



Circular models Leveraging Investments
in Cultural heritage adaptive reuse

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Database of indicators and
data in pilot cities



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Abstract

This Deliverable reports the work conducted within the CLIC project regarding the identification of a set of indicators for the assessment of multidimensional impacts of cultural heritage adaptive reuse projects in the circular economy perspective, as well as their experimental application in CLIC pilot case studies.

The set of indicators identified derives from a structured theoretical and experimental research that involved diverse phases, processes and stakeholders. The main phases of the research were: analysis of the state-of-the-art and identification of knowledge gaps, structuring of the theoretical conceptual model of “circular” adaptive reuse of cultural heritage, identification of criteria, identification of indicators, experimentation of indicators through data collection, critical analysis and reporting. Despite this research process could seem linear, the different phases were not always subsequent, as many evolutionary dynamic “back and forth” processes occurred according to the complexity of the research topic that involved a great interdisciplinarity and trans-disciplinarity, going beyond the academic knowledge and co-developing indicators through a large participatory process, in-depth reflections and peer-to-peer constructive criticism. The result is a structured set of criteria and indicators that could serve the scope of providing a guidance to researchers, stakeholders and policy-makers willing to create evidence of the impacts of cultural heritage adaptive reuse projects.

The present document takes the cue from the CLIC framework to develop a set of evaluation tools (criteria, indicators, and methods for their assessment) to make it operational. The results come out of a long and complex process of research, experimentation and stakeholders consultation, adopting a interdisciplinary and trans-disciplinary approach, exploring concepts, methods and tools and hybridizing scientific/expert and practice knowledge.

This report aims to become a reference for the identification and use of multidimensional indicators for ex-post and ex-ante evaluation of cultural heritage adaptive reuse projects, in the perspective of the “circular human-centred development model”, providing an overview of tools and methods useful for the scope.

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Table of Contents

1.	Description of the Project	1
1.1.	CLIC Specific objectives	2
2.	Introduction	4
2.1.	Why assessing the impacts of cultural heritage adaptive reuse?	4
2.2.	Aims and structure of this report	5
3.	Indicators for cultural heritage impacts assessment	8
3.1.	Cultural heritage counts for Europe	11
3.2.	The “Complex Social Value” of cultural heritage	16
3.3.	Culture as sustainable development: beyond the three pillars approach	21
3.4.	Cultural Heritage Adaptive Reuse in the perspective of the Circular Economy	25
3.5.	Indicators for systemic circular cultural heritage impacts assessment: a review	39
4.	CLIC evaluation framework of criteria and indicators	45
4.1.	The CLIC framework	46
4.2.	Circularity dimensions and criteria	50
4.3.	Circularity indicators and data collection	54
5.	Ex-post evaluation: case studies analysis	58
5.1.	Circularity assessment on best practices	58
5.2.	In-depth analysis of selected case studies	59
5.3.	Matrix of indicators for ex-post evaluation	70
5.4.	Social impacts assessment	81
	Assessment of social impacts in Giardino della Minerva, Salerno (Italy)	83
5.5.	Circularity assessment report: aims and proposed structure	99
6.	From best practices to better projects: ex-ante evaluation	103
6.1.	Criteria and indicators to enhance choices in cultural heritage adaptive reuse	104
6.2.	Regenerative capacity indicators	107
6.3.	Symbiotic capacity indicators	111
6.4.	Generative capacity indicators	113
7.	Conclusions and recommendations	116
	References	119
	Annex 1 – Literature sources and indicators analysed	131
	Annex 2 – Assessment of social impacts in Not Quite, Västra Götaland region (Sweden)	140
	Annex 3 – Assessment of social impacts in Open Jazdów, Warsaw (Poland)	159

Figures Summary

Figure 1. Impacts related to MCH in the stakeholder countries/regions in 2016 (source: ESPON research, Lykogianni et al., 2019)	10
Figure 2. The different subdomains of cultural heritage impacts in CHCfE research.....	11
Figure 3. Total Economic Value of cultural heritage: representation according to CHCfE	12
Figure 4. Proposed indicators in CHCfE research, case study of Mechelen, Belgium (Source: CHCfE, 2015)	15
Figure 5. Total Economic Value (TEV) components	19
Figure 6. The Social Complex Value of cultural heritage	19
Figure 7. Proposed approach: Culture as the foundation for sustainable development.....	23
Figure 8. The systemic circular economic model: a conceptualization	26
Figure 9. Temporal frequency of the analysed literature sources.....	41
Figure 10. Classification of the analysed sources according to (a) Typology; (b) Scope	42
Figure 11. Classification of indicators according to (a) Geographical scale; (b) Evaluation phase; (c) Typology; and (d) Sustainability dimensions	44
Figure 12. The triple circular model of cultural heritage adaptive re-use: conceptual model.....	48
Figure 13. The general evaluation framework structure	49
Figure 14. Circular CHAR dimensions	54
Figure 15. Evaluation process and type of indicators in relation to the adaptive reuse phases	57
Figure 16. Perceived household ability to make ends in percentages in Minerva Garden neighborhood.....	84
Figure 17. The availability of pace for organizing civic-related events for free in Minerva Garden neighborhood.....	89
Figure 18. Participation in different types of activities in Minerva Garden neighbourhood within last 12 months	90
Figure 19. Travel time to Minerva Garden from home.....	92
Figure 20. The most favourite activities in the Minerva Garden	93
Figure 21. Social value of the Minerva Garden on a scale of 0-5 points.....	94
Figure 22. The emotions elicited by the visit in Minerva Garden	95
Figure 23. Sources of enjoyment in Minerva Garden	96
Figure 24. Who should be responsible for keeping cultural heritage alive in Minerva Garden?	97
Figure 25. Perceived household ability to make ends meet in percentages	141
Figure 26. Declared participation in the cultural events in the neighbourhood.....	143
Figure 27. The availability of a place for organizing civic-related events for free.....	147
Figure 28. Participation in different types of activities in the neighbourhood within last 12 months	148
Figure 29. Travel time to Not Quite from home	149
Figure 30. The most favorite activities in the Not Quite, multiple choice answer	150
Figure 31. Social functions of the Not Quite on a scale of 1-5 points	151
Figure 32. The intrinsic value of Not Quite site on a scale of 1-5 points.....	152
Figure 33. The emotions elicited by the visit in the Not Quite (before and after), multiple choice answer.....	154
Figure 34. The sources of enjoyment in Not Quite	155
Figure 35. Who should be responsible for keeping cultural heritage alive?	157
Figure 36. Who should be responsible for making cultural heritage circular?.....	157
Figure 37. The availability of a place for organizing civic-related events for free in Open Jazdow	165
Figure 38. Participation in different types of activities in the neighbourhood within last 12 months in Open Jazdow. Multiple choice answer	165

Figure 39. Reasons for not participating in activities around Open Jazdow. Multiple choice answer	166
Figure 40. Travel time to Open Jazdow from home	167
Figure 41. The most favourite activities in the Open Jazdow, multiple choice answer.....	168
Figure 42. Social value of the Open Jazdow on a scale of 0-5 points	169
Figure 43. The emotions elicited by the visit in the Garden in Open Jazdow, multiple choice answer	170
Figure 44. Sources of enjoyment in Open Jazdow, multiple choice answer	171
Figure 45. Who should be responsible for keeping cultural heritage alive in Open Jazdow? Multiple choice answer	172

Tables Summary

Table 1. The 9 R's approach in relation to the adaptive reuse of cultural heritage	34
Table 2. The Ellen MacArthur ReSOLVE framework in relation to the adaptive reuse of cultural heritage.....	36
Table 3. CE principles in relation to the adaptive reuse of cultural heritage	38
Table 4. Evaluation framework of criteria for Circular Cultural Heritage Adaptive Reuse	51
Table 5. Case studies investigated	59
Table 6. Database of indicators and data for ex-post evaluation of cultural heritage adaptive reuse impacts: results of in-depth case studies analysis	65
Table 7. Matrix of indicators for ex-post evaluation of cultural heritage adaptive reuse impacts	72
Table 8. Circularity indicators in ex-ante evaluation	104
Table 9. Groups of indicators used for Salerno Edifici Mondo.....	105
Table 10. Regenerative capacity indicators proposed for ex-ante evaluation.....	107
Table 11. Symbiotic capacity indicators proposed for ex-ante evaluation	111
Table 12. Generative capacity indicators proposed for ex-ante evaluation	113

1. Description of the Project

The overarching goal of CLIC trans-disciplinary research project is to identify evaluation tools to test, implement, validate and share innovative "circular" financing, business and governance models for systemic adaptive reuse of cultural heritage and landscape, demonstrating the economic, social, environmental convenience, in terms of long lasting economic, cultural and environmental wealth.

The characteristics of cultural heritage and landscape pose significant challenges for its governance. Cultural heritage is a “common good”, which enjoyment cannot be denied to citizens, although many buildings and landscape structures are privately owned. Furthermore, the large economic resources needed for recovery and maintenance of heritage goods are rarely available to the private owner, often charged of the additional cost of non-use due to limited degree of transformation allowed. The existing governance arrangements currently involve limited stakeholders concerning for the historic, aesthetic or religious sociocultural values, severely restricting the use of the heritage properties, and charge the central government of conservation costs. The approach of regulatory and planning tools throughout European countries has been to preserve cultural heritage by preventing transformation of buildings or areas having historic-cultural significance.

“The current monument-based, full protection, and government-financed approach that restricts the use of protected properties and relies almost entirely on public funds is incapable of tackling the vast urban heritage of most communities and of sustaining conservation efforts in the long term” (Rojas, 2016). To turn cultural heritage and landscape into a resource, instead of a cost for the community, the structures of authority, institutions and financial arrangements should be adjusted to ensure larger stakeholders’ involvement in decision-making, attract private investments and facilitate cooperation between community actors, public institutions, property owners, informal users and producers (Rojas, 2016). The risk is that without financing channels the decay of European heritage and landscape will increase, until its irreversible loss.

Flexible, transparent and inclusive tools to manage change are required to leverage the potential of cultural heritage for Europe, fostering adaptive reuse of cultural heritage / landscape. Tools for management of change should consider costs and benefits at the local level and for all stakeholders, including future generations, and should take into account the cultural, social, environmental and economic costs of disrepair through neglect, compared to the benefits obtained through diverse scenarios of transformation / integrated conservation.

Costs and values of cultural heritage adaptive reuse have to be compared in a multidimensional space: the relationship between costs and “complex values” influences the willingness to invest in the functional recovery of cultural heritage and landscape. Therefore, it is necessary to clarify what is intended for the value of cultural heritage. The higher the perceived value for potential actors, the higher the willingness to take the risk of investment. This “complex value” of cultural heritage depends on the intrinsic characteristics, but also from extrinsic (context) characters.

Investment costs are related to the materials, technologies and techniques to be used to preserve the cultural value of the heritage / landscape, and to maintenance / management / operating costs. The willingness to invest, the same value done, increases with the reduction of costs. Then, the social cost of abandonment – and eventual irreversible loss of heritage – must be included in the investment choice.

The investment gap in cultural heritage and landscape regeneration can be addressed through careful evaluation of costs, complex values and impacts of adaptive reuse, providing critical evidence of the wealth of jobs, social, cultural, environmental and economic returns on the investment in cultural heritage.

1.1. CLIC Specific objectives

The scopes of CLIC project will be achieved through a set of specific, measurable, achievable, realistic and time-constrained (SMART) specific objectives:

Objective 1 - To synthesize existing knowledge on best practices of cultural heritage adaptive reuse making it accessible to researchers, policy makers, entrepreneurs and civil society organizations, also with direct dialogue with their promoters;

Objective 2 - To provide a holistic ex-post evaluation of the economic, social, cultural and environmental impacts of cultural heritage adaptive reuse, stressing on the importance of appropriate conservation and maintenance approaches able to highlight the integrity and authenticity of heritage;

Objective 3 - To provide EU-wide participated policy guidelines to overcome existing cultural, social, economic, institutional, legal, regulatory and administrative barriers and bottlenecks for cultural heritage systemic adaptive reuse;

Objective 4 - To develop and test innovative governance models and a set of evidence-based, participative, usable, scalable and replicable decision support evaluation tools to improve policy and management options/choices on cultural heritage systemic adaptive reuse, in the perspective of the circular economy;

Objective 5 - To analyse hybrid financing and business models that promote circularity through shared value creation, and assess their feasibility, bankability and robustness for cultural heritage adaptive reuse;

Objective 6 - To validate the CLIC circular financing, business and governance practical tools in 4 European cities / territories representative of different geographic, historic, cultural and political contexts;

Objective 7 - To contribute to operationalise the management change of the cultural landscape also in implementing the UNESCO Recommendation on Historic Urban Landscape;

Objective 8 - To re-connect fragmented landscapes, through functions, infrastructures, visual relations at macro and micro scale;

Objective 9 - To design and implement a stakeholders-oriented Knowledge and Information Hub to make tools and information accessible, useful and usable and test them with policy-makers, entrepreneurs, investment funds and civil society organizations;

Objective 10 - To contribute to the creation of new jobs and skills in the circular economy through cultural heritage adaptive reuse, boosting startups and sustainable hybrid businesses and empowering local communities and stakeholders through public-private-social cooperation models.

Objective 11 - To contribute to the monitoring and implementation of SDGs (especially Target 11.4) and the New Urban Agenda, creating operational synergies with global initiatives of UN-Habitat, UNESCO/ICOMOS and the World Urban Campaign.

All partners have wide experience in developing and testing CLIC proposed tools, ensuring the effective and time-constrained achievement of all the above-mentioned specific goals. The integration of sectorial knowledge, tools and methods will be achieved through a trans-disciplinary approach promoting partners and stakeholders' cooperation, co-creation of knowledge and co-delivery of outcomes.

The expected impacts of the project are the following:

- Validation of integrated approaches and strategies for cultural heritage adaptive re-use, comprising innovative finance with high leverage capacity, business models and institutional

and governance arrangements that foster multi-stakeholder involvement, citizens' and communities' engagement and empowerment;

- New investments and market opportunities in adaptive re-use of cultural heritage, also stimulating the creation of start-ups;
- An enabling context for the development and wide deployment of new technologies, techniques and expertise enhancing industrial competitiveness and contributing to economic growth, new skills and jobs;
- Innovative adaptive re-use models that are culturally, socially and economically inclusive;
- Contribution to implementing the Sustainable Development Goals (SDGs) (Goals 1, 15, 11 particularly) and the United Nations New Urban Agenda.

2. Introduction

This Deliverable reports the work conducted within the CLIC project regarding the identification of a set of indicators for the assessment of multidimensional impacts of cultural heritage adaptive reuse projects in the circular economy perspective, as well as their experimental application in CLIC pilot case studies.

The set of indicators identified derives from a structured theoretical and experimental research that involved diverse phases, processes and stakeholders.

The main phases of the research were: analysis of the state-of-the-art and identification of knowledge gaps, structuring of the theoretical conceptual model of “circular” adaptive reuse of cultural heritage, identification of criteria, identification of indicators, experimentation of indicators through data collection, critical analysis and reporting. Despite this research process could seem linear, the different phases were not always subsequent, as many evolutionary dynamic “back and forth” processes occurred according to the complexity of the research topic that involved a great interdisciplinarity and trans-disciplinarity, going beyond the academic knowledge and co-developing indicators through a large participatory process, in-depth reflections and peer-to-peer constructive criticism. The result is a structured set of criteria and indicators that could serve the scope of providing a guidance to researchers, stakeholders and policy-makers willing to create evidence of the impacts of cultural heritage adaptive reuse projects.

2.1. Why assessing the impacts of cultural heritage adaptive reuse?

There are many thoughtful reasons for assessing the multidimensional impacts of cultural heritage adaptive reuse. First, cultural heritage adaptive reuse can be a relevant strategy for heritage conservation ensuring at the same time the preservation and transmission of cultural values and the economic-financial viability, that is of intrinsic and instrumental values, allowing maintenance and conservation of cultural heritage over the long period. As adaptive reuse implies a certain level of transformation of the existing heritage to allow new functions of buildings, sites and landscapes for contemporary uses, it becomes fundamental to assess whether and how the foreseen adaptive reuse intervention generates net positive impacts in the territory or urban area, justifying some level of “change” in cultural heritage through a higher liveability and attractiveness of places, for present and future generations. In this respect, the recently published “European quality principles for cultural heritage interventions”¹ (ICOMOS, 2019) point out the need of careful evaluation of interventions on cultural heritage, ensuring the preservation of authenticity and integrity in line with UNESCO and ICOMOS conservation principles, while also considering the positive (for example, employment) and negative implications of heritage interventions for local communities. Thus, impacts assessment should become an integrated process embedded in any adaptive reuse intervention on cultural heritage.

Secondly, cultural heritage is more and more considered as a “common good”, highlighting with this definition the active role of the local community in its conservation, fruition, valorisation and transmission to future generations, representing an integral part of peoples’ “identity” and the “memory of the urban structure” (Fusco Girard). Therefore, transparent decision processes and accounting of impacts generated by any transformation of cultural heritage, physical or functional, often becomes the centre of a community debate, generating alliances and conflicts which can be better handled by decision-makers through evidence based information. Impacts assessment can

¹ <http://openarchive.icomos.org/id/eprint/2083/>

thus drive more informed decisions and provide relevant motivations in the search of dialogue and consensus between stakeholders at local, regional and higher level, advancing processes of deliberative democracy, transparency and citizens' co-responsibility and awareness.

Finally, a non-secondary aspect in cultural heritage conservation is funding. In the last years, diverse hybrid public-private funding mechanisms have been used to finance heritage interventions. Pure public funding is directly linked by laws and regulations to 'public benefit'. Therefore, in the case of traditional public funding for cultural heritage, it goes without saying that investments should ensure a transparent assessment of their actual impacts, to ensure citizens' "control" on outcomes and enhance trust in public institutions, and thus social cohesion. However, the role of public sector for supporting 'welfare' services such as culture, health and inclusiveness is decreasing, with less financial resources available and, on the other side, an increasing number of buildings and sites recognized as 'cultural heritage' achieving the 'right' of being maintained and conserved. The gap between the public resources available and the need of providing support to many sectors which are less attractive for private finance market, mainly due to longer timespan for investment return and lower overall expectations, stimulated in the last decades the birth of the so-called "second welfare", which represents an alternative welfare system provided by private entities to benefit directly people and communities who lack an adequate level of assistance and support from the public. "Third sector" actors (a hybrid between public and private) are engaged in this second welfare system, but as they remain private entities, they need to respond to market "rules", ensuring financial viability of the services supplied. On the other side, these entities respond to their final users and their recognized reputation largely influences the market share they are able to reach. Thus, a clear assessment of net positive impacts of their services and actions greatly helps to develop their 'social business' and ensures financial support from "impact oriented" investors. A large research body exists on social enterprise development, third sector finance, impact finance, social and environmental impacts assessment. The third sector is supported partly by partnerships with the public sector, which recognizes the important social role of those actors in filling the gap between social needs and actual services supply, and partly by "impact investors" of diverse nature that have a complex motivation for investing in social projects, aiming to "blend" financial return to preserve their financial capital and social return for the sake of community benefit – recognizing that higher social welfare benefits all individuals of a society, and not only those target of specific welfare policies/services. The "Impact investment" or "Socially responsible investment" sector is enlarging more and more in the last decades, including also investments for environmental regeneration and climate change mitigation and adaptation as key elements at the base of societal wellbeing. However, to ensure that investments are reaching the goal of enhancing wellbeing, health and quality of life of the target communities, the assessment of impacts is a fundamental aspect to be addressed. Without impacts assessment, it is impossible to know whether the goals have been reached or not over a period of time, or even whether any progress has been made and how to revise investment and action strategies to enhance social welfare. Thus, reliable impacts assessment can even become a leverage for unlocking alternative sources of funding, attracting 'responsible investors' of both public or private nature who can be ensured, up to a certain acceptable level of "certainty", of the results achieved through their support.

2.2. Aims and structure of this report

This work was conducted under the Horizon 2020 CLIC research and aims to fill the gap of knowledge - as far as possible - on criteria and indicators that could be relevant and sufficiently robust for the assessment of multidimensional impacts of cultural heritage adaptive reuse, adopting the specific perspective (or "point of view") of the circular economy and human-centred development model through the CLIC theoretical/conceptual framework of "circular human-centred adaptive reuse of cultural heritage".

The theoretical philosophical and scientific foundations of the CLIC framework are presented in detail in the related document “CLIC Deliverable D2.7 CLIC framework of circular human-centred adaptive reuse of cultural heritage”. The present document takes the cue from the CLIC framework to develop a set of evaluation tools (criteria, indicators, and methods for their assessment) to make it operational.

As said, the results come out of a long and complex process of research, experimentation and stakeholders consultation, adopting a interdisciplinary and trans-disciplinary approach, exploring concepts, methods and tools and hybridizing scientific/expert and practice knowledge.

Chapter 3 synthesizes the state-of-the art of indicators for cultural heritage impacts assessment, presenting the most relevant research results analysing the scientific literature and previous research projects.

Chapter 4 presents the CLIC framework and particularly the criteria identified for circular adaptive reuse of cultural heritage through the consultation process involving experts and practitioners in diverse sectors.

Chapter 5 introduces indicators for ex-post evaluation of circular adaptive reuse of cultural heritage, focusing on quantitative, qualitative and spatial indicators and methods for data collection, proposing a comprehensive matrix of multidimensional indicators to assess the circularity performance of adaptive reuse practices. This chapter includes the specific indicators and evaluation methods that may be used according to the CLIC experimentation conducted in pilot case studies, while leaving the field open for the development of further integrative and/or alternative, site-specific and target-specific indicators adaptable to local needs. It presents few examples of cultural heritage adaptive reuse impacts assessment conducted within the CLIC research. It also presents the results of a social impact assessment conducted in three case studies in Salerno (Italy), Västra Götaland region (Sweden) and Warsaw (Poland), defining a possible structure of “impact report” that could be useful for local heritage sites managers to analyse and present the social impacts and outcomes of their activities, addressing actual and potential supporters, donors and investors.

Chapter 6 focuses on indicators for ex-ante evaluation to support decision makers to achieve circularity goals in the planning, construction and operation phases of cultural heritage adaptive reuse. Starting from the lessons learned from best practices analysis, a set of usable indicators for ex-ante evaluation are identified, helping to set goals and targets and to monitor the implementation of adaptive reuse interventions, supporting also the promotion of sustainable finance initiatives for cultural heritage.

Finally, Chapter 7 synthesizes the conclusions of the study and proposes practical recommendations for stakeholders and policy-makers.

This report aims to become a reference for the identification and use of multidimensional indicators for ex-post and ex-ante evaluation of cultural heritage adaptive reuse projects, in the perspective of the “circular human-centred development model”, providing an overview of tools and methods useful for the scope. We do not aim to provide the ultimate indicators and methods to assess all aspects of cultural heritage adaptive reuse impacts through this report, as diverse multi-sectorial criteria and indicators require specialised sectorial knowledge and tools, such as the assessment of biodiversity, pollutants, or macro-economic spillovers. However, this report can be indeed useful for a wide range of stakeholders to orient themselves in the complex challenge of assessing the multidimensional impacts of cultural heritage adaptive reuse projects, making them aware of which dimensions and criteria are relevant, as well as which sectorial expertise may be involved for specific aspects.

This works introduces innovations in the impacts assessment of cultural heritage, related to the concept of the “Complex Social Value” which includes the “intrinsic value” of cultural heritage, going far beyond the concept of the Total Economic Value of heritage assets, promoting the search of



“satisfying solutions” balanced between instrumental and non-instrumental values. Furthermore, this work promotes the assessment of cultural heritage adaptive reuse projects in the circular economy perspective, paying particular attention to metabolism flows in and out of the heritage site/area, including the assessment of wastes, pollution, energy, but also intangible elements such as knowledge and values, which can be considered within design and management processes.

Finally, we hope this report will be of interest for all those researchers and stakeholders who directly contributed to the work and who shared critical insights, highlighting the need of relevant, reliable, robust, viable, practical and understandable evaluation tools for “circular human-centred cultural heritage adaptive reuse” impacts assessments.

3. Indicators for cultural heritage impacts assessment

Cultural heritage is considered a key element of cities and regions identity and uniqueness, potentially contributing to peoples' wellbeing and health, as well as to jobs creation, environmental regeneration and places attractiveness (Licciardi and Amirtahmasebi, 2012; Australia ICOMOS, 2013; European Commission, 2014b; UNESCO, 2015; Wijkman and Skånberg, 2015). However, heritage conservation needs large investments, while the resources available are scarce and investment projects are subject to high uncertainties (Fusco Girard, 1987; Fusco Girard and Nijkamp, 1997a, 2004; Ost and Carpentier, 2017).

The **adaptive reuse of abandoned and underused cultural heritage** sites can be a strategy to enhance heritage conservation, stimulating sustainable development processes through new uses of old buildings and sites, co-creating new meanings and re-activating neglected areas turning them into new vibrant cultural places (Bullen and Love, 2011; Gravagnuolo *et al.*, 2017; Fusco Girard, 2019a; Gustafsson, 2019). Adaptive reuse is defined as «any building work and intervention to change its capacity, function or performance to adjust, reuse or upgrade a building to suit new conditions or requirements» (de la Torre, 2002; Douglas, 2006). Several authors (Bullen and Love, 2011; De Medici, De Toro and Nocca, 2019b) stress the importance of adaptive reuse for urban regeneration. Günçe and Mısırlısoy (Mısırlısoy *et al.*, 2016) explore how investments in adaptive reuse can contribute to revitalize neglected areas, thus improving the living standards for the local community and attracting consequently new investments that foster economic growth in a virtuous circle. Considered as a critical economic condition for heritage conservation, adaptive reuse is not only economic in terms of relative costs of resources allocated in existing places from the past and new contemporary places (Shipley, Utz and Parsons, 2006).

Moreover, **cultural heritage adaptive reuse is a restorative, regenerative and a sustainable form of conservation** that extends the life of our cherished heritage, stimulates civic pride and responsibility, and preserves cultural values for future generations. It is not only a value bearer and a cost-efficient strategy, but also a sustainable approach that enables the reduction of depletion of raw materials, decrease transport and energy consumption and dispersion, contributes to lower waste and landfill environmental costs and to scaling down the production of carbon emissions. Thus, adaptive reuse can be a trigger for sustainable, inclusive and circular processes of tomorrow's economic system.

Cultural heritage impacts: overview of evaluation tools and studies

The concept and tools of evaluation for cultural heritage and the general development of thematic indicators have started emerging (Di Stefano, 1979, 1996; Nijkamp, Leitner and Wrigley, 1985; Nijkamp, 1989, 1990; Nijkamp, Rietveld and Voogd, 1990; Fusco Girard and Nijkamp, 1997b; Ost, 2009), and this is still confirmed by the more or less recent development of many documents and international papers (Nijkamp, 1989; Elsorady, 2014; Kutut, Zavadskas and Lazauskas, 2014; CHCfE Consortium, 2015; Historic England, 2016c, 2016a; Guzmán, Roders and Colenbrander, 2017; Stanik, Aalders and Miller, 2018; De Medici, De Toro and Nocca, 2019a).

The objectives of using specific **indicators** are diverse, from mapping and assessment of heritage attributes and values, to ex-ante evaluations to take decisions on heritage conservation vs. transformation choices, to ex-post evaluations focusing on the actual impacts generated through heritage investments. Multi-criteria techniques are used in order to evaluate different adaptive reuse strategies, selecting suitable sets of indicators, pointing out the consideration of cultural heritage as a driver of urban development. Elsorady (Elsorady, 2014) identifies a set of indicators with the goal of evaluating the compatibility of new uses for the adaptive reuse of heritage buildings, while Kutut *et al.* (Kutut, Zavadskas and Lazauskas, 2014) analyse indicators to assess whether or not historic

buildings should be reconstructed. Stanik et al. (Stanik, Aalders and Miller, 2018) investigate the relationship between cultural heritage and cultural ecosystem services, developing an indicator-based framework aimed at mapping cultural heritage in the spatial dimension. Moreover, Nijkamp (Nijkamp, 1989) gives an overview of cultural heritage evaluation methods, while Nocca (Nocca, 2017) deepens the role of cultural heritage for sustainable development, stating that there is an insufficient amount of indicators that demonstrate this relationship.

The European research “**Cultural Heritage Counts for Europe**” analysed a large literature body on methods and tools for the assessment of impacts of cultural heritage conservation projects, highlighting diverse areas of impact based on the four pillars of sustainability: economic, social, environmental, cultural (CHCfE Consortium, 2015). The reports of the “**Heritage Counts**” initiative developed in UK similarly explored the economic impacts of cultural heritage, deepening also wellbeing aspects (Historic England, 2016b, 2016a). Diverse studies focused on indicators to place cultural heritage in the sustainable development agenda (Labadi, 2011b; Rypkema and Cheong, 2011; Fusco Girard *et al.*, 2015; Nocca, 2017).

More recently, a ESPON research underlined the role of Material Cultural Heritage (MCH) as a strategic driver for sustainable territorial development (Lykogianni *et al.*, 2019). The ESPON research on the Material Cultural Heritage as a Strategic Territorial Development Resource identified a set of common European socio-economic indicators to map the impacts of material cultural heritage at the macro level. The study proposes three key indicators to assess the economic impacts of cultural heritage conservation, valorisation and reuse activities:

- **Number of employees** of the share related to CMH;
- **Turnover** of the share related to MCH;
- **Gross Value Added (GVA)** of the share related to MCH.

In addition, the study also considered the following indicators to complement the analysis:

- **Value of heritage volunteering** (both in terms of **estimated FTE and estimated monetary value**);
- **Expenditure by the public sector** on MCH (investments by public authorities on cultural services and spending on conservation, restoration, repair and maintenance of protected constructions).

The findings of the study demonstrate the importance of MCH for territorial development: “*Beyond its intrinsic value, MCH matters in economic terms as it fuels locally rooted employment and generates economic activities*” (Lykogianni *et al.*, 2019, p. 8). **Errore. L'origine riferimento non è stata trovata.** shows the contribution of MCH in key economic sectors for territorial development such as Tourism, Architecture, Real estate, Construction, Museums and Archaeology, as well as two ancillary sectors of ICT and Insurance.

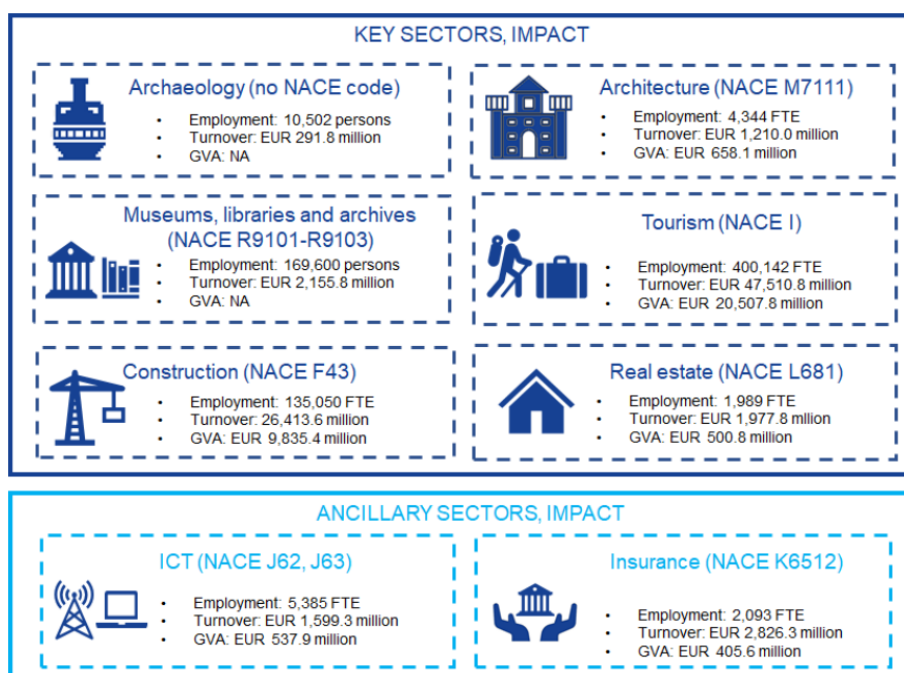


Figure 1. Impacts related to MCH in the stakeholder countries/regions in 2016 (source: ESPON research, Lykogianni et al., 2019)

In addition, the study proposed a monitoring system to gather data and calculate impact more optimally going forward in the future. For ESPON, the main challenges related to the assessment of MCH contribution to sustainable territorial development are linked to data availability and stakeholders engagement: *“the collaboration with the relevant stakeholders has been challenging for the data collection, especially since much of the available data is dispersed across many different categories of stakeholders (e.g. NSIs, heritage organisations, industry associations, etc.)”* (Lykogianni et al., 2019, p. 6).

Despite the huge range of studies developed in order to assess the multidimensional impacts of cultural heritage conservation, most of these studies focus on single economic impacts, for example tourism, cultural and creative sector, sustainability, wellbeing, while an integrated perspective is still missing and considerable efforts are still necessary to build a multidimensional framework (Gravagnuolo et al., 2017). Moreover, the decision-making processes for cultural heritage requires careful attention and cannot ignore the use of appropriate decision-making tools. Hence, in this context, *“evaluation can be considered a relevant tool to build choices, to recognize values, interests and needs, and to explore the different aspects that can influence decisions”* (Cerreta M; De Toro P., 2012). Consequently, the evaluation phase, in its different approaches, allows facilitating the decision-making process when different solutions are available, but different criteria have to be taken into account and the involved decision-makers may be conflicting (Mendas and Delali, 2012).

The CLIC project aimed at overcoming sectorial approaches in cultural heritage impacts assessment, providing a multidimensional evaluation framework based on evaluation criteria and indicators. In the next sections, a synthetic review of diverse studies and approaches on cultural heritage impacts assessment is presented².

² This report is complementary to CLIC Deliverable D2.5 “Methodologies for impacts assessment of cultural heritage adaptive reuse” in which the specific evaluation methods developed for cultural heritage impacts assessment in the ex-ante / decision-making phase are presented, to support decision processes towards higher level circularity.

3.1. Cultural heritage counts for Europe

The research project “Cultural Heritage Counts for Europe” (CHCfE Consortium, 2015) represents a key study for the assessment of cultural heritage contribution to sustainable development. The overall objective of the Cultural Heritage Counts for Europe project was to collect and analyse evidence for the significance of cultural heritage for the European economy, society, culture and environment, and to raise awareness of the value of cultural heritage for the development of contemporary Europe. The research collected a large number of studies dealing with the impact of cultural heritage, and organised the research output into three levels of analysis: macro, meso, and micro. In the macro level of the report (ca 140 studies reviewed), a theoretical framework was established which allowed the data to be understood within a broader global perspective, covering a review of theoretical literature on heritage impact as well as on indicators (both qualitative and quantitative) employed. The meso level entailed an analysis of the research that was done across the European Union (with 221 studies selected for further analysis) demonstrating the wide-ranging impacts of cultural heritage at local, regional, national, and European levels. Finally, the research was completed at the micro level with case studies which provided evidence of cultural heritage impacts in one or more of the four sustainability domains: economic, social, cultural, and environmental.

Based on the review of literature conducted, Cultural Heritage Counts for Europe identified a set of domains divided into the four sustainability dimensions in which cultural heritage has an impact, as well as methods and tools to assess this impact. As a fundamental study in the field of heritage impacts assessment, CLIC built on its conclusions, assuming them as the starting point of the research. It is therefore relevant in this report to briefly recall the main highlights from CHCfE, also to identify the innovations of CLIC with respect to the state of the art inherited.

First, CHCfE adopted a “pillar” approach by identifying four separate sustainability dimensions: economic, social, environmental, cultural. The cultural dimension was introduced as the “fourth” pillar with respect to mainstream sustainability definitions, stressing the role of culture for sustainable development. Then, the study identified 22 domains of heritage impacts, as shown in **Errore. L'origine riferimento non è stata trovata.**

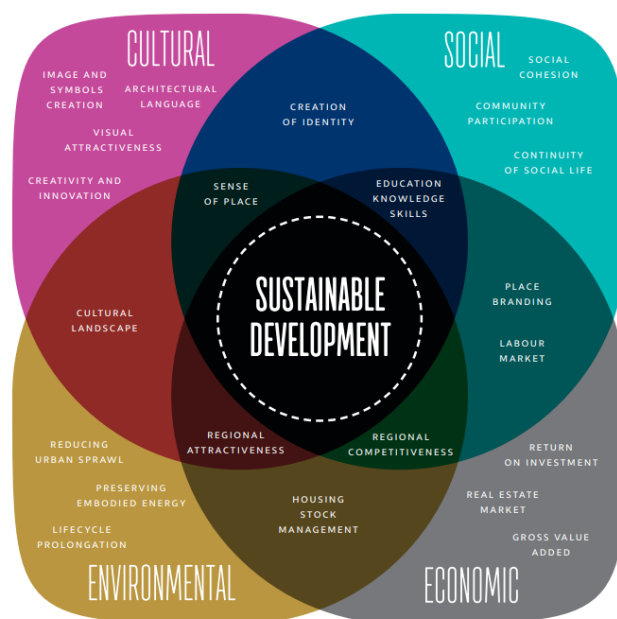


Figure 2. The different subdomains of cultural heritage impacts in CHCfE research

The analysis conducted within the CHCfE project showed that investments in cultural heritage from the mainstream policy stakeholders can be seen in terms of “upstream investment” which has the potential to deliver significant “downstream benefits” (e.g. jobs creation, environmental services, regional attractiveness and competitiveness).

The theoretical framework of CHCfE assumed the “total economic value” of cultural heritage as the base for the evaluation of its impacts, as showed in **Errore. L'origine riferimento non è stata trovata..** The Total Economic Value (TEV) theory will be briefly recalled in next sections, and compared with the CLIC proposition of the “Social Economic Value” of cultural heritage³.

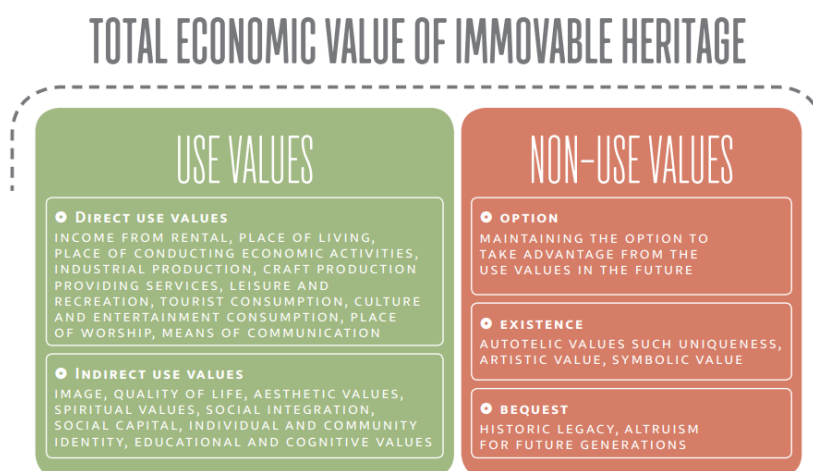


Figure 3. Total Economic Value of cultural heritage: representation according to CHCfE

The TEV theory leads to the recognition of economic values of heritage, identifying benefits which can be expressed in monetary terms. Indeed, the scientific literature provides diverse methods to assess cultural heritage benefits in monetary terms, from traditional market-based techniques such as cost-benefit analysis, financial analysis and economic modelling, and more sophisticated techniques based on revealed preferences of actual users such as the hedonic price assessment method and the travel cost method⁴; finally, in cases where a “market” for cultural heritage cannot be identified, such as for public goods, the stated preferences techniques such as contingent valuation method and choice modelling allow to identify cultural heritage value in monetary terms, building an “hypothetical market” through specific survey tools and assessing the potential “willingness to pay” of users. These techniques have been widely used to assess the value of non-market goods, including cultural and environmental goods, however their widespread use remains limited for many reasons, from the need of very specialised knowledge to the difficulty of anchoring the results to practical programmes and policies, as they assess an hypothetical “monetary value” of cultural heritage, but not its actual impact for city/region development. Other methods are reported by CHCfE to assess socio-cultural values through qualitative research, using ethnographic assessment procedures and/or anthropology based methods. Between the methodologies for qualitative impacts assessment, it is mentioned cultural mapping and participatory mapping, which were used also in CLIC to build the knowledge base of cultural heritage in pilot cities and regions.

³ Luigi Fusco Girard, 1987, 1997.

⁴ For the scopes of this report, it is not relevant to describe all methods in detail, however the CHCfE full report can be consulted for more details and references to scientific studies.

Finally, Multi-criteria analysis is mentioned as a “non-monetary evaluation method, [which] takes into consideration the multiple dimensions of a decision problem. Project effects are addressed in their own dimensions and a weighing procedure is used to compare or assess the various project effects against each other (Ost, 2009, p. 90)”. Indeed, CLIC assumes Multi-criteria analysis as the most appropriate method to build the structured impacts assessment framework considering multiple objectives, dimensions, criteria and indicators, in a circular economy perspective.

As per the assessment of environmental sustainability, CHCfE identifies methods such as building stock research, life cycle analysis and life cycle costing as potentially relevant for cultural heritage.

In the economic dimension, it is highlighted the potential of cultural heritage to generate jobs directly and indirectly, taking into account also induced impacts on jobs creation, in which tourism can be one relevant field. Jobs are assumed to be generated directly in fields such as heritage services, restoration works and heritage works. Spillover effects on economic vitality and attractiveness of an urban/landscape area are also considered. Moreover, jobs generated through the new uses of cultural heritage, including business activities localised in the heritage site, were briefly considered. At a larger scale (regional/national), the contribution of cultural heritage to GDP, increased tax income for public sector related to the economic sectors activated, and Gross Value Added (GVA) was reported as a relevant aspect.

In the social dimension, social cohesion, community participation and integration were considered important aspects to take into account in the integrated impacts assessment.

In the implementation phase, three case studies were explored. A comprehensive table of indicators divided into categories and sub-categories was built, providing some first results based on “micro” level data collection (i.e. the single case study).

