in relazione alle condizioni specifiche di contesto e al modello di riuso circolare del patrimonio culturale come descritto all'art.2 del presente avviso.

#### **Art. 5. – Modalità di presentazione della manifestazione di interesse**

La partecipazione alla consultazione avverrà attraverso presentazione della seguente documentazione da trasmettere via pec al seguente indirizzo: [protocollo@pec.comune.salerno.it](mailto:protocollo@pec.comune.salerno.it) ; o a mano all'ufficio protocollo dell' Archivio Generale del Comune di Salerno – sito nel Palazzo di Città- 1° piano – via Roma Salerno, indicando nell' oggetto della pec, o sul plico cartaceo, "CONSULTAZIONE PUBBLICA FINALIZZATA ALLA RACCOLTA DI PROPOSTE PER IL RIUSO ADATTIVO DEGLI EDIFICI MONDO NELLA PROSPETTIVA DELL'ECONOMIA CIRCOLARE" entro e non oltre il giorno 6 aprile 2020:

- a) Formulario di partecipazione
- b) Documento di identità del legale rappresentante / referente per il progetto

**Art 6. – Documentazione informativa a supporto**

Tutta la documentazione informativa a supporto della corretta presentazione della manifestazione di interesse – predisposta dall' Ufficio di Piano del Settore Trasformazioni Edilizie /S.U.E./Uffici di Piano e Progettazione - è disponibile sul sito del Comune di Salerno [www.comune.salerno.it](http://www.comune.salerno.it)

**Art. 7. – Valutazione delle manifestazioni di interesse**

Le proposte saranno valutate secondo criteri di coerenza della proposta rispetto alle finalità della consultazione e impatti attesi.

Il punteggio massimo attribuibile è di 30 punti, come di seguito indicato:

- Coerenza della proposta rispetto alle finalità della consultazione ed agli impatti attesi - MAX 20 punti (rif. art. 2, art. 4 punto 1)
- Fattibilità della proposta - MAX 10 punti (rif. art. 4 punto 2)

Il punteggio minimo (soglia) per conseguire l' idoneità alla partecipazione al workshop di co-progettazione "Circular Business Model" è di 15 punti.

La Commissione di valutazione delle proposte sarà nominata successivamente e sarà composta da rappresentanti del Comune di Salerno e del CNR IRISS nella qualità di Coordinatore del progetto Horizon 2020 CLIC. Potranno essere invitati in Commissione fino ad un max. di 5 esperti esterni.

**Art 8. – Effetti della manifestazione di interesse**

La presente consultazione pubblica non avrà alcun carattere di vincolatività né per il Comune di Salerno, né per i partecipanti all' invito medesimo, le cui proposte non precostituiscono alcun titolo o condizione rispetto ad eventuali successive decisioni assunte dall' Amministrazione, e non daranno diritto a pretendere nulla in termini di risarcimento, rimborso (anche se a titolo di mero rimborso delle spese sostenute), indennizzo o mancato guadagno o altro qualsivoglia preteso titolo. L' iniziativa in questione non costituisce un invito ad offrire, né, in alcun modo, una gara per l' affidamento, né un' offerta al pubblico ai sensi dell' art. 1336 c.c.

La presente manifestazione di interesse ha, dunque, carattere esclusivamente esplorativo. Non è indetta alcuna procedura di gara, di affidamento concorsuale o paraconcorsuale.

Il Comune di Salerno si riserva la facoltà di interrompere in qualsiasi momento, di modificare o annullare, in tutto o in parte, il procedimento avviato e di non dare seguito all' indizione della successiva gara per l' affidamento dei servizi di cui trattasi, senza che i soggetti richiedenti possano vantare alcuna pretesa.

Con la presentazione della proposta di valorizzazione e l' accettazione della liberatoria, i soggetti partecipanti autorizzano il Comune a disporre dei contributi forniti nell' ambito della proposta formulata (documenti, file, elaborati grafici ecc.), con la facoltà, ma non l' obbligo, di utilizzare, riprodurre e fissare con qualsiasi procedimento e per qualunque finalità, comunicare al pubblico, stampare, pubblicare, trasmettere e/o diffondere, sub-concedere a terzi, il materiale trasmesso e condiviso, in tutto o in parte, con qualsiasi mezzo e sistema di diffusione a distanza, senza alcun limite di sorta ed in particolare senza limiti territoriali e per tutta la durata dell' iniziativa, con ogni mezzo tecnico, tecnologia, modalità, mezzo ora conosciuti o di futura invenzione, anche per scopi relativi a indagini di mercato. Nell' ipotesi in cui il Comune di Salerno provveda alla predetta

utilizzazione, sarà indicato il soggetto proponente e l'autore della proposta. Resta inteso che il soggetto partecipante dovrà garantire che l'utilizzo della documentazione presentata non comporti la violazione di alcun diritto di terzi, impegnandosi, al contempo, a manlevare e tenere indenne il Comune di Salerno da eventuali pretese al riguardo.

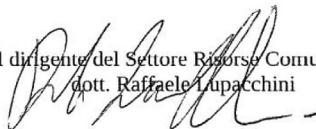
**Art. 9. – Informativa ai sensi del GDPR 2016/679**

Ai sensi del GDPR 2016/979 e del D. Lgs 101/2018 si informa che i dati raccolti sono trattati per finalità istituzionali, al fine di procedere all'espletamento della presente raccolta di manifestazione d'interesse. Il trattamento dei dati avverrà nel rispetto dei principi di correttezza, liceità, trasparenza, in applicazione di quanto disposto dal predetto D.Lgs. Il trattamento dei dati potrà essere effettuato sia manualmente sia attraverso l'ausilio di mezzi elettronici.

**Art. 10.- Responsabile del Procedimento e Richiesta di Informazioni**

Il Responsabile del Procedimento, ai fini della procedura di cui al presente Avviso, è il Dirigente del Settore Risorse Comunitarie. Ulteriori informazioni relative al presente Avviso in relazione alle modalità di partecipazione o di carattere tecnico urbanistico possono essere richieste rispettivamente al Settore Risorse Comunitarie e-mail: r.crudele@comune.salerno.it ; o all' Ufficio di Piano e-mail: f.daraio@comune.salerno.it

Il dirigente del Settore Risorse Comunitarie  
dott. Raffaele Lupacchini



## APPENDIX B

The questionnaire was preceded by an informed consent form: “I have read and understood the information about the CLIC project as per informed consent. I have been given the opportunity to ask questions about the project and my participation. I voluntarily agree to participate in the project. I understand that I can withdraw at any time without explanation. I have been explained the procedures regarding confidentiality (e.g. use of names, confidentiality of data, etc.) I have been explained the use of data in sharing, archiving, disclosure and publication. I consent to the processing of the data collected for this study. I confirm that I want to take part in the online questionnaire”.

Acceptance of these conditions was set as a necessary precondition for going ahead with the questionnaire.

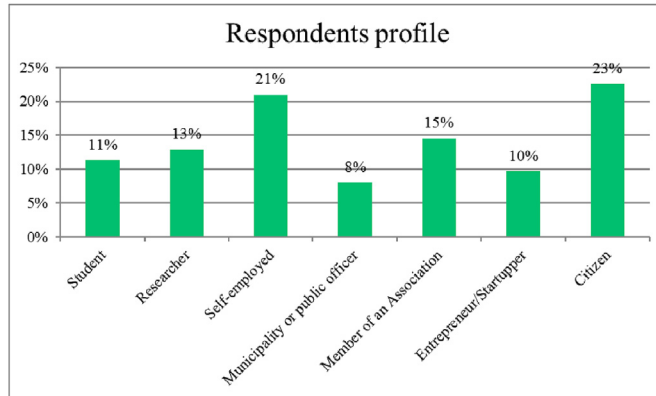


Fig. B.1. Respondents profile.