A data collection was conducted in Mechelen, Belgium, including indicators from the economic, cultural, social, and environmental dimensions/domains (see **Errore. L'origine riferimento non è stata trovata.**). Some aspects were assessed based on the **opinion of interviewed residents and users** of the heritage site. **Quantitative “hard” data** were collected and/or estimated on economic and social aspects such as **jobs creation, income from cultural tourism, number of visitors** to the heritage site. **Detailed information on environmental aspects resulted not available**, such as **pollution, energy efficiency, green areas and general quality of life factors**. The **impacts on wellbeing** were also included but **no data was available**. In synthesis, the CHCfE research showed that **detailed information about some of the impacts of cultural heritage for sustainable development were still missing**, and a **comprehensive approach was far to be adopted by heritage managers**.

DOMAIN	SUBDOMAIN	INDICATOR	RESULTS
ECONOMIC	Cultural tourism	Amount of visitors and their expenditures	180,000 night visits, 775,000 day trips and 55 million EUR of income (in 2011)
		Accessibility of the city	Easy to reach by car, bus, train. Twelve parking lots and tourism signage throughout the city
		Number of heritage-related events in the city	No data
	Jobs	Amount of jobs directly related to heritage	2.8 FTEs in Monumentenzorg (in 2014) and 1.7 FTEs guides (in 2013)
		Amount of jobs indirectly related to heritage	No data
	Maintenance and restoration works	Estimate of the city for future maintenance and restoration works of the immovable heritage	33,850,000 EUR from 2014 to 2019
		Amount of contractors active in Mechelen and their activities	No data
		Turnover of heritage-related contractors (example)	8% of the turnover of Altritempi from 2002 to 2013 came from projects in Mechelen
CULTURAL	Real estate	Rental values of heritage	No data
		Property prices in the proximity of heritage	An increase of 257% in real estate prices in Mechelen from 2002 to 2012
	Attracting new investments	Opinion of people about heritage as a factor to attract new investments	40% of the respondents rank this factor as the least important out of six when setting up a new investment
	Education	The influence of heritage on students' knowledge about their culture's past	No data. 71% of respondents think that it should get more attention in class
		Offer of specialised studies related to heritage in schools	In Mechelen, there are 5 studies related to immovable and 2 to movable heritage
	Civic pride	Opinion of inhabitants about the image of Mechelen	84% of the respondents think that Mechelen has obtained a new image and heritage projects are rated as the biggest contributing factor
		Opinion of people about immovable heritage contributing to their feeling of identity	48.5% of the respondents identify themselves as Mechelaars, of which 71% state that the built heritage contributes to this feeling
	Recreation	Number of recreational activities taking place in the heritage	No data, but 85.3% of the respondents have visited a heritage building in Mechelen in the past
		Number of visitors on Open Monuments Day	14,662 visitors in Mechelen in 2013
	City revitalisation	Opinion of inhabitants about a trade-off between a heritage and a non-heritage building	74.7% of the respondents would prefer to keep the heritage building (the Hanswijk Basilica)
	Quality of life	Willingness to pay by inhabitants for the entrance to a heritage monument	41.2% of the respondents would be willing to pay 2.5 to 5 EUR, 23% 5 to 10 EUR, 17.3% 1 to 2.5 EUR and 11.1% nothing
		Preference of people for their residence	18.8% and 6.6% of the respondents would mostly like to live in a protected or an unprotected heritage building in the urban centre respectively

SOCIAL	Policy	Opinion of inhabitants about the policy on the conservation and maintenance of heritage	57.9% of respondents agree with the number of organised heritage projects, while 17% think the city invests too much money in these projects
	Cultural tourism	Carrying capacity on a social level	Inhabitants are not disturbed by tourists
		Satisfaction of visitors coming to Mechelen	Large majority of the tourists are satisfied with their visit to Mechelen
	Social cohesion	The amount and popularity of initiatives related to immovable heritage	No data
		Perception of involvement of the inhabitants in heritage	More or less 50% of the inhabitants feel they are involved in heritage
		Number of heritage related activities involving minority groups	No data
	Education and personal development	Increase of awareness of heritage (including its history) by the inhabitants	72% of the respondents agree that heritage should be addressed frequently in school
	Quality of life	Opinion on feelings of safety: increased/decreased feeling of safety in the city	65% of the respondents feel safe in Mechelen and 46% acknowledge that this feeling has altered during the past decade
		Increase or decrease of crime statistics in Mechelen	No noteworthy change during the past decade
		Feeling of well-being of the inhabitants	No data
		Increase of interest in living in heritage buildings	20% of the respondents would prefer to live in a protected building and 7% in an unprotected heritage building inside the city centre
ENVIRONMENTAL	Reduction of emission and pollution	Amount of pollution related to heritage	No data
	Energy efficiency	Energy consumption of heritage buildings	No data
		Accessibility and congestion related to heritage	No data
	Quality of life	Development of green areas related to heritage	No data
		Carrying capacity on an ecological level	No data
		Heritage as part of the urban planning	No data

Figure 4. Proposed indicators in CHCfE research, case study of Mechelen, Belgium (Source: CHCfE, 2015)

Thus, the key findings of CHCfE are related to the recognition of the contribution of cultural heritage to:

- the **attractiveness of Europe's regions, cities, towns and rural areas** in terms of private sector inward investment, developing cultural creative quarters and attracting talents and footloose businesses — thereby enhancing regional competitiveness;
- a **unique identity** that creates compelling city narratives providing the basis for effective marketing strategies aimed at developing **cultural tourism** and attracting **investment**;
- **jobs creation** across Europe, covering a wide range of types of job and skill levels: from conservation-related construction, repair and maintenance through cultural tourism, to small and medium-sized enterprises (SMEs) and start-ups, often in the creative industries;

- **creativity and innovation**, generating new ideas and solutions to problems, and creating innovative services with the aim of interpreting historic environments and buildings and making them accessible to citizens and visitors;
- providing a good **return on investment** and is a significant generator of **tax revenue for public authorities** both from the economic activities of heritage-related sectors and indirectly through spillover from heritage-oriented projects leading to further **investment**;
- sustainable **heritage-led regeneration**;
- Europe's **climate change challenges**, for example through the protection and revitalisation of the huge **embedded energy** in the historic building stock;
- **quality of life**, providing character and ambience to neighbourhoods, towns and regions across Europe and making them popular places to live, work in and visit;
- **education** and lifelong learning, including a better understanding of history as well as feelings of **civic pride and belonging**, **cooperation** and **personal development**;
- **build social capital** and deliver **social cohesion** in communities across Europe, providing a framework for **participation** and **engagement** as well as fostering **integration**.

Thus, the five strategic recommendations of CHCfE were:

1. Supporting evidence-based policy making;
2. Measuring impact;
3. Monitoring trends;
4. Sharing and disseminating data;
5. Maximising impact.

The CLIC research built on CHCfE results, advancing the state-of-the-art of scientific knowledge and developing new tools and methods for cultural heritage adaptive reuse impacts assessment in the perspective of the circular economy. Specifically, **CLIC introduced a systemic approach overcoming the “pillars” approach through the circular economy framework in cultural heritage adaptive reuse**, supported by the theory of the **Complex Social Value** that includes the **“intrinsic value” of cultural heritage**, as explained in the next sections.

The specific notion of **value of cultural heritage** is central in the CLIC research, introducing an innovation with respect to the CHCfE research. CLIC introduces a fundamental **shift of the ecological values, such as the “intrinsic value”, in social ecology and humanities**. Thus, **CLIC developed innovative evaluation methods and tools to support the implementation of circular business, financing and governance models in cultural heritage adaptive reuse**.

The innovation of CLIC is also represented by the focus on **future generations**, along with present generations. This frames cultural heritage adaptive reuse into a broader perspective.

3.2. The “Complex Social Value” of cultural heritage

Cultural heritage is more and more recognized also as **“common good”**, a hybrid category between “private good” (that has characteristics of excludability and rivalry in consumption) and “public good” (that has characteristics of non-excludability and non-rivalry). The concept of “heritage as common good” is mainly understood as “co-owned by heritage communities”, implying the right to accessibility and enjoyment, as well as the responsibility of heritage communities for its conservation. It implies the concept of **communities’ “co-ownership” of cultural heritage**, being the heritage legal property private or public. This new notion challenges the concepts of **responsibility** and current practice also in the investment models for the conservation of cultural heritage, opening up the scenario to new cooperative models for the conservation and regeneration of the “common goods” in cities (EUTROPIAN, 2017).

As common good, cultural heritage has a **Complex Value** (Fusco Girard, 1987; Fusco Girard and Nijkamp, 1997a; Zeleny, 2005; Lichfield, 1988, 1995; Fusco Girard & Vecco, 2019, 2021; Fusco Girard et al., 2019), which depends on its value for all stakeholders, including future generations. The **Complex Value** includes the “**intrinsic value**” as the expression of the need of keeping relevant parts of material heritage as it represents a symbol of common and shared characteristics rooted in the history of a community⁵.

This complex value includes:

- (1) a **use-value**, which depends on its localization (e.g. real estate values), state of conservation (related to costs), re-functioning possibilities (economically productive / non-productive functions), branding (attractiveness for tourism / local use);
- (2) an **independent-of-use value**, which is linked to its historic-cultural significance, symbolic value for the community, local identity that it expresses / conveys, and its value for future generation.

Although the economic value directly created by cultural heritage conservation could be low for traditional investment appraisal, the most advanced approaches in cultural economic theory demonstrate how **the economic value is created indirectly, through shared meanings that glue together people and chains**.

This requires the development of **new metrics that embody the traditional economic analysis in multidimensional innovative forms** (Throsby, 2012; Angrisano *et al.*, 2016; Gravagnuolo and Fusco Girard, 2017), namely through **multi-criteria and multidimensional evaluation frameworks** that consider costs and benefits for all actors and stakeholders involved, including their perception of the “complex value” of the cultural heritage / landscape (Rypkema, Cheong and Mason, 2011; Heritage Lottery Fund, 2016; TBR, 2016). This approach, which requires economic methodological innovations, is in line with current conservation practices relying on the Historic Urban Landscape recommendation (UNESCO, 2011, 2015, 2016).

Evaluation methods should be able to capture the Complex Value of cultural heritage for the society before and after the reuse in business models, in the perspective of the “new capitalism” (Porter and Kramer, 2011). The precondition is that cultural heritage has an economic value that can be assessed and increased (Licciardi et al, 2012).

Three main research streams are identified in other sectors and translated in the cultural heritage field:

- The concept of “Shared value” proposed by Porter and Kramer (Porter *et al.*, 2011)
- The concept of “Complex Social Value” proposed by Fusco Girard (Fusco Girard, 1987; Fusco Girard and Nijkamp, 1997a)
- The concept of “intrinsic value” of nature as ‘non-instrumental value’ in ecological economics, shifted to the field of cultural heritage

The definition of “complex value” of heritage resources includes the “**Total Economic Value**” (as proposed in Environmental Economics) but enlarges it introducing the notion of “**intrinsic value**” as proposed by Fusco Girard (1987, 1997) and in the literature on ecological economics.

⁵ See Fusco Girard, CLIC Deliverable D2.7 “CLIC Framework”, and Fusco Girard (2020, 2021), Fusco Girard and Vecco (2020, 2021).

To explore the notion of value for “public goods without market” such as forests, wetlands, and even specific heritage resources, we refer first to the notion of “Total Economic Value” (TEV) widely used in environmental economics and adopted in the large literature on Ecosystem Services evaluation, particularly in the framework of the Millennium Ecosystem Assessment in 2003 and 2005, and further elaborations (MEA, 2003; MA, 2005) and TEEB study - The Economics of Ecosystems and Biodiversity, 2010 and further elaborations (TEEB, 2010).

Below a definition of TEV from Emerton (2017):

“Total economic value (TEV) is an all-encompassing framework that is used by economists to identify and categorize environmental benefits. The concept of TEV first came into general use in the late 1980s and early 1990s (Pearce et al. 1989). It has now become one of the most widely used and commonly accepted systems for classifying wetland economic benefits and for attempting to integrate them into decision-making (Barbier et al. 1997). TEV emerged largely in response to the perception that conventional economic approaches tended to see the value of the natural environment only in terms of the raw materials and physical products generated for human production and consumption, especially focusing on market activities and commercial profits. It was argued that this persistent under-valuation of environmental goods and services had in many cases led to decisions being made which resulted in economically suboptimal outcomes and, in the worst case, had incurred substantial costs and losses to the economy (Emerton 2005). Rather than just considering commercial or extractive values, TEV also takes into account subsistence and nonmarket values, ecological functions, and non-use benefits. Looking at the TEV of a wetland essentially involves considering its full range of characteristics as an integrated system—its resource stocks or assets, flows of environmental services, and the attributes of the ecosystem as a whole (Barbier 1994). As well as presenting a more complete picture of the economic importance of wetlands, TEV clearly demonstrates the high- and wide-ranging economic costs associated with their degradation, which extends beyond the loss of direct use values.

Total economic value distinguishes between use values and non-use (or passive use) values. Whereas use values refer to the value of actual, planned, or possible uses of a wetland and its resources, non-use values are the values that people ascribe to keeping the wetland in existence, even when there is no actual, planned, or possible use (OECD 2006). The TEV categories of use and non-use values are usually disaggregated further into four components: direct use value, indirect use value, option value, and existence value (Pearce 1993).”

The following **Errore. L'origine riferimento non è stata trovata.** schematizes TEV value components.

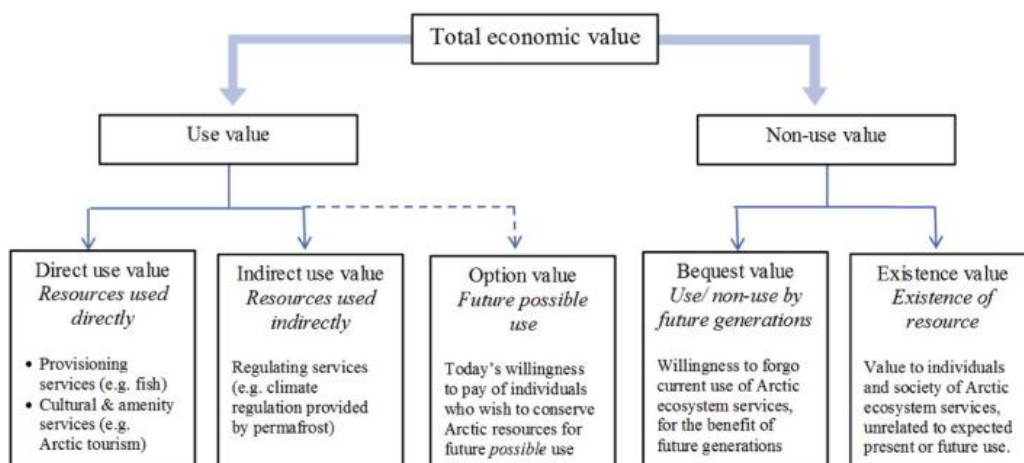


Figure 5. Total Economic Value (TEV) components

Source: O'Garra (2017) *Economic value of ecosystem services, minerals and oil in a melting Arctic: A preliminary assessment.*

The specific notion of “Social Complex Value” of cultural heritage has been proposed by Fusco Girard (1987) and Fusco Girard and Nijkamp (1997), and further developed in recent literature by Luigi Fusco Girard (Fusco Girard, 2019a, 2021; Fusco Girard and Vecco, 2019, 2021; Bosone *et al.*, 2021).

Errore. L'origine riferimento non è stata trovata. synthesizes the Social Complex Value.

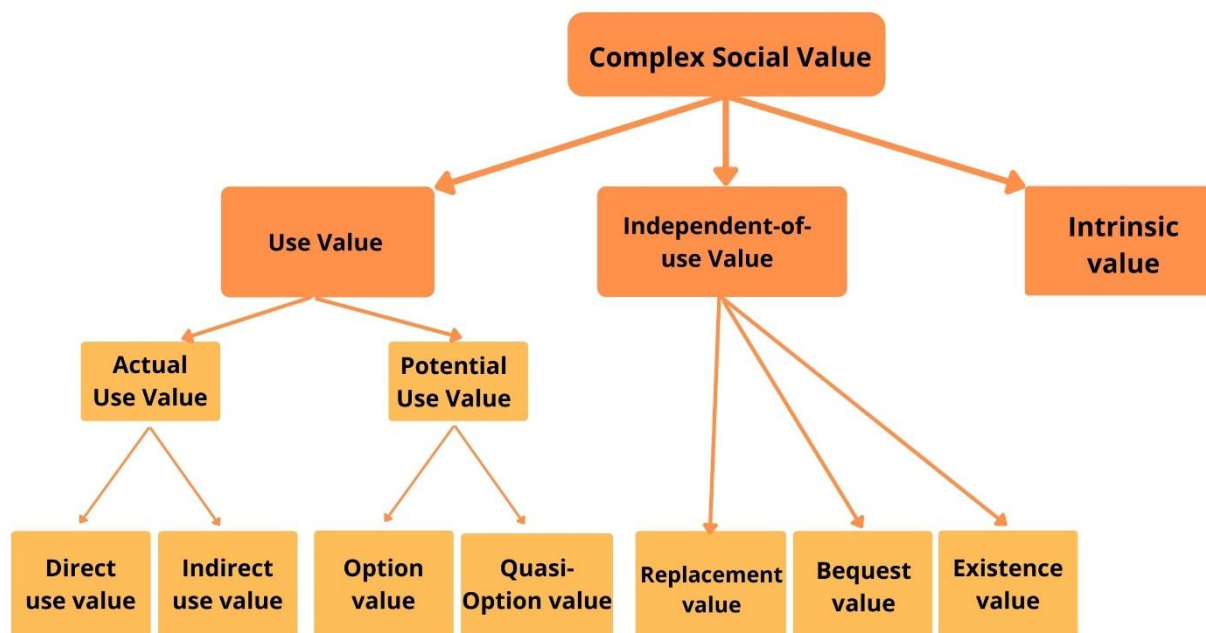


Figure 6. The Social Complex Value of cultural heritage

Source: adapted from Fusco Girard, L (1987), and Fusco Girard and Nijkamp (1997)

For the scope of this research, it can be thus assumed that the “complex social value” of heritage includes:

- A “use value” – direct, indirect and optional;
- A “independent-of-use value” – including “bequest value” and “existence value”;
- An “intrinsic value” – that is linked to its cultural significance as introduced in the ICOMOS Burra Charter (ICOMOS Australia, 2013), its “meaning” as understood and perceived by the heritage community.

The intrinsic value of cultural heritage is thus linked to its “cultural significance” (ICOMOS Australia, 2013), its “meaning” layered through history.

The concept of the intrinsic value of cultural heritage can be understood in relation to the concept of intrinsic value of nature (as proposed by ecological economics studies). Nature has an instrumental value, but nature has also a “value in itself” that is not dependent from the possibilities of achieving human benefits from its use, being it present, potential or future. It is rather linked to the generative and self-regenerative capacity of nature, its “life” generation capacity built over millennia through the circular auto-poietic capacity of ecosystems.

From the concept of intrinsic value of nature derives the concept of intrinsic value of cultural heritage, which is specifically linked to the expression of creativity of the human being, in analogy with the creativity regenerative capacity of nature, and to the synergic and symbiotic relationships between people and nature built over millennia of human history.

Heritage expresses uniqueness, non-reproducibility, human-nature relationship, the roots of the identity, the capacity of glue different components in a systemic perspective. The intrinsic value of heritage is linked to the sense and meanings recognized in particular by local communities, the spiritual value of sacred sites, the capacity to link together, etc.

The contemporary adaptive reuse of this heritage places should not be in conflict with their original meanings. Thus, the adaptive reuse of cultural heritage is a process that is not only directed to find new instrumental values, but also to expand the collective conscience, awareness and creativity.

For this reason, the sense and meaning of cultural heritage should be recognized, expressed, interpreted and evaluated, as it represents the direction that should orient any adaptive reuse perspective of disused cultural heritage ⁶.

A “rational” adaptive reuse choice is that aiming at the best compatibility between possible creative use values and the intrinsic value of cultural heritage.

A circular adaptive reuse based on intrinsic value allows the identification of new use values, that can be turned into exchange values to generate resources for the maintenance and management of heritage, enhancing its intrinsic value.

It becomes a self-regenerative / autopoietic process able to regenerate different values.

⁶ The intrinsic value of cultural heritage can be understood through the following elements:

- Essential elements
- Identity roots
- Recognized meanings
- “DNA”
- Glue elements (cooperation...)
- Permanence elements in the urban evolutionary dynamic

Source: Fusco Girard, CLIC Horizon 2020 project: the general framework, draft 21-12-2020

In analogy, the autopoiesis in terms of production of community values can be interpreted as stemming from the intrinsic value to the identification of the most compatible use values able to promote social inclusion and community values, contributing to the enhancement of the intrinsic value.

Moreover, in analogy, the autopoiesis of natural values proceeds from the intrinsic value to the identification of compatible use values, integrating man-made and natural capital. This integration contributes again to the enhancement of the intrinsic value.

This “intrinsic value” of heritage should be central in the development of business models, also in order to identify new use values (functions) compatible with it. This is linked to the cultural dimension of the business activity, and to the accounting of its cultural costs and impacts.

3.3. Culture as sustainable development: beyond the three pillars approach

The adaptive reuse of abandoned and underused cultural heritage and landscapes can be a key driver of economic growth, social wellbeing and environmental preservation, contributing to sustainable development of cities and regions (European Commission, 2014b, 2015b; CHCfE Consortium, 2015; European Parliament, 2017b). However, the assessment of the impacts of cultural heritage conservation, adaptive reuse and regeneration is still rarely conducted, therefore the actual **contribution of cultural heritage to sustainable development** remains underestimated or not estimated at all. Methodologies and approaches for the **assessment of the impacts** of cultural heritage conservation and adaptive reuse have been identified in recent research, considering the multiple interrelated **dimensions of sustainability: economic, social, environmental, and finally the cultural dimension, highlighted as the fourth pillar of sustainable development** (CHCfE Consortium, 2015). Another body of studies places the **cultural dimension in a more central place as the foundation of sustainable development** (Dessein *et al.*, 2015). Although comprehensive approaches to the assessment of multidimensional impacts of cultural heritage conservation have been developed (CHCfE Consortium, 2015; Fusco Girard *et al.*, 2015), many studies focus on the **sectorial economic impacts** (de la Torre and Mason, 1998; Davies and Clayton, 2010; Historic England, 2016b), other studies highlight the **benefits of heritage conservation for society** (Bertacchini, 2016; Historic England, 2016a), but **less attention has been devoted to the complex interrelationships between culture, economy, society and the environment**. The highly specialized and sectorial knowledge on impact assessments produced in the fields of heritage preservation, economics, social science, and ecological economy, has reached well-validated and reliable methodologies in each respective scientific field. However, on the operational perspective, working in silos hinders the possibilities of inter-disciplinary knowledge exchange and dialogue, preventing scientists from developing **complex multi-dimensional impact assessment frameworks for cultural heritage conservation**. Moreover, the **adaptive reuse of cultural heritage**, which necessarily foresees certain thresholds of **transformation**, ideally at minimum levels, to allow adaptation to new functions (Douglas, 2006; Bullen and Love, 2011), is mainly approached from a **pure “conservative” perspective**, underestimating the **potential positive impacts that minimum levels of transformation can generate on local economies, social cohesion, wellbeing, and environmental preservation**, opening the field to the **innovative uses of heritage resources**.

The circular economy approach allows to adopt a systemic perspective, introducing the complex notion of value in traditional economics that links ecological and human-centred values, intrinsic and instrumental values. However, the circular economy cannot be implemented only through a technical/technological approach: **culture, which influences how values are perceived**

at societal level, is central in the transition towards a more sustainable development model based on the circular economy.

Culture and sustainable development⁷

Culture is intended as mindset, ways to approach life, lifestyle, and thus as ways of behaving and taking choices. It represents the most peculiar human product and expresses the relationship between man and nature. In this sense, culture expresses the way through which man approaches nature, or interprets nature, or acts on it (as a private good or a common good).

Culture becomes thus the foundation of humanity, its root. Highlighting culture as the foundation for a sustainable development means introducing the perspective of a human development. More precisely, it means introducing the perspective of **human sustainable development** (Fusco Girard and Forte, 2000).

It means to set the objective of **promoting a human horizon of development**, interpretable in the perspective of a **new humanism in the era of globalization**, founded on **reciprocal inter-subjective relationships and man-nature relationships**.

The above reflection, on a conceptual/theoretical sphere, views **culture as the element unifying the three dimensions of sustainability**. On the operational sphere, it positions the three dimensions in a reciprocal relationship and systemic interdependence, based on the external effects to the economic dimension (social and environmental impacts). The consequence is to avoid that choices that are rational in the economic dimension, determine negative impacts (irrationality) on the ecological/environmental and social dimensions.

More precisely, it intends to verify **in which way an economic value is generative and re-generative also of ecological and social values**. Finally, the above argumentations introduce a **co-evolutive perspective** between the economic dimension, environmental dimension, and social dimension.

After reviewing a number of graphs and visual representations of the relationships and systemic interdependences between culture and the three dimensions of sustainability, and for the purpose of this report, **Errore. L'origine riferimento non è stata trovata.** is proposed. According to this approach, **culture is perceived as the foundation for sustainable development and thus it embodies the three dimensions of sustainable development**.

⁷ This section is based on scientific articles published by prof. Luigi Fusco Girard and CLIC researchers between 2018 and 2021 in BDC, Sustainability, and other international journals.

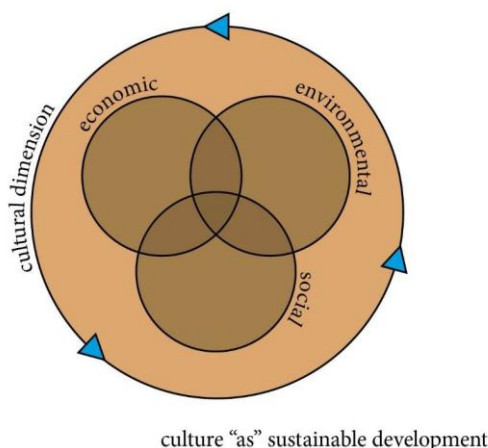


Figure 7. Proposed approach: Culture as the foundation for sustainable development

Source: adapted from Dessein et al., 2015

Culture is here recognized as the very foundation of sustainable development, as it influences how economics and environmental values are perceived, as well as their priority scales. In fact, **economic values are expression of perceived needs, which are a consequence of cultural values**, beliefs and behaviours. Culture means also the way in which one reacts to problems. For example, **environmental values can be perceived differently in a cooperative or competitive context**.

Since UN Habitat II which was held in Istanbul in 1996, UNESCO continued to advocate for **humanizing the city** and urging the International community to adopt a new urban paradigm (see the Foreword of the New Urban Agenda of Joan Clos, as well as the paragraphs 15-24). This urban paradigm shift **embraces a human centred city where people and their wellbeing are crucial for achieving development**. However, people are not perceived as passive actors in the process, on the contrary, **people participation in humanizing the city throughout culture is key**.

In 1998, the intergovernmental conference on cultural policies for development which took place in Stockholm, shed the light on the **interactions between culture and development** and the need to reflect this finding in the cultural policy and decision-making mainstream. Building on the previous efforts, the **UNESCO Declaration on cultural diversity in 2001 affirmed the crucial role of cultural diversity in sustainable human development**.

In the last eighteen years, the UN General Assembly has repeatedly acknowledged the role of culture for sustainable development through several resolutions: UN resolution on **Culture and development** 2010 (A/RES/65/166) and 2011 (A/RES/66/208), **Culture and sustainable development** 2013 (A/RES/69/230); 2014 (A/RES/68/223); and 2015 (A/RES/70/214).

In 2013, the **UNESCO International Congress ‘Culture: Key to Sustainable Development** which took place in Hangzhou, draw a line on the correlation between culture and sustainable development. As a consequence, the UN recognized in 2015 the role of **culture as crucial enabler of sustainable development**.

A definition of cultural heritage in terms of cultural capital

The theoretical basis for **Culturally Sustainable Development** derives from the **theory of cultural capital** as it is understood in **economics**.

Tangible and intangible assets which embody or give rise to cultural value in addition to whatever economic value they possess can be interpreted as items of cultural capital.

Such cultural assets may be long-lived, inherited from the past, and valued for their **cultural significance**. Alternatively, **cultural goods and services being created in the present by artistic or cultural endeavours may endure as eventual contributions to the tangible or intangible cultural capital stock**. However, it arises, the stock of cultural capital available to a community or a nation comprises a valued resource that has somehow to be managed, and it is this management function that can be interpreted within a sustainability framework (Throsby, 2017).

In urban context, cultural capital is made of different categories of urban cultural assets, which include **tangible and intangible heritage assets**, with possible extension to **natural assets** (riverfront, green areas, gardens, parks) and **other urban assets** (schools, creativity and innovation centers, markets, historic places, universities, landscapes, public squares).

The cultural capital of a place generates over time a flow of economic values (private, public, externalities) for all kind of stakeholders, **in addition to the cultural values that express the significance of the place**. Because it is not always possible to link economic values of a place to a specific monument or urban cultural asset, it is assumed that economic values are generated collectively (macro-economically) to a specific cultural capital zone.

Therefore, **from an economic perspective, adaptive reuse of cultural heritage is embedded in a three-tier framework**:

1) Heritage with cultural significance constitutes a cultural capital, or an economic asset yielding a flow of services over time that in turn generates both economic and cultural values (Throsby, 2001). As a capital, cultural heritage fits in a particularly long timeline, deteriorates over time unless resources are devoted to maintenance and upkeep, and unless its uses is adapted on a regular basis.

2) Urban conservation presents a specific challenge of adapting complex, diversified, and spatially integrated cultural capital. Adaptive reuse in urban settings fits in a new “up-stream” paradigm that starts with global challenges and considers cultural heritage as a resource subject to the creativity of technological innovation and contemporary cultural production, such to have a better chance of surviving the threats of mass-tourism or modern urban development. Adaptive reuse aims to prioritize, exemplify, and integrate circular, inclusive, and sustainable values in the processes of heritage conservation.

3) Cultural heritage is made of tangible and intangible assets that require appropriate methodologies in terms of adaptive reuse. The growing interest for intangible heritage, in particular in non-Western context of conservation, implies to reflect on what to conserve, and for whom. Multi-criteria and multi-stakeholders’ analysis provides insight on best compatible reuses of tangible heritage in close connection to owners and users, to social practices and intangible concerns.

3.4. Cultural Heritage Adaptive Reuse in the perspective of the Circular Economy

The Circular Economy

The **circular economy** represents a **pathway to sustainability**, promoting a development model that “**decouples growth from resource constraints**” (Ellen MacArthur Foundation, 2015c), **internalizing negative environmental and social externalities, or reducing them through innovative production-consumption models** and business models (Ellen MacArthur Foundation, 2014). A circular development model is also “**regenerative**”: this means that not only negative externalities are reduced, but also **positive environmental, social (and cultural) impacts are produced** to benefit the society as a whole (Wijkman and Skånberg, 2015).

The implementation of this model requires diversified action at the macro, meso and micro level (Ghisellini, Cialani, Ulgiati, 2016), the macro level referring to governmental action (laws, regulations, taxes and incentives) (European Commission, 2015a; Yuan, Bi, Moriguchi, 2008), while micro level refers to the scale of the single actor and enterprise business model. The meso level refers to the relationships between actors, especially enterprises in industrial ecology and industrial symbiosis studies (Boons *et al.*, 2011; Chertow, 2000, 2008; Dong and Fujita, 2015; Jacobsen, 2008) and eco-industrial parks (Shi *et al.*, 2010; Yu *et al.*, 2015) while in other studies it is linked to the scale of the city / territory considering the relationships and synergies between territorial actors (Chen *et al.*, 2012; van Berkel *et al.*, 2009).

The **circular economy model** exploits synergies in the business/financing sector, in the social, cultural and institutional dimension through innovative public-private-civic partnerships for the management of commons, and environmental synergies through adaptive reuse of buildings and landscapes, of their embodied energy and local materials.

The **Circular economy** is a **sustainable economy that enables a continuous positive development cycle that preserves and enhances the created values, in an indefinite time, of cultural and natural capital, optimises resource yields and minimises system risks by managing finite stocks and renewable flows** (Ellen MacArthur Foundation, 2012, 2015c; Wijkman and Skånberg, 2015; Ghisellini, Cialani and Ulgiati, 2016; Kirchherr, Reike and Hekkert, 2017; Korhonen, Honkasalo and Seppälä, 2018). Thus, it is a **win-win-win regenerative approach** where economic growth and heritage conservation (tangible and intangible) and community co-exist and co-evolve (Fusco Girard and Gravagnuolo, 2017). It focuses on closed loops especially in recovering (and recycling) values in order to keep materials circulating through the economy and by considering the potential of cultural heritage in adaptive re-use that includes, socially and environmentally responsible use, innovative sourcing and designing to address human needs and well-being. It adopts a whole system perspective (consider value in a broader view) and longer, multiple and cascade cycles and it addresses all sectors of society at all levels (European Commission, 2015a; European Commission and Eco-innovation observatory, 2016).

Errore. L'origine riferimento non è stata trovata. expresses in different terms the systemic circular economy model, where each value in one dimension is generative of impacts / values / externalities (disvalues) in other dimensions. The symbolic dimension becomes attractor of economic activities. The environmental value becomes attractor of economic activities as well, which in turn enhance livelihoods income and employment in a reciprocal process.

The circular economy model, in this sense, projects the economic dimension into a multidimensional space, and thus requires a multidimensional / complex notion of value.

The co-evolutive model of ecological economics sees in culture a fundamental filter: culture influences the quantity of wastes discharged in the ecosystems, the quantity of resources extracted from ecosystems, and the percentage of wastes reused / recycled, the perception of economic needs, the consumption patterns, etc.

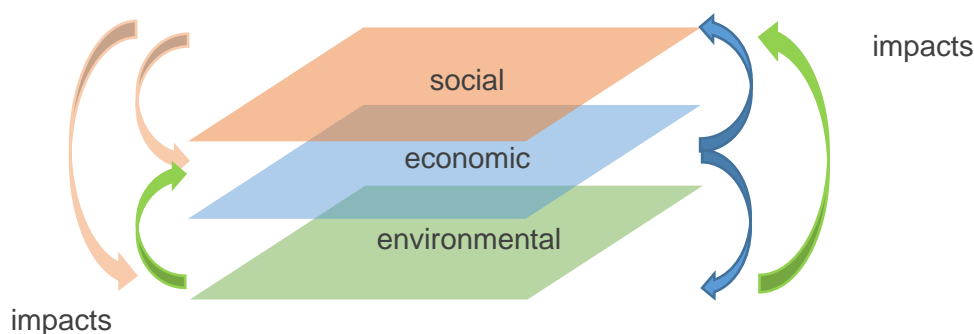


Figure 8. The systemic circular economic model: a conceptualization

Many **European cities and regions are developing their strategies for the circular economy** (Amsterdam, Paris, London, Glasgow, Kalundborg, Rotterdam, Brussels, Lille...), stressing the role of territorial actors and synergies to deliver new services and products and sustainable, “circular” production-consumption strategies, with the aim of boosting sustainable economic growth while enhancing the environment and social benefit (European Commission, 2015a). While most of the strategic plans for the circular city are focused on waste management and industrial symbiosis, studies focus also on the social and institutional dimensions as key to achieve a “full” circular development (Moreau *et al.*, 2017).

The circular economy concept has been often linked to the concept of sustainability in scholarly literature (Geissdoerfer *et al.*, 2017). However, **the definition of sustainability can be still challenging, since scientific studies often do not consider “culture” as a key dimension and fourth pillar of sustainability** (CHCfE Consortium, 2015). Culture, cultural heritage and landscape are considered as key resources for sustainable development in Europe (European Commission, 2014b, 2015b; European Parliament, 2017a). Culture, cultural heritage and cultural landscape (which include natural preservation (European Parliament, 2017a) can drive a new European development model based on the circularization of processes (the circular economy) (European Commission, 2014a, 2015a, 2017). For example, the **BES evaluation framework (Sustainable and Equitable Wellbeing)** developed by the Italian National Institute for Statistics (ISTAT) identifies that the **quality of the landscape as an “indicator” of wealth and wellbeing** (ISTAT, 2015). Thus, it can be argued that the multidimensional benefits expected by the implementation of a circular economy development model can be “measured” using the **landscape “beauty” as a complex indicator**, correlated to environmental wealth, enhanced wellbeing and human health.

Strategic investments are needed to implement the circular economy model, both through policies aimed at re-orienting producers’ and consumers’ behaviours, and through bottom-up definition of new industrial relationships, business models, social corporate responsibility. It is more and more clear that investments in cultural heritage produce positive impacts in the economic, social, cultural and environmental dimensions. A regenerative development model, as proposed in the circular economy European policy documents, can be achieved introducing culture as one strategic area of investment.

The unique beauty of European cultural landscapes is an attractor of investments and economic activities linked to tourism, but also to cultural and creative industry, traditional “bio” food production, artistic creation, and are a reason for cultural identity, social cohesion and wellbeing. Their beauty is able to stimulate new relationships and a renewed responsibility, which entails the responsibility towards the “other” man and towards the environment.

Beauty, economy and fairness could become pillars of the circular economic model through which Europe will realize sustainable development.

The approach proposed by **Faro Convention on the Value of Cultural Heritage for Society** (Council of Europe, 2005) introduced the idea of “**heritage community**”, pointing out the ability of cultural heritage to strengthen communities’ bonds.

Cultural heritage can produce wealth both directly, through use values, which meet demand and supply, both indirectly, through relational values, which get the foundation of symbiotic processes and in turn generate added economic, social and environmental values. In this way, cultural heritage can subvert the negative dynamics which affect our times, by producing **synergies and symbiosis**, tackling the **loss of relationships**, and by **regenerating common memories and knowledge**, addressing the **loss of local identity driven by globalization process**. Local communities are fundamental for cultural heritage conservation, as they contribute both to understand and to share its complex values, reinforcing their perception and enhancing the real availability to pay for conservation (Fusco Girard, 2014).

In the framework of the UN-Agenda 2030, the **regeneration of cultural landscape, supported by circular relationship between city and countryside, is critical to achieve most of the SDGs** (Hosagrahar *et al.*, 2016; UN-Habitat, 2015). In fact, the major issues of sustainability lie in the **landscape**: poverty and social inequality, distribution and consumption of resources, production of waste, climate change, loss of biodiversity.

Acting on landscape is not only possible to regenerate cultural heritage, but to deal in a structural way the main challenges of our time too. This requires the development of approaches, methods and technical tools that are the result of new scientific knowledge, which pushes for reconfiguration of didactic paths, scientific research and the same vocational training.

"The challenge of sustainability is won or lost in the city" has been repeatedly noted (United Nations, 2016). Indeed, the New Urban Agenda proposed to Quito by UN Habitat suggests a series of indications to achieve sustainable development in the concrete space of cities. This New Urban Agenda, while reaffirming the call to the category of responsibility, introduces the idea of civic responsibility (par 156), after emphasizing the central role of culture (par 124) (United Nations, 2017).

Cultural heritage is an example of hybrid resource between market and public institutions, general interest and specific interest, collective and personal... cultural landscape is a hybrid between nature and culture. The perspective of cultural heritage and landscape as a “common goods” opens up the conservation scenario to new innovative forms of business, financing and governance, abler to conserve / valorise the heritage together with the social and natural environment through the subsidiarity principle.

Innovation is here interpreted in the perspective of the circular economy. Commons and circular economy are interrelated: **the circular economy offers a co-evolutive perspective in conservation / management of the heritage, imitating nature auto-poietic processes.**

The circular economy expresses the new economic model (4.0), because:

- It takes into account / incorporates the external effects on the natural and social environment in generating economic wealth;
- It expresses a form of co-evolutionary capitalism that makes integration of environmental, social, development goals (Porter and Kramer, 2011);

- It projects the conventional economy in a multi-dimensional space in which, therefore, economic, ecological and social values coexist:
- It modifies and enriches the very notion of value towards a Complex economic, ecologic and social value (Complex Value).
- It modifies the project of investment/project/plan that necessarily becomes systemic.
- Technological innovation fosters innovation reducing costs/enhancing performances.

This requires hybrid trans-disciplinary approaches able to combine millennial traditional knowledge with scientific knowledge, develop multistakeholder win-win business, financing and governance models, inclusive planning and decision-making. The circular paradigm is assumed here not only for the economic grow but also for promoting the human development paradigm, without “waste of people”.

It projects the capitalist economy in a *multidimensional* space in which, therefore, economic, ecological and social values coexist. It is modified and enriched the very notion of value through the notion of Complex Social Value. The CE is a central political project for Europe, as it offers the potential to set a strong perspective on renewed competitiveness, positive economic development, and job creation (Morgan and Mitchell, 2015). **The circular economy vision for a competitive Europe, makes strong cases for business models centred on re-use, rather than consumption of ecological resources, and regenerative practices that have, on top of economic advantages, beneficial impacts for society as a whole** (Ellen MacArthur Foundation, 2015c).

The multidimensional productivity of cultural heritage adaptive reuse in the circular economy perspective

Within a circular economy, the adaptive reuse and regeneration of abandoned and underused cultural heritage and landscapes can be seen as a fundamental contribution to ‘decoupling growth from resource consumption’. In fact, the reuse / recycle / refurbish / recovery / repurpose of abandoned heritage buildings, sites and landscapes, practically contributes to a circular urban-territorial economy, enlarging the lifetime of heritage assets providing new uses, economic opportunities and jobs from wastes.

For the purpose of developing a structured framework for the assessment of “multidimensional productivity” of cultural heritage adaptive reuse, before identifying the dimensions and related criteria that will characterize the evaluation framework, it is necessary to clarify some premises about the productivity of the reuse in terms of added value and added values: “productive” reuse as generative action.

The **multidimensional productivity** of the reuse reflects the attractive capacity that is determined by the intensity of functions, their typology and reciprocal synergistic combination. In other terms, it is needed to focus on the complex and multidimensional nature of the impacts of the conservation of cultural heritage, that is represented by the “external effects” that are generated by the conservation. This added value is certainly linked to the type of conservation intervention, that can vary from adaptive reuse to restoration and preservation. The added value tends to be higher in the adaptive reuse, compared to other conservation interventions. With the adaptive reuse, the concrete regeneration of cultural heritage is realized, in the sense that a new use value is recognized to the cultural heritage, both from the private and the social perspective, that tends to last in the longer-term. This reflects exactly one of the characteristics of the circular economy model (de Jesus *et al.*, 2017; Kirchherr, Reike and Hekkert, 2017).

The impacts, thus the external effects of the adaptive reuse, have to be evaluated on different dimensions, since they are expressed in the cultural dimension (e.g. education, communication, etc.), in the economic dimension (on touristic attractiveness, on the real estate market), in the social dimension (on labour market, on social networks and relationships), and in the physical-spatial-urban context in which the cultural heritage is localized (Brito *et al.*, 2012). The entry of materials and energy and their exit are included in the evolutionary perspective.

The circular economy has three main characteristics:

1. **it is oriented to enlarge the lifetime of goods**, assigning them new functions (in a long time perspective);
2. **it is based on synergies/symbioses between actors** in fostering closed loops of value creation: economic wealth is created through multiplying of relationships;
3. **it enhances the productivity**, decoupling wealth production from negative environmental impacts.

These characteristics are features of cultural heritage as well. In fact, **cultural heritage has an ideally infinite lifetime, which should be guaranteed through reuse/recover; and it has the ability of creating relationships, cooperation and bonds within economic, institutional and community actors in the local territorial level, in a positive game perspective.** Public institutions, enterprises and local community implement circular processes, which enhance the circular economy, the wellbeing perception and also the perceived quality of life.

The entry points for the realization of forms of circular economy can be the following:

1. in cities that have already experienced forms of sharing economy / zero waste economy;
2. in cities that promote the tourist economy as an economic base, being the tourist economy predominantly linear and unable to take into account the value capture, etc.;
3. in the disused port areas, where there is an industrial heritage of particular interest;
4. interventions of enhancement in historic centers of small towns, because here there is still a form of culture antithetical to that of disposable (culture of reuse conservation). In addition, it is easier to promote forms of interpersonal / inter subjective synergies.

The closed loop is the key principle of the circular economy model. Circular models can be applied not only to industrial processes, but also to financing, business and governance models, creating synergies between multiple actors, reducing the use of resources and reusing / regenerating values, capitals and knowledge.

The regeneration of abandoned or underused cultural heritage / landscape realizes operationally the circular economy, reducing land consumption and allowing the preservation of ecosystem services. It is an integral part of the circular development model, realizing in practice many circuits of the theoretical model:

The reduction of materials use - reducing the need of new land and buildings;

Reuse and shared use of existing goods with new functions;

- Maintenance of existing goods (buildings, cultural landscape) ensuring longer life;
- Energy recovery – valorising the embodied energy and using renewable energy sources;
- Re-creation of value through the use of parts of existing (ancient, historical) buildings (refurbishing / remanufacturing);
- Regeneration of cultural values

The circular economy needs to be implemented on evolutionary circular business model for entrepreneurs, public institutions (cities) and social actors (associations, etc.).

The innovation is in the research of creative hybrid business models able to integrate traditional business centered on profit maximization with social and environmental productivity, thus implementing economic, social and environmental responsibility. This kind of hybridization includes also the profit and non-profit, traditional and social enterprise, repositioning business in a social / cultural and environmental perspective (Bannik *et al.*, 2017; Jackson and Harji, 2014). **Short loops** are at the core of social – environmental business, financing and governance models. They regard in different ways traditional entrepreneurs, public institutions and social actors (Schaltegger *et al.*, 2014; Schaltegger, Lüdeke-Freund and Hansen, 2016):

- Examples of **circular business models** are related to Social and cooperative enterprise models, with the simultaneous reduction of costs through circularization of processes and creation of social, cultural and economic value (Dalberg Global Development Advisors, 2014). Also, to “ESCo-like” models, to Public/private/social partnerships, assuming (also) a long term time perspective, attentive to non-use values, to intrinsic values, and not only to use and market values (Direct and indirect users are interested to use and market values; Future users / generations are interested to non-use and intrinsic values);
- **Circular governance models** are related to the juridical and cultural recognition of the category of “commons”, which has an impressive potential in fostering shared care and responsibility toward heritage, particularly at local level - see for example the Emilia Romagna Italian regional legislation on “shared management of commons” (Michiara, 2016);
- **Circular financial models** are related to multi-stakeholder win-win solutions of social-public-private partnerships, which should include a well-balanced mix of diverse financial mechanisms (Center for Global Development and Social Finance, 2013).

The fundamental thesis here is that economic / financial, business and governance circular models can be successfully applied to cultural heritage/landscape regeneration, interpreted as particular examples of hybrid resource (between market and state, personal and collective interest, use value and exchange value). The circular processes are here interpreted also in terms of reuse/regeneration of knowledge: city/territories produced specific knowledge (skills, meanings, glue relationships) that can be re-used for producing new values in an indefinite, continuous perspective.

The consequences can be read on different levels:

- Design / planning of conservation;
- Changes in management;
- Changes in the use;
- Changes in the evaluation between alternatives.

In particular, the changes on the design / planning of requalification refer to the need to highlight the contribution of conservation to the closure of the cycles and to promote short circuits of proximity.

It refers not only to the research of multi-functionality and simultaneously of the maximum flexibility, but also to the identification of forms of selective demolition or “creative destruction” (Ost and Carpentier, 2017), reduction of waste transport costs, recovery of all unused/under-used spaces and their transformation into places of circular economy: co-working, co-housing, commons management, therefore in proximity spaces; maximization of complex social value in the long term: attention to the impacts of requalification with only tourist function that does not keep the intrinsic characteristics of the heritage in the long time. Attention to the recovery of the relationship between tourism and the recovery of waste products (closure of production-consumption-waste cycles...).

Complex values in the circular economy

The circular economy model enriches the notion of value from the perspective of a complex economic, ecologic and social value (Complex Value) (Fusco Girard, 1987; Fusco Girard and Nijkamp, 1997a). The notion of complex value in the circular economy expresses the “relational value” that also generates and regenerates connections with the “intrinsic value”, in a dynamic process.

In conventional economics, the economic value is traditionally the market value. In the circular economy the economic value is represented by the use values and not only by the exchange value, where the use value is potential generator of the market value. The social use value and the private use value are relevant in the circular economy. In particular, it concerns the conservation of use values over a long time horizon. This means that the value notion in the circular economy is not based on the consumption of a resource over time, due to the intensity of use, but on a conservation of values over a long time period.

The traditional economic theory recognizes so-called market failures when negative environmental externalities are generated. These negative environmental impacts (externalities) at the expense of society are not incorporated in the production costs of the company: they are referred to as social costs that are charged to society or the public budget. Examples of such social costs are: negative impacts on perceived wellbeing and health conditions, which are linked to degraded landscapes and polluted soil, water or air. In the circular economy, the spillovers of production-consumption are explicitly considered. And also the “intrinsic value” should be taken into account.

The “*intrinsic value*”, reflecting the specific, unique, irreproducible character and meanings / significance / identity and beauty of a place or asset, determines a sense of “connection” between different subjects and between community and manmade capital (monuments). There is clearly a “circular” relationship among them.

The circular economy aims to respect this “intrinsic” (or primary or “glue”) value of ecosystems (Ehrlich and Roughgarden, 1987; Turner, 2001; de Groot *et al.*, 2010), which reflects the ecosystem is functioning. Turner (2001) clearly expresses that “*the continued functioning of a healthy ecosystem is more than the sum of its individual components. There is a sense in which the operating system yields or possesses ‘glue’ value, i.e. value related to the structure and functioning properties of the system which hold everything together*” (p.34). This primary or ‘glue’ value is related to the capacity of ecosystems to hold everything together. In the case of cultural heritage, which can be assumed as a cultural-natural ecosystem, the “intrinsic value” certainly expresses the “spirit of places” (Norberg Schulz, 1979), being connected to the permanence of tangible and intangible elements over the long time and to cooperative behavior of citizens.

The role of “intrinsic value” is essential to help not only to identify a coherent (with its history) functional re-use for certain cultural heritage/sites, but above all to guide local development, both in its tangible and intangible components, thus supporting the conservation of *roots* in a dynamic and innovative perspective.

The “intrinsic value” reflects the value that has been the linking pin for cultural heritage over centuries and millennia.

Relationships between circular economy and cultural heritage adaptive reuse

Cultural heritage adaptive reuse can be considered an integral part of the CE, first of all because both ensure the enlargement of use values for the longest time possible (Fusco Girard, ICOMOS Italy meeting 2017, Florence) (ARUP and BAM, 2018). Next sections explain more in particular how adaptive reuse fulfils the principles of the CE. We consider different frameworks that define the principles of the circular economy: the 9 Rs of the circular economy (van Buren *et al.*, 2016; Potting *et al.*, 2017); 12 principles identified through analysis of literature reviews on circular economy (Ghisellini, Cialani and Ulgiati, 2016; de Jesus *et al.*, 2017; Kirchherr, Reike and Hekkert, 2017); and the ReSOLVE framework proposed by Ellen MacArthur Foundation (2015c).

- The 9R's approach
 - Reuse: preventing the use of raw materials
 - Reduce: reducing the construction waste and landfill
 - Reuse: product reuse (second-hand, sharing of products)
 - Repair: maintenance and repair
 - Refurbish: refurbishing a product
 - Remanufacture: creating new products from (parts of) old products
 - Repurpose: product reuse for a different purpose
 - Recycle: processing and reuse of materials
 - Recover: energy recovery from materials
- Ellen MacArthur Foundation ReSOLVE framework
 - Regenerate
 - Share
 - Optimize
 - Loop
 - Virtualise
 - Exchange
- CE principles - synthesis from scientific literature review sources
 - Decoupling growth and resource consumption
 - Close loops / close metabolisms – short loops able to stimulate symbioses and cooperation
 - Enhancement of productivity (less inputs, more outputs; Factor 10, Factor 5...)
 - Optimization in the use of existing resources
 - Conservation of use values and of the performances of building in the long horizon
 - Prolongation of the life of goods (durability)
 - Adaptability over time (e.g. open buildings...)
 - Transition to the service economy (profit comes from effective maintenance over time)
 - Management of wastes as a resource
 - Sharing economy, cooperative economy, social and solidarity economy
 - Capacity of regeneration of cooperative relationships (relational economy)
 - Interdependences economy: ecological economy

The 9 R's approach

R0: Refuse

Reike, Vermeulen and Witjes (2017), argue that a preventive R0 precede the 9R's which is Refuse. According to the scholars, this preventive measure applies both to consumers and producers. In the case of adaptive reuse, it applies to the concept and design life cycle but it embodied by default since conservation architects refuse to use materials not compatible with the integrity of the built environment and thus refuse a priori the use of hazardous materials (Murzyn-Kupisz, 2010).

R1: Refuse

In order to preserve and transmit the existing cultural heritage to future generations, conservation architects are concerned with prolonging the life and preserving the integrity and authenticity of the architectural character of the built environment. Thus, s/he safeguard, preserve, and reuse the largest portion possible of the built environment (Hebel, 2015; ARUP and BAM, 2018). In doing so, not only the cultural values are preserved but also the same building materials are maintained and preserved and reused. Moreover, another relevant advantage is the saving in embodied energy.

R2: Reduce

According to DG Environment of the European Commission, Construction and demolition waste accounts for approximately 25% - 30% of all waste generated in the EU (European Commission, 2016). Adaptive reuse projects reduce the amount of construction waste and landfill because the ultimate goal is to preserve the buildings integrity and authenticity and demolitions occur only if extremely needed i.e. for safety reasons.

R3: Reuse

As stated by Jane Jacobs, "new ideas must use old buildings" (1961, p. 188) and adaptive reuse is ideal not only for the reuse of product and materials (second-hand, sharing of products) but also for space sharing and introducing new entrepreneurial initiatives.

R4: Repair

The construction cycle involves high energy expenditure related to the take, make dispose model (extraction, transportation, processing, assembly) while in adaptive reuse projects materials are repaired, thus embodied energy is maintained and as a result, less carbon dioxide emissions are released (Rayman *et al.*, 2017).

R5: Refurbish

Refurbishing is linked with product design and future proof vision. The designer has to broaden his/her imagination towards new ideas, new uses and synergies. But s/he should also consider current and future challenges in terms of sustainability and users' preferences. Finally, needless to say that the product needs to be appealing aesthetically but also from a health-safety perspective (ARUP and BAM, 2018).

R6: Remanufacture

In order to be able to create new products from parts of old products, a long-term business model based on a take back program has to be developed. This program should be built on an agreement with a local network of: designers, remanufacture facilities, logistics (transportation, tracking facilities, sell and buy-back) and construction companies, that values sharing, products performance and innovation. The ultimate goal is to guarantee the remanufacturing of safe and healthy materials that can be unlimitedly reused and remanufactured (ARUP and BAM, 2018).

R7: Repurpose

Repurposing is very much linked with construction waste. So in order to avoid landfill, designers need to engage with new inspiring ideas for repurposing waste and upgrade it on demand (Wood, 2006). For example, stones can be repurposed for historic centres roads paving.

R8: Recycle

The concept of recycling and upcycling is the hard core of the 9 R's approach since its prerequisite is to avoid using precious virgin materials. For the sake of this process waste/demolition materials need to be classified according to quality level and future users within the local network loop. Therefore, a traceable database with relevant information concerning the cost and condition, ownership, life cycle and warranty of materials is crucial (ARUP and BAM, 2018).

R9: Recover

According to Reike et al. (2017), this concept is three-fold and its linked to collecting, recovering and reusing materials at end-of-life for new uses; extraction of waste materials from landfill site; and recovering energy embodied in waste by "linking it to incineration in combination with producing energy or use of biomass" (2017:13). In the case of adaptive reuse, preserving the built environment per se means saving its embodied energy and enhancing its cultural value (CHCfE Consortium, 2015).

Table 1. The 9 R's approach in relation to the adaptive reuse of cultural heritage

CIRCULAR ECONOMY PRINCIPLE	How ADAPTIVE REUSE fulfils the principles
Refuse: preventing the use of raw materials	Adaptive reuse of cultural heritage prevents the use of raw materials because it reuses a large part of the materials already extracted in the past. Moreover, it ensures resource efficiency; maintains material productivity over the lifecycle of development; and reduces loss of non-renewable materials. Thus, it makes best use of new materials developed to enhance renewable energy, bio-based, less resource intensive or fully recyclable materials.
Reduce: reduce the construction waste and landfill	Adaptive reuse reduces greenhouse gas emissions along a building's life cycle and reduces the construction waste and landfill. The demolished parts of heritage buildings for the adaptation to new uses can be recovered and reused as part of a circular economy process which optimize the life cycle cost and value of buildings
Reuse: product reuse (second-hand, sharing of products)	Reused heritage buildings can be considered as "second-hand" buildings. They can have a mix of functions and their usage can be shared by different users.
Repair: maintenance and repair	Maintenance and repair are an integral part of the adaptive reuse project. Also a concept of maintenance and recovery of embodied energy is here considered. Adaptive reuse design creates healthy and comfortable spaces , and enhances adaptability and resilience to climate change.
Refurbish: refurbishing a product	The concept of "refurbishing" is defined by Reike et al. (2017): "The use of the concept 'refurbish' seems to be most adequate in cases where the overall structure of a large multi-component product remains intact, while many components are replaced or repaired, resulting in an overall 'upgrade' of the product (...). Applied in this way, the

concept refurbish is also known from common language in the context of an overhaul of buildings (...).

It is clear that adaptive reuse of cultural heritage is integral part of city “refurbishment”.

However, a concept of innovative design is to be addressed as well, a design meant at deconstruction and reassembly while keeping in mind flexibility for future re-use. Thus, introducing also innovative and sustainable materials such as biocomposite materials. In addition, the new design has to take into consideration the state-of-the-art technology which helps moving towards a Circular Economy such as digital platforms, product passports, 3D printing and tagging sensors. Finally, the design and new materials have to guarantee a positive health and well-being of the users.

Remanufacture:
creating new
products from
(parts of) old
products

In some cases, historic buildings have been realized using parts of existing, more ancient buildings (for some examples, the use of roman columns, or capitals, in medieval buildings). This “remanufacture” of existing buildings contributed to the conservation of many historic arts and architectural pieces. Today, it is preferred to not dismantle historic buildings, although some specific parts that must be dismantled for adaptation to new uses can be reused to create new products.

An example is the Palace Viscounts of Balsemão in Porto, Portugal, where the characteristic “Azulejos” are collected from dismantled buildings in the city of Porto, and reused as models for contemporary productions.

A take back program has to be in force which guarantees that materials are safe, healthy and their life cycle is extended in a way that they can be unlimitedly reused. For example: steel. A number of industries are re-designing materials in a way that they can be returned after use and repurposed.

Repurpose:
product reuse for
a different
purpose

Repurpose is essentially a synonym of adaptive reuse, which confirms that adaptive reuse of cultural heritage can be considered as integral part of the circular economy.

Recycle:
processing and
reuse of materials

Materials and technological parts from selective dismantling of cultural heritage buildings can be recycled and reused in other industries. One example is the strategy of the city of Amsterdam for the building sector.

That’s why a traceable database has to be kept re the cost and condition, ownership, life cycle and warranty of materials. Also a network of industries and logistics enterprises have to be mapped.

Keeping materials ownership incentive developers to invest in safe, healthy and better quality materials that they can sell, reuse and exchange with others in the future.

Recover: energy
recovery from
materials

In cultural landscapes, especially rural traditional landscapes, many materials are used to recover energy. However, there is a more indirect correlation between recover and adaptive reuse.

Ellen MacArthur Foundation ReSOLVE framework

The Ellen MacArthur Foundation identified three principals for defining the circular economy:

“1- Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows;

2- Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles; and

3- Foster system effectiveness by revealing and designing out negative externalities

Applying these principles means creating an economy that is restorative and regenerative, that preserves ecosystems and increases their return over time, that creates prosperity, and that fuels growth by capturing more value from existing infrastructure and products”.

(Ellen MacArthur Foundation, 2015c, p. 23)

The foundation delineates primary and secondary metrics to monitor and measure the application of each principal. Moreover, it translates these three principals into a framework of six concrete actions for businesses’ and countries willing to convert to a circular economy. The first three actions: regenerate; share; and optimise, are already embodied in the adaptive reuse perspective. Nevertheless, the remaining three: loop, virtualise; and exchange, are interesting innovative actions related to among others, organising the design-buy-sell back materials loop; virtualising practices and processes; and integrating materials passports in building design, etc.

Table 2. The Ellen MacArthur ReSOLVE framework in relation to the adaptive reuse of cultural heritage

#	ReSOLVE Model	CIRCULAR ECONOMY PRINCIPLE	How ADAPTIVE REUSE fulfils the principles
1	Regenerate	It implies the shift to renewable energy and material, as well as reclaim, retain, and regenerate health of ecosystems and the return of recovered biological resources to the biosphere.	In adaptive reuse, cultural capital is preserved and enhanced by offering a new use that regenerates values for stakeholders.
2	Share	It refers to slow the product loops by maximising its utilization, by sharing them among different users (e.g. peer-to-peer sharing of privately owned products or public sharing of a pool of products), by reusing them (e.g. second hand), and by prolonging their lifetime through maintenance, repair, and design for durability.	In adaptive reuse, the endless reuse of the same asset creates lasting relationships with the asset owner/s and user/s
3	Optimize	An organization can optimize by increasing the performance and efficiency of a product, by removing waste from the production process and supply chain and by leveraging big data, automation, remote sensing and steering. These actions are carried out without changing the actual product or technology.	Products are designed with future uses in mind and only components that retain the highest value throughout the entire lifecycle of the product are used in order to minimize losses of raw materials. Thus, by developing new fully recyclable materials, not only performance is improved but also the safety and environmental friendly

standards are future proof and waste is eliminated from the process

4 Loop	This means to keep components and materials in closed loops, prioritizing inner loops. In case of finite materials in the technical nutrients cycle, it relays in remanufacturing of products or components, as well as recycling of materials. While in the natural nutrients cycle, activities that loop the material are anaerobic digestion and extracting biochemical from organic waste.	A take back system and collection services to recover useful resources from disposed products or by-products in coordination with entrepreneurs and logistics services.
5 Virtualise	It refers to the dematerialization of resources by delivering utility virtually directly (e.g. books and music), or indirectly (e.g. online shopping, virtual offices, etcetera).	Through the help of digital innovations such as bespoke apps, adaptive reuse can make the project accessible to impaired citizens to engage with cultural heritage more closely and in different ways but also potential visitors or interested stakeholders that wish to visit the project from distance can access virtual reality tours and 360° photography and videos and additional interactive apps.
6 Exchange	It implies the replacement of old materials with advanced non-renewable, as well as the application of new technologies. (e.g. 3D printing) and the selection of new products or services (e.g. multimodal transport).	The adaptive reuse design has to take into consideration the state-of-the-art technology which helps moving towards a Circular Economy such as digital platforms, product passports, 3D printing and tagging sensors.

CE principles - synthesis from scientific literature review sources

The identified 12 principles from the literature and proposed in Table 3, summarize the philosophy and vision of the Circular Economy and its potential application on adaptive reuse. The vast majority of the principals are already in symbiosis with the practice principals namely: 1, 3, 4-7, 10-12. However, principals 2, 8 and 9 represent a new addition in the process of conceptualizing and implementing the practice. Thus, innovative models have to be collected, analysed and tailored to adaptive reuse projects in order to fulfil the principals of close loops; the transition to the service economy; and the management of waste as a resource (Baker, Moncaster and Al-Tabbaa, 2017; Circle Economy, 2018).

Table 3. CE principles in relation to the adaptive reuse of cultural heritage

#	CIRCULAR ECONOMY PRINCIPLE	How ADAPTIVE REUSE fulfils the principles
1	Decoupling growth and resource consumption	Adaptive reuse contributes to boost growth while preserving natural resources.
2	Close loops / close metabolisms – short loops able to stimulate symbioses and cooperation	Adaptive reuse of cultural heritage can be supported by multi-actor partnerships, stimulating symbioses and cooperation – it closes the loops of urban metabolism especially at local level.
3	Enhancement of productivity (less inputs, more outputs; Factor 10, Factor 5...)	Adaptive reuse realizes less land consumption, less materials and energy consumption, reducing inputs to realize new functions in the city for contemporary social needs. It can also be argued that the single investment in cultural heritage adaptive reuse can have positive impacts in multiple dimensions (social, environmental, cultural...) and in this way it fulfils the request of enhanced productivity of the CE, promoting a “multidimensional productivity”.
4	Optimization in the use of existing resources	Existing resources are used in an optimal way through adaptive reuse. They are cultural resources, but also social, economic, and environmental resources.
5	Conservation of use values and of building performances of in the long horizon	Use values and building capacity of fulfilling changing societal needs are conserved in an indefinite time through adaptive reuse, contributing also in this way to the circular economy.
6	Enlargement of the life of goods (durability)	Adaptive reuse is able to give new life to abandoned or underused buildings. Ideally, cultural heritage can last for an indefinite future time.
7	Adaptability over time (e.g. open buildings...)	Adaptive reuse is a concept of adaptability of cultural heritage.
8	Transition to the service economy (profit comes from effective maintenance over time)	Adaptive reuse adopts often a model of “use” above “ownership”, when the ‘owner’ gives the use of the building/site to users that are asked to maintain it in a good conservation state. Suppliers and manufacturers have an opportunity to recover materials but also to allow for a second source of income through reselling or repurposing and to offer new specialized jobs to new personnel.

9	Management of wastes as a resource	“Waste” buildings/sites are reused as a resource, rather than being a cost for the owner and the society. Demolition companies can revise their business models and become material reuse providers and disassembly experts
10	Sharing economy, cooperative economy, social and solidarity economy	New models for cultural heritage adaptive reuse, based on community and multi-stakeholder engagement, are emerging as effective models for cultural heritage adaptive reuse.
11	Capacity of regeneration of cooperative relationships (relational economy)	The reuse of heritage buildings stimulates “heritage communities” (Council of Europe, 2005). It regenerates relationships and contributes to create relational economies.
12	Interdependences economy: ecological economy	The approach of reusing and transforming (to an acceptable level) cultural heritage, instead of conserving empty “containers” or leaving them in abandonment, is based on the recognition of the interdependencies between the cultural dimension of SD and the economic, social and environmental dimensions, thus recognizing that conservation without use, regeneration and transmission of cultural values is useless in the economic, social and environmental dimension. These interdependencies find their ground in the ecological economy.

3.5. Indicators for systemic circular cultural heritage impacts assessment: a review⁸

A specific literature review was conducted on the current use of indicators in cultural heritage research. Through the analysis of 76 literature sources on cultural heritage impacts, more than 3500 indicators were retrieved and classified.

Review methodology

The **methodological process** for the analysis of literature sources and indicators is described below, following four main steps:

Step 1: Selection and analysis of **studies specifically focused on cultural heritage impacts**, including existing reviews of indicators. This first screening allowed to select 23 papers and studies focused on cultural heritage impacts. In analogy with the results of previous studies, a database of literature sources and indicators classifications was built.

Step 2: Selection and analysis of **studies related to urban development and urban regeneration which include heritage indicators**. Using the same procedure described in step 1, literature sources indirectly linked to cultural heritage or to some of its most relevant domains (for example cultural tourism or the creative and cultural sectors) were collected and analysed. These domains have been identified on the basis of the first screening of analysed sources. Only a sub-set of indicators linked to cultural heritage was retrieved and classified from the studies included in Step 2. These indicators can be adapted to assess relevant impacts related to cultural heritage adaptive

⁸ This section is based on Bosone *et al.* (2021)

reuse, such as cultural vibrancy in a certain area where a reused cultural building is located. A number of 48 literature sources was collected in Step 2.

Step 3: Selection and analysis of specific studies focusing on circular economy and circular city that include heritage aspects and indicators. Circular economy literature was analysed, particularly related to circularity in the built environment and building construction sector, circular city model, and the few specific studies available on “circular adaptive reuse of cultural heritage”. According to this analysis, additional 5 sources and 54 indicators were retrieved.

All the selected documents were thus **classified based on the year of publication, type of source, and sector of implementation to provide a general overview of the studies regarding cultural heritage indicators and the indicators related to its impact sectors.**

Step 4: Construction of a taxonomy of indicators. Existing heritage indicators were classified based on the taxonomy categories. A first tentative taxonomy of indicators was structured according to the objectives of the study and based on other taxonomies found in previous studies. In particular, Saidani et al. (Saidani *et al.*, 2019) proposed, between other categories, to classify indicators based on the “level” or “scale”, “usage”, “sustainability dimension”, “transversality of the implementation sectors” and “type of sources”. Additionally, Gravagnuolo et al. (Gravagnuolo *et al.*, 2017) proposed to identify relevant indicators of “circular adaptive reuse of cultural heritage”, according to the “sustainability dimension”, “typology” (quantitative or qualitative) and “scale of implementation”. According to these reference studies and taking into account the specific objectives of this analysis, the final taxonomy was built.

Results

“Heritage indicators” are here meant as indicators directly or indirectly related to cultural heritage impacts. They were selected from existing studies, including scientific articles retrieved from Scopus/WoS, Google scholar and Italian scientific journals indexed by the Italian national agency for research quality evaluation (ANVUR). Additionally, “grey” literature was collected from institutional sources, including both policy-related documents and practice-based guidelines. Some examples are documents by ICOMOS, UNESCO, European Commission, Historic England, as well as international organisations focused on circular economy such as Ellen MacArthur Foundation, ARUP, Club of Rome, and others. The selection process consisted of using specific keywords within the “Science Direct” database (up to the year 2020) to facilitate the search, such as: “cultural heritage adaptive reuse” (1.621 initial results), “cultural heritage sustainability indicators” (9.754 initial results) and “cultural heritage indicators” (16.170 initial results). To narrow the focus of our search, literature sources were selected giving priority to the most recent (years 2017–2020). Sources that did not present indicators and were not strictly related to impacts assessment were immediately excluded. An in-depth analysis of the identified literature sources was then performed, reading the abstracts and selecting the most relevant documents for further analysis. Subsequently, titles, abstracts and keywords were carefully read in order to select the relevant literature to be analysed in-depth. Starting from this initial sample of about 20 documents, the references of these sources were analysed to identify further documents that could be useful for our purpose and adding also grey literature such as institutional reports retrieved from the web.

Initial reading was processed by selecting papers and studies that focused on the evaluation of impacts of cultural heritage conservation, presenting a set of evaluation tools, methods, criteria and/or indicators. As existing reviews of indicators were included, this study has the characteristics of a systematic review integrated with a meta-analysis of diverse sources, where the meta-analysis specifically refers to “the statistical analysis of the data from independent primary studies focused on the same question, which aims to generate a quantitative estimate of the studied phenomenon” (Parchomenko *et al.*, 2019).

The analysed literature sources were classified according to the following criteria, to build the Heritage Indicators Literature Database:

- **Year of publication.**
- **Typology:** institutional reports (i.e., report provided by Institutions), scientific articles, research reports, working papers, websites, handbooks and books.
- **Scope:** ranging from the sources strictly focused on cultural heritage impacts (cultural heritage), to sources addressing other sectors indirectly associated to cultural heritage impacts (“other topics”) and, finally, to sources linked to the concept of circular economy applied to cultural and built heritage.

A total of **76 literature sources** was analysed.

Figure 9 shows the temporal frequency of publications from the 80s to 2020. It can be recognised an increasing attention to heritage indicators over time, with the highest frequency in the last ten years. This attention is growing, with a peak in the more recent years (2014–2020).

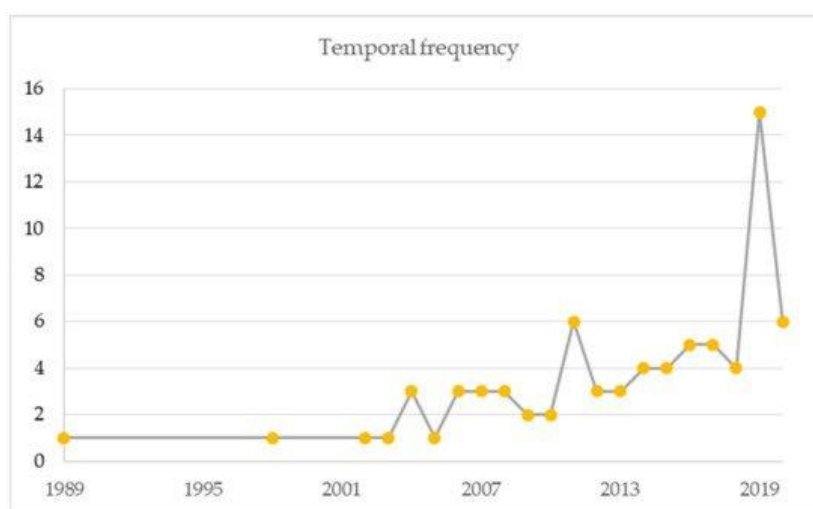


Figure 9. Temporal frequency of the analysed literature sources

The typology of literature sources analysed showed a significant prevalence of institutional reports (about 35.5%) and scientific articles (32.9%). Research technical reports represented about the 22.3% of the total sources collected, while working papers, books and websites were present only for a small percentage (between 2.6 and 1.3%). In particular, websites were used as a source from which analysed indicators were directly deduced. These are online information and monitoring platforms used by international associations and organisations to assess and support cultural heritage strategies.

The “Compendium of Cultural Policies & Trends” (Compendium of Cultural Policies & Trends, 2021) is an online database with in-depth information on cultural policies, statistics and trends. It shows two monitoring categories, “Statistics” and “Comparison”, each of which is subdivided into sub-categories from which the indicators have been derived directly.

The Eurostat “Circular Economy Indicators” (EUROSTAT, 2021) is a monitoring framework set up by the European Commission. The framework consists of ten indicators, some of which are broken down in sub-indicators, for a total of 16 indicators. Compared to the four categories suggested in the framework (“Production and Consumption”, “Waste Management”, “Secondary

Raw Materials” and “Competitiveness and Innovation”) the indicators were reorganised and adapted to the four dimensions proposed in this research.

Academic and practice literature was included, so that the database is representative of theoretical and practical knowledge (Figure 10a).

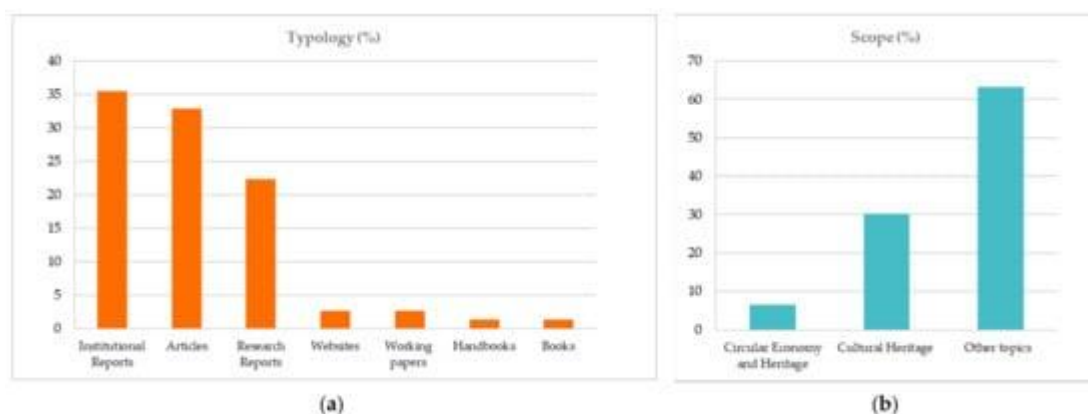


Figure 10. Classification of the analysed sources according to (a) Typology; (b) Scope

Literature sources were classified according to their scope. The first group was made of 23 sources specifically related to “Cultural heritage” (30%). The second groups included 48 sources not specifically related to cultural heritage, but in which heritage-related indicators are present, classified as “Other topics” (63%). As already specified, for those sources, only a sub-set of indicators was analysed. Indeed, indicators were selected both from sources strictly linked to cultural heritage, and from sources linked to broader sectors, such as circular built environment. In this last case, studies and indicators that are very far from our scope could also be found. Therefore, only those indicators useful to evaluate the circularity of cultural heritage adaptive reuse have been selected, according to the boundaries of the investigation as set out in the methodology section. Finally, a number of 5 sources related to “Circular economy & cultural heritage”, as well as built environment was identified (7%), in which all indicators were considered for the successive analysis (Figure 10b).

The existing **indicators** included in these selected studies were analysed and classified according to the following categories:

- **Geographical scale (level):** “macro” scale was assumed for indicators addressed at the national scale (NUTS 0) or regional scale (NUTS 2), “meso” scale for indicators at city level and “micro” scale for indicators at the scale of the heritage building or site.
- **Evaluation phase (usage):** “ex-ante evaluation indicators”, when the assessment is performed before a specific project or reuse design is realised, in order to take informed choices between diverse alternatives, “monitoring indicators” when the assessment is performed during the implementation of a specific project and “ex-post evaluation indicators” used to examine the results of actions or activities and to compare the programmed measures with the actual results.
- **Typology:** qualitative, if based on perceptions or subjective and unquantifiable aspects (soft); and quantitative, if based on precisely measurable aspects (hard).
- **Sustainability dimensions addressed:** economic; social; cultural; and environmental—according to the “four pillars” approach proposed by “Cultural Heritage Counts for Europe” research (CHCfE Consortium, 2015).

A number of 3543 relevant indicators was collected and classified. Figure 11 shows how the indicators are distributed and classified. In particular, Figure 11a shows that most of the indicators are applied at the macro scale of the region or state (52.6%), followed by indicators applied at the meso scale of the city and urban areas (34.2%) and a smaller percentage applied at the micro scale of the building or site (13.2%). While the adaptive reuse interventions on cultural heritage are mostly realised in specific buildings or sites, there is evidence of a lack of indicators supporting the evaluation of impacts at the “micro” scale. Regarding the evaluation phase, it has been identified according to the scope of the evaluation in the original sources. Figure 11b shows that most indicators are applied in the ex-post evaluation phase (94.6%), highlighting a particular focus of existing policies and practices in the post-realisation phase, according to the literature sources selected. Clearly, it is important to assess the impacts of heritage conservation, reuse and valorisation projects after their realisation. The ex-post assessment should also represent a starting point for future practices, learning from the past to take better choices. However, the scarce attention in the ex-ante and ongoing/monitoring evaluation seems to highlight that evidence-based evaluations are poorly adopted in the planning and design stages. The classification of indicators was conducted based on clear information retrieved from the reference sources, as well as comparison with other similar indicators used in other studies. However, in some cases the classification was uncertain, due to the unclear definition of the fields of application of the reference documents analysed. Therefore, some indicators were exclusively classifiable as “ex-post”, while in other cases the classification of indicators usage was flexible and could be applied in different phases of the evaluation. It should also be noted that, in order to build effective decision-support tools, evidence-based data should be collected on extensive scale and following structured, harmonised and agreed approaches, building datasets that can support as far as possible the estimation of key indicators in the ex-ante design and planning phase. Quantitative indicators are needed in this sense and represent the 66.3% of all indicators included in the database, as showed in Figure 11c, while 33.7% are qualitative indicators based on “soft” data mostly represented by citizens and stakeholders’ perceptions, as well as spatial or visual representations. Observing the sustainability dimensions addressed, it is possible to note that indicators related to the social dimension represent the majority (33.4%), economic indicators are also well represented (28.7%), and indicators related to the cultural dimension represent the third group (25.1%). Indicators related to the environmental dimension of heritage conservation are limited (12.8%), which highlights that the environmental impact of heritage conservation has been quite disregarded in the heritage sector, not representing a particular focus for researchers and practice stakeholders. However, as stated by Fusco Girard (Fusco Girard, 2019a) a circular economy approach in heritage conservation could substantially contribute to achieve climate objectives and reduce the overall costs of conservation, turning it into an “investment”.

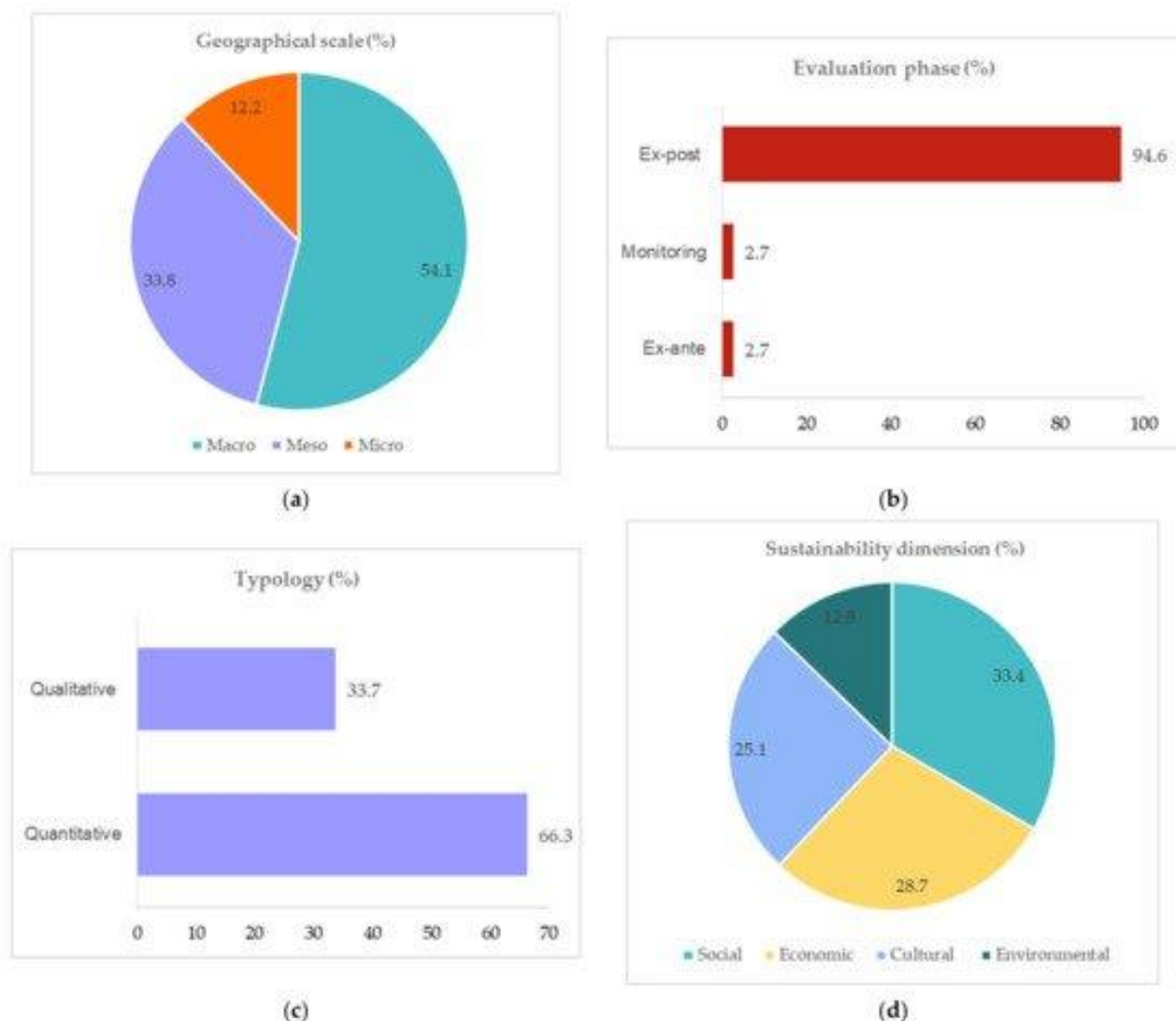


Figure 11. Classification of indicators according to (a) Geographical scale; (b) Evaluation phase; (c) Typology; and (d) Sustainability dimensions

This study resulted in a better **understanding of the actual use of indicators in the heritage sector** as well as in **heritage-related additional sectors**, such as cultural tourism and urban regeneration. Between the literature sources scope groups, **the circular economy was identified as an emergent issue for cultural heritage research**. Annex 1 provides the tables of literature sources and indicators analysed.

In the following section, the CLIC evaluation framework for circular cultural heritage adaptive reuse is presented, aiming to integrate indicators referred to the diverse dimensions of sustainability, considering the ex-ante and ex-post evaluation phases, as well as quantitative and qualitative indicators.