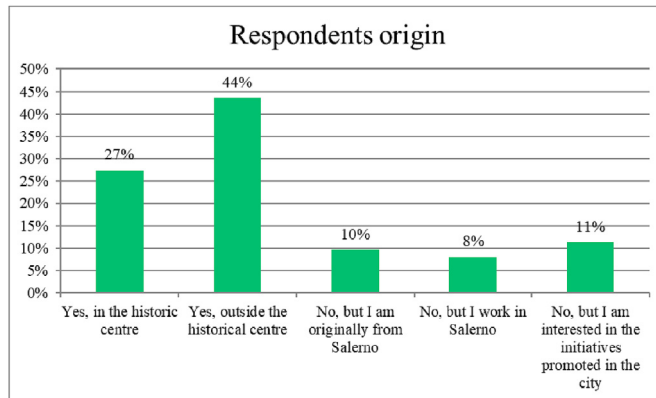


Fig. B.2. Respondents origin.

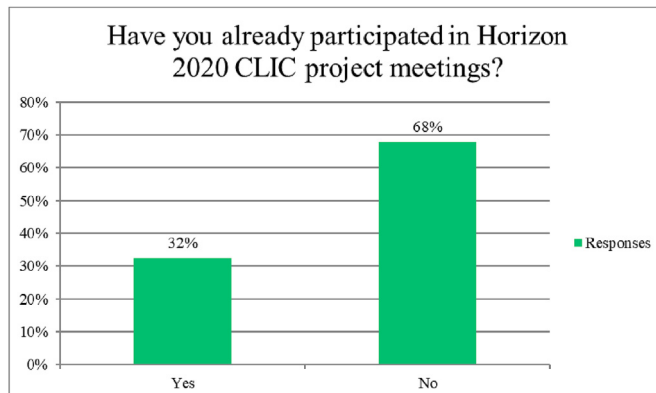


Fig. B.3. Respondents participation in CLIC project.

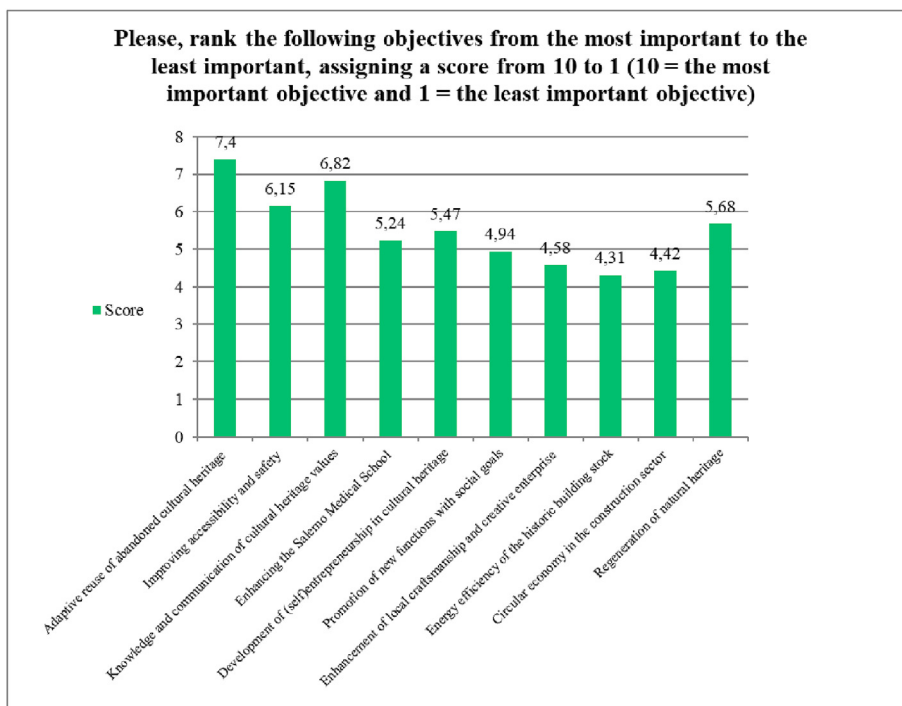


Fig. B.4. Respondents prioritization of CLIC objectives<sup>13</sup>.

<sup>13</sup> The full version of the objectives is the follow:– adaptive reuse of abandoned and under-utilised cultural heritage (e.g. Mondo buildings, disused religious cultural heritage, old furnaces, other abandoned and under-utilised buildings and historical-cultural sites ...) inside and outside the historic centre;– improving accessibility and safety both in the historic centre, especially in the upper historic centre, and in the more peripheral areas, also through sustainable electric, pedestrian and bicycle mobility;– knowledge and communication of the values of cultural heritage through awareness-raising actions with students, residents, visitors, also through the increase and diversification of the cultural offer for residents and tourists (e.g. alternative tourist routes/itineraries, continuous cultural initiatives and events, initiatives to rediscover abandoned cultural heritage, etc.);– enhancement of the Salerno Medical School as a cultural identity and ‘brand’ for sustainable tourism: ‘Salerno city of health and wellbeing’– development of the local ecosystem of entrepreneurship and self-entrepreneurship in cultural heritage for the support of enterprises and start-ups and the creation of new jobs;– promotion of new functions that regenerate interpersonal and community relations, including those related to the social/solidarity economy and social innovation;– valorisation of local craftsmanship, creative enterprise and productions of excellence;– energy efficiency and positive energy balance of the historical building heritage including both publicly owned and privately owned ‘diffuse’ cultural heritage;– circular economy in the construction sector for the reuse of cultural heritage (water reuse and recycling, reuse of demolition materials, ‘nature-based’ solutions also to improve air quality, biological or recycled materials, etc.);– regeneration of the natural heritage also for the improvement of air quality (e.g. urban green areas, sea and beaches, hilly areas ...).



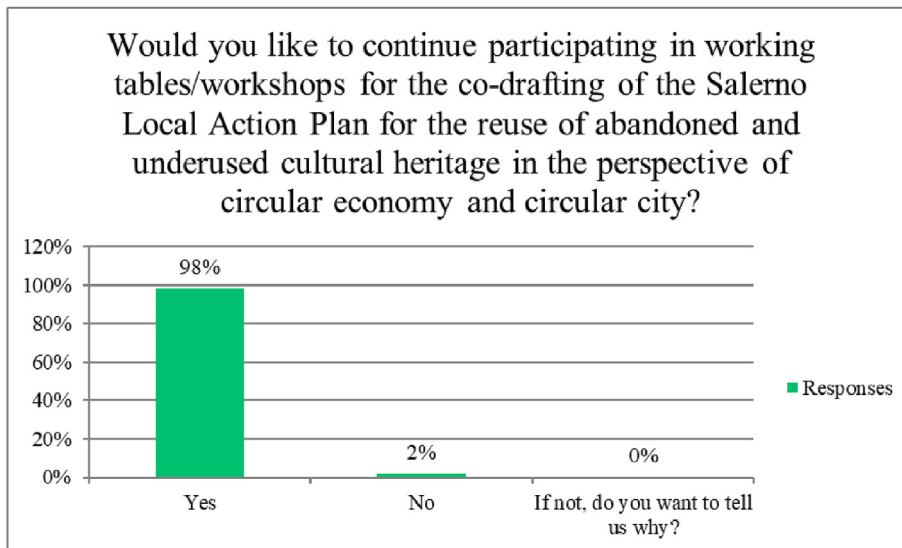


Fig. B.5. Respondents willingness to continue participating in activities of the CLIC project.