4. CLIC evaluation framework of criteria and indicators

The **CLIC evaluation framework** developed aims to make explicit the multidimensional productivity that arises from the adaptive reuse of cultural heritage, in the circular economy perspective, highlighting the **complex notion of value** embedded cultural heritage (Fusco Girard, 1987; Fusco Girard and Nijkamp, 1997a). This report proposes the multi-criteria impact assessment framework based on the concept of multidimensional productivity of cultural heritage (Hosagrahar *et al.*, 2016), which has been grounded into the theory and practice of the circular economy as way to achieve economic growth and wellbeing “decoupling growth from resources consumption” (Ellen MacArthur Foundation, 2012; Le Moigne, 2014; Wijkman and Skånberg, 2015; Ghisellini, Cialani and Ulgiati, 2016; Geissdoerfer *et al.*, 2017).

The aim of this section is to present the structured framework for the analysis and ex-post evaluation of the impacts of cultural heritage adaptive reuse practices in the perspective of the circular economy. This framework can be used also for ex-ante evaluation, enhancing decision making and planning for heritage conservation and adaptive reuse. It builds on previous analysis of more than 120 case studies of cultural heritage adaptive reuse (CLIC Deliverable D1.3 Survey on best practices of cultural heritage adaptive reuse). The CLIC evaluation framework is theoretically based on Multi-Attribute Utility Theory (MAUT) (Keeney and Raiffa, 1976; Zeleny, 2005), identifying evaluation goals, objectives and criteria in multiple interrelated dimensions.

Adaptive reuse interventions of buildings and sites contribute to sustainable urban regeneration (Rayman *et al.*, 2017). The reuse of abandoned and underused assets, which represent urban “wastes”, supports the implementation of the **circular economy** model in the spatial dimension (Gravagnuolo *et al.*, 2017; Angrisano, Fusco Girard and Bianchi, 2019; European Commission, 2019). However, circular economy indicators are rarely applied to cultural heritage (Fusco Girard *et al.*, 2019; Gravagnuolo, Angrisano and Girard, 2019), even if circular economy started to be implemented in the built environment and building construction sectors in recent years (ARUP, 2016; Ellen MacArthur Foundation and ARUP, 2019).

The concept of cultural heritage adaptive reuse as an instrument to achieve circular economy goals at the territorial scale emerged through the CLIC research. An integrated and multidimensional approach should be adopted within the systemic circular approach (Gravagnuolo *et al.*, 2017; Fusco Girard, 2019b). However, recent reviews of the literature on circular economy indicators showed that the most used indicators are currently related to waste management, raw materials, recycling rates, economic performance of circular businesses, energy, toxicity and clean materials cycles (Moraga *et al.*, 2019; Parchomenko *et al.*, 2019). A different study focused on the objectives of using circular economy indicators, classifying them based on a taxonomy of ten categories: levels, loops, performance, perspective, usage, transversality, dimension, units, formats, sources (Saidani *et al.*, 2019). In particular, the social and cultural dimension of the circular economy seem to be less explored, with fewer consideration on the impacts on people and local communities (Kirchherr, Reike and Hekkert, 2017; Lemille, 2017; Moreau *et al.*, 2017), while first studies indicate that implementing circular economy (World Health Organization Regional Office for Europe, 2018) determines a potential positive impact on human health and more generally between health and climate change issues (Watts, Amann, Arnell, *et al.*, 2018; Watts, Amann, Ayeb-Karlsson, *et al.*, 2018; Gupta *et al.*, 2019; Watts *et al.*, 2021).

All in all, when it comes to the relationships between cultural heritage adaptive reuse and circular economy, few studies are currently available. Indirect approaches can be identified in the **ecosystems services assessment frameworks** (MEA, 2003; TEEB, 2010; Costanza *et al.*, 2014). For example, Stanik *et al.* (2018) analysed **cultural heritage from the perspective of cultural ecosystem services**, with the aim of identifying and developing an indicator-based framework formed by indicators related to historic land uses and historic elements. Still, Gravagnuolo *et al.*

proposed an **evaluation framework for circular economy implementation in the adaptive reuse of cultural heritage** (Gravagnuolo *et al.*, 2017) on which this report is based, while Foster (Foster, 2020) associates the concepts of **adaptive reuse, cultural heritage and circular economy, focusing on the environmental benefits of heritage conservation**. More in depth, the study of Foster (Foster, 2020) performs a literature review to demonstrate the alignment between circular economy goals and adaptive reuse of heritage assets in a life-cycle perspective. Foster and Kreinin (Foster and Kreinin, 2020) also realised an in-depth **review of environmental indicators for the adaptive reuse of cultural heritage in the perspective of the circular economy**, able to demonstrate the environmental savings of adaptive reuse. Then, Foster *et al.* (Foster, Kreinin and Stagl, 2020) developed a **Circular Environmental Impact Indicator Framework** for cultural heritage adaptive reuse, in order to integrate macro European Union-level indicators with environmental indicators at the micro scale.

The existing literature body on the linkages between cultural heritage adaptive reuse and circular economy shows a potential in building a comprehensive framework of quantitative and qualitative indicators to assess performances and impacts of adaptive reuse interventions in a circular economy perspective.

The article of Bosone *et al.* (2021) analysed and classified existing heritage indicators, comparing them with circularity criteria. Through the analysis of 76 literature sources on cultural heritage impacts, the study explored how indicators are currently used in heritage research and practice as impacts assessment tools. More than 3500 indicators were retrieved and classified. The study explored the **concept of circular economy in cultural heritage adaptive reuse**, identifying specific **impact criteria** and highlighting the knowledge gaps for further research. Despite many indicators are already in use in the cultural heritage sector and attempts to systematize heritage indicators have been developed (Labadi, 2011a; Fusco Girard *et al.*, 2015; Nocca, 2017), **the circular economy perspective still needs to be fully implemented in this field**.

4.1. The CLIC framework

Circular re-use is characterized by the capacity to move towards the regeneration of the different forms of capital. The circular re-use is thus the regenerative re-use that contributes to implement the transition towards a de-carbonized local economy (ecological economy). It is organized assuming that the natural system is functioning from the perspective of circular processes. Thus, it minimizes waste and negative environmental impacts and ecological footprint; it re-uses/recycles wastes, transforming these into resources (for example biomass as fertilizer, etc.). It extracts most of its resources from the surrounding territory; it re-uses 'grey' water; it uses as far as possible renewable energy sources; it contributes to regenerate the ecosystems services on which the human activities and the wellbeing of people depend; it promotes the use of nature-based solutions (walls, vertical gardens, roofs, urban areas for agriculture, urban forests, etc.). All in all, it contributes to transform the linear metabolism into a circular one, imitating the wisdom of nature. The cultural re-use is able to regenerate also cultural values/meanings/sense horizons, if "well" managed.

But the above ideas are only some of the attributes of circular re-use. Many others are linked also to economic/financial aspects, to social and cultural dimensions. The **financial circular re-use of cultural heritage** is the re-use able to regenerate the financial resources for functioning over time (balancing grants support coming from public/private sources). **From a social perspective, the circular re-use of cultural heritage is the re-use able to generate a community, i.e., a heritage community**. The circular re-use is characterized by **synergies/symbioses and cooperative activities** which increase productivity.

A common feature of “circular” experiences is the search for synergies/cooperation between different subjects or groups of subjects and between these groups and the relevant institutions. The re-use of the cultural heritage can be also interpreted as a way to improve the immaterial social infrastructure of the city, generating micro-communities through the management of cultural heritage as a common good, characterized by “intrinsic value”. It reflects the value that has been present over centuries and millennia. **The circular re-use transforms dead assets into living systems, and is thus able to promote city resilience.**

The most frequent functions in many cultural heritage adaptive re-use good practices **re-interpret and make up-to-date the original cultural and social values of places for the community.**

Thus, a conceptual model of adaptive re-use of cultural heritage in the perspective of the circular economy has been synthesized, according to three main critical drivers⁹:

- a **regenerative capacity** linked to the self-regeneration of the cultural assets, as well as of the economic, environmental and social resources needed for its maintenance over time (in analogy with the circular economy principle of extending the use value of resources in the largest time horizon possible);
- a **generative capacity**, linked to the net positive economic, environmental and social externalities generated in the area/territory – which in part come back to the heritage asset;
- a **symbiotic capacity**, linked to the cooperation and collaboration approaches that enable a more efficient use of resources (such as those realized in “industrial symbioses”), as well as clustering processes in the territory (implementing an “economy of relationships”).

⁹ See Fusco Girard – CLIC internal document 21-12-2020

THE CIRCULAR TERRITORIAL CLUSTER: REGENERATIVE, GENERATIVE AND SYMBIOTIC CAPACITY

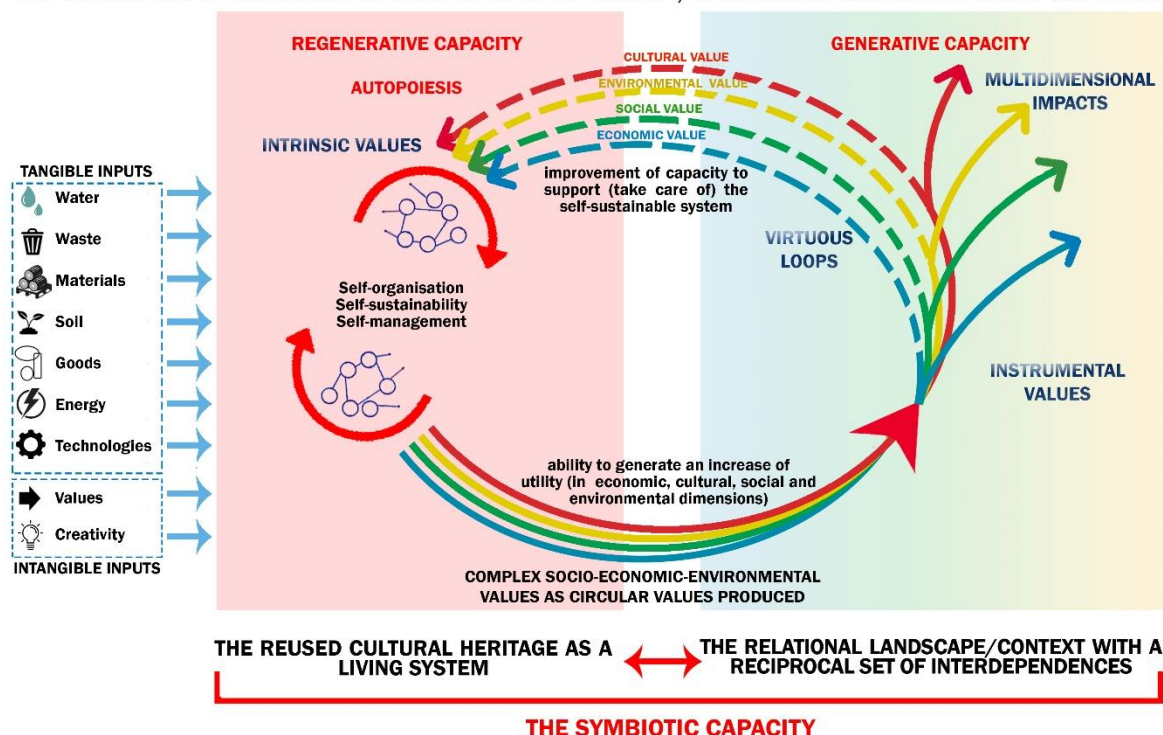


Figure 12. The triple circular model of cultural heritage adaptive re-use: conceptual model

Source: Luigi Fusco Girard, CLIC internal working document 21-12-2020; presented at CLIC LabT London, February 2019 – finalised in CLIC D2.7 “General Framework”

According to the CLIC theoretical framework, a structured set of evaluation criteria was developed, aimed to reflect the circular economy perspective in cultural heritage adaptive reuse.

Criteria definition under the MAUT theory

To avoid any doubt on what is to be considered a “criterion” in the evaluation, and to provide a unifying definition useful also for non-technical stakeholders, we adopt the definition of criteria as proposed and largely accepted since the 70s in the scientific field of the Multi-Attribute Utility Theory (MAUT). This theory represents the foundation of the multicriteria evaluations (Farquhar, 1977).

In the literature it does not exist a univocal definition of these terms: objectives, goals, criteria, attributes (Keeney and Raiffa, 1976).

Some scholars as MacCrimmon (1973) distinguish these 4 terms. Others, such as Fishburn (1977), prefer less precise definitions.

More in general:

- **Attributes** are related to the description of objective reality (and its characteristics)

- **Objectives** express the direction towards the enhancement of current conditions and are subject to processes of maximization or minimization
- **Goals** are intended as more general/strategic objectives

Zeleny (1982) affirms that “attributes, objectives, goals and perhaps also **criteria**, are synonymous”. Then, he specifies that “the term criterion is a more general term that includes the others”.

Criteria express what is interpreted / chosen as relevant in a certain context.

The evaluation problem can be thus structured by defining the Goals, Objectives, Criteria and Attributes.

Moreover, in order to assess the level of achievement/compliance of the reality (practices) with all the objectives and criteria that we ideally wish to fulfil, the next step will be to identify a set of relevant and measurable indicators.

The problem is to identify a series of criteria in relation to which, the ex-post evaluation is expressed. The indicators used can be quantitative and/or qualitative. The choice of these indicators depends also from the concrete availability of data/information.

In general, the structure of the evaluation (ex-ante and also ex-post) is defined by its elements: Goals, Objectives, Criteria, Attributes, and finally Indicators and their related quantitative, qualitative and spatial data.

Each of these elements contributes to orient the overall evaluation framework toward a specific direction. The overall evaluation structure can be shown as follows (see).

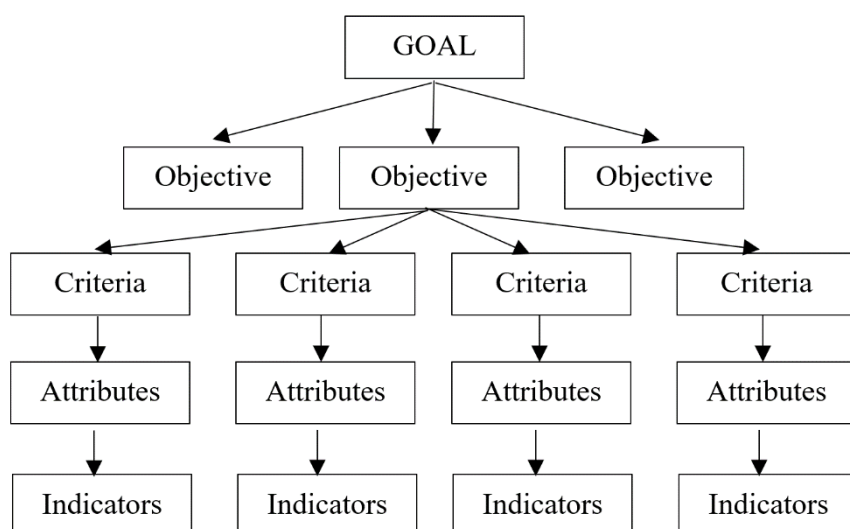


Figure 13. The general evaluation framework structure

The **Goal** is here expressed by the concept of “Human Sustainable Development”

Criteria express what is relevant to describe, to assess whether the CH adaptive reuse fulfils the objectives or principles of the Circular Economy

Attributes are the characteristics of the reality object of the evaluation

Indicators are tools to measure the fulfilment of criteria based on the observation of attributes

The definition of all the above-mentioned elements becomes a fundamental step, because the definitions adopted will influence the results of the evaluations. It shows how the general elements of the evaluation framework can be declined for the aims of this study.

4.2. Circularity dimensions and criteria

Ex post evaluations are key to identify specific criteria and indicators that can orient decision making towards higher circularity levels, enhancing ex-ante evaluations. CLIC assumes a specific definition of circular economy which helps to identify evaluation criteria, and thus the indicators, as elements of the multidimensional evaluation framework.

We define the circular economy in cultural heritage adaptive reuse as ‘a sustainable economy that enables a continuous positive development cycles that preserve and enhance the created values, in an indefinite time, of cultural and natural capital, optimises resource yields and minimises system risks by managing finite stocks and renewable flows’ (Gravagnuolo *et al.*, 2017).

According to research papers and operational reports, in previous sections the main characteristics of the circular economy model for cultural heritage were identified, including diverse frameworks such as the 9 Rs approach (Reuse, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, Recover) (van Buren *et al.*, 2016; Potting *et al.*, 2017), and the ReSOLVE framework proposed by Ellen MacArthur Foundation (Regenerate, Share, Optimize, Loop, Virtualize, Exchange) (Ellen MacArthur Foundation, 2015a, 2015c, 2015b). A first set of evaluation criteria for CHAR was developed and applied in scientific articles (Gravagnuolo *et al.*, 2017; Fusco Girard and Gravagnuolo, 2018; Bottero and Lerda, 2019), highlighting potential and actual impacts of CHAR projects in the economic, social, cultural and environmental dimension.

According to Luigi Fusco Girard, the auto-poietic model of nature regeneration is embedded in the conceptual framework of circular adaptive reuse of cultural heritage¹⁰. As natural systems, the heritage site can be interpreted as a ‘lively regenerative/auto-poietic system’, able to self-generate the resources needed for its functioning and to use all wastes as resources for new productive cycles. Through the circular economy approach applied, it is possible to interpret and evaluate the adaptive reuse process identifying diverse forms of capital that are re-generated: man-made capital, natural capital, social capital, human capital. The model of circular CHAR was initially tested through empirical evidence based on a large dataset of 126 projects in CHAR, identifying a set of “building blocks” of circularity through statistical methods: Cultural value, Management characteristics, Circular metabolism, Landscape quality, Social impact, Economic spillovers (Gravagnuolo *et al.*, 2021).

Based on this conceptual evaluation model of “Circular CHAR”, and its initial implementation through case studies analysis, a structured set of evaluation criteria for circular adaptive reuse of cultural heritage was built. The ‘circularity dimensions’ or “building blocks” were considered: the ‘regenerative capacity’, the ‘symbiotic capacity’, and the ‘generative capacity’.

The evaluation criteria proposed in the literature were synthesized and discussed during a series of Focus group sessions conducted with 14 experts in heritage conservation, heritage economics, evaluation methods, circular economy, sustainable finance, economic spillovers of development projects and social impacts.

A number of **40 general evaluation criteria** resulted from different rounds of discussion. A description was provided for each criterion (Table 4). Finally, the **circularity criteria were compared**

¹⁰ Luigi Fusco Girard, Horizon 2020 CLIC Deliverable “CLIC framework”

with existing indicators retrieved and classified in the first phase of the analysis, to identify areas in which data may be already available, and areas in which data may be lacking. The level of operationalization of the impacts assessment framework was thus assessed based on three aspects considered:

- **Criteria for which consolidated evaluation methods and indicators are available**, based on the meta-analysis of heritage impacts studies conducted in the first phase of this study (visualized with symbol “O” in Table 4);
- **Criteria for which evaluation methods and indicators could be available**, but should be adapted to the circularity framework (visualized with symbol “Δ” in Table 4);
- **Criteria for which evaluation methods and indicators are currently not available**, or only few studies could be detected, defining in some cases a complete new field of study for heritage research, such as Intrinsic value, Local circular economies, Heritage community, Circular metabolism, Smart Specialization Strategies, Health impacts (visualized with symbol “X” in Table 4).

Table 4. Evaluation framework of criteria for Circular Cultural Heritage Adaptive Reuse

Circularity dimension	Criteria	Sustainability dimension	Description / motivation	Comparison with current indicators
Regenerative capacity (auto-poietic capacity)	Authenticity and integrity	Cultural	Regeneration of cultural capital, tangible and intangible, through conservation of heritage authenticity and integrity as defined by UNESCO and ICOMOS	Δ
	Intrinsic value	Cultural	Re-generation and transmission of heritage values and meanings through the adaptive reuse intervention, also through hybridization between historic and contemporary values integrated with cultural landscape and coherent with the intrinsic value of cultural heritage	X
	Financial self-sustainability	Economic	Self-generation of financial resources needed for heritage conservation and continuous maintenance, through diverse revenue flows from reuse activities; independence of financial sources from public sector	Δ
	Local circular economy	Economic	Circular re-use of profits in the local context for further adaptive reuse projects and/or activities in additional heritage buildings or sites, circular entrepreneurial activities, social and solidarity economy activities; Local resources such as food, craft, materials are valorised through the adaptive reuse; stimulation of local investments	X
	Energy efficiency	Environmental	Self-generation of energy sources for the operational phase through renewables, also reducing energy consumption needs through heritage-compatible technologies	○
	Freshwater efficiency	Environmental	Self-generation of water resources for the operational phase through water capture, filtering and reuse systems	○

	Nature-Based Solutions	Environmental	Regeneration of natural resources through nature-based solutions aimed to enhance air quality, freshwater quality, green surfaces	○
	Soil recovery	Environmental	Remediation of polluted soils and brownfields, land recovery through reuse interventions	○
	Materials extraction	Environmental	Avoided raw materials extraction through the adaptive reuse intervention	○
	Heritage community	Social	Self-organization capacity of active citizens to build a cohesive and pro-active Heritage Community for heritage conservation, valorization and adaptive reuse	X
	Local community and human capital	Social	Enhancement of skills, education and learning opportunities for the local community, enhancement of entrepreneurial capacity and attitude	Δ
	Traditional skills	Cultural	Enhancement of traditional skills through the adaptive reuse, incl. traditional construction techniques, intangible heritage, “rehabber” approaches and training opportunities in the field	Δ
Symbiotic capacity	Local identity	Cultural	Contribution of the adaptive reuse intervention to local identity; enhanced access to the educational function of cultural heritage	Δ
	Civic pride	Social	Enhancement of civic pride, belonging and civic responsibility; shared values and bonds in the local community, openness of the local community	Δ
	Mutual cooperation, partnerships and synergies	Cultural	Attitude of stakeholders to mutual cooperation, sharing common resources, knowledge, assets; involvement of third sector actors and/or sharing economy actors in the adaptive reuse; Collaboration pacts / agreements between public, private and people are implemented	Δ
	Circular metabolism and symbioses	Economic	Realization of circular supply chains to reduce costs of energy, wastes, materials, water achieving circular metabolism of heritage buildings and sites	X
	Smart Specialization Strategies	Economic	Contribution of the adaptive reuse intervention to regional development, through coherence of the reuse functions and processes with regional Smart Specialization Strategies	X
	Construction & Demolition Wastes	Environmental	Avoided Construction & Demolition Wastes through the adaptive reuse intervention	○
	Participation in decision-making	Social	Involvement of diverse stakeholders and citizens in the decision-making process for the adaptive reuse	Δ
	Social cohesion and collaboration	Social	Increase of trust, cooperation, collaboration and awareness of present and future generations’ needs and rights	Δ
Generative capacity	Cultural vibrancy	Cultural	Enhancement of cultural activities and events as a result of the adaptive reuse; enhanced access to culture and cultural heritage	Δ
	Creativity and innovativeness	Cultural	Enhancement of creativity and innovativeness as a result of the adaptive reuse	○
	Cultural and knowledge capital production	Cultural	Knowledge production and cultural production stimulated by the adaptive reuse intervention	Δ

	Jobs creation	Economic	Creation of long-term jobs, directly and indirectly linked to the adaptive reuse	○
	Economic spillovers	Economic	Indirect and induced economic impacts in the area incl. diverse sectors such as building construction, cultural and creative activities, tourism, education and training, technologies for sustainability, research and innovation, entrepreneurship, etc.	○
	Public finance benefit	Economic	Avoided costs for public finance and direct and indirect benefits from adaptive reuse interventions	Δ
	Attractiveness for creative, cultural and innovative enterprises	Economic	Localization of innovative entrepreneurs, cultural and creative industries, research and development activities	Δ
	Attractiveness for residents	Economic	Localization of permanent or temporary residents as a result of the adaptive reuse	Δ
	Attractiveness for circular cultural tourism	Economic	Localization of economic activities linked to circular cultural tourism and hospitality as a result of the adaptive reuse	Δ
	Soil consumption reduction	Environmental	Avoided natural and fertile soil consumed, incl. for new buildings construction	○
	Air quality and microclimate	Environmental	Contribution to air quality and microclimate quality in the heritage context area	○
	GHG emissions reduction	Environmental	Contribution to GHG emissions reduction, incl. embodied energy valorization of buildings and sites	○
	Water quality	Environmental	Contribution to enhancement of water quality in urban and rural environment	○
	Biodiversity	Environmental	Contribution to biodiversity conservation and enhancement, incl. actions to halt and reverse biodiversity loss	○
	Landscape quality and atmosphere	Social	Contribution to beauty and harmony of the landscape, enhancement of “place atmosphere”, place-making	Δ
	Safety of public spaces	Social	Contribution to safety and accessibility of public spaces “for all”	Δ
	Cleanliness and healthiness of public spaces	Social	Contribution to cleanliness and healthiness of public spaces	Δ
	Quality of life for residents	Social	Contribution to objective elements of quality of life of residents, incl. presence of proximity shops, avoidance of gentrification effects and ‘touristification’ of heritage sites	Δ
	Health	Social	Contribution to health incl. healthy materials, green installations, indoor air quality, natural lighting, noise control, electromagnetic pollution, healthy productions (e.g. healthy food in rural landscapes), mental health	X
	Wellbeing	Social	Enhancement to self-perceived wellbeing for citizens and users, related to the adaptive reuse intervention	Δ

Figure 14 visualizes the circularity dimensions: “Resources” linked to the re-generative capacity; “Circularity enabling factors” linked to the symbiotic capacity in the context area; “Outcomes” linked to the generative capacity of the heritage system.

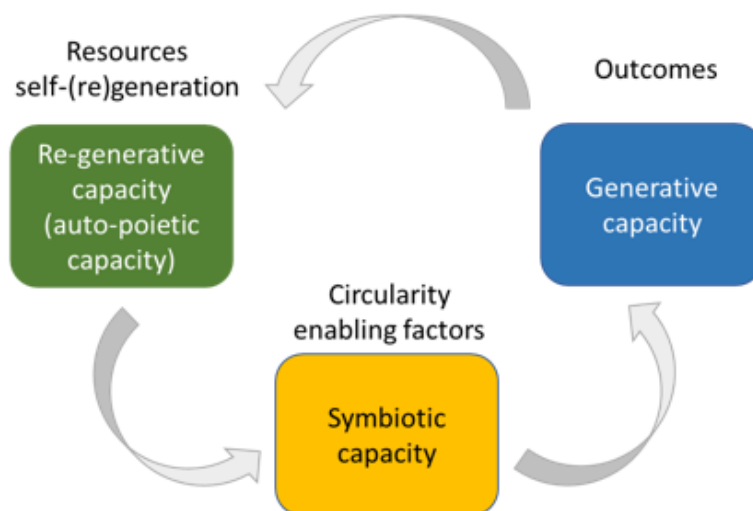


Figure 14. Circular CHAR dimensions

Source: adapted from “Tripod model” by Luigi Fusco Girard, Horizon 2020 CLIC project

4.3. Circularity indicators and data collection

The **definition of indicator** is not univocally recognized and the nuances between “indicators”, “criteria”, “objectives” and “attributes” may be not always clear in the applications. Indicators can be applied at different decision levels and are always linked to a set of ‘criteria’, meant as ‘points of view’ recognized as relevant (Gravagnuolo *et al.*, 2017). Finally, indicators can be used to assess impacts, i.e. any change from an initial condition to a subsequent condition¹¹ and they are referred to ex-post evaluation. They can also be used to analyse the state of a certain aspect (ongoing evaluation) and finally they can also support the decision-making phase before the implementation of a certain project (ex-ante evaluation).

Heink and Kowarik (Heink and Kowarik, 2010) propose the following definition of indicator as a **«measure or component from which conclusion on the phenomenon of interest (the indicandum) can be inferred»**. They underline the necessity of avoiding failure in defining technical terms, proposing a systemic overview of existing definitions of the term indicator, with a special focus on ecology and environmental planning. According to Hockings *et al.* (Hockings, Marc; James, Robyn; Stolton, Sue; Dudley, Nigel; Mathur, Vinod; Makombo, John; Courrau, Jose; Parrish, 2008), indicators are **«measurable entities that are used to assess the status and trend of a range of site values. A given value, objective, or additional information need can have multiple indicators. A good indicator meets the criteria of being measurable, precise, consistent and sensitive»**. Indicators represent also essential tools when it occurs the necessity to synthesize complex information on the territorial functions, as they are able to monitor the state and the functioning of urban areas and to verify the achievement of predetermined goals (Fry *et al.*, 2009).

¹¹ With reference to the Theory of Change

Still, Zhang *et al.* (Zhang, Y., Yang, Z., Li, 2006) state that «**indicators and measurement systems are an essential tool for ensuring management targets are reached [...]**» and this was also confirmed by Stanners and Bordeau (European Environment Agency, 1995) , that consider **indicators as vital elements for developing awareness** of urban issues.

Elaborating good indicators facilitates the decision-making phase, identifying limits and opportunities and thus reducing risks or costs. Through indicators, emerging issues and impacts can be envisaged, allowing corrective actions when necessary. Experts involved in the indicators elaboration are entrusted with the task of **providing information that is comprehensible and credible by all for their correct use in the decision-making process** (World Tourism Organization, 2004).

Despite a huge quantity of definitions is available, for the aims of this study it was adopted the description of an indicator as

«a quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect changes connected to an intervention, or to help assess the performance of a development actor» (OECD-Organisation for Economic Co-operation and Development, 2014).

Indicators must always be **clearly defined in theoretical and operational terms** and they must be **simple and understandable according to their scope**. In the field of evaluation, the “**SMART**” framework (Doran, 1981) is a widely used reference to guide the definition of quality indicators. SMART is an acronym of the words “**Specific**”, “**Measurable**”, “**Achievable**”, “**Relevant**” and “**Time-Bound**”. The SMART principles is most widely used, incisive and common approach in defining monitoring and evaluation indicators.

The **CLIC evaluation framework is addressed to cultural heritage managers and owners, as well as to public institutions**, to support them in taking more informed and more effective choices in cultural heritage adaptive reuse with respect to circularity objectives.

The evaluation framework is based on a set of criteria and indicators that enable performance assessment of existing projects with respect to circularity objectives, and that can be used to orient choices towards circular «human-centred» adaptive reuse of cultural heritage.

Indicators are synthetic tools to interpret reality: sound data collection, data analysis and data interpretation is needed to assess the indicators.

There are three main types of indicators¹²:

- **Statistical indicators** which are normally expressed as ratios or as percentages, allowing them to be assessed in relation to a baseline.
- **Trends**, whereby ‘raw’ numbers are monitored over time (e.g., number of visitors from one year to the next).
- **Checklists** which are not statistical (i.e., non-parametric), but enable some assessment of topics which cannot be captured through quantitative assessment (e.g., asking residents whether a certain cultural heritage site represents a factor of local identity). Even a checklist requires supporting evidence to permit validation of the responses.

Indicators can be diverse according to the evaluation phases: ex-ante (decision-making) and ex-post (impacts assessment). The indicators have thus a double use: **in the ex-ante phase, they express the goals and expected results that the circular adaptive reuse will achieve**, and

¹² Reference: UNESCO Culture 2030 indicators

in the ex-post phase they become a tool for monitoring and assessing the results, providing evidence-base of actual results to stakeholders.

The indicators set was developed also considering the diverse phases of the adaptive reuse intervention, mainly:

- Planning and design
- Building construction works
- Operations

In each phase, diverse types of data and indicators may be available, while the circularity dimensions and criteria to be considered should be coherent in all phases.

Also, **the scale of the adaptive reuse intervention should be considered** when adopting an indicators set. In fact, small interventions cannot be assessed based on the same indicators used in large-scale adaptive reuse projects, as some criteria may be more relevant than others in diverse typologies of adaptive reuse.

The relevance of criteria, and thus the weight assigned to each of them, can be highly variable, also according to the **needs and preferences of stakeholders and local communities**. The weight of criteria, and even criteria and indicators, could be variable in relation to different phases of the evaluation process itself, as some “hidden” information or data may arise during the process, supported by evidence and stakeholders involvement, and can thus lead to a change in preferences and thus evaluation results. This **“adaptive” and evolutive process of evaluation and co-evaluation** can take some time and effort for decision makers, however the benefits of reaching a more desirable solution for more stakeholders, and a more effective use of the financial resources available, should encourage public and private actors to adopt it.

The CLIC experimentation conducted in pilot cities provided promising results, however further application and testing is needed to go towards larger agreement in the scientific and practice community. Two indicators set are proposed in this report, according to the evaluation phase:

- **Indicators set 1.** A structured set of applicable indicators was developed based on the CLIC Circular-CHAR framework in the city of Salerno (Italy). The indicators selected were applied in the case study of Salerno – Edifici Mondo, to support the **ex-ante evaluation** process of new uses of four large historic buildings abandoned since 30 years.
- **Indicators set 2.** A set of ten case studies were assessed collecting detailed data on the impacts of cultural heritage adaptive reuse projects. Impact/performance indicators were used in this case in the context of **ex-post evaluation**.

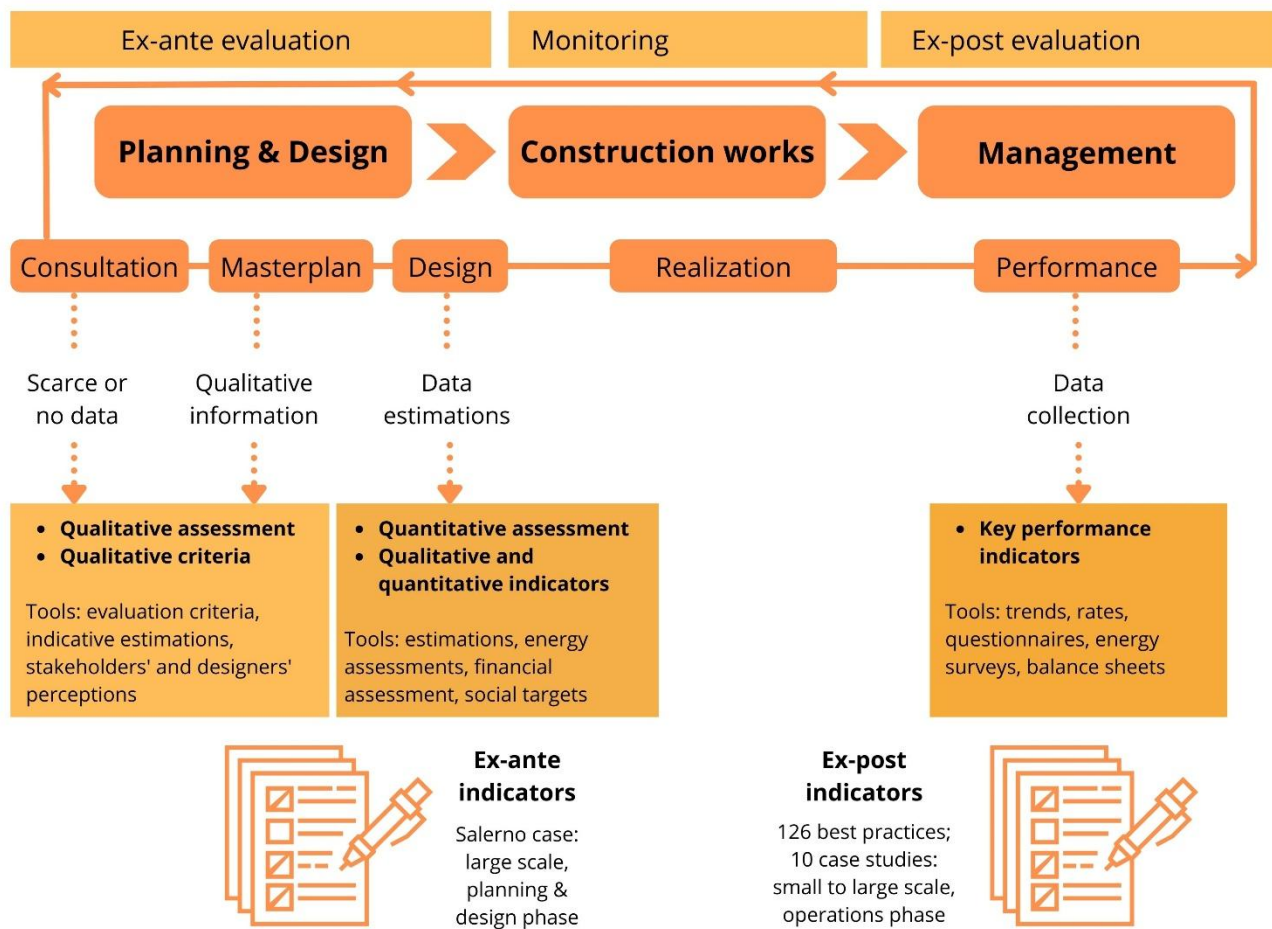


Figure 15. Evaluation process and type of indicators in relation to the adaptive reuse phases

5. Ex-post evaluation: case studies analysis

The ex-post evaluation phase is characterized by the use of indicators able to provide evidence base of the results achieved, to compare the expectations with the actual results and eventually adapt strategies and management models to achieve the goals. This section describes how ex-post evaluation contributed to identify specific criteria and indicators able to enhance choices in the decision making (ex-ante) phase of the adaptive reuse of cultural heritage. A set of more than 120 case studies of cultural heritage adaptive reuse was analysed in the first stage of the project identifying the best practices in terms of circularity¹³ and a in-depth investigation of ten case studies was conducted through interviews to managers of reused heritage sites. The result is a matrix of indicators that can be used in diverse phases of the adaptive reuse process and at different scales.

5.1. Circularity assessment on best practices

The **ex-post evaluation** of the adaptive reuse process is key to collect useful data that can shed light on the actual results of decisions and management models taken in different contexts, enhancing decision-making processes for “better projects”.

In the first phase of the CLIC research, a database of more than 120 case studies was built, to assess the performance of diverse adaptive reuse projects based on common circularity criteria. The CLIC Survey on best practices of cultural heritage adaptive reuse was developed with information on cultural heritage adaptive reuse projects already implemented, provided by researchers and stakeholders with their own interpretation and explanations of why these examples could be potentially considered as “best / good practices”. The CLIC Survey included 126 cultural heritage adaptive reuse practices from European countries. It provided general information on the adaptive reuse projects and their location, specified in general terms its governance, financial and management models. It enabled the assessment of the level of “circularity” based on the information provided. The analysis aimed to investigate the characteristics of cultural heritage adaptive reuse practices and their ‘performance’ in terms of circular economy, as well as the relationships between different typological, governance and management characteristics and the level of achievement of circular economy goals.

The statistical analysis of the CLIC Survey data allowed to identify six elements / “Building blocks” of circularity: Cultural value enhancement, Management characteristics and self-sustainability, Closed metabolism realization, Landscape quality enhancement, Social impact, and Economic spillover effects. The value of each of these elements was explained through a set of associated “manifest” variables, mostly assessed in ordinal terms assigning a qualitative and synthetic judgement based on managers and researchers’ knowledge, in absence of quantitative information. The added value of the CLIC Survey was to analyse a large set of data on cultural heritage adaptive reuse practices, identifying potential success factors and important elements influencing the overall circularity performance, providing a first test bed of the circular model applied to cultural heritage adaptive reuse.

Results showed that the best practices in the sample could be divided into two large groups, the first including those focusing on financial results, being more self-sustainable in terms of private co-investments, revenues and costs balance, jobs generation, and measures for closed metabolism, and the other group including those focusing on social return, with high scores in communities involvement, social inclusion, cultural impacts and wellbeing and health enhancement. It is also worth to note that the best practices in circularity performance for all assessment criteria were those

¹³ See CLIC D1.3 CLIC Survey on best practices of cultural heritage adaptive reuse

involving local communities in the decision-making process, confirming the positive impact of people participation and active engagement.

5.2. In-depth analysis of selected case studies

The second phase of the ex-post evaluation regards a more in-depth investigation through the collection of detailed data on a smaller set of practices, shifting from a qualitative-based assessment to a quantitative and qualitative assessment. In particular, some of the aspects considered more relevant to be explored through ex-post evaluation are related to social and cultural impacts, environmental performance (e.g. energy, water, materials), as well as economic-financial results and management models.

The results of the CLIC Survey were explored further through 10 case studies, for which more detailed information was sought through **in-depth interviews** with site managers, conducted by CNR IRISS¹⁴. The interview for managers was structured in different sections related to:

- Revenues and costs
- List of activities generating revenue or supported
- Overall yearly income
- Type and mission of the organization
- Detail of operating costs
- N. of jobs / permanent jobs / volunteers
- Funding information: which type of funding, purpose of funding (renovation, management, other)
- Fundraising
- Functions / uses of the place (tourism/recreation, education, cultural, production, residential/accommodation, community hub)
- Audience (how many clients or people in the community)
- Synergies and collaborations with other organizations

The list of case studies investigated is reported in the Table below:

Table 5. Case studies investigated

N.	Adaptive reuse project	City	Country	Organization	Role of interviewee	Date of interview
1	Villa Campolieto	Ercolano	Italy	Fondazione Ente Ville Vesuviane	Director	9 May 2018
2	H-Farm	Treviso	Italy	H-Farm	EU projects responsible	26 June 2019
3	Palazzo Innovazione	Salerno	Italy	Palazzo Innovazione	CEO	13 January 2020
4	Not Quite	Fengersfors	Sweden	Enderlien & CO	Owner of the mill in Fengersfors	30 March 2020
5	Pfefferberg	Berlin	Germany	Pfefferberg Foundation	Director	7 April 2020

¹⁴ with the exception of Not Quite, that was interviewed by VGR partner, reporting the data to CNR IRISS

6	Catacombe di San Gennaro	Naples	Italy	Catacombe di Napoli	President	9 April 2020
7	Pakhuis de Zwijger	Amsterdam	Netherlands	Tertium	Owner director	10 April 2020
8	Musil	Brescia	Italy	MUSIL	Director	12 May 2020
9	Toolbox	Torino	Italy	Toolbox	CEO	26 May 2020
10	Edit	Torino	Italy	EDIT	CEO	4 June 2020

Each interview lasted from 1 to 3 hours and was conducted online, except for two interviews that were conducted between 2018 and 2019 before the Covid-19 pandemic (Villa Campolieto and H-Farm). A synthetic information is provided below for each case study investigated. Additional information regarding the two cases of Catacombe di San Gennaro in Naples, Italy and Pakhuis de Zwijger in Amsterdam, The Netherlands (CLIC partner) are reported in D1.4 Database of best practices.