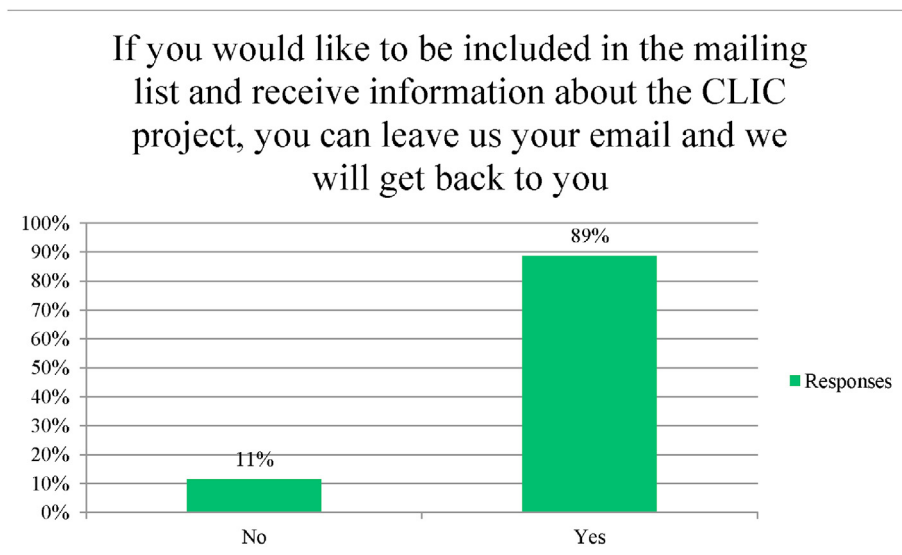


Fig. B.6. Respondents willingness to be included in the CLIC mailing list.

## APPENDIX C

**Table C.1**  
Assignment of values to qualitative and quantitative indicators for each project proposal (part I)

Alternatives	Objectives	1. Adaptive reuse of tangible cultural heritage				2. Awareness and knowledge of cultural heritage values	3. Valorisation of intangible heritage resources	4. Entrepreneurial ecosystem enhancement and new jobs		5. Social capital enhancement		
	Criteria	1.1 Regeneration of cultural capital	1.2 Financial viability			2.1 Education on cultural heritage values	3.1 Valorisation of Salerno Medical School	4.1 Jobs creation	4.2 Local co-investments	5.1 Local community diversity	5.2 Quality of life (neighbourhood activities)	5.3 Stakeholders engagement
	Indicator	1.1 Coherence of new uses with	1.2a Net Value	1.2 b Internal Rate of Return	1.2c Payback period	2.1 Learning opportunities on heritage	3.1 Contemporary interpretation of Salerno Medical School traditions	4.1 Number of jobs directly and indirectly created	4.2 Local co-financing foreseen including crowdfunding, local co-investors, financial participation in community foundations and other local co-investment forms	5.1 Diversity of community groups involved as users	5.2 Intensity of neighbourhood activities and proximity shops in the area	5.3 Diversity of stakeholders involved
	min/max	max	max	max	min	max	max	max	max	max	max	max
	Unite of measure	Five points scale	€	%	No. of years	Five points scale	Five points scale	No.	Five points scale	%	Five points scale	%
<b>Solidarity Condominium</b>	<b>Score</b>	5	4,300000	17	5	4	1	250	5	25	5	25
	<b>Score description</b>	The project has the aim to create a new identity for the city.	The project's financial sustainability will be ensured by the generation of revenue streams from the rent of rooms, flats, co-working spaces, green areas, and access to training activities. Reduced running costs are expected due to reduced use of raw materials, recycling, reuse of products, etc.		The project foresees the activation of a community cooperative.		There is no reference to this objective in the project	The project provides the creation of new jobs inherent in the management of the social cooperative, of the new residences and services.	The project includes investments from private funds, regional tenders, crowdfunding, bank foundations, etc.	The project envisages actions of interaction with the neighbourhood, the creation of a supportive community and the involvement of numerous users.	The project provides for the activation of shared services in the area such as home shopping, assistance for the elderly and children, shuttle bus service for travel, etc.	The project foresees the activation of a community cooperative.
<b>The identity between tradition and innovation</b>	<b>Score</b>	5	1,490000	14	6	4	5	540	4	33	5	33
	<b>Score description</b>	The aim of the project is to gather, promote and valorise all the intangible-tangible assets of our cultural heritage and identity by bringing	Financial self-sustainability is guaranteed by the new activities envisaged by the project (researcher centre, museums, bar, restaurants, theatre, library, exhibition centre, food and wine centre, cinema, recording and dance studios, conference/exhibition halls).		The project involves the creation of community centres as places of social gathering, territorial partnership for a cross fertilisation between		The project plans to enhance the courtyards and green spaces to be equipped as green areas to enhance the Salerno medical school.	The project provides for the reduction of youth unemployment through the creation of new jobs deducted from the new activities included.	The project envisages various forms of financing through the activation of partnerships, co-management and crowdfunding.	The project involves the creation of community centres as places of social gathering, territorial partnership for a cross fertilisation between different sectors	The project envisages the creation of a Salerno museum network, a permanent observatory on the integrated development of the ancient centre with functions of control over the	The project foresees the Local stakeholders involvement, municipality included.

(continued on next page)

Table C.1 (continued)

		together: local community, local associations, visitors and main stakeholders.				different sectors in order to stimulate social innovation.			in order to stimulate social innovation.	entrepreneurial and productive activities of the entire district.		
<b>House of Music</b>	<b>Score</b> <b>Score</b> <b>description</b>	4 The House of Music opens to the city enjoying the growth of the social and economic values of the urban context and regenerating shared cultural horizons, with the aim of extending the identity value that the community recognizes to the creativity of the site.	26,000000	24	4	4 The project promote the management of the common good by the local community.	1 There is no reference to this objective in the project	936 The functions foreseen within the project are able to generate new forms of work.	5 The project provides the regeneration of micro- communities.	50 The project promote the management of the common good by the local community.	4 The project provides the strengthening of links with the third sector, activating new production dynamics in the territorial economic sphere.	50 The stakeholders engagement is guaranteed by the involvement of the local community, the third sector, professionals, public bodies, local entrepreneurs, etc.
<b>Hippocratica Hills and Water Paths</b>	<b>Score</b> <b>Score</b> <b>description</b>	5 The aim of the project is to create a complex system integrated into the urban context that enhances the intrinsic and unique cultural and territorial potential of Hippocratica Civitas.	2,370000	6	11	4 The project involves local and foreign investors, small and medium enterprises, start-ups, local community.	5 The project refers to the Salerno medical school through the strengthening of pharmaceutical and therapeutic- herbalistic research.	930 The project foresees a circular work and training system with the creation of jobs for creative enterprises, crafts and commerce.	4 The project includes both public and private funding, a system of tax incentives, contributions from foundations, crowdfunding and donations.	58 The project involves local and foreign investors, small and medium enterprises, start-ups, local community.	5 The project plans to improve the tourist offer, through the enhancement of craft activities, the creation of creative enterprises to implement the socio-economic framework of the area.	58 To improve the connection with the territory the project provides to enhance the cultural heritage responsibility, involving various community actors and third sector associations.