Villa Campolieto is a Vesuvian villa located along the “Miglio d’Oro” historic road, so defined for the historical and landscape beauty and the presence of Vesuvian villas, in the municipality of Ercolano, nearby Naples in Italy. The Villa and its garden dates back to XVIII Century. The site was restored since the 70s through diverse interventions funded by the Italian Ministry for Culture, Cultural Heritage and Tourism. Today the Villa is included in a network of four historic sites in the area of Ercolano and it hosts cultural and educational events, as well as private events and training courses. The last interventions included the implementation of a special photovoltaic system ensuring very low impact on the cultural value and aesthetic of the building, as well as low energy consumption lighting system. The ancient water recovery system was also recovered and provides irrigation water for the garden and green areas. The management is fully public, exploiting the opportunities offered by access to additional funding for cultural events and other revenues from private events. The adaptive reuse of the historic Villa Campolieto led to the attraction of almost 10.000 visitors per year, and contributed to the urban area regeneration attracting foreign and domestic cultural visitors and new commercial activities.

H-Farm was established in 2005 on a former agricultural farm as an incubator of innovative SME in the field of ICT, developing into a diversified complex, including education activities. H-Farm is at present a innovation hub where Innovation, Entrepreneurship and Education are combined together, in the historic rural environment. The main premises of H-Farm were built in the agrarian land surrounding Venice and Treviso, around a typical rural building in need of conservation. The implemented restoration was conducted with careful attention to respect the historic-cultural values of the site, linking the conservation with contemporary design and environmental sustainability through the adaptive reuse. The current extension of the complex, including newly designed and built offices, is fully integrated with the natural assets. H-Farm is originally a ICT consultancy company, but the new localization in the historic rural area of Treviso in Italy promoted the diversification of the company’s activities, the creation of a large community of innovators and a hub of entrepreneurial education for all ages, and the revitalisation of the rural area. The rural buildings in the area of H-Farm include co-working spaces, offices, guest rooms, bar and restaurants, and open spaces for relax in nature and gatherings, providing opportunities to the local community to take part in free innovation events.

Palazzo Innovazione is a co-working space and headquarter of Healthware company, which located in the historic building of the ex-Convent “Santa Sofia” in Salerno, Italy. The Convent was built at the end of the 10th century as the first monastery of the Benedictine Order. The Convent hosted many functions over time, up to the latest adaptive reuse as digital health enterprise headquarter, business incubator and co-working space. The private company managing the site invested about 800.000 € for the renovation of the building, which is used partially as its own headquarter – this allows to pay a rent of 6.000 € per month to the municipality who own the historic building. In the other parts, the building hosts a co-working space and incubator for startups in digital health sector, with a bar/kitchen and facilities for the enterprises. The place offers free educational events on entrepreneurship and digital innovation each week, opening-up its doors for interested citizens. This activity is part of its marketing strategy, linked to the consulting services offered for the enterprises of the territory. The success of these initiatives lies in the balance of private and public interest. The uses / functions are in line with the city strategic policies, and an additional benefit for the municipality is the private investment that the companies allowed to repair and maintain the buildings (Lupacchini and Gravagnuolo, 2019). The adaptive reuse of the ex-Convent as “Palazzo Innovazione” contributed to the urban regeneration of the historic city centre, providing new opportunities for the local community and strengthening the local innovation ecosystem.

Not Quite is an artists’ community located in Västra Götaland region, in a small village (350 inhabitants) surrounded by forests in the Swedish countryside. Not Quite is at the forefront in the development of an industrial heritage site into an art and culture driven community, exhibition and workshop spaces. The adaptive reuse of the industrial building conducted by Not Quite aimed at maintaining the buildings in their historic shape, avoiding rebuilding but valorising the industrial atmosphere of the place. The industrial site includes diverse buildings renovated, in a post-industrial area which needs extensive remediation. The private owner rents the buildings to the collective of artists, that manages the membership fees, workspaces, the bar and the shop. Many artists involved live in the village area. Educational projects are developed with local schools. Initial investment risk was lowered thanks to regional rural development funds through which the region provided guaranteed access to finance, fully repaid over the last years. A crowdfunding campaign was started to collect the investment capital to buy the old mill¹⁵. Guided tours and recreation activities are active in the site, with around 30,000 people participating each year. Educational and training courses and conferences are organized, where around 2,000 cultural workers come and spend a weekend at the site. A informal heritage community is active in the place, specifically there is a working group on local identity aiming at collecting and disseminating the stories from the ones who worked at the mill in the past. The old paper machines are conserved in the site, providing a special setting for the artworks along with the industrial remains.

Pfefferberg is a old brewery with restaurants founded in 1841 in Berlin, Germany. The site has a long story of adaptive reuses over time. It turned into a enterprise for chocolate production and after that into a bakery, with offices, storerooms and restaurants. After the World War II, it became a printery with storerooms, garages, workshops and offices. In the late 80s the idea of “Factory of Culture” was launched and the Pfefferwerk association and Pfefferwerk GmbH (Ltd.) were founded aiming to carry out social and cultural activities on Pfefferberg area. In the 90s the Pfefferwerk Ltd. Bought the site with subsidies from Berlin Senate and private contribution, later the Pfefferwerk Foundation was established to manage the site under the “heritage building right” regulation. A leasehold contract was agreed with the construction company for the renovation of the site and the rental services to be started, maintaining the intended use as established by Berlin Senate: culture, art, social services, small businesses. During the 2000s the site was renovated and the Foundation started its activities to manage the diverse buildings with various uses. A number of 24 buildings is managed in Pfefferberg, with around 40 enterprises running the cafés, hostel, workspaces, exhibition spaces, offices and other cultural activities, sharing social criteria for running the activities, as

¹⁵ <https://bitforbit.notquite.se/>

improving the chances of disadvantaged people to enter the labour market, thus generating a high social impact. Also, the Foundation invests in social projects external to the site of Pfefferberg, generating additional positive impacts in the urban area. Thanks to the success of the site with almost 180,000 users each year, Pfefferberg can rely on a sustainable business model able to support the social activities conducted and the renovation and maintenance of the heritage site.

The **Catacombe di San Gennaro** are a archaeological heritage site which dates back to the 2nd and 3rd centuries AD, recovered and reused as a cultural tourism and community place in a disadvantaged Sanità district in the city of Naples, Italy. The archaeological site includes the Catacombs of San Gennaro and the Catacombs of San Gaudioso and two other Basilicas annexed to them. They represent one of the oldest monuments of Christianity in Naples. In addition to the archaeological heritage of the Catacombs, other spaces were recovered for a total of 12,000 square meters. The site hosts around 160,000 visitors a year with a large economic impact in the urban area. The archaeological site represents also an engine to which other “poles” are economically and financially linked, such as the guest house and the laboratories for social, cultural and educational activities. The Catacombs generated 40 new jobs for disadvantaged youths in this area of Naples over the last 10 years, stimulating also cultural and social development in the area. The initiative was taken by the local Church leader, starting with the training of a first group of youths as local guides and the renovation of the site promoted thanks to a first funding from Foundations. From 2006-2008 the training and experimentation of guided tours with volunteers was started at the Catacombs of San Gaudioso. In 2009 the Catacombs of San Gennaro were opened to the public. In 2006, “La Paranza” cooperative was founded by a group of 5 young people and the local Church leader, which has now 40 employees. In 2008, the “Officina dei Talenti” cooperative was also founded, where the young people with the greatest manual skills were brought together in order to take care of the maintenance activities of the spaces. “Officina dei Talenti” has now 15 employees and in addition to taking care of the Catacombs spaces, it has also private contracts for the recovery of residential units in the area, turning into a well-established construction company specialized in recovery works. From the experience of the artist Riccardo Dalisi, another cooperative called “Iron Angels” was founded, a craft workshop that reuses waste materials for the creation of works of art, employing currently other 3 local youths. The great generativity of this experience can be observed also in the visual enhancement of the neighbourhood, with the collaboration of local owners of commercial units and the entire community working to make the historic urban area clean, safe, green and more and more beautiful. In 2014, the Community Foundation “San Gennaro Onlus” was created, composed of both the non-profit sector and the local owners of commercial units. The Foundation has invested over 4,5 M€ on the whole Sanità district coming from fundraising activities and donations for the recovery of the squares, recovery of the heritage sites, and the recovery of other spaces for cultural and social activities. The large social and economic impact of this experience, conducted in a disadvantaged urban area with high criminality and poor education levels, makes it one of the best examples of “circular” adaptive reuse of cultural heritage.

Pakhuis de Zwijger is a cultural organization which opened its doors in 2006. It is located in a industrial heritage building listed as national heritage, a former storage warehouse in an area which was previously an abandoned port area called the Eastern Docklands. Over the past decades Pakhuis de Zwijger has grown to become a fundamental cultural organizations within the city of Amsterdam. At Pakhuis de Zwijger there are over 600 public, freely accessible events per year, that all aim at analysing, rethinking and redesigning solving the biggest urban challenges of our time. Sustainable solutions and true innovation is promoted by including all urban stakeholders in critical, constructive and action-oriented dialogue. These include the traditional parties -the (local) government, (big) businesses and academia- but also (social) entrepreneurs, societal organisations and above all: the citizens. Throughout the year, Pakhuis de Zwijger organizes various event series, city expeditions and festivals that aim to inspire, activate, inform, connect and empower citizens and stakeholders to arrive at “better cities for all”. The creative and innovative approach to these matters has become the trademark of Pakhuis de Zwijger in Amsterdam, participating as key stakeholder in

the Circular Amsterdam initiative. Stadsherstel, a public limited non-for profit company, manages the building implementing also renewable energy and retrofit interventions. A large investment of about 13 M€ was realized to renovate the building, combining private investment, grants from local government and subsidies to make sure that some areas in the building have a social price for rental. Pakhuis de Zwijger programming generates social value, produces knowledge, insight, creates a larger network, contributes to enhance the local community, to enhance knowledge in the local community, and provides a platform to initiatives, voices, and narratives, which otherwise would not have a large platform. The platform and expertise of Pakhuis de Zwijger is offered to diverse initiatives so they can enhance their impact, bringing people together to come to creative and innovative solutions for urgent and present-day challenges. Pakhuis de Zwijger builds *communities of practice*, and works together with partners to create programming on urgent matters concerning urban development.

The **MUSIL** (Museum of industry and work in Brescia, Italy) is a little system of 4 industrial museums. The project began in the 1980s and continued with the first collections at the beginning of the 1990s. The musil is the first Italian museum dedicated to industrialization as a phenomenon that involves the whole of society, represented through a great variety of materials, conceptually organized in a unitary way. The Foundation, established in 2005, has the task of jointly managing the 3 existing museums and coordinating the activities for the construction of the headquarters in Brescia city. Specifically, the Foundation is responsible for setting up the Museum Headquarters. The museographical path is linked to water, from its formation in the atmosphere to its fall on the earth - its condensation on ice, its gathering in the alpine lakes, the harnessing in artificial dams until the arrival in the hydroelectric power station, where it is turned into electricity. The communication of scientific contents is offered takes through a dialogue with technological artifacts full of history. The voice of workers, technicians and ordinary people provide the social frame of this epic history. In 2015, the museum was recognized as an anchor point of the European Industrial Heritage Route, the European “road” that collects the main sites of the continental industrial heritage. The project is fully funded and managed by public bodies and hosts 4,000 visitors per year, educational and cultural activities. The public oriented governance model guarantees the functioning of the site, even if the generativity of the reuse intervention remains limited.

Toolbox industrial building was built starting in 1915 and is part of a much larger complex of about 51,000 square meters hosting industrial and manufacturing activities in Torino, Italy. The company marked an important activity for the city on a national and international level and collaborated in the expansion of Turin linked to the presence and success of the FIAT group’s automotive industry. In addition to the phase of maximum building development of the area, 1962 represented the beginning of the deindustrialization process that went through several steps and changed the ownership of the site, until reaching the abandonment and degradation of the entire area at the end of 2007. The Toolbox proposal of coworking managed to take shape by proposing, in a complex period of economic crisis, a valid alternative to the work difficulties of those years. Toolbox represented the first structured coworking created in Italy, capable of offering new working areas able to attract and welcome freelancers in a dynamic space, in which it was possible to meet similar people, oriented towards the future, with which to exchange ideas, dreams and practical advice to in the face of a limited expense for the workstation. Toolbox was in fact built through step-by-step investments, and its size has expanded with the increase in demand, thus allowing to limit investment risks. The various adaptive reuse interventions have made it possible to recover the large spaces of the former Carlo Garrone foundry, which are the new areas of the coworking stations surrounded by “service boxes”, volumes of limited dimensions designed to encourage socialization. Inaugurated in 2010, with the first intervention of a thousand square meters, Toolbox today covers an area of 10,000 square meters with a total investment of 3 M€ (Bottero and Lerda, 2019). The philosophy of Toolbox is centred on the “economy of relationships”, on values that enable the shifting from the sharing economy to the “caring economy”. Users co-create the meaning and atmosphere

of the place, co-generating added social value and a self-sustainable business model led by a socially-oriented private entrepreneur.

EDIT is a former industrial site in the city of Torino, Italy, built in 1888 in a block that is now known as the former INCET area, a factory that for years produced and exported internationally the technological innovation products of the period, such as wires for transmission of electricity, cables for telephone and telegraph transmission and ropes for transportation. INCET was an industrial symbol of the city of Turin and it contributed to the urban expansion of the Barriera di Milano industrial district. The industrial production lasted until 1968 when it was then moved elsewhere and the buildings were abandoned, starting a period of decay of the entire urban area for over 40 years. Today the Barriera district of Milan is a symbol of urban rebirth and EDIT represents the latest reconversion and redevelopment project that has allowed the old beauty of the industrial complex to be brought back to life, offering an innovative concept in the food and beverage sector. The adaptive reuse works were completed between 2015-2017 and involved an area of 5,000 square meters, with a total investment of almost 12 M€. Before the intervention, the building consisted of an industrial volume with a rectangular plan in a severe state of neglect; this has been recovered in its entirety while maintaining its original volume. Internally, it was possible to exploit the height to insert a new slab, re-proposed in an industrial nature, in order to double the walkable surface. The original perimeter walls were covered with insulating panels, to improve the energy efficiency of the building, and walls and volumes were inserted from scratch to ensure the development of different areas but with a visual continuum, respecting the industrial heritage structure in a dynamic and flexible reality. The main functions of EDIT include areas intended for bakery cafes, restaurants and pubs with an adjoining brewery also made available to external users who can use them to produce their own beers with the help of master brewers. The offer also expands with the presence of four kitchens for workshops and show cooking events. The EDIT project has made it possible to bring an old dilapidated building back to life, giving it the opportunity to host a new innovative function that can increase the attractiveness of the neighbourhood, together with the other adaptive reuse interventions in the same area (Bottero and Lerda, 2019). The place promotes a local economy based on local food and beverage products, establishing relationships with high quality product enterprises.

In Table 6 are presented the key data summarizing the in-depth adaptive reuse case studies analysed and the impacts generated.

Table 6. Database of indicators and data for ex-post evaluation of cultural heritage adaptive reuse impacts: results of in-depth case studies analysis

PROJECT		Villa Campolieto	H-Farm	Palazzo Innovazione	Not Quite	Pfefferberg	Catacombe di San Gennaro	Pakhuis de Zwijger	Musil	Toolbox	Edit
GENERAL INFORMATION	Country	Italy	Italy	Italy	Sweden	Germany	Italy	Netherlands	Italy	Italy	Italy
	Region	Campania	Veneto	Campania	Vastra Gotaland	Berlin	Campania	North Holland	Lombardia	Piemonte	Piemonte
	City	Ercolano	Treviso	Salerno	Fengersfors	Berlin	Naples	Amsterdam	Brescia	Torino	Torino
	Urban context	Medium-sized city	Small city, Rural	Medium-sized city	Small city, Rural	Large city	Large city	Large city	Medium-sized city	Large city	Large city
	Heritage type	Residential Palace	Rural heritage	Monastery	Rural heritage	Industrial heritage	Archeological heritage	Industrial heritage	Industrial heritage	Industrial heritage	Industrial heritage
	Adaptive reuse (uses)	Cultural events, Education, Visits	Headquarter, Digital hub, Co-working, Entrepreneurial hub and school	Headquarter, Digital health hub, Co-working, Events	Co-working, Creative hub, Workshop space, Exhibition	Cultural events, Workshop spaces, Art galleries, Hostel, Bar & restaurant	Cultural tourism, Education hub, Hospitality	Cultural events, Dialogue platform, Bar & restaurant	Museum	Co-working, Events, Leisure, Bar & restaurant	Beer production, Bar & restaurant
	Adaptive reuse (period)	1970-2010 (various phases)	2000-2005	2017	2003	2000	2005-2010	2000s	2000	2006-2010	2015
MANAGEMENT	Ownership	Public	Private	Public	Private	Foundation	Church	Private	Public	Private	Private
	Management model	Public supported	Rent	Rent	Rent	Rent	Use concession	Rent	Public supported	Rent	Rent
	Manager organisation	Foundation	Private for profit	Private for profit	Private for profit	Foundation	Private non profit	Private non profit	Public	Private for profit	Private for profit

PROJECT		Villa Campolieto	H-Farm	Palazzo Innovazione	Not Quite	Pfefferberg	Catacombe di San Gennaro	Pakhuis de Zwijger	Musil	Toolbox	Edit
	Governance model	Public custodian	Private custodian	Private custodian	Private custodian	Community custodian	Community custodian	Community custodian	Public custodian	Private custodian	Private custodian
	Funding sources	Public	Private	Private	Private	Public	Community	Private	Public	Private	Private
	People involvement in decision making	No	No	No	No	No	No	Yes	No	No	No
	Total investment	7 M€	1-3 M€	800,000 €	1,5 M€	100 M€	1-3 M€	>10 M€	1-3 M€	<1 M€	>10 M€
	Sqm adaptive reuse	2500	4800	4000	15000	22000	6000	6200	3200	10000	5000
BUSINESS MODEL	Leadership	Foundation	Entrepreneur	Entrepreneur	Entrepreneur	Civil society	Church	Activist	Municipality	Entrepreneur	Entrepreneur
	Activities non generating revenue	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yearly overall income	300,000 €	60 M€	300,000 €	275,000 €	350,000 €	860.000 €	2.000.000 €	100.000 €	n.d.	3.000.000 €
	Operating costs	300,000 €	n.d.	250,000 €	270,000 €	100,000 €	700.000 €	1.600.000 €	90.000 €	n.d.	5.000.000 €
	Reinvestment in the urban area	Yes	Yes	No	Yes	No	Yes	No	No	No	No
	Jobs (direct+indirect)	8	25+650	3	1	2+500	40	100	3	n.d.	50
	Volunteers	No	No	No	30	5	10	No	2	No	No
	Fundraising	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	No
ACTIVITIES AND OUTCOMES	N. enterprises localised	No	100	10	n.d.	40	3	3	No	200	n.d.
	Cultural tourism	Yes	No	No	Yes	Yes	Yes	No	Yes	No	No
	N. of visitors	10.000	200	800	30.000	180.000	160.000	No	10.000	No	No
	Education activities	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	N. of people receiving education	5000	500	No	20	300	n.d.	1.000	400	400	100
	Cultural activities	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

PROJECT		Villa Campolieto	H-Farm	Palazzo Innovazione	Not Quite	Pfefferberg	Catacombe di San Gennaro	Pakhuis de Zwijger	Musil	Toolbox	Edit
	N. of participants in cultural activities	n.d.	4000	No	2000	n.d.	n.d.	77.000	300	8.000	500
	Productive activities	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes
	Residential / hospitality function	No	Yes	No	No	Yes	Yes	No	No	No	Yes
	Community activities	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
	N. organisations collaborating	n.d.	n.d.	n.d.	40	100	22	460	5	200	n.d.
	N. people in the community	n.d.	n.d.	n.d.	100	n.d.	60	80.000	50	600	n.d.
	Heritage Community	No	No	No	Yes	No	Yes	No	Yes	No	No
ENVIRONMENTAL DATA AND CIRCULAR TECHNOLOGIES	Energy need	60 KW	n.d.	n.d.	200 KWh	n.d.	n.d.	1.025.000 KWh	6.000 KWh/sqm	n.d.	n.d.
	Renewable energy sources on site	Yes	Yes	No	Yes	Yes	No	Yes	No	n.d.	No
	Share of renewable energy in gross final energy consumption	80%	85%	0%	40%	n.d.	0%	68%	0%	n.d.	0%
	Building Energy Performance Certificate Rating	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	G	n.d.	n.d.
	Energy Efficiency Label of major heating and cooling systems	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	Fresh water consumption: Liters/person/year	n.d.	n.d.	n.d.	1000 m3/year	n.d.	n.d.	2.640 m3/year	n.d.	n.d.	n.d.
	Water recovery systems	Yes	Yes	No	No	Yes	n.d.	No	No	n.d.	No

PROJECT	Villa Campolieto	H-Farm	Palazzo Innovazione	Not Quite	Pfefferberg	Catacombe di San Gennaro	Pakhuis de Zwijger	Musil	Toolbox	Edit
Nature-based solutions	n.d.	Yes	No	Yes	No	Yes (green areas)	No	No	n.d.	No
Recycled materials	n.d.	Yes	Yes	Yes	n.d.	Yes	No	No	n.d.	No
Traditional and local materials	Yes	Yes	Yes	Yes	Yes	Yes	No	No	n.d.	Yes
Remediation	No	Yes	No	No	n.d.	No	No	No	n.d.	Yes
Biodiversity preservation	Yes	Yes	No	No	n.d.	Yes	No	No	n.d.	No

Note: n.d. stands for "no data"

The relatively high number of “n.d.” (no data), especially in the section regarding environmental data and circular technologies, makes clear how difficult it is, even for the managers of heritage sites, to realize the information needed for their sustainable management. Clearly, the sample of ten case studies is not representative of adaptive reuse projects, however a general lack of quantitative data was present also in the CLIC Survey, which was formed of more than 120 case studies with information mostly provided by site managers and professionals with a good level of knowledge. Also, compared with previous studies such as Cultural heritage Counts for Europe (2015), the difficulty in identifying quantitative data on several aspects related to the environmental dimension seems coherent with the CLIC results.

The lack of skills and competences in environmental management could be probably a motivation for the **lack of environmental data**, even if common information such as the Building Energy Performance Level should be available for buildings in European countries. During the interviews conducted, it was observed a scarce attention of some site managers to the environmental circularity aspects of the adaptive reuse intervention, related to energy consumption, water consumption, nature-based solutions, reduction of raw materials extraction, biodiversity and remediation. Northern and Central Europe case studies demonstrated higher awareness, however quantitative data remained difficult to collect. Another reason for the scarce attention on environmental aspects can be identified in the conflict often arising between heritage preservation regulations and environmental needs in view of higher building performances. In fact, renewable energy sources such as common photovoltaic panels, external walls insulation or change of windows and doors could not be applicable to heritage buildings, or determine higher costs to find alternative and more compatible solutions. It should be also noted that, since this in-depth assessment was conducted on case studies with a history of 5 or more years of activity, the environmental measures taken 5 or 10 years ago could be not updated. With the launch of the European Green Deal, it is likely that also heritage buildings will be object of careful environmental assessments, from basic energy assessment to more complex Life-Cycle Assessment of each intervention, however the issue of **skills would need more attention**.

As per the **economic-financial performance**, many sites investigated were sufficiently self-sustainable, not receiving subsidies from the public sector in the operational phase, except from Villa Campolieto and Musil managers who declared to receive public support for the functioning of the heritage sites. Large public investments were present in three sites (Villa Campolieto, Musil and Pfefferberg), however public co-investment was also included in other cases, showing the central role of the public sector for heritage conservation, especially in the case of low or null short-term returns. Circular business models, as studied and tested in the CLIC research¹⁶, could support heritage owners and managers to develop **more sustainable business models for the adaptive reuse of cultural heritage**, enhancing the attractiveness of investments in cultural heritage also for private and third sector actors, engaging the local community and stakeholders in co-investment, and ensuring larger participation and collaborations in the operation phase.

The in-depth assessment highlighted also rare attempts to assess the **cultural and social impacts** of the adaptive reuse project. In many cases, the number of visitors per year can be seen as a relevant proxy of the appreciation of the heritage site. However, visitors' numbers are influenced by the size of the heritage site, and by the management model, considering that not all places are open every day for the general public and many do not provide guided visits as they are mostly working places. Therefore, it could be interesting to conduct more careful assessments of the heritage appreciation after the adaptive reuse, investigating how people perceive the atmosphere of the place, its openness, creativity and vibrancy, as well as people's perceived wellbeing, mutual trust, and general attachment to the place in relation to the collective memory, introducing the “intrinsic value” as a key aspect of heritage cultural diversity and uniqueness. In order to respond to

¹⁶ See CLIC Deliverables D4.4 and D4.5.

these open questions, “how people perceive the heritage site after the adaptive reuse” and “which are the cultural and social impacts, positive or negative, of the adaptive reuse intervention”, the University of Warsaw conducted a specific **data collection campaign focused on social impacts** of cultural heritage adaptive reuse practices, using questionnaires to compare social impacts in three sites in Italy (Giardino della Minerva, Salerno), Sweden (Not Quite, Västra Götaland region) and Poland (Open Jazdow, Warsaw).

The next sections present the matrix of suggested indicators for ex-post evaluation, and the results of the social impacts assessment conducted by the University of Warsaw within the CLIC project, with a focus on the “Social impact assessment report” as a useful tool to engage stakeholders and shareholders, and the overall local community in the adaptive reuse of cultural heritage, contributing to enhance net positive impacts over time. Finally, a structure of “circularity assessment report” is proposed to support heritage sites managers in the reporting of actual results of cultural heritage adaptive reuse practices.

5.3. Matrix of indicators for ex-post evaluation

The matrix of quantitative and qualitative indicators proposed for ex-post evaluation is based on the CLIC evaluation framework, refined through the assessment of best practices and in-depth case studies of cultural heritage adaptive reuse described in previous sections. The matrix of indicators for ex-post evaluation was built through the collaboration of CLIC researchers and experts in diverse sectors, from heritage sectors to economics and finance, social science and ecological economics / environmental science, covering multiple dimensions, tools and approaches.

The set of multidimensional and multicriteria indicators is meant as a useful orientation for heritage managers to make sense of the diverse impacts of cultural heritage adaptive reuse, supporting circular management and business models which are based on the recognition of the positive and negative externalities of human activities, and their “internalization” in a systemic social-ecological model that takes into account the business as integral / interconnected part of the larger societal and ecological system, and thus responsible for its functioning and overall sustainability.

The structure of the indicators matrix includes:

- The circularity dimension (regenerative capacity, symbiotic capacity and generative capacity);
- The specific criteria considered;
- The specific indicators proposed.

Each indicator is also described through its characteristics:

- Unit of Measure;
- Potential Data sources;
- Sustainability dimension (cultural, economic, social, environmental);
- Typology (qualitative, quantitative and/or spatial indicator);

Furthermore, additional information are provided on the specific use of indicators:

- Adaptive reuse phase (Planning, Construction, Operations);
- Scale (Micro, Meso and Macro).

The high variability of heritage typologies, scales, historic-cultural value, level of conservation, does not allow to identify a large set of universally applicable indicators. The additional information elaborated for each indicator is aimed at facilitating the **use of the tool in a flexible way, allowing “adaptation” in the selection of indicators** which can be selected by site

managers based on the scale and adaptive reuse phase. In fact, not all indicators can be adequate for each stage of the adaptive reuse process and at each scale. Particularly, the “Micro” scale indicates data that can be assessed at the level of the specific building or site, while the “Meso” scale refers to data to be assessed at the neighbourhood/city level, and “Macro” scale refers to the regional level.

The typology of indicators include also a number of **spatial indicators**, highlighting the spatial and visual dimension of the cultural heritage adaptive reuse intervention, which should be always considered to avoid the fragmentation and separation of cultural heritage from its surroundings, in line with the UNESCO Historic Urban landscape recommendation. For example, some of the in-depth case studies analysed demonstrated that the adaptive reuse and valorisation of heritage resources was a driver for the entire neighbourhood revitalisation, stimulating residents and owners of commercial activities to invest in the refurbishment / renewal of surrounding buildings, streets, green areas and public spaces. This was the case in particular for the “Catacombs of San Gennaro” in Naples, Italy, where a socially and physically degraded neighbourhood was substantially regenerated, enhancing the cleanliness, safety and beauty of the area and thus attracting more commercial activities and visitors nearby the heritage site. Thus, the indicators set proposed aims to capture the **spatial, visual and perceptual impacts of cultural heritage adaptive reuse**, integrating those elements in the assessment of impacts.

The circularity indicators matrix for ex-post evaluation represents a tool to create evidence base of cultural heritage impacts, allowing comparison and benchmark between diverse adaptive reuse practices, thus **providing useful information to enhance choices for new adaptive reuse interventions**. Heritage sites managers and owners, in the public, private and third sector, can use the indicators to orient projects and monitor results in a systematic way. However, the assessment of some indicators requires **specific expertise and skills to be conducted, calling for multidisciplinary knowledge and new capacities** of managers that should be able to **coordinate diverse aspects of circularity**, from environmental measures for the “circular building” to sensitiveness for historic-cultural and “intrinsic” values of cultural heritage, to economics and financial assessments, to aspects related to social cohesion, participation, engagement, inclusion.

Table 7. Matrix of indicators for ex-post evaluation of cultural heritage adaptive reuse impacts

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit Measure	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale	
Regenerative capacity	1	Authenticity and integrity	1.1	Quality of adaptive reuse intervention	1.1.1	Involvement of all relevant stakeholders (heritage authorities, heritage experts and community) in the adaptive reuse intervention	yes/no	Questionnaire assessment	Cultural Social	–	Qualitative	x	x	x	Micro
	2	Intrinsic value	2.1	Intrinsic value	2.1.1	Level of enhancement of “intrinsic value” of cultural heritage	Qualitative	Questionnaire assessment	Cultural Social	–	Qualitative	x	x	x	Micro
	3	Financial self-sustainability	3.1	Financial self-sustainability	3.1.1	Payback period	n. of years	Manager	Economic	Quantitative	x			x	Micro
					3.1.2	EBITDA (Earnings Before Interests Taxation and Depreciation and Amortization)	€	Manager	Economic	Quantitative	x			x	Micro
					3.1.3	Return on Investment	%	Manager	Economic	Quantitative	x			x	Micro
					3.1.4	Net Present Value	€	Manager	Economic	Quantitative	x			x	Micro
					3.1.5	Diversity of funding sources (share of public and private contribution)	%	Manager	Economic	Quantitative	x			x	Micro
	4	Reinvestment of profits	4.1	Reinvestment of profits	4.1.1	Existence of reinvestment policies (non profit organizations)	yes/no	Manager	Economic	Qualitative				x	Micro

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit Measure	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
						or CSR policies (for profit organizations)								
					4.1.2	Amount of profits reinvested / total profits	%	Manager	Economic	Quantitative			x	Micro
	5	Energy efficiency	5.1	Energy consumption (renewable & fossil energy)	5.1.1	Energy consumption for electricity, heating, and cooling (convert heat to kWh)	kWh/user/year	Manager	Environmental	Quantitative			x	Micro
					5.1.2	Share of renewable energy in gross final energy consumption (on or off-site)	% of kWh/user/year	Manager	Environmental	Quantitative			x	Micro
					5.1.3	Building Energy Performance Certificate Rating	A,B,C,D, E,F,G	Manager	Environmental	Quantitative			x	Micro
					5.1.4	Energy Efficiency Label of major heating and cooling systems	A+++, A++, A+, A, B, C, D	Manager	Environmental	Quantitative			x	Micro
			5.2	Embodied energy conservation	5.2.1	Embodied Energy maintained through reusing building and materials (concrete, stone, brick, steel, etc.) during construction	CO2 equiv. GHG tons	Manager	Environmental	Quantitative		x	x	Micro
	6	Freshwater efficiency	6.1	Water Consumption (freshwater & recovered water)	6.1.1	Fresh water consumption	Litres/person/year	Manager	Environmental	Quantitative	x	x	x	Micro

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit Measure	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
					6.1.2	Recovered/reused water consumption collected on or off site	% of litres/user/year	Manager	Environmental	Quantitative			x	Micro
	7	Nature-Based Solutions	7.1	Solutions for nature regeneration	7.1.1	Adoption of Nature-Based Solutions in the heritage site	yes/no	Manager	Environmental	Qualitative	x	x	x	Micro
	8	Heritage community	8.1	Heritage community network	8.1.1	Number of people actively participating in heritage reuse and valorisation activities (compared to the inhabitants)	n.	Manager	Social	Quantitative	x		x	Micro
					8.1.2	Number of people registered to memberships and loyalty programs	n.	Manager	Social	Quantitative			x	Micro
					8.1.3	Number of people volunteering in the site	n.	Manager	Social	Quantitative			x	Micro
	9	Local community	9.1	Diversity	9.1.1	Diversity of skills	n.	Questionnaire assessment	Social	Quantitative	x	x	x	Micro
			9.2	Capacity for learning	9.2.1	Number of learning opportunities nearby the site	n.	Questionnaire assessment	Social	Quantitative	x	x	x	Micro
	10	Traditional skills	10.1	Traditional skills involved in the adaptive reuse	10.1.1	Number of craftsmen and/or traditional skilled workers employed in the adaptive reuse works	n.	Manager	Cultural Social	Quantitative		x	x	Micro

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit Measure	of	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
Symbiotic capacity	11	Smart Specialisation Strategies	11.1	Contribution to entrepreneurial ecosystems development and Smart Specialisation Strategies	11.1.1	Coherence and alignment of heritage uses with existing Smart Specialisation Strategies (primarily NUTS 2 and NUTS 3; NUTS 1 if a country has only NUTS 1)	yes/no		Manager	Economic	Qualitative	x		x	Micro
	12	Construction & Demolition Wastes	12.1	Construction & Demolition Wastes avoided through the adaptive reuse	12.1.1	Description & Volume of C&DW avoided (concrete, brick, rebar, etc.)	Metric Tons or M3s		Manager	Environmental	Quantitative	x	x		Micro
	13	Materials extraction	13.1	Reused materials onsite	13.1.1	Description & Volume of recycled and reused materials originating off-site and onsite used (furniture, fixtures, building materials)	kilos, metric tons or m3		Manager	Environmental	Quantitative	x	x	x	Micro
			13.2	Traditional and/or biomass and/or local	13.2.1	Description & Volume of traditional and/or biomass-based	kilos, metric tons or m3		Manager	Environmental	Quantitative	x	x	x	Micro

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit Measure	of	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
				sustainable materials used onsite		and/or local sustainable materials									
			13.3	Reused materials off-site	13.3.1	Description & Volume of recycled and reused materials off-site originating onsite (furniture, fixtures, building materials)	Kilos, metric tons or m3		Estimate	Environmental	Quantitative	x	x	x	Micro
	14	Social Sustainability	14.1	Cooperation and collaboration network	14.1.1	Number of stakeholders involved in cooperation and collaboration networks	n.		Manager	Social	Quantitative	x		x	Meso
					14.1.2	Density of social network relationships	Intensity based on social network analysis		Questionnaire assessment	Social	Qualitative			x	Meso
					14.1.3	Involvement of third sector actors in the adaptive reuse process	Yes/no		Questionnaire assessment	Social	Qualitative	x	x	x	Micro
					14.1.4	Involvement of marginalized groups in the adaptive reuse process	Yes/no		Questionnaire assessment	Social	Qualitative	x	x	x	Micro

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit Measure	of Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
			14.2	Level of openness in the local community	14.2.1	Level of openness in local community members and stakeholders	Intensity based on questionnaires	Questionnaire assessment	Social	Qualitative			x	Meso
			14.3	Level of trust in the local community	14.3.1	Level of trust in local community members and stakeholders	Intensity based on questionnaires	Questionnaire assessment	Social	Qualitative			x	Meso
	15	Participation in decision-making	15.1	Participation in decision-making related to the adaptive reuse process	15.1.1	Number of stakeholders involved in decision-making	n.	Manager	Social	Quantitative	x		x	Micro
					15.1.2	Diversity of stakeholders involved in decision-making	n.	Manager	Social	Qualitative – Quantitative	x		x	Meso

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit of Measure	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
Generative capacity	16	Participation in culture	16.1	Participation in cultural activities	16.1.1	Number of people participating in cultural activities in the area	n.	Manager	Cultural	Quantitative	x		x	Meso
	17	Cultural visitors	17.1	Visitors to the heritage site	17.1.1	Number of annual visitors to the heritage site including school visits	n.	Manager	Cultural	Quantitative			x	Micro
	18	Jobs creation	18.1	High-quality jobs created	18.1.1	Number of jobs directly and indirectly created		Manager	Economic	Quantitative	x	x	x	Micro
	19	Indirect and induced economic impacts	19.1	Economic spillovers linked with the adaptive reuse	19.1.1	Indirect and induced jobs generated	€	Estimate	Economic	Quantitative	x		x	Macro
	20	Financial returns for public sector	20.1	Financial returns for public sector	20.1.1	Financial returns for public sector thanks to adaptive reuse intervention	€	Estimate	Economic	Quantitative	x		x	Macro
	21	Cultural vibrancy	21.1	Cultural and educational events	21.1.1	Number of participants to cultural and educational events organized in the site	n.	Manager	Social	Quantitative			x	Micro
	22	Landscape quality	22.1	Landscape quality in the area	22.1.1	Perceived visual quality and atmosphere	Visual-perception survey	Questionnaire assessment	Social	Qualitative - Spatial			x	Meso
			22.2	State of maintenance of surrounding buildings	22.2.1	Average state of maintenance of surrounding buildings	Buildings survey	Manager	Social	Qualitative - Spatial			x	Meso

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit of Measure	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
	23	Place attractiveness	23.1	Attractiveness for creative workers	23.1.1	Localization of creative, cultural and innovative entrepreneurs, craftsmen and artists in the area	n.	Manager	Social	Quantitative - Spatial			x	Meso
			23.2	Social Sustainability Index	23.2.1	Perceived attractiveness and atmosphere of the area	Intensity based on questionnaire	Questionnaire assessment	Social	Qualitative - Spatial			x	Meso
	24	Cleanliness of public spaces	24.1	Cleanliness of public spaces	24.1.1	Perceived cleanliness of public spaces	Intensity based on questionnaire	Questionnaire assessment	Social	Qualitative - Spatial			x	Meso
	25	Safety of public spaces	25.1	Safety of public spaces	25.1.1	Perceived safety of public spaces	Intensity based on questionnaire	Questionnaire assessment	Social	Qualitative - Spatial			x	Meso
	26	Wellbeing	26.1	Local community wellbeing	26.1.1	Self-reported wellbeing of local community members	Intensity based on questionnaire	Questionnaire assessment	Social	Qualitative			x	Meso
	27	Quality of life	27.1	Liveability of the area for residents	27.1.1	Proximity shops in the area (compared to total shops)	Spatial survey	Estimate	Social	Quantitative - Spatial			x	Meso
	28	Greenhouse gas emissions (GHG)	28.1	Greenhouse gas emissions (GHG)	28.1.1	GHG emissions in the operation phase	CO2 equiv. GHG tons/year	Manager	Environmental	Quantitative			x	Micro
	29	Air quality	29.1	Air quality in the proximity of the heritage site	29.1.1	Implementation of purification techniques to clean the air	Yes/no	Manager	Environmental	Qualitative			x	Meso
					29.1.2	Level of pollutants at cultural heritage site	CO2, Nox, Sox,	Manager	Environmental	Quantitative - Spatial	x		x	Micro

Circularity dimension	N.	Criteria	N.	Indicator categories	N.	Indicator	Unit of Measure	Data sources	Sustainability dimension	Typology	Planning	Construction	Operations	Scale
						based on the presence of CO ₂ , Nitrogen oxides (Nox), Sulphur oxides (Sox), and particulate matter	Particulate matter							
	30	Water quality	30.1	Water quality in the proximity of the heritage site	30.1.1	Implementation of purification techniques to clean water	Building survey	Manager	Environmental	Qualitative	x		x	Meso
					30.1.2	Level of pollutants at cultural heritage site based on the presence of Nutrients (phosphorous and nitrogen), Dissolved Oxygen, etc	ppm	Manager	Environmental	Quantitative - Spatial	x		x	Meso
	31	Biodiversity	31.1	Conservation of biodiversity and natural heritage	31.1.1	Implementation of actions for natural heritage and biodiversity conservation	Yes/no	Manager	Environmental	Qualitative - Spatial	x		x	Meso
	32	Soil pollution	32.1	Soil pollution in the proximity of the heritage site	32.1.1	Implementation of remediation techniques to clean the soil before the adaptive reuse intervention	Yes/No	Manager	Environmental	Qualitative - Spatial	x		x	Meso

5.4. Social impacts assessment

Social impacts of cultural heritage adaptive reuse projects have been extensively addressed in CLIC Deliverable D2.2 on “Socio-cultural impact indicators”¹⁷. Cultural heritage represents the “connective infrastructure” of the city, its memory and identity¹⁸, which differentiates cities and urban areas, marking their uniqueness and atmosphere. Through cultural heritage, individuals and communities are connected to their history, collective memory and cultural identity, even in cases of “contested” heritage¹⁹ that continues to stimulate reflection on contemporary social and political issues. The adaptive reuse of cultural heritage starts from the idea of “recovering” and “regenerating” abandoned and/or underused heritage sites, necessarily attaching to the interventions quite complex meanings related to specific histories, identities and communities. Cultural heritage becomes thus a “common good”, a space of collective care, encounter and dialogue, in which individual values are confronted with collective values, which can be also conflictual. The exploration of cultural heritage values, significance and meanings can be hardly solved through simplifying tools. Instead, it can become an opportunity to trigger a fruitful process / exercise of education to dialogue, collective care for the common good and shared responsibility. Thus, the adaptive reuse of cultural heritage, if supported by participatory processes and co-evaluation tools, can promote the formation of “micro-communities” which are at the basis of democratic and cohesive societies, in which differences are not eliminated in the search of the “simple/good” solution, but valorised as the entry points of a co-evolutionary evaluation process which aims at re-shaping the perception of “needs” through dialogue, analysis and confrontation, towards the collective “building” / co-creation of solutions, enhancing the collaboration capacity through the valorisation of diverse points of view, capacities and needs at stake (i.e. the cultural diversity) as the key “capital” of a community, including “future generations” in the accounting of costs and benefits.

In this perspective, the assessment of social impacts should be grounded on the acknowledgment and understanding of the “Complex Social Value” of cultural heritage, and particularly of its “intrinsic value”, which is the base for other instrumental values (direct and indirect use values, non-use values, option values, bequest values). The social impact of cultural heritage adaptive reuse is thus linked to the consequences of the intervention on the collaboration capacity, exploring which are the starting conditions: the level of openness, trust, cohesion, capacity and diversity of a community. The specific impact of the adaptive reuse “process” on the capacity of a community for collaboration and collective care of the common good can be extremely relevant to understand whether and how the adaptive reuse of cultural heritage has been exploited as a way to promote social cohesion, inclusion, diversity, wellbeing, social and cultural development. But how to assess these specific impacts?

CLIC has developed and tested a set of specific tools to assess social impacts and to provide evidence-base of how cultural heritage can have a deep influence on the social and cultural development of our society, particularly in the current historical period of extreme social fragmentation, standardisation, isolation, inequality, which undermines social cohesion at local, national and European level.

The following sections present the results of the social impacts assessment conducted in three European cases of cultural heritage adaptive reuse: the Garden of Minerva (Giardino della Minerva), in Salerno, Italy, one of the CLIC pilot cities; the experience of Not Quite, an adaptive reuse of

¹⁷ See CLIC Deliverable D2.2 “Socio-cultural indicators for cultural heritage adaptive reuse”

¹⁸ Luigi Fusco Girard, CLIC framework document 21-12-2020.

¹⁹ For example, in post-communist countries of Eastern Europe in which the communist architecture represents today a controversial memory.

industrial heritage conducted by a collective of local innovators in the rural area of Västra Götaland region, Sweden, also one of the CLIC pilots (see Annex 2); and finally Open Jazdów, a cultural heritage site, which was renovated and transformed in a platform for cultural dialogue and social innovation in the city of Warsaw, Poland (see Annex 3). A questionnaire was developed targeting three main actors: heritage site managers, local community members and visitors, to explore their perception of the adaptive reuse intervention after its realisation, and assess its social impacts using the framework of “social sustainability” developed by the University of Warsaw within CLIC.

Methodology

The studies on the **social impacts of adaptive reuse interventions** in Minerva’s Garden (*Giardino della Minerva*) in Salerno (Italy), Not Quite in Fengersfors, Västra Götaland region (Sweden), and Open Jazdow in Warsaw (Poland), were guided by two main aims.

First, to explore how visitors and users of the heritage sites perceive the place after the intervention, what are the motivations for visiting the site, and what changes would they recommend.

Secondly, to learn about the local community that lives in close proximity of the heritage sites: what is their experience from living in the particular neighbourhood, how they perceive their neighbours, and how they assess the opportunities for fulfilling their needs in the neighbourhood.

In 2020, residents and visitors of the three heritage sites were asked to fill out two questionnaires: one about the quality of life in the area (for community members only), and one about the specific heritage sites (for community members and outside visitors). Both surveys were conducted online and advertised on site, to invite participation of people familiar with the specific heritage sites assessed.

The **assessment of the baseline context** was considered an important to understand the actual impact of the adaptive reuse intervention on the perceived quality of the site and on the overall satisfaction of residents and visitors. Indeed, the adaptive reuse intervention realised in a degraded area could result in higher social and cultural impact than a similar intervention realised in a urban area already perceived as high quality location. This aspect can become relevant in ex-post evaluation to assess the actual impact of the project addressing the “**deadweight**” bias²⁰, as well as in the ex-ante evaluation / decision making process when it should be decided where, when and how to invest in alternative cultural heritage adaptive reuse interventions. The “value for money” in terms of social impact of the diverse projects proposed could be assessed and included between the criteria in a multi-dimensional evaluation matrix.

To assess the social impacts of the adaptive reuse interventions in CLIC pilot cases, the **Social Sustainability framework** developed by the University of Warsaw in CLIC (D2.2) was applied, considering five aspects that influence the overall circularity at neighbourhood level: Diversity and openness of people living in the area; Common vision; Trust; Capacity for Learning; Capacity for self-organisation. Other relevant aspects such as job opportunities, engagement and participation,

²⁰ The term “deadweight” refers to “how much of the impact of a specific project/intervention would have taken place also in the absence of the activity object of the assessment”. Assessing the deadweight is important to avoid overestimation of the social impacts of a particular activity, which could be partially due to external factors not directly related to the activity itself. This aspect has been largely approached in the Social Return on Investment (SROI) methodology for the assessment of impacts of socially oriented projects.

and global satisfaction of residents towards the urban area were explored to assess the baseline context with respect to the perceived quality of life.

The **social impacts assessment questionnaires** were developed and tested before the large implementation in the three case studies. The tool of the questionnaire can be adapted and implemented in diverse heritage sites and at various scales. The **evaluation tools** experimented include the identification of circularity dimensions, criteria, indicators and methods for data collection, that can be used by heritage sites owners and managers in both ex-ante and ex-post evaluations, enhancing the capacity of diverse actors and the communities themselves to take decisions towards higher circularity, including enhanced positive social impacts. The **methodology** developed supports robust assessment and benchmark of social impacts between diverse contexts and heritage sites, increasing the reliability of impacts assessment also for investors and funders who need to have a clear idea of the consequences of investments, to enhance the overall **financial and multidimensional non financial “return”**.

Next sections report a summary of the results of the social impact assessment in the three case studies selected for experimentation in the CLIC project. These results informed the development of “ex-ante” evaluation indicators which are presented in the subsequent Section 5 of this report.

Assessment of social impacts in Giardino della Minerva, Salerno (Italy)²¹

Evaluation of the neighbourhood and the local community

Thirty tree residents of Salerno, who live next to the Minerva’s Garden, took part in the study on perception of their local community. The questions referred to the quality of life in the neighbourhood, respondent’s relation to the area and different factors describing the potential for social sustainability in the local community.

Description of respondents

Socio-demographic description of respondents

- Respondents represented the following age groups: 48.5% of respondents were 55-64, 18.2% were 25-34, 15.2% of respondents were 45-54, 9.1% were 65+, 6.1% of respondents were 35-44, and 3% of respondents were 18-24.
- Men slightly outnumbered women among respondents (54.5%).
- 60.6% have completed MA degree, 12.1% had Bachelors’ degree and another 12.1% had professional degree. 6.1% had doctoral degree, and other 6.1% graduated from a technical school. Remaining 3% refused to answer.
- The respondents had different professions. Most represented industry was art (7), then architecture (4), local services (3), research (3), new technologies (3), and media (2). The remaining group was composed of individuals with diverse occupational background like

²¹ This section has been developed by the team of UNIWARSAW - Robert Zajonc Institute for Social Studies, University of Warsaw: Magdalena Roszczyńska-Kurasińska, Anna Domaradzka, Agata Zabłocka, Bartosz Ślosarski. Data have been collected by local partner CNR IRISS in Salerno, Italy, and analysed by UNIWARSAW team.

travelling, construction industry, environmental protection, public administration, energy sector, to name just a few.

- The majority of respondents were employed (45%) or were self-employed (27%). Almost one third of respondents (27%) declared to be out of work.
- The financial situation of the majority of respondents, who agreed to answer the questions regarding balance of their household's spending, was good. More than half of the respondents reported that their household makes ends meet easily (33,3%) or very easily (18,2%). Still, almost a quarter of respondents declared that they found it hard to make ends meet – with some difficulty or great difficulty.

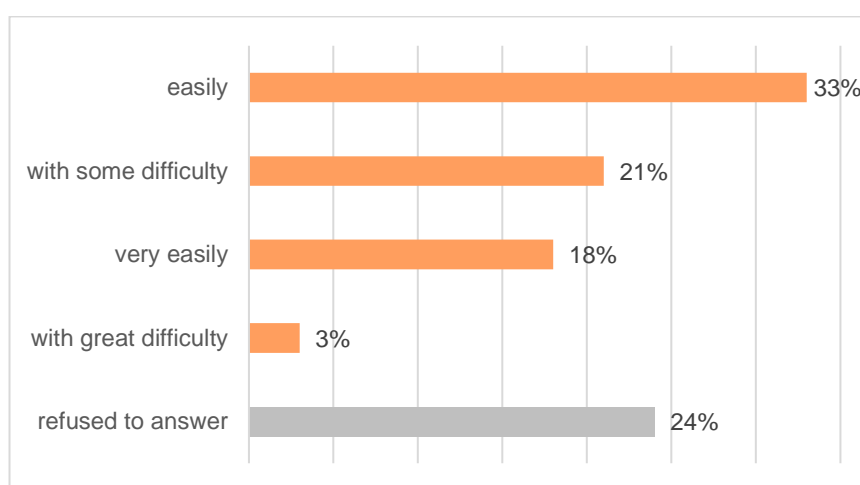


Figure 16. Perceived household ability to make ends in percentages in Minerva Garden neighborhood

A self-reported pro-ecological behavior of respondents

The respondents' attitudes toward nature and pro-ecological practices were measured on the scale from 1 to 5 points.

The respondents generally declared a very positive attitude toward nature. On average, our respondents described themselves as people who very much enjoy spending time outside in nature (4.8 points on the scale from 1 to 5) and agree that it is important to preserve nature for future generations (4.7 points).



The respondents also declared that they engage in many pro-ecological practices: segregate waste (4.8 points), use reusable bags (4.4 points), save household energy (4.1 points) and water (4.1 points). They also tend to repair old things instead of buying new ones (4.1 points). Using second-hand products, such as clothes, furniture and equipment (3.6 points) and choosing public transport over a private car (3.2 points) were a bit less popular among our respondents.

Respondents' attitude toward neighbourhood

The respondents' relationship with their place of residence was measured by four indicators: place identity, place attachment, urban identity and the attitude toward the neighbourhood.

Place attachment. This measure informs about emotional bond between respondents and their place of residence, how much they like living in their neighbourhood and how much they feel "at home" there (Lewicka, 2008). On average, respondents declared being only slightly attached to the neighbourhood they were living in. This is due to significant variation among respondents. In the surveyed group as many as 39.4% of respondents declared strong attachment to the place, while 9.1% declared the complete lack of place attachment. Over half (51.5%) of respondents did not unambiguously declare any attitude regarding place attachment.



Place identity. Place identity is related to the concept of community formation. It informs how much respondent feels part of their community (Hernández *et al.*, 2007). The place identity of respondents was on average lower than their place attachment. Respondents did not seem to feel strongly that they are a part of the neighbourhood where they live. They did

not feel they belonged to the Minerva's Garden area or identify with it. In detail, 27.2% of respondents identified themselves with the place, 36.4% of respondents reported feeling no identity connection to where they live and 36.4% of survey participants did not give a clear answer to this question.

Urban Identity scale. This measure informs about the importance of resident's past experience in the neighbourhood in forming the bond with a place of residence (Lalli, 1992). When respondents were asked to assess how much they feel that their personal history is connected to the neighbourhood where they live or how much they feel connected to the place through past experiences, they had a barely warm attitude towards the place. Respondents' evaluation of their connection to the place was on average 2.9 points out of 5. 27.2% of respondents reported feeling connected to a place through past experiences. Slightly more people, 30.4% of all respondents, reported feeling no connection at all. 39.5% of survey participants have neither strong nor weak connection to Minerva's Garden and the surrounding area due to past experiences.



Attitude towards the neighbourhood. Respondents were also asked to express their attitudes towards the neighbourhood by indicating how much they would like to move out of this neighbourhood and how much they believe this neighbourhood is a good place for kids to grow up. On average, respondents reported that although they

are not strongly attached to the place of residence, they would not like to move out (2.1 points). However, the area didn't seem to be perceived as very appealing to families with young children (2.9 points). Only 21.2% of respondents agreed with the statement that their neighbourhood was a good place for children to grow up. 36.4% of survey participants held the opposite opinion, while 42.4% of respondents did not take a clear position on this issue.

Job opportunities in the place of residence

Respondents rated the opportunities for **creating new jobs** and **developing new businesses** in their **neighbourhood** as low, on average 1.9 points out of 5. The result seems to be especially interesting when we juxtapose it with the respondents' perception of themselves as rather entrepreneurial individuals – 30% of respondents think of themselves as someone who is entrepreneurial. 36% of respondents do not perceive themselves as entrepreneurial, while the rest (44%) neither agreed or disagreed.

Social sustainability – description of the neighbourhood

One of the main aims of the survey was to assess the potential for social sustainability in the Minerva's Garden area. Social sustainability is a factor that can be measured as a combination of several **characteristics** concerning the people living in the area and their relations with each other, i.e., diversity of residents, trust between people and organizations, common understanding of the community's challenges and goals, ability to learn and ability to self-organize. According to the literature (Missimer, Robèrt and Broman, 2017; Roszcsynska-Kurasinska *et al.*, 2019), this combination of characteristics is a good foundation for the embracement of change which is inevitable in life of every community.

Diversity and openness

First of all, the potential for social sustainability in a given neighbourhood lies in the diversity of the community members and their openness towards other people. In a diverse community, different needs of its members can be addressed locally by the people who have different skills and knowledge. Residents of such communities do not have to spend much time and effort to search for a provider of services or goods that they need. In the case of low diversity, rich social relations outside of the neighbourhood can make up for lack of skills and knowledge within the community itself. The needed knowledge can be easily brought into the community through personal links of their residents.

The majority of respondents (70%) agreed that their community is diverse in terms of lifestyle and skills. They perceive themselves as diverse group (3.7 points out of 5). They have a rather sociable attitude towards others when it comes to meeting new people – **76% of respondents enjoys meeting new people** (4.2 points out of 5) but they perceive their neighbourhood as less welcoming to newcomers (3 points out of 5) – **only 24% of respondents declared that the newcomers might feel welcomed in their neighbourhood.** People living in this community are perceived by respondents also as rather lacking wide social relations (55%), **only 18% of respondents declared that people there have many social relations.** This result suggests that there is relative agreement among respondents that they enjoy meeting new people, and they have diverse skills and expertise, from which the members of the local community can profit, but their social relations are not very wide (2.6 points out of 5).

Common vision

For the diverse community to generate socially sustainable reaction to change it has to have the ability to develop a common vision among members. The effective cooperation and engagement need clear vision that is shared by all involved. Without common vision, members of local communities tend to focus on their own interests that can be often contradictory. In such a situation, members of the community will find it difficult to collaborate in a longer run.

The data shows that residents of the Minerva's Garden area felt that **they do not share one vision of their neighbourhood with other residents** (2.6 points out of 5). Only 15% respondents agreed with the statement that they had similar vision of the neighbourhood with their neighbors, while 48% did not agree with the statement. Moreover, **only 9% of respondents agreed that their neighbors share the same values**. Despite low similarity of views within the neighbourhood (2.2 points out of 5), they seem to feel like a part of the local community to some extent (on average 3 points on a scale from 1 to 5). But one third does not agree with the statement that they are part of the local community.

A successful implementation of circular economy and sustainable development requires that the members of a community are sensitive to the matters connected with ecology and nature; their common vision should somehow reflect the need to protect these areas. According to respondents, **the community's awareness of the need for protecting natural resources is relatively low** (average score of 2.1 points). It might be explained by the fact that local jobs are not seen as dependent on natural resources (1.7 points), and local culture does not seem to relate to natural resources such as rivers, forests, and local animals (1.9 points).

Trust

Trust ensures smooth and fast interactions between people. It makes things work without the need to implement costly and time-consuming measures of control. In that way, trust contributes to social sustainability. Here we asked respondents to comment on their level of trust for particular groups and institutions (other residents, local businesses and local authorities).

The level of trust towards neighbors is not very high in the studied community (2.8 points out of 5). Almost half of respondents (42%) do not believe that people in this neighbourhood can be trusted, **only 27% claim that people from their community can be trusted**, while 30% could not decide whether other members of their community could be trusted or not. This result can be better understood when we compare it to the data from World Value Survey Wave 7 (2017-2020) which was conducted also in Italy (N=2282). When the respondents were asked to indicate whether they trust their neighbors, 73% declared that they trust completely or trust somehow their neighbors; while only 26% indicated that they do not trust very much or at all their neighbors. However, when respondents of World Value Survey in Italy were asked if they trust people they meet for the first time, only 27% of them declared that they trust a lot or somehow people they just meet; The majority – 72% do not trust very much or at all just met people. The results from Minerva's Garden indicate that residents of this area perceive other residents more as strangers than neighbors.

The trust towards local business owners is also rather low (3 points out of 5) – 36% of respondents do not perceive owners of local business as trustworthy, 33% declare that they neither can be trusted or not, and only 27% agree that local business owners can be trusted. Despite the

low trust toward business owners, respondents agreed that **more local businesses are needed in the area** (4.2 out of 5 points).

The perception of trustworthiness of local administration is similarly low (2.5 points out of 5). **Almost half of respondents (42%) do not agree that local authorities can be trusted**, only 15% judge them trustworthy. The trust in skills of the local government does not deviate from general trust in local administration.

Capacity for Learning

Social sustainability means that the society is capable of adapting to changing conditions. The adaptation cannot happen without acquiring new knowledge and skills, therefore the capacity for learning is an important indicator in assessing the potential for social sustainability. We found that there are differences between individual learning capabilities and perceived opportunities for learning in their area.

Respondents declared that **they like developing new ideas and activities** (average of 4.2 points out of 5) **and learning new things** (average of 4.9 out of 5). They rated the learning opportunities in their neighbourhoods slightly lower, with an average score of 2.4 out of 5 – which can mean either that there is no such opportunities, residence are unaware of them, the opportunities do not resonate with respondents' interests. The matter requires further investigation because rare opportunities to learn could affect the openness of the neighbourhood towards new ideas. Indeed, on average respondents declared that **it doesn't seem to be easy to bring new ideas to the neighbourhood** (2.2 points), and **they do not perceive people from their neighbourhood to learn new things willingly** (2.0 points).

Capacity for self-organization

The final component of social sustainability is the category associated with the capacity for self-organization. **Respondents rated opportunities for social activity and civic self-organization relatively low.** Most notably, respondents rated opportunities for social activism in the neighbourhood as low (average of 2 out of 5 points). They perceived the level of volunteering among their friends and acquaintances as average (2.8), but a lot of respondents (50%) did not agree that other members of the community participate in civic activities. **The respondents did not either believe in the ability of the local community to address potential difficulties in the near future (2.2 on the scale from 1 to 5).** More than half of respondents (58%) did not agree that local authorities support local organizations and civil initiatives, only 21% saw local authorities as supportive.

Engagement and participation

In this section, we focus on opportunities for participation, interest in community life and events, types of events in which community members participate, and major constraints to participation. We measured matters of engagement with Minerva's Garden heritage site and participation in neighbourhood and community-wide events.

Opportunities for participation. The respondents rather were not satisfied with the opportunities to participate in cultural activities and events that were held in Minerva's Garden neighbourhood. The overall score for all survey participants was 2.7 points out of 5.



The opportunity to participate in community-related activities can be linked with the availability of place in which such activities could be held for free. Therefore, we asked participants what knowledge they had about the possibilities of organizing civic-related events in their area. Most respondents (42%) said there was most likely such a place, while 21% had the opinion that no such place was available. One fifth (21%) of the respondents declared that they know such a place exists.

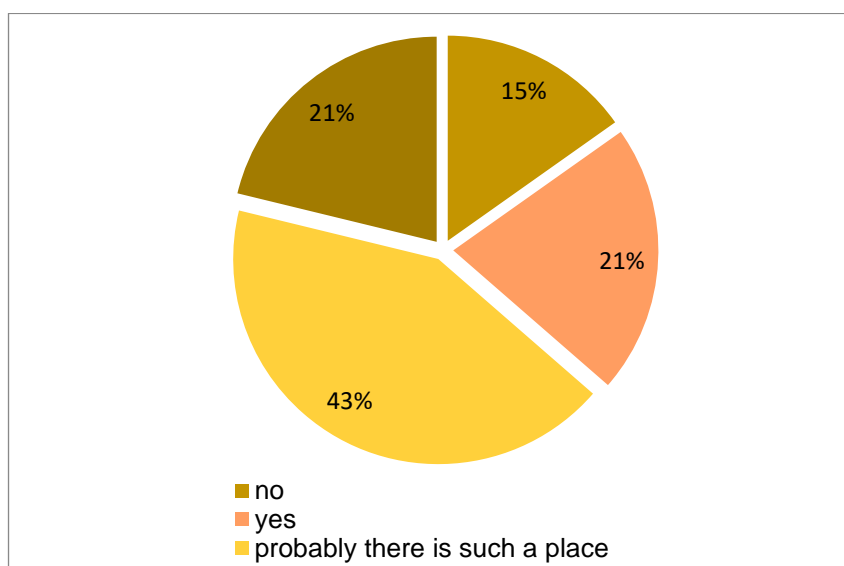


Figure 17. The availability of pace for organizing civic-related events for free in Minerva Garden neighborhood

Interest in local activities. Respondents were interested in community affairs and they were systematically searching news about the community. Nearly all respondents showed interest in local issues by declaring he/she searches for information regarding their neighbourhood in social media or community newsletter at least from time to time; 21% do it every day. This is backed by the information that 88% of respondents read local press.

Types of activities. Respondents were highly active and interested in their community life. On the macro level, the majority of respondents (97%) took part in last local election. On the local level, they were also interested in the participation in different types of events that took place within the neighbourhood community of Minerva's Garden. The high level of voting declarations is typical for Italy. 93% of respondents of Word Value Survey Wave 7 run in Italy declared that the always or usually vote in local elections.

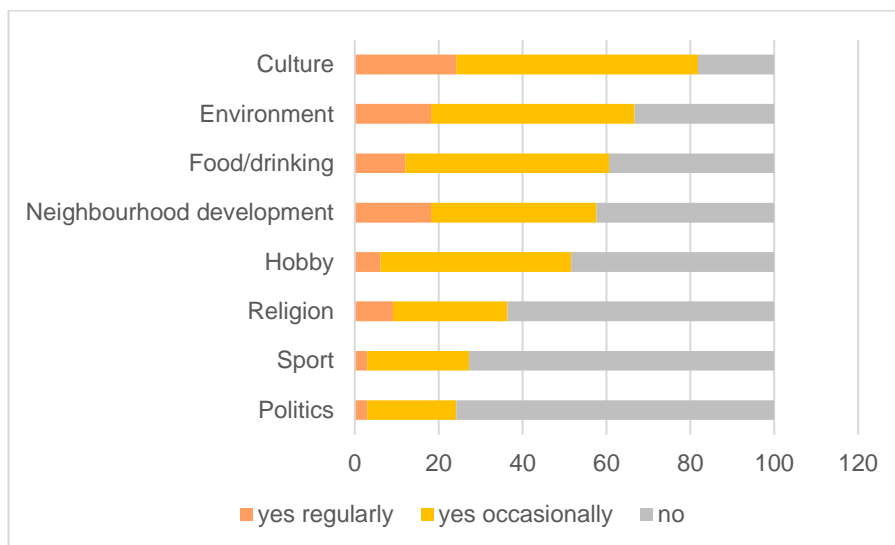


Figure 18. Participation in different types of activities in Minerva Garden neighbourhood within last 12 months

Respondents reported that they most frequently participated in cultural activities, neighbourhood development activities, and environmental activities. They participated in social life, both in food/drinking-related activities and personal hobbies in the past 12 months at the similar rate. Activities that attracted the least people were those related to politics, sports, and religion.

Participation constraints. Some of our respondents declared that they do not participate in activities around the Minerva's Garden. The main reason for non-participation is that the community members are unaware of events happening in their neighbourhood or assume there is little opportunity to do so.

NON-PARTICIPATION



- **community members were unaware of events...**
- **or assumed there is little opportunity to participate**

Evaluation of the heritage site

Description of respondents

Seventy five visitors of the Minerva's Garden took part in the survey. The majority of them were in two age groups – 25 to 44 and 55 to 64 years old. Most respondents were men (50 men compared to 25 women) with post-secondary or university education level (84%).

Financial situation of the respondents was rather good. Only 10.7% answered that they had significant trouble in making ends meet, and 40% said they had no problem in that area. Most of the respondents were also employed or self-employed, working mostly in areas such as architecture (11 respondents), art (15 respondents), research (13 respondents) new technologies (11 respondents).

Almost 75% (56) of all respondents lived in Salerno or next to Salerno, 22% (17 respondents) said they came from a different part of the country and only two came from another country.

RESPONDENTS



- **Are mostly men**
- **Age group: 25-44 or 55-64**
- **Have completed a Master's degree**

Means of transport

Most respondents (85%) took less than an hour to get to the Garden from where they lived; one fifth lived within a walking distance of the place.

Respondents used different means of transport. Almost half of them (49%) said that they reached the place solely on foot, 21% used a car and 11% came by public transport. The rest used bikes and other soft means of transport, or different combination of the above.

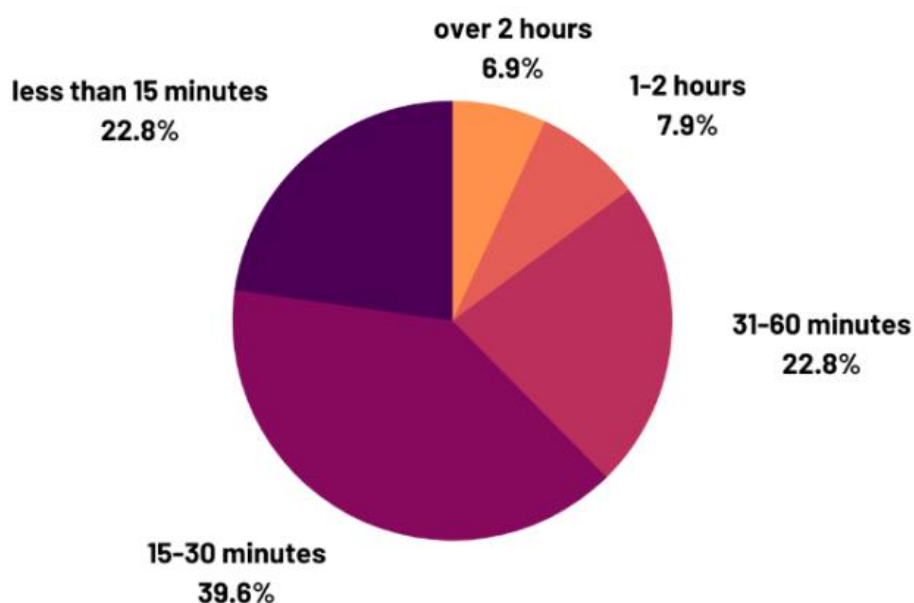


Figure 19. Travel time to Minerva Garden from home

Diversity and accessibility

The respondents' opinions on diversity and accessibility of the place were measured on the scale from 1 to 5 points. Minerva's Garden was considered to be a fairly friendly place.

The place was assessed as very good for tourists as well as local residents – both groups should feel very good there according to respondents (4.7 points out of 5), which might indicate that the touristic activity does not happen at the expense of the local community. Moreover, the Minerva's Garden was also considered to be a place adding a lot to the diversity of local activities (4.5 points). At the same time, it was perceived as a place rather accessible to everyone (3.3 points).

Also, in the opinion of the respondents, local entrepreneurs could find this place as a rather good location to run their businesses (3.6 points).



This is a good place for residents and tourists (4.7 points).

This place is accessible for everybody (3.3 points)



This is a good place to run a business (3.6 points).

Activities in the Minerva's Garden

In general, Minerva's Garden is appreciated mostly for two aspects – experiencing nature and scenic beauty (62 out of 75 respondents – 83%) and opportunities for education (48 out of 75 respondents – 64%). Respondents also cherished the fact that it's a place that provides a safe haven for animals and birds which can be observed (44 indications – 59% of respondents pointed it as their preferred activity on the site), offers fresh air and an opportunity to gaze at water. The Garden is also considered by the respondents as a good place to relax and to discuss issues related to the community.

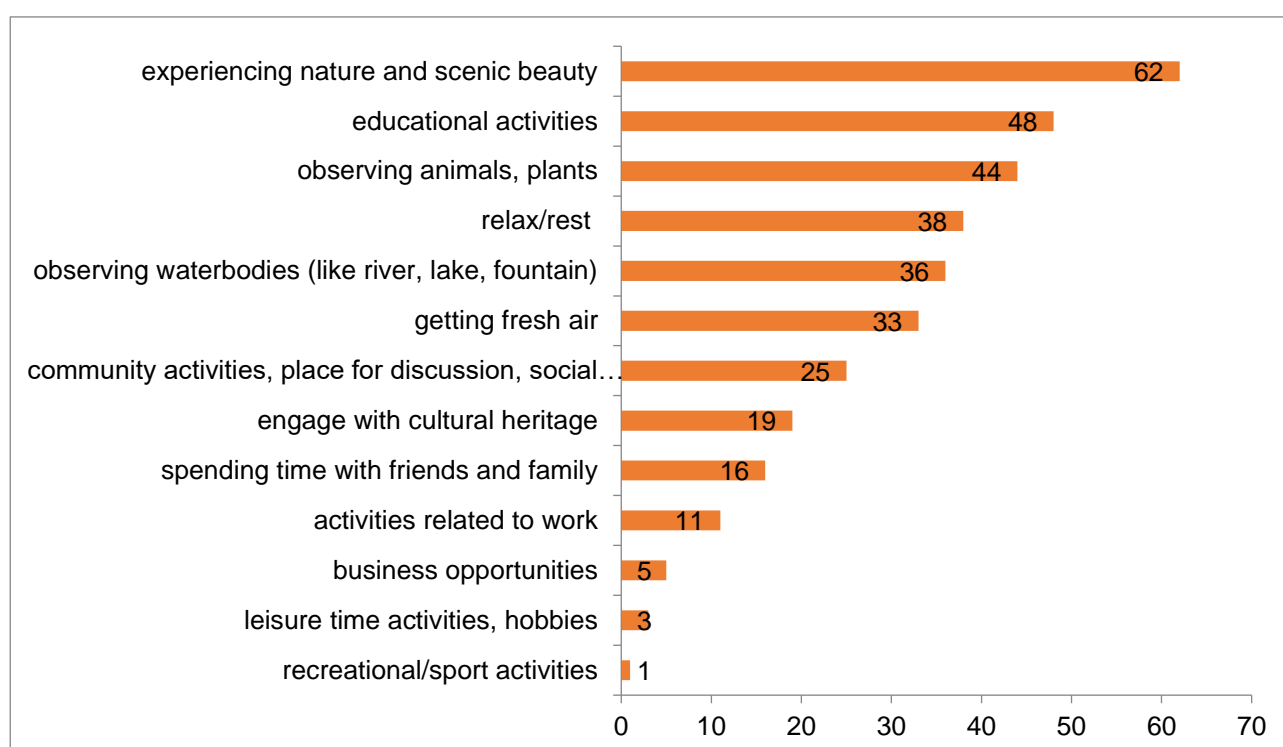


Figure 20. The most favourite activities in the Minerva Garden

On average, respondents considered the Minerva's Garden to be a good place to meet with other people (3.9 points out of 5) and relax (3.4 points). It was considered very safe place (4.4 points), in which people can be trusted (4.5 points).

Learning opportunities in the Minerva's Garden

Most respondents evaluated Minerva's Garden as a good place for learning. It was considered to be an area that inspires creativity (4.5 out of 5 points) and is intellectually stimulating (an average of 4.7 points).

Social value

Cultural heritage sites can be important to people for different reasons. Some will appreciate the beauty of it, others will focus on their economic potential or ecological value. In the case of Minerva's Garden, we measured whether it was a place that had a special value for the respondents and if yes, why.

The respondents considered the Garden as a beautiful and special place. The meaning of the Garden in their personal lives was quite high (4 out of 5 points) – maybe some significant events happened in the Garden, so they had reason to value it as an especially important place in their lives. Certainly, the place was making people proud and for some of them it was an important part of their own history – they felt it connected them to their roots. The Garden seemed to make people reflective; they considered it as spiritual places (4.3 points).

Moreover, the Garden reminded people of the history of the neighbourhood (4.4 points) but much more than it reminded them about the history of the country (3.6), which is not surprising, considering that it is a lesser-known local landmark.

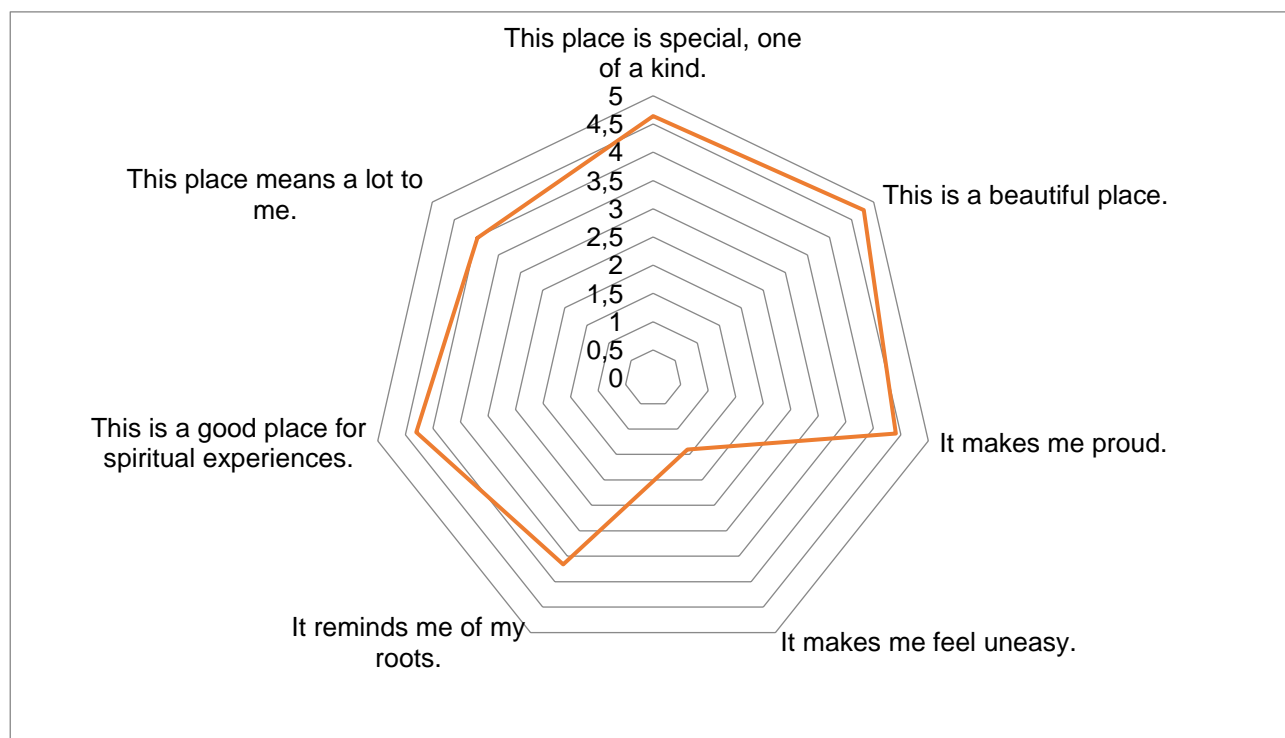


Figure 21. Social value of the Minerva Garden on a scale of 0-5 points

In general, our respondents felt that the Garden is a place worth protecting, that evoked positive feelings. As we can see on the chart above, very few people felt uneasy there.

Emotions

The visit to the Minerva's Garden elicited mostly positive emotions in respondents. As we can see on the chart below, people felt mostly relaxed, curious and generally happy when visiting the place. For many the visit was exiting or energizing, and they felt pleased when leaving the place. Almost none of the respondents experienced negative emotions – it didn't make them sad, frustrated or bored.

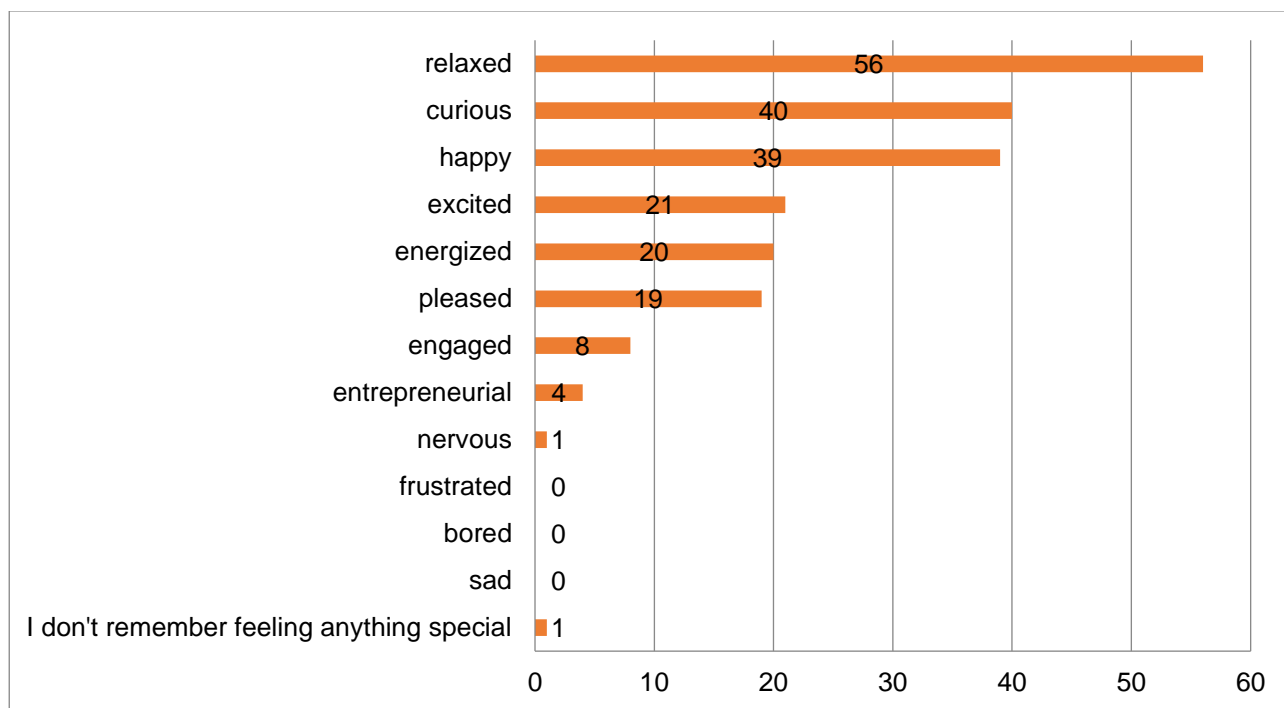


Figure 22. The emotions elicited by the visit in Minerva Garden

The source of enjoyment

In the Minerva's Garden, respondents declared that trees, greenery, sights and quietness were the most enjoyable characteristics of the place. The history and landscape were also considered important. As we mentioned before, the generally pleasant atmosphere of the place and the fact that this is a place with history added to the positive reception of the Garden.

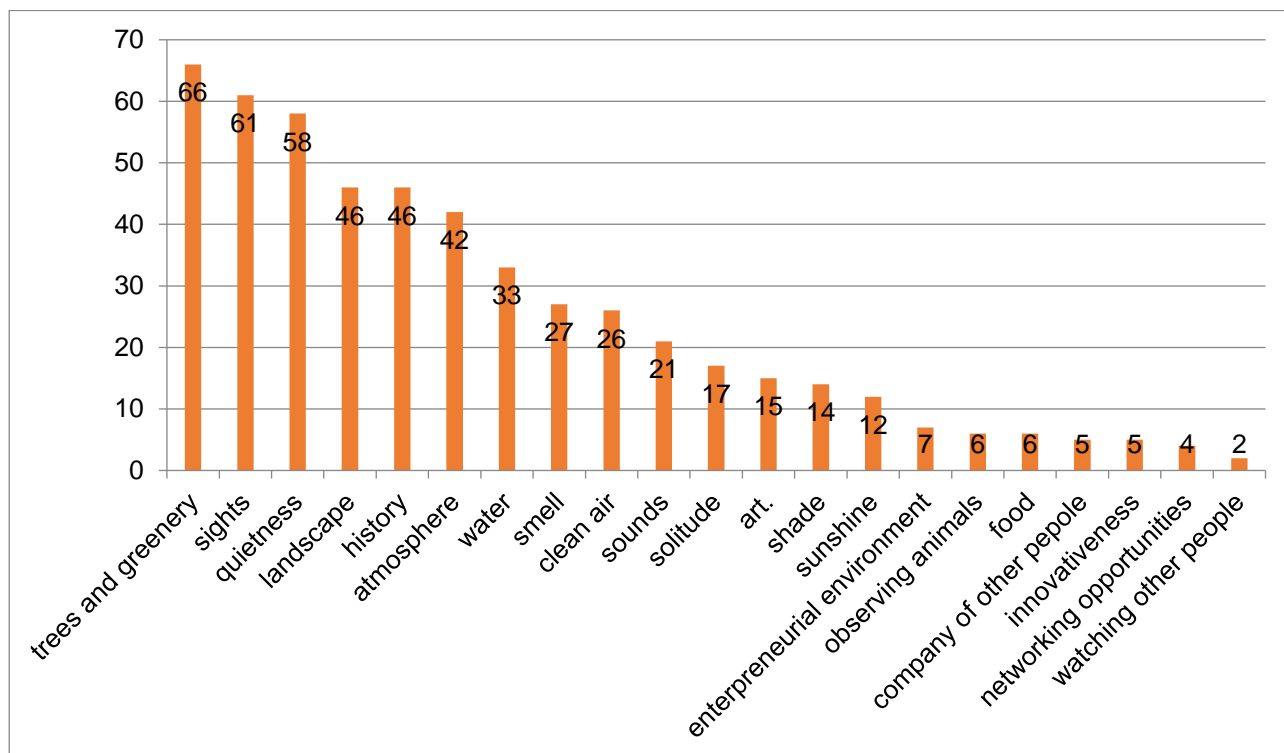


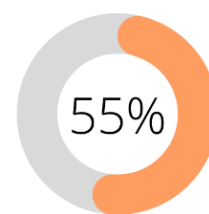
Figure 23. Sources of enjoyment in Minerva Garden

Satisfaction with adaptive reuse intervention

As the Minerva's Garden recently underwent a process of renovation, we asked the respondents if they noticed changes in the area. Over half of the respondents noticed them. In the group that noticed the changes, the process was evaluated extremely positively (4.5 out of 5 points).