**Table C.2**  
Assignment of values to qualitative and quantitative indicators for each project proposal (part II)

Alternatives	Objectives	6. Creative and cultural industries enhancement	7. Accessibility enhancement	8. Energy efficiency and renew	9. Circular building solutions	10. Natural heritage regeneration				
	Criteria	6.1 Cultural vibrancy	6.2 Traditional skills recovery	7.1 Accessibility of the urban area	8.1 Energy efficiency	9.1 Freshwater efficiency	9.2 Nature-Based Solutions	9.3 Construction & demolition wastes	9.4 Greenhouse gas emissions (GHG)	10.1 Biodiversity and green urban areas enhancement
	Indicator	6.1 Cultural activities generated in the area	6.2 Intensity of traditional skills employed	7.1 Public space enhancement	8.1 Use of renewable energy	9.1 Freshwater consumption reduction through water recovery and reuse	9.2 Adoption of Nature-Based Solutions	9.3 C&DM avoided (concrete, brick, rebar, etc.)	9.4 GHG emissions reduction in the operation phase	10.1 Green urban areas regenerated
	min/max Unite of measure	max Five points scale	max Five points scale	max Five points scale	max Five points scale	max Five points scale	max sqm	max Five points scale	max Five points scale	max sqm
<b>Solidarity Condominium</b>	<b>Score</b>	4	5	4	4	4	454	5	5	866
	<b>Score description</b>	The project foresees the activation of a community cooperative.	The project includes the valorisation of Salerno's craft tradition, also through the activation of specific training courses for the training of new craftsmen.	The project plans to improve pedestrian accessibility.	The project provides specific actions for energy saving, producing more with less: product life cycle, energy saving, renewable sources.	The project provides specific actions to reduce water consumption.	There are few references to this design action in the project.	The project does not involve any new construction or demolition.	The project does not involve any new construction or demolition.	The project aims to preserve the natural and cultural heritage of the study area and to conserve and enhance biodiversity.
<b>The identity between tradition and innovation</b>	<b>Score</b>	5	5	5	3	3	2450	4	5	3680
	<b>Score description</b>	The project involves the creation of areas for events and workshops, a library, a centre for artistic and social activities, laboratories on creativity and the reuse of materials, art, theatre and cinema laboratories, etc.	The project has the aim to realise a Museum pole of Salerno with a section on the history of Salerno and on ceramics production. It will include activities and open innovation environments in the fields of traditional and digital art and <i>trans-disciplinary co-working/co-</i>	The project plans to improve pedestrian accessibility, increase parking areas, create new public spaces with squares, gardens and green paths.	All physical intervention on the 'Edifici-Mondo' includes the optimisation of natural light, the provision of solar panels. Over 50% of the structures (25000€/tot. sqm) will be based on renewable energy and recycled materials.	The project includes a rainwater reuse system and a wastewater purification system.	The project provides the use of nature-based solutions.	The project does not foresee any demolition.	The project does not involve any new construction or demolition.	The project involves the creation of terraced and botanical gardens, a shared city garden with the recovery of the products of the Mediterranean diet.

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Table C.2 (continued)

House of Music	Score	3	4	5	4	3	725	4	5	2600
	Score description	The project provides the growth of social and cultural values through the activation of musical events, recycling workshops, the preparation of exhibition spaces, the creation of a media library, recording rooms and congress and conference rooms.	factory spaces and laboratories. The project provides the strengthening of links with the third sector, activating new production dynamics in the territorial economic sphere.	The project includes the realisation of lifts connecting the different levels, the improvement of territorial landmarks, the construction of a promenade on the walls of the convent.	The project includes the installation of photovoltaic tiles on the building's roofs, the realisation of a mini waste composters and pyrolysis plants, a phytodepuration tank.	The project involves the construction of a constructed wetlands, wastewater refining plants, rainwater recovery systems for plants and irrigation.	The project provides the use of nature-based solutions for the construction of green roofs and a mechanical biostabilization system for organic waste.	The project does not include any demolition.	The project provides the construction of a new decarbonised unit.	The project includes the creation of pertinent gardens, green areas where it is possible to organise cultural initiatives and urban gardens, all connected to each other.
Hippocratica Hills and Water Paths	Score	5	4	5	5	5	183	4	5	8410
	Score description	The project includes the valorisation of the enogastronomic heritage, handicrafts and the activation of cultural workshops.	The project plans to improve the tourist offer, through the enhancement of craft activities, the creation of creative enterprises to implement the socio-economic framework of the area.	The project includes the reorganisation of the green infrastructure, the networking of urban spaces, the construction of a pedestrian connection line, the improvement of accessibility by enhancing public transport and the realisation of new parking spaces.	The project includes the installation of a photovoltaic network and other renewable energy sources.	The project provides for the recovery of rainwater.	There are few references to this design action in the project.	The project does not include any demolition.	The project does not include any demolition.	The project includes the creation of an urban park.



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