The Minerva's Garden was considered an asset to the neighbourhood, which would be perceived as less attractive if the place disappeared (4.3 out of 5 points). This is important, because the general opinion of the neighbourhood varied, with respondents pointing out that it is not as well-cared for as it could be (2.7 out of 5 points).

Our respondents said that they would recommend the Garden to their friends (4.7 points), but much less to the entrepreneurs looking for a place to set up a business (3.4 out of 5 points), which might mean that they associate this place with beauty and relaxing, and can't see its economic potential or perhaps they are aware of the special contains of the Garden.



Yes, I've noticed the change.

General expectations from adaptive reuse of built heritage – who should do it and how should it be implemented

Many of our respondents would be willing to spend money on goods and services in places like Minerva's Garden (3.8 points). To understand why this was the case, we tried to establish who – according to visitors – should be responsible for keeping the cultural heritage alive. As we can see below, in our respondents' opinion, **the local community, experts and local municipality** – actors that have the biggest knowledge about the local context – are the entities that are most eligible for this job, while rich people, EU institutions and big businesses, which probably have the lowest level of knowledge about the local cultural heritage sites – are considered to be the least eligible. The respondents felt that local community should be involved in the adaptive reuse process rather strongly (4.5 out of 5 points). It can be concluded that respondents believe that local community should have a say in discussion about adaptive reuse process and might be unwilling to give away a control over cultural heritage to private hands (rich people and big companies).



Figure 24. Who should be responsible for keeping cultural heritage alive in Minerva Garden?

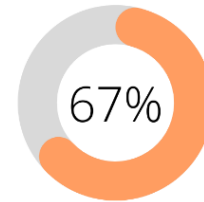
For our respondents it was important that the renovation process uses the resources efficiently and creates as little waste as possible (4.8 points) as well as that it preserves the authenticity of the place (4.6 points). When asked to make a tradeoff between protecting authenticity and making environmentally friendly adjustments in cultural heritage site, the respondents assessed that only to some extent implementation of pro-environmental solutions could be conducted at the expense of losing of the authenticity of the site (3.3 out of 5 points). The respondents believed that the adaptive reuse should consider creation of new jobs (4.6) almost as much as implementation of pro-environmental solutions. The consideration of the diverse needs of the local community was also important to the respondents (4.6 points).

Recommendations

In the opinion of most of our respondents, the Minerva's Garden could be further improved to offer new social and cultural activities, open to the wider public. **Adding services, like places where visitors could eat or drink** in or around the Garden would be welcomed. Respondents suggested that the space could be expanded and allowed for **scientific activities and cultural events**. Opening the site to the local community and involving its members in various educational **and integrating activities (e.g. neighbourhood gardening, place to study)** was also often mentioned among ideas for improvement.

Importantly, the removal of the architectural barriers was underlined, to **enable access for older citizens or people with disabilities**. Some of the respondents mentioned that Garden would be a good place for **wellness-related activities**: to taste herbal teas and healthy products, participate in yoga classes or seminars on health and value of nature.

Upgrading the Garden in terms of quality of flora (making sure that plans are watered and taken care of) as well as making sure that paths are well-designed and information tabs are clearly displayed (possibly translated into English) was also mentioned. Some respondents suggested it would be worth developing the cooperation with schools (for educational projects for children) and Faculty of Medicine, to make Minerva's Garden more alive and attractive for the community.



Yes, this place should be improved.

5.5. Circularity assessment report: aims and proposed structure

One of the findings of CLIC is related to the recognition of the need to collect data, interpret data through a structured and coherent evaluation framework, and communicate data related to cultural heritage. Indeed, the process of **data collection, interpretation and communication** is key in each knowledge sector, especially in the highly digitized society that was accelerated through the Covid-19 pandemic. Data literacy, openness, accessibility and communication is a sensitive matter in today's society, subject to risks of misunderstanding or instrumental use. Thus, transparent, correct and open communication of the data and results of any policy and intervention should be promoted to trigger open discussion, understanding and processes of useful human-centred innovation (e.g. social, technological, policy innovation centred on human needs and rights). Public and private sector are both touched by this need of “reporting” to communities the results of the actions undertaken, **opening up the discussion in the public arena and allowing innovation to take place for real, emerging and evolving needs and societal issues**, enhancing citizens’ and stakeholders’ responsibility.

Moreover, **reporting of results in a clear, understandable, evidence-based and transparent way** (taking care to avoid “green washing” and similar undesirable practices) can be a powerful **strategy to strengthen bonds and partnerships** especially at local level but also within the digital communities which often support social innovation projects. Results reporting can thus pave the way to **attract more investment from diverse sources, including the local and digital community, as well as potential local co-investors**, as demonstrated in cases of “crowdfunding” and “community foundations” / community enterprises.

Large companies in diverse sectors (for example energy, pharmaceutical, technology or venture philanthropy sector) **already use impacts assessment reports** to establish goals and monitor the results achieved, a practice that is also used as a “marketing” strategy to position themselves as “sustainable” businesses. **The third sector is also subject to formal reporting of social impacts in many countries**, as the example of the “B-corporations” in UK, or the recent Law for third sector impacts reporting in Italy (DM 23 July 2019²²), which foresees a **Social Impact Assessment** for a specific range of third sector activities funded by the public sector. Moreover, it should be recalled the **Environmental Impact Assessment** (EIA) and the **Strategic Environmental Assessment** (SEA) foreseen for specific infrastructural and urban development projects having an impact on environmental resources. Finally, the **Heritage Impact Assessment** (HIA) developed by ICOMOS (2011) is a methodology aimed at assessing the impacts of development projects on cultural heritage of Outstanding Universal Value (OUV) included in the UNESCO World Heritage List. The HIA can be potentially used also for heritage sites not included in the UNESCO List.

The mentioned practices, laws and methods remain sectorial and linked to specific conditions to be applied. However, the usefulness of such “assessment reports” is undoubtable, as they provide clear understanding and documentation of the impacts of specific activities for the stakeholders and/or cultural heritage involved.

Indeed, the realisation of a “**Circularity assessment report**” based on the CLIC evaluation framework for circular “human-centred” adaptive reuse of cultural heritage would be extremely

²² Ministerial Decree (DM) of the 23 July 2019, in Italian: <https://www.gazzettaufficiale.it/eli/id/2019/09/12/19A05601/sq>

helpful to support owners and managers of cultural heritage sites in **establishing clear goals, targets and outcomes, collecting data and monitoring results in a systematic way.**

According to the CLIC evaluation framework, a Circularity assessment report can be structured in specific sections, taking into account the circularity dimensions, criteria and indicators suggested, eventually integrated according to site-specific and context-specific conditions.

The base **structure of a Circularity assessment report** can be made of the following sections:

- **Preliminary information**
 - **Brief description of the cultural heritage**, its history, attributes and values, abandonment/underuse;
 - **Objectives of the adaptive reuse intervention**;
 - **Scope of the assessment report**.

The Circularity assessment report can have a different structure according to the phase of the adaptive reuse intervention: planning & design, construction works, operations. In each phase a different set of impacts and indicators can be considered, along with context variables such as the scale of the intervention, stakeholders involved, type of uses/functions, circular business model, circular financing instruments and actors involved, circular governance model adopted.

- **Planning & design phase**
 - **Survey on heritage building/site**: urban context, state of conservation, historic-cultural value, intrinsic value assessment, vulnerability and degree of transformation allowed; visual and perceptual assessment of project alternatives;
 - **Participation and engagement**: processes of citizens and people participation and engagement in the decision-making; co-creation, co-evaluation, heritage community building and other forms of consultation, participation, active engagement and inclusion ensuring representativeness of diverse voices, stakeholders and social groups;
 - **Building/site environmental assessments**: results of environmental assessments performed such as Life-Cycle Assessment, LEVEL(s) assessment, Green Building Council assessment; Energy performance assessment, Metabolic assessment;
 - **Economic-financial pre-assessment**: results of economic-financial pre-assessments and estimations conducted to evaluate the self-sustainability of the planned intervention, including evaluation of functions/uses distribution, potential for jobs creation, return on investment.
- **Construction phase**
 - **Energy circularity assessment**: measures adopted to reduce energy consumption needs, generate energy on site from renewable sources, adopt circular metabolism and local symbioses to reduce costs and enhance energy efficiency at the “meso” level;
 - **Materials circularity assessment**: measures adopted to reduce raw materials extraction and wastes, use recycled and local materials, health impacts assessment of materials, life cycle assessment of materials;
 - **Water circularity assessment**: measures adopted to reduce freshwater consumption, collect rainwater, filter, recycle and reuse water;
 - **Green surfaces and Nature-Based Solutions**: measures adopted to increase green surfaces, including green roofs, green façade, green open spaces; Nature-Based Solutions adopted; biodiversity enhancement measures adopted; other ecological and environmental benefits of the intervention;

- **Management (operations) phase**

- **Economic impacts in the area:** jobs created, distinguishing temporary and full-time / permanent jobs; economic value of voluntary workers; reinvestment of profits for new cultural and social projects in the area; enterprises and businesses localised in the heritage building/site; localisation of innovative and creative enterprises in the surroundings of the intervention, attracted by the revitalisation process; people and organisations co-financing cultural heritage reuse; volume of public and private investments, funding, donations and other forms of contribution including in-kind contributions; increase of cultural tourists / visitors, participants to cultural events, people trained and educated;
- **Social impacts in the area:** enhancement of the appreciation of and access to cultural heritage; enhancement of cultural diversity; regeneration and co-creation of heritage values for/by the local community; heritage communities activated, collaboration pacts activated, collective care actions activated; participation in crowdfunding and other forms of collective co-investment; enhancement of skills, capacities, knowledge including traditional knowledge and construction techniques; involvement of youths, women and marginalised social groups; increase of collaboration, cooperation, trust, openness, dialogue, relationships between stakeholders and between people in the local community; involvement of third sector actors and activation of socially oriented programs and activities; enhancement of cultural activities, including both cultural production, arts, crafts and cultural participation; increase of people's health and wellbeing; increase of proximity shops and activities; localisation of new productive activities in the field of circular economy (repairing, recycling, refurbishment, etc.);
- **Environmental and health impacts in the area:** measures for reduction of greenhouse gas emissions and pollution, enhancement of air quality; biodiversity enhancement; water quality enhancement; reduction of soil consumption and soil pollution;
- **Spatial and visual impacts in the area:** enhancement of landscape visual quality, place identity, place attachment, atmosphere; enhancement of safety in public spaces; enhancement of pedestrian accessibility and sustainable mobility in the area; increased cleanliness and responsible / "care" behaviour of residents, visitors and commercial activities; enhancement of surrounding buildings conservation and visual quality.

The proposed Circularity assessment report can be useful in particular for heritage site managers to report back to funders and investors, and to the whole community, the diverse positive impacts of cultural heritage adaptive reuse, in the circular perspective. However, also eventual **negative impacts should be recognised**, and mitigation measures should be proposed to reduce the negative externalities. For example, processes of **gentrification** can be recognized observing **real estate values, presence of proximity commercial activities** and **"Airbnb" / "touristification" phenomena** such as **increase of rental prices, empty dwellings, prevalence of tourist oriented shops and activities on proximity shops and activities, delocalisation of marginalised social groups**. Any risks of **loss of authenticity and integrity of cultural heritage** should be identified. **Social exclusion processes** and **lack of diversity in the local community and users/heritage community** should be also monitored as a potential sign of negative social impact.

The Circularity assessment report can thus serve as a fundamental tool for **enhancing circular governance and management models**, as well as the **circular business model** in the planning and operations phase, focusing on the **objectives** and keeping an eye at eventual negative impacts to be taken into account. Moreover, **public, private and social co-investors** can benefit from the



Circularity assessment report as they can monitor actual results, particularly in view of the implementation of the EU taxonomy and sustainable finance principles, as well as **social and impact finance** participation. Finally, **the local community could be actively engaged through regular reporting of impacts, fostering donations and other forms of community support for cultural heritage.**

6. From best practices to better projects: ex-ante evaluation

The analysis of diverse case studies and best practices of circular cultural heritage adaptive reuse represented the starting point for the development of ex-ante indicators of circularity to support decision-making processes. The “lessons learned” and the observations deduced from ex-post evaluation led to the identification of 10 groups of indicators that can support a multidimensional analysis: **economic-financial indicators**, necessary to assess the financial viability and self-sustainability of the proposed adaptive reuse intervention on abandoned and/or underused cultural heritage; **environmental indicators**, used to promote closed cycles of energy, materials, water in material cultural heritage, and avoid other environmental costs such as soil consumption, biodiversity loss, pollution, greenhouse gases emission; **social indicators**, necessary to 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 wellbeing and quality of life; and last, but not least, **cultural indicators**, which are related to the conservation, regeneration and transmission of cultural heritage values, both tangible and intangible, instrumental and intrinsic, in line with the “complex” notion of value of cultural heritage proposed in the CLIC project.

The indicators for ex-ante evaluation have been tested in the CLIC pilot city of Salerno (Italy), particularly with a focus on four large abandoned heritage buildings in the historic city centre. The four buildings are the ex-Convent San Francesco, Palazzo San Massimo, Ex-Convents San Pietro e Giacomo, and the ex-Convent of Santa Maria della Consolazione. They are commonly known as “Edifici Mondo”, for their large dimensions in the historic city centre of Salerno. These buildings (three convents and one noble palace) are in abandonment since more than 30 years, despite many attempts of the municipality to find a use and the necessary funding / investments for their recovery and adaptation. The Edifici Mondo represent the greatest challenge for the adaptive reuse of cultural heritage in Salerno, with an estimated investment of more than 100 million Euro for about 70.000 square meters of surface.

The Municipality of Salerno initiated a participatory process to identify new sustainable uses of the four buildings, integrating this challenge in the larger strategic “Local Action Plan” for the adaptive reuse of abandoned cultural heritage in the perspective of Salerno Circular City²³. Initially, a public consultation was started to collect innovative ideas for the adaptive reuse of the four buildings in the perspective of the CLIC circularity framework. In a subsequent phase, the best ideas were selected and invited to further improve them through the Circular Business Model workshops led by ICHEC Brussels Management School²⁴. Based on the project proposals developed, circularity criteria and indicators were discussed with diverse stakeholders’ groups, to evaluate and rank the projects based on their impacts and financial sustainability. Finally, new alternatives were developed and evaluated more in-depth based on quantitative and qualitative indicators²⁵.

According to the experimentation conducted, previously analysed literature and practice partners and stakeholders suggestions, a set of 62 indicators was selected to be used in the ex-ante evaluation stage to support decision-making processes towards circularity implementation in cultural

²³ The Local Action Plan of Salerno was synthesized in CLIC Deliverable D5.5 “Local Action Plans: one approach, diverse outcomes”, developed by ICLEI <https://www.clicproject.eu/wp-content/uploads/2021/05/CLIC-D5.5-CLIC-Pilot-Local-Action-Plans-One-Approach-Diverse-Outcomes.pdf>

²⁴ See CLIC Deliverable D4.5 Circular Business Model Workshops For Cultural Heritage Adaptive Reuse <https://www.clicproject.eu/files/D4-5.pdf>

²⁵ See CLIC Deliverable D2.5 “Methodologies for impacts assessment of cultural heritage adaptive reuse”

heritage adaptive reuse. Next sections present these specific criteria and indicators developed for ex-ante evaluation.

6.1. Criteria and indicators to enhance choices in cultural heritage adaptive reuse

The evaluation of alternatives for new uses of the Edifici Mondo was conducted through different phases²⁶:

1. Knowledge phase
2. Definition of objectives and evaluation criteria
3. Development of project alternatives
4. Evaluation through qualitative criteria
5. Synthesis, discussion and re-assessment
6. Evaluation through quantitative-qualitative indicators
7. Discussion and Circular Iteration (back to previous phases)

The guiding criteria, expressing circular goals and targets, were used from the initial public consultation phase to the advanced phase of co-development through the circular business model workshop in Salerno, to identify creative and feasible circular solutions for the adaptive reuse of Edifici Mondo.

A detailed design of new uses for the four buildings was further developed²⁷, and finally a set of 62 quantitative and qualitative indicators divided into 11 indicators categories was built (see).

Table 8. Circularity indicators in ex-ante evaluation

CIRCULARITY DIMENSIONS	GROUPS OF INDICATORS
<i>Regenerative / autopoietic capacity</i>	<ol style="list-style-type: none"> 1. CULTURAL CAPITAL REGENERATION 2. FINANCIAL CAPITAL REGENERATION 3. NATURAL CAPITAL REGENERATION 4. HUMAN CAPITAL REGENERATION 5. SOCIAL CAPITAL REGENERATION
<i>Symbiotic capacity</i>	<ol style="list-style-type: none"> 6. ACCESSIBILITY OF THE URBAN AREA 7. PARTNERSHIPS AND SYNERGIES
<i>Generative capacity</i>	<ol style="list-style-type: none"> 8. EMPLOYMENT GENERATION 9. LOCAL ENTREPRENEURSHIP AND INNOVATION 10. QUALITY OF LIFE, WELLBEING AND HEALTH 11. ECONOMIC IMPACTS

²⁶ described in detail in CLIC Deliverable D2.5 “Methodologies for impacts assessment of cultural heritage adaptive reuse”

²⁷ See CLIC Deliverable D2.5 for details on the project alternatives

This set of indicators can be used by public, private and social investors, including Investment Funds and Revolving Funds, to (1) take financing decisions in line with the EU Taxonomy²⁸ and the European Commission guidelines for sustainable finance²⁹, and (2) to monitor the achievement of goals and targets.

Table 9. Groups of indicators used for Salerno Edifici Mondo

REGENERATIVE CAPACITY	Financial indicators group	Indicators
	FINANCIAL CAPITAL REGENERATION (financial self-sustainability)	NPV; IRR; RoI; Payback period; Debt service ratio (ADSCR, LLCR, PLCR); Value for Money; Share of public and private contribution; Co-financing rate
	Impact indicators groups	
	CULTURAL CAPITAL REGENERATION	Authenticity and integrity; Intangible values; Historic Urban Landscape quality; Accessibility of cultural heritage site; Intrinsic value
	NATURAL CAPITAL REGENERATION	Energy; Water; Soil; Raw materials extraction; Green surfaces; Local and healthy materials; Remediation; Carbon emissions; Use of regional resources; Use of Nature-Based Solutions
	HUMAN CAPITAL REGENERATION	N. of people involved in Entrepreneurship, Skills enhancement, Education & Training
SYMBIOTIC CAPACITY	SOCIAL CAPITAL REGENERATION	N. of people from weak and marginalised social groups target of activities and services; N. of people involved in Heritage Communities
	ACCESSIBILITY OF THE URBAN AREA	Public space accessibility, accessibility enhancement for pedestrians, sustainable and public mobility
GENERATIVE CAPACITY	PARTNERSHIPS AND SYNERGIES WITH THE CONTEXT	N. of people and organizations, including third sector actors, involved in Partnerships, Collaboration Pacts, Symbioses; Involvement of people and marginalised social groups; Synergies with higher level policies, Trust level (e.g. Edelman survey)
	EMPLOYMENT GENERATION	N. of jobs generated directly and indirectly; N. of new businesses localised in the area
	LOCAL ENTREPRENEURSHIP AND INNOVATION	N. of enterprises and entrepreneurs localized in the reused cultural heritage site
	QUALITY OF LIFE, WELLBEING AND HEALTH	N. of final beneficiaries enhancing their quality of life; N. of proximity and neighbourhood activities; N. of cultural activities per year; Cultural participation; Arts, craft, making and repairing activities; % of space dedicated to creative and innovative activities; % of space equipped with urban arts; % of public space for socialisation; % of publicly accessible green areas
	ECONOMIC IMPACTS	Real estate market values, Attractiveness for commercial activities in the area

²⁸ EU Taxonomy for sustainable activities https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en

²⁹ European Commission Sustainable Finance https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/overview-sustainable-finance_en

The indicators identified represent goals to be monitored during the development of the project, ensuring the achievement of the proposed objectives, in particular in case of implementation of financing mechanisms based on “pay for result” and “pay for success”, including the hypothesized revolving funds³⁰.

The following sections present the indicators set in detail, according to the circularity criteria identified, and the specific indicators suggested, along with their typology and assessment method suggested.

³⁰ See CLIC Deliverables D4.1 and D4.2 on circular financing models for cultural heritage adaptive reuse

6.2. Regenerative capacity indicators

The regenerative capacity includes 32 indicators divided into five groups: regeneration of cultural capital (tangible and intangible), financial capital, natural capital, human capital, social capital.

This regenerative / “auto-poietic” capacity is here expressed as the capacity of economic-financial self-sustainability of the cultural heritage site intended in its management model, the capacity of self-regenerating the resources needed for its “life” in the long term, such as energy, materials, water resources, and the capacity of self-regenerating its cultural value over time. The “human-centred” perspective introduces also the capacity of regenerating the “human capital”, including people’s skills, knowledge, entrepreneurial attitude, and “social capital” as the capacity to support each other as a cohesive community and build the “heritage community” as defined in the FARO Convention (Council of Europe, 2005).

Table 10. Regenerative capacity indicators proposed for ex-ante evaluation

Indicator group	Indicator adopted	Typology	Assessment method
CULTURAL CAPITAL REGENERATION	Authenticity and integrity conservation	Checklist	Expert evaluation, based on a Likert scale 1-5 and/or list of measures adopted / not adopted
	Intangible values regeneration	Checklist	Expert evaluation, based on a Likert scale 1-5, and/or assessment of community’s perceptions
	Intrinsic values	Checklist	Linguistic evaluation including expert and non-expert assessment
	Historic Urban Landscape quality regeneration	Checklist	Expert evaluation, based on a Likert scale 1-5, and assessment of community’s perceptions also through visualizations and simulations
	Accessibility of cultural heritage site	Checklist	Expert evaluation, based on a Likert scale 1-5 and/or list of measures adopted / not adopted
FINANCIAL CAPITAL REGENERATION	Net Present Value of investment (NPV)	Statistical	NPV is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. To calculate NPV, it is necessary to estimate future cash flows for each period and determine the correct discount rate. If the NPV of a project is positive, it means that the discounted present value of all future cash flows related to the project will be positive, and therefore attractive.
	Internal Rate of Return (IRR)	Statistical	IRR is the discount rate that makes net present value (NPV) of all cash flows equal to zero. When comparing investment options with other similar characteristics, the investment with the highest IRR would be considered more desirable to undertake.
	Return on Investment (ROI)	Statistical	ROI is a performance measure used to evaluate the efficiency or profitability of an investment or

Indicator group	Indicator adopted	Typology	Assessment method
			compare the efficiency of a number of different investments. ROI is expressed as a percentage and is calculated by dividing an investment's net profit (or loss) by its initial costs. ROI does not take into account the holding period or passage of time, and so it can miss opportunity costs of investing elsewhere.
	Payback period	Statistical	The payback period refers to the amount of time it takes to recover the cost of an investment or how long it takes for an investor to reach breakeven. Shorter payback periods mean more attractive investments, while longer payback periods are less desirable. The payback period is calculated by dividing the amount of the investment by the annual cash flow.
	Debt Service Coverage Ratio (DSCR)	Statistical	DSCR is a measure of the cash flow available to pay current debt obligations. The formula for the DSCR requires net operating income (EBIT) and the total debt servicing for the project (interest and principal payments that are due in the coming year). A DSCR less than 1 means negative cash flow, which mean a borrower will be unable to cover or pay current debt obligations.
	Loan Life Coverage Ratio (LLCR)	Statistical	LLCR is a financial ration used to estimate the ability of a borrowing organisation to repay an outstanding loan. LLCR is calculated by dividing the net present value (NPV) of the money available for debt repayment by the amount of outstanding debt. LLCR is similar to the DSCR: the DSCR captures a single point in time, whereas the LLCR addresses the entire span of the loan.
	Project Life Cover Ratio (PLCR)	Statistical	PLCR is the ratio of the NPV of the cashflow over the remaining full life of the project to the outstanding debt balance in the period.
	Public Sector Comparator (PSC) and Value for Money (VfM)	Statistical	PSC and VfM calculation aims at verifying the opportunity and convenience of realizing a project under a project financing scheme rather than a traditional tender. PSC may be defined as the risk-adjusted cost for the Public Administration for an infrastructural project to be realized in a project finance scheme. PSC is especially useful to assess the convenience of the project financing considering the correct allocation of risks among the Public and the private partners. The PSC is defined as the sum of the following variables: <ul style="list-style-type: none"> ▪ Present value of construction costs;

Indicator group	Indicator adopted	Typology	Assessment method
			<ul style="list-style-type: none"> Present value of O&M costs; Present value of the risks transferred to the private subject in case of project finance. It is necessary to calculate the PSC for the realization of the project in a project finance scheme on one side, and with a traditional tender on the other side. The difference between the two indicators (tender vs project finance) is the Value for Money (VfM): if VfM is positive, then the activation of a project finance is convenient for the Public Administration.
	Share of public and private contribution	Statistical	% equity, % debt; % public contribution (for construction and/or operations and maintenance)
	Local investment	Statistical	Percentage of local co-financing on total investment, including crowdfunding, local co-investors, financial participation in community foundations and other local co-investment forms
NATURAL CAPITAL REGENERATION (Circular solutions)	Energy generated on site through renewable sources	Statistical	Percentage of KWh generated on total estimated energy need (Energy assessment)
	Energy performance level upgrade	Trends	Number of levels upgrades in Energy performance levels (e.g. from level G to level A = 7 levels)
	Carbon emissions per sqm indoor area	Statistical	Life Cycle Assessment, CO ₂ eq/sqm of the adaptive reuse intervention
	De-impermeabilization of soils	Statistical	Percentage of permeable outdoor surfaces
	Heat island effect reduction	Statistical	Percentage of surfaces interested by interventions of heat island reductions
	Reduction of freshwater consumption	Trends	Litres of freshwater consumption avoided
	Rainwater recovered	Trends	Litres of rainwater recovered through water filtering and recovery systems
	Reduction of raw materials consumption	Statistical	Percentage of materials from reused and recycled products (volume)
	Use of regional resources	Statistical	Percentage of materials from reduced distance (<50 km) (volume)
	Green surfaces	Statistical	Percentage of green surfaces including buildings (green roofs, green façade)

Indicator group	Indicator adopted	Typology	Assessment method
	Nature-Based Solutions	Checklist	Use of Nature-Based Solutions in the adaptive reuse of the heritage building or site
	Environmental remediation	Statistical	Percentage of soils remediated, and/or elimination of pollution causes and unhealthy materials
HUMAN CAPITAL REGENERATION	Traditional skills and construction techniques	Trends	Number of people employing traditional skills and construction techniques involved in the adaptive reuse intervention
	Entrepreneurship enhancement	Trends	Number of activities stimulating entrepreneurship and self-entrepreneurship, such as incubators, accelerators, co-working spaces)
	Education and training activities	Trends	Number of people educated and trained
SOCIAL CAPITAL REGENERATION	Heritage Community	Trends	Number of people involved in the care of cultural heritage as common good
	Support to weak and marginalised social groups	Trends	Number of people from weak and marginalised social groups target of activities and services included in the heritage site reused

6.3. Symbiotic capacity indicators

The symbiotic capacity (also in terms of symbiotic exchanges with the context) should be expressed through the relationships of the cultural heritage adaptive reuse project with the “context” in which it is realized. The concept of circular metabolism (i.e. circular and symbiotic exchanges with the context) can be applied at the “meso” level of the heritage area/neighbourhood, or even city/region.

This concept can be better understood through a simple example: the same adaptive reuse project with the same characteristics and same management model (e.g. the reuse of an abandoned church as location for community hub and cultural events) could have different performances in terms of overall circularity if placed in different context (e.g. rural vs. urban, metropolis vs. village, high-income livelihoods neighbourhood vs. marginalized neighbourhood, young ‘hipster’ neighbourhood vs. elderly residential area, etc.).

The symbiotic capacity includes 13 indicators divided into two groups: the capacity of stimulating partnerships and synergies between diverse territorial actors and multi-level policies, and the contribution to the reconnection of fragmented landscape through enhanced accessibility, public and green space integrity, quality and safety.

Table 11. Symbiotic capacity indicators proposed for ex-ante evaluation

Indicator group	Indicator adopted	Typology	Assessment method
ACCESSIBILITY OF THE URBAN AREA	Accessibility enhancement	Trends	Distance on feet from the nearest public transport node
	Public and green space accessibility	Statistical	Percentage of public and green space recovered / regenerated or made more accessible
	Pedestrian mobility	Statistical	Percentage pedestrian areas on total intervention surfaces
	Sustainable mobility	Statistical	Percentage of surfaces dedicated to sustainable mobility such as bicycle routes
PARTNERSHIPS AND SYNERGIES WITH THE CONTEXT	Stakeholders involvement in decision-making	Trends	Number of organisations involved in the decision-making phase of the adaptive reuse process
	Stakeholders involvement in the management phase	Trends	Number of organisations involved in the management phase
	Third sector actors involved	Trends	Number of third sector actors involved in all phases of the adaptive reuse process
	People involvement	Trends	Involvement of people in the decision-making process, such as through consultation and co-creation
	Marginalised social groups involvement	Trends	Involvement of minor and marginalised social groups in the decision-making process, such as through consultation and co-creation

	People collaboration	Trends	Number of collaboration agreements and pacts signed for the collective care of cultural heritage
	Businesses collaboration and symbioses	Trends	Number of collaboration and symbioses contracts, such as through circular supply chains models and localisation of complementary businesses in the area
	Synergies with higher level policies	Checklist	Assessment of the contribution to the realisation of regional, national and international policies, and/or local ecosystems policies
	Trust levels	Statistical	Trust levels (e.g. Edelman trust survey)

6.4. Generative capacity indicators

The generative capacity is expressed by the capacity of the cultural heritage adaptive reuse intervention to generate resources for the local context, which in turn provide new financial, cultural, social and environmental resources for cultural heritage regeneration, in a circular perspective.

The generative capacity includes 17 indicators divided into three groups: employment generation, attractiveness for new businesses and entrepreneurs, enhancement of quality of life, wellbeing and health. It includes the “spillover” effects at regional level, the revitalisation of the local economy in the urban/rural area, the overall attractiveness for new businesses, commercial activities, residents, innovators, entrepreneurs, creative workers, thus in general the generation of a desirable environment turning a “dead” site into a vibrant “place”.

Table 12. Generative capacity indicators proposed for ex-ante evaluation

Indicator group	Indicator adopted	Typology	Assessment method
EMPLOYMENT GENERATION	Jobs creation	Trends	Number of direct and indirect full-time equivalent jobs generated in sectors such as: professional and consulting activities, construction works, circular economy, research and development, creative and cultural activities, sustainable tourism
	Regional economy spillovers	Trends	Number of indirect jobs created through the adaptive reuse intervention (calculation of spillover effects)
	Local economy	Trends	Number of new businesses localised in the urban area, such as commercial activities, cultural and creative activities, circular economy activities as repairing and recycling, sustainable cultural tourism, and other sectors
	Jobs/Investments ratio	Statistical	Number of jobs generated per 100.000 euro of investment
LOCAL ENTREPRENEURSHIP AND INNOVATION	Enterprises localisation	Trends	Number of enterprises localised in the heritage site reused
	Entrepreneurs and self-entrepreneurs localisation	Trends	Number of entrepreneurs and self-entrepreneurs localised in the heritage site reused
QUALITY OF LIFE, WELLBEING AND HEALTH	Beneficiaries of adaptive reuse intervention	Trends	Number of final beneficiaries target of the adaptive reuse intervention who are likely to enhance their quality of life, wellbeing and health
	Proximity activities	Trends	Number of new proximity activities localised in the area, such as commercial activities, neighbourhood services

	Cultural activities	Trends	Number of cultural activities likely to be activated in the area
	Cultural participation	Trends	Number of people estimated to participate in cultural activities per year
	Arts, craft, making and repairing activities	Trends	Number of arts, traditional craft, making activities (such as fab labs), and repairing activities localised in the area
	Creative and innovative spaces	Statistical	Percentage of surfaces dedicated to arts, craft, innovation, culture
	Urban art	Statistical	Percentage of surfaces equipped with urban art
	Public space and socialization	Statistical	Percentage of surfaces dedicated to socialisation, such as squares, parks, community hubs, bars and restaurants, and other types of activities promoting gathering and socialisation
	Green space	Statistical	Percentage of publicly accessible green spaces, including roads and streets equipped with green surfaces
ECONOMIC IMPACTS	Real estate market values	Trends	Average market values of residential units in the heritage area (€/sqm)
	Commercial activities	Trends	Number of new commercial activities in the heritage area

The indicators proposed can be used in the ex-ante evaluation to support the planning and design process and help identifying the most desirable alternatives to be funded and/or financed, also in line with the objectives of the European sustainable finance initiative and the recently launched EU Taxonomy framework. Also, the proposed indicators are in line with the global Sustainable Development Goals (SDGs) and the UN New Urban Agenda 2030, providing useful information on the contribution of cultural heritage to sustainable development.

Indicators in the ex-ante evaluation phase represent specific “objectives” and targets of circular “human-centred” adaptive reuse of cultural heritage, in line with the CLIC framework, to be assessed and monitored before, during and after the realisation of the intervention. They support specifically “result-based” financing instruments and governance models, building a framework of useful data which can inform choices of owners, managers and the local communities.

Moreover, as described more in detail in Deliverable D2.5 on the CLIC “Methodology for impacts assessment of cultural heritage adaptive reuse”, criteria and indicators are an important tool to be used in participatory co-evaluation processes to trigger evidence-based analysis and informed decisions, taking into account the point of view, needs and desires, costs and benefits of diverse stakeholders. Through prioritization techniques, weights can be assigned to criteria and indicators to build preferences matrices and analyse synergies and conflicts between stakeholders, in a evolutionary process in which preferences are not static but can change through discussion, reflection, understanding of impacts and simulations.

The matrix of criteria and indicators, adapted and “weighted” according to the specific contexts and preferences / needs, represents the base for building a flexible indicators framework inspired to the OECD “Better Life Index” (OECD, 2011). Also, it can be integrated with context-specific additional indicators, which can be linked to the specific heritage typology and conditions, as well as to the specific activities, stakeholders, beneficiaries and final users involved, in line with the Theory of Change³¹. For example, the impact on individual and collective “wellbeing” can be explored more in-depth through integrative indicators, which have been proposed in the EU funded research Makswell³².

The proposed CLIC evaluation framework was developed to provide a flexible, adaptable but still usable set of indicators for ex-post and ex-ante evaluation reliable for diverse heritage typologies, contexts, scales, and adaptive reuse phases. It should be used and tested extensively by diverse stakeholders to ensure its wide usability outside of the experimentation of the CLIC research, adapting and refining it according to further findings achieved through extensive testing. However, the reflections developed in CLIC and the space for experimentation provided by the EU funded research project was an opportunity to develop a coherent, first-tested and validated framework which can potentially work to assess the real contribution of cultural heritage adaptive reuse to sustainable development, in Europe and beyond.

Next section provides first conclusions and reflections about the results of the CLIC research, highlighting the contribution of evaluation tools for the development of circular governance, business and financing models in cultural heritage adaptive reuse, and opening up a new circular perspective for cultural heritage integrated conservation, focusing on the recognition of values and potential of cultural heritage for fully sustainable and circular cities/regions and society.

³¹ For more details on the Theory of Change, see REFERENCE; for the specific application of the Theory of Change in the CLIC evaluation framework, see D2.5 Methodology for impacts assessment of cultural heritage adaptive reuse.

³² See project website <https://www.makswell.eu/the-project/about-makswell.html>

7. Conclusions and recommendations

The CLIC research started in 2017 implementing an extensive review of the existing literature and practice on cultural heritage impacts assessment. The **Cultural heritage Counts for Europe research** (CHCfE Consortium, 2015) was considered the most comprehensive literature base synthesizing approaches, methods and tools for assessing cultural heritage contribution to sustainable development in terms of multidimensional impacts. The CHCfE research was based on the **sustainability “four-pillars” approach**, and considered the Total Economic Value of cultural heritage as the starting point for the **assessment of values and impacts in cultural heritage conservation**. Diverse methodologies for the assessment of impacts were identified, as reported in Section 1, however the scarce availability of data highlighted also the **need of developing new tools to support impacts assessment** in the heritage sector.

CLIC built on the existing body of knowledge introducing the innovative perspective of the circular economy in cultural heritage adaptive reuse, through the development of the theoretical framework of “CLIC Circular human-centred model of cultural heritage adaptive reuse” (D2.7), which is briefly synthesized in this report (Section 3). An extensive exploration of more than 120 case studies of cultural heritage adaptive reuse was conducted to test the CLIC theoretical framework through **empirical research**, identifying **best practices in the circularity perspective** (CNR IRISS, D1.3, 2019). In-depth research was also conducted under CLIC WP2 on **spillover effects of cultural heritage adaptive reuse** (Uppsala University, CLIC D2.1, 2019), **socio-cultural impacts** (University of Warsaw, D2.2, 2019), and **environmental impacts** (University of Vienna, CLIC D2.3, 2019), contributing to advance scientific knowledge about **methods, tools and indicators for cultural heritage adaptive reuse impacts assessment**, in line with the proposed **CLIC circularity framework**.

Thus, the innovations of CLIC WP2 with regards to the state-of-the-art in cultural heritage impacts assessment research can be synthesized in the following contributions:

- **Introducing the perspective of the circular economy in cultural heritage adaptive reuse** towards higher sustainability, overcoming the “pillars” approach towards a **systemic circular approach**;
- **Introducing the concept of Complex Social Value of cultural heritage**, taking into account non-instrumental value – the “intrinsic value” – of cultural heritage as the base/origin of other instrumental values (economic, social, cultural, environmental);
- **Developing of a systemic impacts assessment framework** coherent with the circular economy approach and the Social Complex Value of cultural heritage;
- **Developing practical and usable tools for the assessment of multidimensional impacts and for data collection** that can be employed by heritage owners, managers and professionals to support circular adaptive reuse interventions and sustainable management, as well as by sustainable finance actors to identify social targets “blended” with financial returns;
- **Developing evaluation tools to support innovative circular business, financing and governance models** for cultural heritage adaptive reuse.

Particularly, this report contributed to **identify a set of multidimensional criteria and indicators of circularity** for the ex-post and ex-ante evaluation. The indicators represent a system of information able to quantify and synthesize complex phenomena with the aim of supporting decision-making, monitoring and management processes.

The multidimensional indicators about impacts of cultural heritage conservation/regeneration were initially classified on the base of the 4 pillars of sustainability: cultural, economic, social, environmental. The development of the theoretical framework³³ lead to the identification of **three dimensions of circularity: the regenerative / autopoietic capacity, the symbiotic capacity, and the regenerative capacity**³⁴. These three dimensions include indicators expressing sustainability dimensions, integrated in a systemic perspective, overcoming the “pillars” approach. The related criteria and indicators are both quantitative and qualitative and they are referred to different scales (micro, meso and macro scales). **Indicators** in each dimension were deduced from the analysis of best practices and from national and international sources. They **represent a grid able to ensure that the assessment reflects all values and dimensions to be considered**. They are a basis of information and, at the same time, allow developing a common language about impacts and benefits of cultural heritage adaptive reuse.

The assessment of impacts is more and more necessary especially in view of the implementation of **sustainability policies** such as the European Green Deal, the New European Bauhaus, and the Sustainable finance initiative with the EU Taxonomy. Sustainable finance and sustainable policies should be grounded in careful assessment of impacts / results obtained, both in the public and in the private sector. The **Third sector**, including social enterprises, foundations, philanthropy, civic associations and other organisations with a “social” mission, already started the process of better accounting for the activities carried out. Third sector actors are more used to carry out impacts assessments, based on diverse methods and tools and mostly using ESG (Environmental, Social, Governance) criteria and indicators (Zamagni, Venturi and Rago, 2015; Venturi and Perra, 2018). **Circular Economy** policies are supported as well by a set of clear indicators which provide evidence base of the impacts of investments, projects, programmes and initiatives (Ellen MacArthur Foundation, 2015a; Gravagnuolo *et al.*, 2019; Circular economy network, 2021; EUROSTAT, 2021; OECD, 2021).

The **cultural heritage sector**, and especially the initiatives related to cultural heritage adaptive reuse, do not use a specific set of indicators to assess the impacts of diverse conservation, regeneration and reuse projects. It still remains difficult to assess the contribution of cultural heritage to territorial development (Lykogianni *et al.*, 2019). It was therefore considered timely and useful to develop a set of criteria and indicators that, according to the CLIC circularity framework, can practically suggest sustainable directions for cultural heritage adaptive reuse, and contribute to enhance the quality of interventions (ICOMOS, 2019) and the accountability of management bodies that “care” for cultural heritage as common good.

Based on the research conducted, a particular issue was raised about **skills** in cultural heritage accounting. The public and private sector managers interviewed were rarely aware of environmental impacts of cultural heritage adaptive reuse, and in some cases they were not able or not interested in accounting for social impacts. On the other side, third sector / grassroots organisations and more “spontaneous” groups of citizens who “take care” of cultural heritage as common good in the frame of the FARO Convention (Council of Europe, 2005) have usually less capacity for business modelling, financing and economic accounting, resulting in difficulties to develop sustainable business and management models starting from bottom-up initiatives. On this base, a call should be raised to policy makers to develop new training and educational programmes to **enhance skills in the cultural heritage sector, including skills related to circularity management. Specialised**

³³ Led by prof. Luigi Fusco Girard, CLIC Scientific Coordinator

³⁴ The CLIC circularity framework is detailed in D2.7 “CLIC framework of circular human-centred adaptive reuse of cultural heritage”

and multi-sectorial competences are needed to implement the proposed impacts assessment framework for circular adaptive reuse of cultural heritage, as well as **higher collaboration and cooperation capacity** between diverse specialists, and between diverse territorial organisations. These new capacities are strongly needed to **enhance heritage-led local innovation ecosystems** based on “collaborative attitude and capacity” at district/regional, national and European level. Moreover, issues of data availability and data management can be overcome through the inclusion of the right skills which are currently lacking in the cultural heritage sector.

The CLIC indicators proposed in this report should not be intended as the “definitive” indicators for all cultural heritage adaptive reuse interventions. Based on the specificities of cultural heritage, the size/scale of the intervention, the stakeholders and beneficiaries involved, and the type of activities / functions for the adaptive reuse, **additional integrative indicators can be identified**. The set of indicators to be used for ex-post and ex-ante evaluation should always be the **result of a consultation and discussion process**, involving the stakeholders, experts and community members/representatives who should take care of providing and analysing data, also at the scope of defining shared/consensual priorities between the diverse aspects of circularity. Indeed, the process of **ranking and selecting criteria and indicators**, and testing them in all phases of the adaptive reuse process, should ideally become a common practice, able to make clear to all parties of a community the goals and targets of the intervention, eventual issues and conflicts to be addressed, the results expected in the ex-ante phase and the impacts actually obtained in the ongoing/ex-post phase. This practice of **“continuous” circular co-evaluation** can become an experimental field also to **enhance democratic decision-making processes**, promoting open and transparent discussion, as well as collaborative efforts to generate evidence-base through data collection, data analysis, data interpretation and evaluation.

Finally, it is worth to highlight the role of **reporting and communication practice** in the assessment of cultural heritage adaptive reuse impacts. Reporting and communication of impacts, in multiple dimensions, can be highly beneficial to many stakeholders. **Heritage sites managers**, first, have the responsibility of reaching circularity goals and targets and can benefit from accountability receiving back increased trust, stronger community relationships, marketing impact, and eventually leverage private donations, as well as private and public funding and financing to enhance more and more the abandoned / underused heritage sites. This is particularly relevant in cases of **bottom-up initiatives**, which **rarely start with a large funding covering all needs of the adaptive reuse, but rather proceed through small interventions over time**, funded through diverse projects, initiatives and donations/crowdfunding initiatives. In this sense, to develop a practice and capacity of accountability for impacts, can highly **leverage the possibility of raising funding and other contributions** from the civil society, public and private stakeholders. Moreover, funding and financing actors especially in the social finance and impact finance sector need to have reliable information on the outcomes / impacts of financing initiatives. Therefore, the CLIC proposed set of impact indicators for the cultural heritage sector can become the base for common and larger impact assessment practice, **opening up new opportunities for financing heritage initiatives through the social / impact investment sector**. Finally, **local communities and stakeholders**, as beneficiaries of the interventions, could receive additional benefits from the impacts assessment practice itself, probably enhancing their trust towards the local managers and between each other as a result of transparent accounting and discussion, thus feeling more involved in the care of cultural heritage as a true common good. This process can lead to higher **community wellbeing**, enhancing trust, engagement and community relationships.

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Annex 1 – Literature sources and indicators analysed³⁵

In this Annex, the sources consulted to develop the analysis of indicators in Section 3.5 are reported.

Table A. Literature sources on cultural heritage impact sectors and indicators.

Source	Year	Source typology	Number of indicators	Dimensions				Scale	Phase	Typology	
				Ec	S	En	C			Quant	Qualit
Nijkamp [1]	1989	Article	6	3			3	Meso	Ex-post	3	3
Pearson et al. [2]	1998	Institutional Report	139	19	9	36	75	Meso	Ex-post	137	2
Grefe [3]	2004	Article	4	4				Meso	Ex-post	4	
Hockings et al. [4]	2008	Institutional Report	17	2	7	5	3	Meso	Ex-post	17	
Labadi [5]	2008	Institutional Report	57	24	22	7	4	Meso	Ex-post	35	22
Rypkema and Cheong [6]	2011	Article	29	16	17	6		Meso	Ex-post	8	21
Licciardi and Amirtahmasebi [7]	2011	Institutional Report	13	4	7	2		Meso	Ex-post	7	6
Zancheti and Hidaka [8]	2011	Article	3				3	Meso	Ex-post		3
Elsorady [9]	2014	Article	16	1	3	3	9	Micro	Ex-ante		16
CHCfE Consortium [10]	2015	Research Report	54	18	13	9	14	Meso	Ex-post	32	22
Fusco Girard et al. [11]	2015	Article	124	77	14	15	18	Meso	Ex-post	121	3
James [12]	2015	Article	40	8	16	9	7	Meso	Ex-post	35	22
Sowińska-Świerkosz [13]	2017	Article	15	3	1	7	4	Meso	Ex-post	10	5
Guzmán et al. [14]	2017	Article	14		4	6	4	Meso	Ex-post	12	2
Nocca [15]	2017	Article	178	111	35	1	31	Meso	Ex-post	172	6
Stanik et al. [16]	2018	Article	6			2	4	Macro	Ex-post	3	3
Vecco and Srakar [17]	2018	Article	7	2	1	1	3	Macro	Ex-post	7	

³⁵ The Tables A, B and C were developed and published in Sustainability scientific journal: Bosone, M. *et al.* (2021) 'Indicators for Ex-Post Evaluation of Cultural Heritage Adaptive Reuse Impacts in the Perspective of the Circular Economy', Sustainability 2021, 13(9), p. 4759. Doi: 10.3390/SU13094759.

Airaghi et al. [18]	2019	Research Report	13	12	1			Meso	Ex-post	13	
Historic England [19]	2019	Research Report	41	7	5	7	22	Macro	Ex-post	41	
Günçe and Mısırlısoy [20]	2019	Article	25	5	4	6	10	Micro	Ex-post		25
Della Spina [21]	2020	Article	11	6		4	1	Micro	Ex-ante	4	7
De Leão Dornelles et al [22]	2020	Article	1				1		Ex-post		1
Melloni et al. [23]	2020	Research Report	144	19	82	7	36	Meso	Ex-post	121	23

Table B. Literature sources on other impact sectors and indicators.

Source	Year	Source typology	Number of indicators	Dimensions				Scale	Phase	Typology	
				Ec	S	En	C			Quant	Qualit
Mercer [29]	2002	Institutional Report	373	56	204	21	92	Macro	Ex-post	181	192
WTO [30]	2004	Institutional Report	29	6	7	16		Macro	Ex-post	24	5
OCPA Task Force [31]		Institutional Report	64	15	21	2	26	Macro	Ongoing	21	43
Home Affairs Bureau [32]	2005	Institutional Report	27	7	10		10	Macro	Ex-post	12	15
Choi and Sirakaya [33]	2006	Article	98	16	42	30	10	Meso	Ex-post	35	63
OECD [34]	2006	Institutional Report	104	68	26		10	Macro	Ex-post	103	1
Jackson et al. [35]	2006	Research Report	53	16	9	1	27	Macro	Ex-post	46	7
UNESCO [36]	2007	Institutional Report	21	3	3		15	Meso	Ex-post	19	2
UNESCO [37]	2007	Institutional Report	23	11	8		4	Macro	Ex-post	23	
Institut de la statistique du Québec [38]	2007	Institutional Report	67	29	29		9	Macro	Ex-post	56	11
OECD [39]	2008	Institutional Report	31	20	3	1	7	Macro	Ex-post	21	10
Ministry for Culture and Heritage [40]	2009	Institutional Report	17	5	5		7	Macro	Ex-post	15	2
KEA European Affairs [41]	2009	Institutional Report	11	3	5		3	Macro	Ex-post	11	
NCCRS [42]	2010	Institutional Report	16	6	4		6	Macro	Ex-post	16	
UNESCO [43]	2010	Institutional Report	312	83	99	15	115	Macro	Ex-post	177	135
Ngamsomsuk et al. [44]	2011	Article	20	4	3	7	6	Macro	Ex-post		20
Daschko [45]	2011	Institutional Report	47	5	28	2	12	Macro	Ex-post	7	40
Ministry of Culture and Education of Finland [46]	2011	Institutional Report	116	54	33	3	26	Macro	Ex-post	105	11
ESSnet-CULTUR [47]	2012	Research Report	28	9	11		8	Macro	Ex-post	28	

Lozano Oyola et al. [48]	2012	Article	62	20	6	28	8	Meso	Ex-post	54	8
Montalto [49]	2012	Institutional Report	23	13	5	1	4	Meso	Ex-post	16	7
UNESCO and UNDP [50]	2013	Research Report	54	23	18	2	11	Macro	Ex-post	44	10
Columbia Basin Rural Development Institute [51]	2013	Research Report	164	48	36	6	74	Macro	Ex-post	94	70
Oxford Economics [52]	2013	Research Report	4	4				Macro	Ex-post	4	
UCLG [53]	2014	Institutional Report	57		34	5	18	Meso	Ex-post		57
ARTS COUNCIL ENGLAND [54]	2014	Institutional Report	59		51		8	Micro	Ex-post		59
UNESCO [55]	2014	Institutional Report	22	2	13		7	Macro	Ex-post	16	6
United Nations [56]	2015	Institutional Report	53	12	27	8	6	Macro	Ex-post	53	
Global network "Future we want includes culture" [57]	2015	Institutional Report	28	2	8	5	13	Macro	Ex-post	26	2
Kushner and Cohen [58]	2016	Research Report	17	15	2			Macro	Ex-post	28	
Council of Europe University of Baltimore Blancas et al. [48]	2016	Institutional Report	26	5	14		7	Macro	Ex-post	16	10
European Commission, UNESCO, Ortega-Villa and Ley-Garcia [59]	2016	Institutional Report	56	6	27	18	5	Meso	Ex-post	53	3
Rei and Huan ISTAT [60]	2016	Article	52	26	11	12	3	Macro	Ex-post	52	
EUROSTAT [61]	2016	Research Report	43	14	10	18	1	Meso	Ex-post	41	2
EUROSTAT [62]	2017	Institutional Report	60	6	20	13	21	Macro	Ex-post	36	24
UNESCO [63]	2017	Article	19		12		7	Meso	Ex-post	4	15
Montalto et al. [64]	2018	Article	67	14	18	24	11	Micro	Ex-post	41	26

ISTAT [65]	2018	Research Report	2	2				Macro	Ex-post	2	
Asmelash and Kumar [66]	2019	Research Report	14	3	2		9	Macro	Ex-post	12	2
European Commission [67]	2019	Research Report	9	1	4	4		Macro	Ex-post	9	
European Commission [68]	2019	Research Report	21	7	6	1	7	Macro	Ex-post	1	8
OECD and ICOM [69]	2019	Article	12	4	4		4	Meso	Ex-post	7	5
Compendium of Cultural Policies & Trends [70]	2018	Research Report	11	2	3	6		Macro	Ex-post	9	2
Mercer [29]	2019	Article	61	10	31	12	8	Macro	Ex-post	14	47
WTO [30]	2019	Website	16	8	2	6		Macro	Ex-post	14	2
OCPA Task Force [31]	2019	Institutional Report	29	3	21		5	Meso	Ex-post	23	6
Home Affairs Bureau [32]	2019	Institutional Report	8	2	6			Macro	Ongoing	2	6
Choi and Sirakaya [33]	2019	Website	26	8	11		7	Macro	Ex-post	18	8

Table C. Literature sources on Circular Economy impact sectors and indicators.

Source	Year	Source typology	Number of indicators	Dimensions				Scale	Phase	Typology	
				Ec	S	En	C			Quant	Qualit
Gravagnuolo et al. [24]	2019	Article	17			17		Meso	Ex-post	17	
Historic England [25]	2019	Research Report	2			2		Micro	Ex-post	2	
Foster and Kreinin [26]	2020	Article	12			12		Micro	Ex-post	12	
Foster et al. [27]	2020	Article	20			20		Micro	Ex-post	20	
Heisel and Rau-Oberhuber [28]	2020	Article	3			3		Micro	Ex-post	3	

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Annex 2 – Assessment of social impacts in Not Quite, Västra Götaland region (Sweden)³⁶

Evaluation of the neighbourhood and the local community

Twenty two residents of Fengersfors, who live next to the cultural center Not Quite, took part in the study on the perception of their local community. The questions referred to the quality of life in the neighbourhood, respondent's attachment to the place, and different factors describing the potential for social sustainability in the local community.

Description of respondents

Socio-demographic description of respondents

- Respondents represented the following age groups: 36.3% of respondents were in the 35-44 age group, 27.1% were over the age of 65, 13.6% of respondents were in the 45-54 age group, and another 13.6% were in the 55-64 age group. The smallest share were respondents aged 25-34, accounting for 9% of the studied sample.
- Women (71.4%) outnumbered men (28.6%) among respondents.
- 27.3% had a doctoral degree, 22.7% have completed a Master's degree, 18.2% graduated from a technical school, 13.6% had a Bachelor's degree, 9.1% had professional degree and another 9.1% graduated from a primary school.
- The respondents had different professions. Most represented industry was art (7), then health care (3), construction (3), and public administration (2). The remaining group was composed of individuals with diverse occupational background like retail, architecture, IT, and agriculture forestry, to name just a few.
- The majority of respondents were employed or self-employed (18). Three respondents were retired and not working.
- More than half of the respondents reported that they had studied or worked abroad (12), while others said they had no such experience (10).
- The financial situation of the majority of respondents wasn't very good. More than half of the respondents reported that their household makes ends meet with some difficulty (54.5%). One third of respondents (31.8%) declared that that they found it easy to make ends meet, while 13.6% reported it is very easy to do so.

³⁶ This section has been developed by the team of UNIWARSAW - Robert Zajonc Institute for Social Studies, University of Warsaw: Magdalena Roszczyńska-Kurasińska, Anna Domaradzka, Agata Zabłocka, Bartosz Ślosarski. Data have been collected by local partner VGR in Västra Götaland, Sweden, and analysed by UNIWARSAW team.

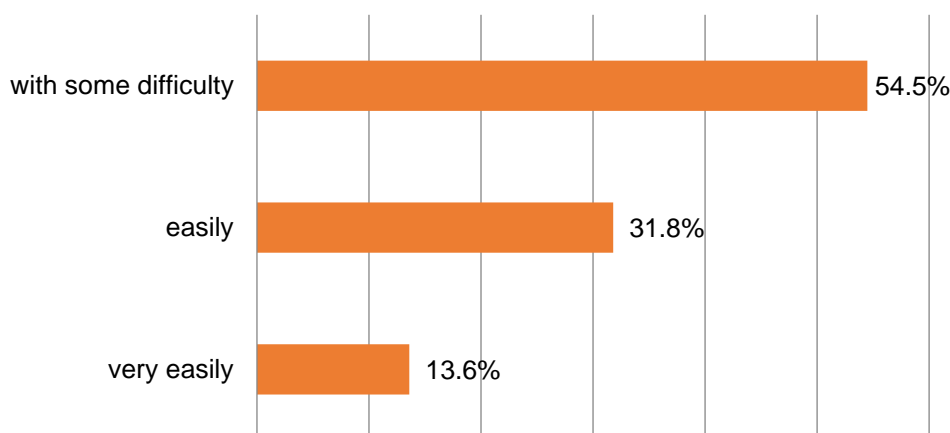
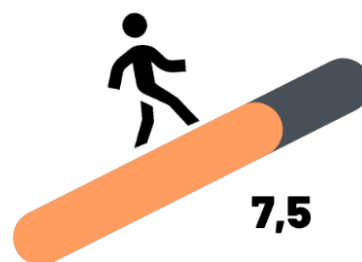


Figure 25. Perceived household ability to make ends meet in percentages

Well-being ladder as the respondent's perception of the standard of living

Respondents were asked to indicate their perceived well-being on a scale from 1 as the worst possible standard of living to 10 as the best possible standard of living.

On average, respondents assessed their current level of well-being quite high, at 7.5 points. Two respondents refused to answer.



A self-reported pro-ecological behavior of respondents

The respondents' attitudes toward nature and pro-ecological practices were measured on the scale from 1 to 5 points.



The respondents generally declared a very positive attitude toward nature. On average, our respondents described themselves as people who enjoy spending time outside in nature very much (4.7 points) and agree that it is important to preserve nature for future generations (4.5 points). The respondents also declared that they engage in pro-ecological practices, such as waste segregation (4.4 points) and the use of reusable bags (4.2 points). Saving energy (3.5 points) and water (3.2 points) were a bit less popular among our respondents.

The least popular practice among survey participants was the use of public transportation instead of private transportation (2.6 points). 50% of respondents reported that they do not use public transport instead of a private car. This may be due to the characteristics of the group of respondents who were generally older residents or lack of public transport in the area.

Respondents' attitude toward neighbourhood

The respondents' relationship with their place of residence was measured by four indicators: place identity, place attachment, urban identity and the attitude toward the neighbourhood.

Place attachment. This measure informs about an emotional bond between respondents and their place of residence, how much they like living in their neighbourhood and how much they feel "at home" there (Lewicka, 2008). On average, respondents declared being strongly attached (4.3 points) to the neighbourhood where they were living.



**Place identity
(3.7 points)**

Place identity. Place identity is related to the concept of community formation. It informs how much a respondent feels part of their community (Hernández et al., 2007). The place identity of respondents was relatively lower on average than their place attachment. However, respondents felt that they are a part of the neighbourhood

where they live and they felt they belong to this area or identify with it. The average result in this category was 3.7 points.

Urban Identity scale. This measure informs about importance of resident's past experience in the neighbourhood in forming the bond with a place of residence (Lalli, 1992). Respondents were asked to assess how much they feel that their personal history is connected to the neighbourhood where they live or how much they feel connected to the place through past experiences. On average, respondents evaluated their connection to the place at 3.1 points. 54.4% of respondents declared feeling no connection to the place, while 31.7% reported feeling connected to the place through past experiences. 13.5% of all respondents felt neither strong nor weak connection to the cultural center Not Quite and the surrounding area due to past experiences.



**Urban identity
(3.1 points)**



**I would like to
move out
(1.8 points)**

Attitude towards the neighbourhood. Respondents were also asked to express their attitude towards the neighbourhood by indicating how much they would like to move out of this neighbourhood and how much they believe this neighbourhood is a good place for kids to grow up. On average, respondents agreed with

the statement that the neighbourhood of Not Quite is a good place for children to grow up (4.3 points). Positive attitude and strong attachment to the place is also expressed in considerable reluctance to the idea of moving out of the neighbourhood (1.8 points out of 5).

Job opportunities in the place of residence

Respondents evaluated two important features of the neighbourhood, namely economic opportunities for creating new jobs and developing new businesses, and cultural opportunities associated with the participation in diverse cultural events.

Respondents rated the opportunities for **creating new jobs** and **developing new businesses** in their **neighbourhood** as moderate, on average 3.3 points out of 5. The result seems to be especially interesting when we compare it with the respondents' perception of themselves as rather non-entrepreneurial individuals, on average 2.8 points out of 5. Only 22.7% of survey participants perceive themselves as entrepreneurial individuals, 40.0% of respondents think of themselves as someone who is not entrepreneurial at all, while the rest (37.3%) neither agreed or disagreed with such self-description.

When it comes to **cultural opportunities**, respondents on average rated opportunities for participation in cultural events in their place of residence as high (4 points). In fact, respondents declared high level of participation in cultural events that were organized in the Not Quite area. As many as 90% of respondents attended these types of events in the past. Respondents reported being active in the cultural sphere – nearly a quarter of survey participants declared they attended events like theatre spectacles, opera or ballet each month.

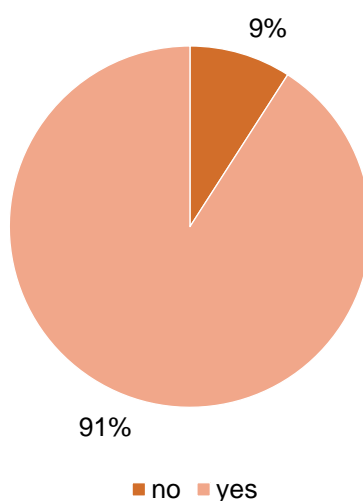


Figure 26. Declared participation in the cultural events in the neighbourhood

The most popular types of events were music concerts, cinema screenings, art exhibitions and sporting events, most notably soccer. The diversity of cultural activity in Not Quite area manifested itself in community events like communal walks and picnics, popular science events like book talks and open seminars, as well as in playing board games or bingo.

Social sustainability – description of the neighbourhood

One of the main aims of the survey was to assess the potential for social sustainability in the Not Quite area. Social sustainability is a factor that can be measured as a combination of several **characteristics** concerning the people living in the area and their relations with each other, i.e., diversity of residents, common understanding of the community's challenges and goals, trust between people and organizations, ability to learn and ability to self-organize. According to the literature (Missimer et al., 2017; Roszczynska-Kurasinska et al., 2019), this combination of characteristics is a good foundation for the embracement of change which is inevitable in life of every community.

Diversity and openness

First of all, the potential for social sustainability in a given neighbourhood lies in the diversity of the community members and their openness towards other people. In a diverse community, different needs of its members can be addressed locally by the people who have different skills and knowledge. Residents of such communities do not have to spend much time and effort to search for a provider of services or goods that they need. In the case of low diversity, rich social relations outside of the neighbourhood can make up for lack of skills and knowledge within the community itself. The needed knowledge can be easily brought into the community through personal links of their residents.

On average, respondents expressed that their neighbourhood community **is rather diverse in terms of skills** (3.9 points) and **age** (3.7 points). Respondents have a sociable attitude towards others when it comes to meeting new people (4.2 points) and **they also perceive others in the community as opened to newcomers** (3.8 points). However, people living in this community are perceived by respondents also as having average social relations – survey participants reported that **the members of the local community have a moderate number of links with others** (on average 3.2 points).

This result suggests that there is relative agreement among respondents that they enjoy meeting new people but they do not have exceptionally many relations with others. The community is diverse in terms of age and skills.

Common vision

For the diverse community to generate socially sustainable reaction to change it has to have the ability to develop a common vision among members. The effective cooperation and engagement need clear vision that is shared by all involved. Without common vision, members of local communities tend to focus on their own interests that can be often contradictory. In such a situation, members of the community will find it difficult to collaborate in a longer run.

According to our respondents, **residents of the Not Quite area do not clearly share the same values** (3 points) and **a common vision** (3 points). Half of the respondents felt that the community neither agrees nor disagrees on common values and visions. Only 27% of respondents felt that people in the community shared a common vision. For shared values, the number was even lower – only 14% of respondents felt that residents share the same values. Therefore, values and vision are not a bonding agent for the community. A positive factor in Not Quite area is the **sense of belonging to the community itself, which was rather high** (4 points out of 5).

A successful implementation of circular economy and sustainable development requires that members of a community are sensitive to the matters connected with ecology and nature; their common vision should somehow reflect the need to protect these areas.

This community was quite conscious about protecting natural resources (3.4 points). The majority of respondents (54%) declared that the community is aware that they need to protect natural resources, while only 9% of survey participants held the opposite view. This might stem from the fact that respondents perceived **local culture as being slightly related to natural resources** such as rivers, forests, and wildlife (3.4 points). 54% of respondents felt that the local culture in Not Quite area is directly related to local nature.

The situation is slightly different when it comes to the issue of dependence of local jobs on natural resources. Only one third of respondents felt that local jobs were related to natural resources, 27% did not see this type of relation between jobs and nature in the area.

COMMON VISION



- **there is no one common vision of the neighborhood**
- **people have different values**
- **but they have a strong sense of belonging to a community**

Trust

Trust ensures smooth and fast interactions between people. It makes things work without the need to implement costly and time-consuming measures of control. In that way, trust contributes to social sustainability. Here we asked respondents to comment on their level of trust for particular groups and institutions (other residents, local businesses and local authorities).

The level of trust is high in the studied community of Not Quite, specifically when it comes to trust towards other residents. On average, respondents declared that **the people in the community are trustworthy (4.3 points out of 5)**, which is also expressed by the fact that members of the community are perceived by survey participants as **skillful and competent (4.3 points)**.

The trust in local business representatives is similarly high. On average, respondents reported that **businesses in the community can be trusted (4.3 points)** and that they are skillful and competent (4.4 points). Furthermore, respondents believed that more private businesses were needed in neighbourhood of Not Quite (average score of 4.4 points out of 5).

The perception of trustworthiness of local administration is relatively lower than other groups in the community. On average, respondents agreed that **local government can be trusted (3.5 points)**, but were a little bit more hesitant in agreeing that **local government is skillful and competent (3.2 points)**. Only 18% of survey participants disagreed with this statement that local authorities can be trusted, while half of respondents felt that authorities can be trusted.

Capacity for Learning

Social sustainability means that the society is capable of adapting to changing conditions. The adaptation cannot happen without acquiring new knowledge and skills, therefore the capacity for learning is an important indicator in assessing the potential for social sustainability.

Respondents declared that **they like learning new things very much** (average of 4.4 out of 5), **like engaging in activities requiring learning** (3.8 points) and **slightly like developing new ideas** (3.3 points). All respondents reported having learned some new skill within the last year. 68% of all survey participants enjoyed reading in their spare time, while 77.3% of respondents attended a conference or a seminar within the last year. The learning activity may be due to the high education level of the respondents, as more than a quarter held a doctoral degree.

The structural opportunities for learning were rated as slightly lower. On average, respondents rated learning opportunities for 3.4 points out of 5. **45% of respondents reported that there are opportunities to learn**, while 36% of participants were undecided on this issue. Only 18% felt that learning opportunities in the community were poor. The same is true for bringing new ideas to the community. On average, respondents rated these opportunities at 3.4 out of 5 points. Again, **45% of respondents declared that they think it is easy or very easy to introduce new ideas**, while the other 45% of respondents neither agreed nor disagreed with this statement. The remaining 10% were of the opinion that it is difficult to introduce new concepts and solutions into the community life.

What is particularly interesting is the positive assessment of other community members in terms of their willingness to learn. On average, **respondents rated community members willingness to learn at 3.8 points out of 5**.

Capacity for self-organization

The final component of social sustainability is the category associated with the capacity for self-organization. **Respondents rated opportunities for social activity (3.8 points) and civic self-organization (3.9) as high**. In particular, opportunities for environmental activities were rated quite good - 3.8 out of 5 points. Respondents declared that their friends are active in volunteering (3 points). Survey participants believed that local authorities support local initiatives (3.4 points), however, only one-third of respondents had a strongly positive view on this issue. **Respondents were convinced about people's ability to solve problems in this community (66.7% of all study participants agreed with that statement)**.

Engagement and participation

In this section, we focus on opportunities for participation, interest in community life and events, types of events in which community members participate, and major constraints to participation. We measured levels of engagement with the Not Quite area and participation in neighbourhood and community-wide events.

Opportunities for participation. The opportunity to participate in community-related activities can be linked to the availability of a place in which such activities could be held for free. Therefore, we asked participants what knowledge did they have about the possibilities of organizing civic-related events in their area. Most respondents (59.1%) said that they know such a place exists, while 13.6% believed there was most likely such a place. 18.2% of respondents had no knowledge of such a place, while only 9.1% did not think such a place exists at all.

Interest in local activities. Respondents were interested in community affairs and they were systematically searching news about the community (86% of all survey participants declared this activity). More than three-quarters of respondents showed interest in local issues by declaring they searched for information regarding their neighbourhood in social media or community newsletter at least from time to time. This was backed by the information that 72.7% of respondents read local press.

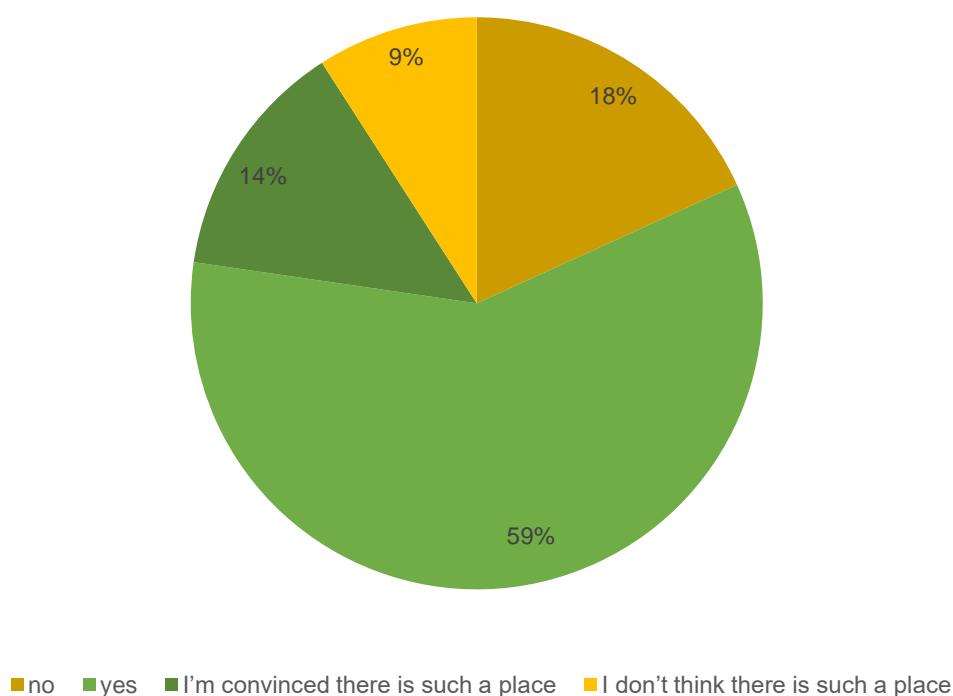


Figure 27. The availability of a place for organizing civic-related events for free

Types of activities. Respondents were interested in participation in different types of events that took place within the neighbourhood community of Not Quite. The most popular activities were those centered around the arts, pursuing personal hobbies, neighbourhood life, and events focused on youth and environmental issues. Respondents are least likely to participate in activities related to entrepreneurship, as well as religion and politics.

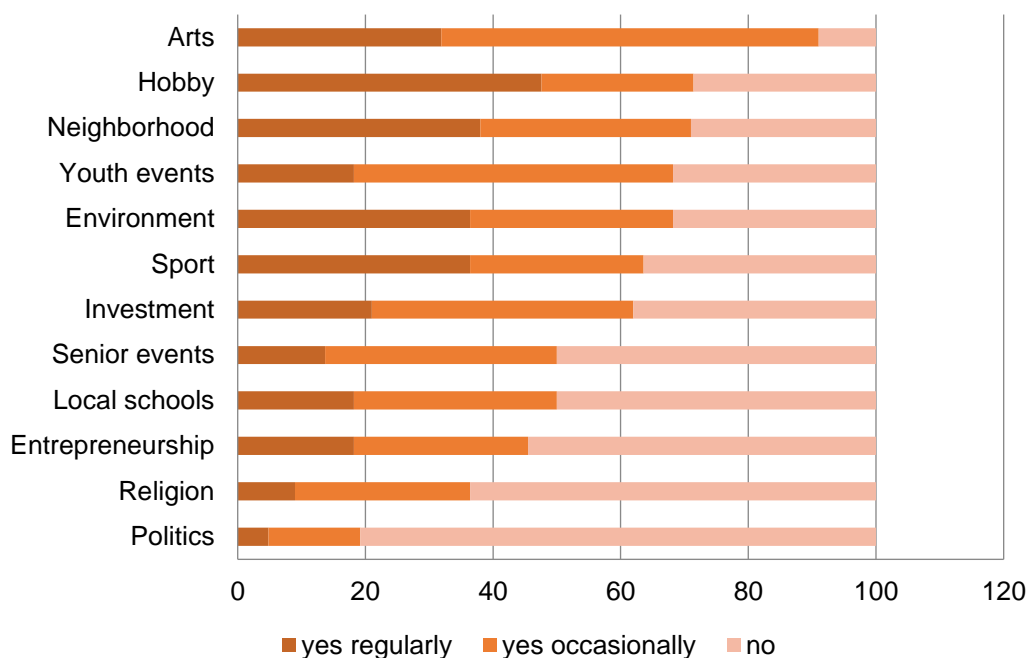


Figure 28. Participation in different types of activities in the neighbourhood within last 12 months

Participation constraints. Some of our respondents declared that they do not participate in activities around the Not Quite. However, this is not due to reluctance or lack of knowledge about the events in the neighbourhood. The main reason for non-participation is the declared lack of time in everyday life.

Evaluation of the heritage site

Description of respondents

Eighteen visitors and users of the cultural center Not Quite took part in the survey. The majority of them were in three age groups – 35 to 44, 45 to 54, and 25-34 years old. **Most respondents were women** (12 women compared to 5 men, one person refused to answer) with a doctoral (47.1%) or Master's degree (29.4%).

Financial situation of the respondents was rather bad. **As much as 76.5% of respondents answered that they had at least some difficulty to make ends meet.** Most of the respondents were self-employed or employed, working in art industry (12 respondents), public administration (3 respondents) and tourism (2 respondents).

Almost 67% of all respondents lived in the neighbourhood of Not Quite, 16.7% said they came from a different country and one respondent came from another continent. More than half of the respondents (10) had the experience of working or studying abroad.

Means of transport

Most respondents (83.3%) took less than an hour to get to the cultural center Not Quite from where they lived; almost half of them lived within a walking distance of the place. Interestingly, more than 16% of respondents had to travel more than 6 hours to this site.

Respondents used different means of transport. **More than two-thirds of respondents (66.7%) reached the place solely by car.** The rest used bikes and other soft means of transport, or different combination of the above (33.3%).

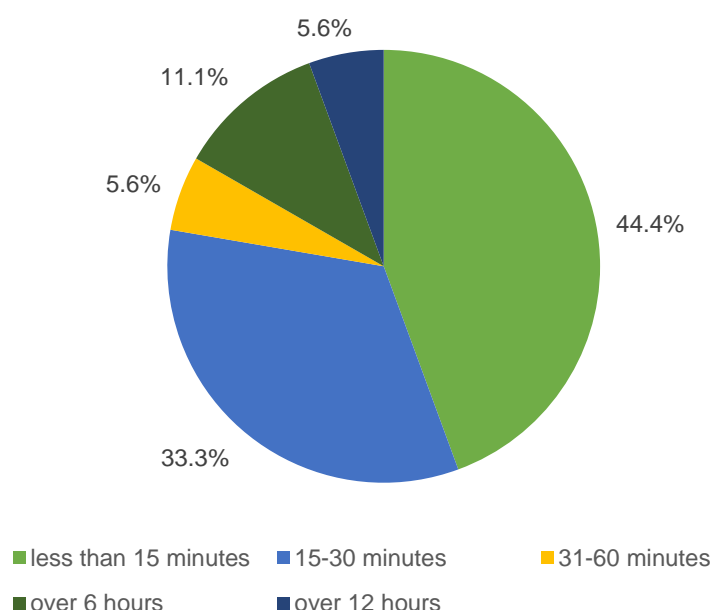


Figure 29. Travel time to Not Quite from home

Diversity and accessibility

The respondents' opinions on diversity and accessibility of the place were measured on the scale from 1 to 5 points. Not Quite was considered to be a fairly friendly place.

The place was assessed as primarily **very good for tourists** (4.7 points out of 5) **as well as local residents** (4.5) – both groups could feel very good there according to respondents, which might indicate that the touristic activity does not happen at the expense of the local community. Moreover, Not Quite was also considered to be a place adding enormously to the diversity of local activities (4.9 points). In the opinion of the respondents, **local entrepreneurs could find this place as a rather good location to run their businesses (3.9 points)**. At the same time, the cultural center was perceived as a place accessible to everyone (3.4 points).

Activities in Not Quite

In general, Not Quite is appreciated mostly for three aspects – community activities associated with discussions and social meetings (15 out of 18 respondents), activities related to work (14 out of 18 respondents), and spending time with family and friends (13 out of 18 respondents). Respondents also cherished the fact that it's a place that provides business opportunities and a space to indulge in one's hobby in leisure time (both categories received 10 indications each).

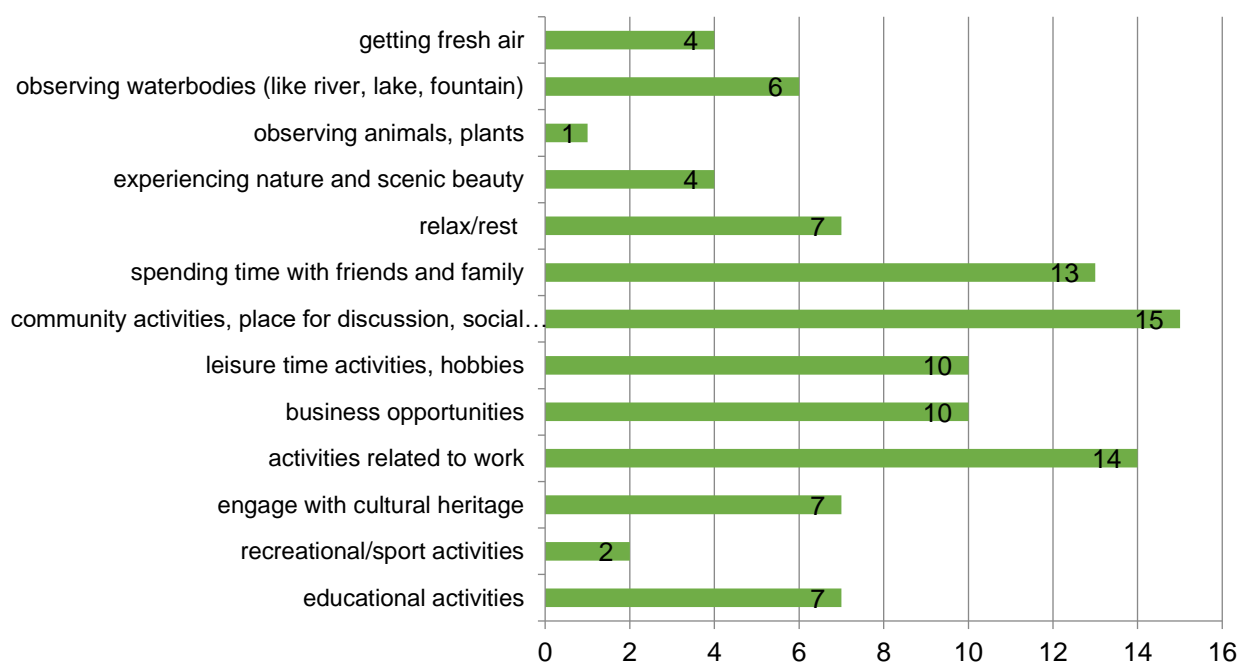


Figure 30. The most favorite activities in the Not Quite, multiple choice answer

The cultural center offers dual opportunities – on the one hand it is a space for relaxation and socializing with family and friends, on the other it is a space to work and develop own businesses. In both cases, the place provides opportunities for networking and building social relationships with other people.

Learning opportunities in Not Quite

Most respondents evaluated Not Quite as **a good place for learning** (4.5 out of 5 points). It was considered to be **an area that greatly inspires creativity** (4.9 out of 5 points) and **is intellectually stimulating** (an average of 4.3 points)

Social functions

Cultural heritage sites can be important to people for different reasons. Some will appreciate the beauty of it, others will focus on their social and economic potential or ecological value. In the case of Not Quite, we focused on exploring the social functions that this place has in the opinion of respondents. As it was indicated above, the cultural center was recognized as a space for socializing activities, both in personal and professional manner.

Respondents were asked to rate which social functions were most important to them. They marked each category on a scale from 1 to 5 points. On average, survey participants felt that the most important benefit of Not Quite was that they could meet other people there. Moreover, the people in Not Quite were perceived as trustworthy, while the place itself provided a sense of safety. All these elements together created the conditions for the cultural center to be considered a good place for recreation.

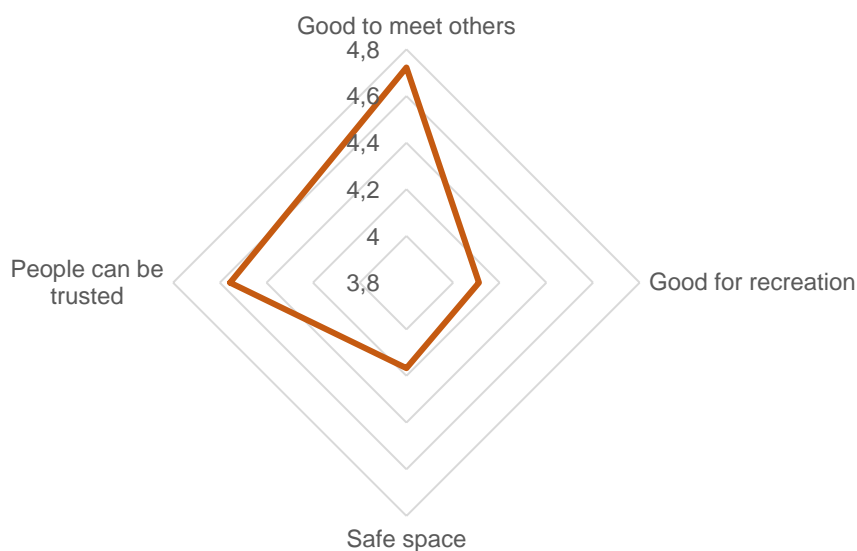


Figure 31. Social functions of the Not Quite on a scale of 1-5 points

Nature

Cultural heritage sites are often linked to the wider natural heritage, therefore adaptation processes of heritage sites need to address ecological issues to achieve sustainability of the place (understood both as social and natural sustainability).



Not a good place for animals

Respondents were asked whether Not Quite is a good place for local wildlife, specifically whether animals and plants thrive in this area. On average, respondents felt that Not Quite site is not a good place for animals and plants to thrive (2.6 out of 5 points).

Intrinsic value

One of the important aspects of cultural heritage sites is their intrinsic value (Girard, Vecco 2021). The intrinsic value is produced in the process of collective meaning-making, and thus is derived from the social perception of a given place (Roszczyńska-Kurasińska et al. 2021). The concept of intrinsic value describes the significance of a place for the local community which is the result of a collective definition of a place and its functions for past and future generations.

We asked our respondents about their perception of the Not Quite site, as well as associations they have when they think about it.

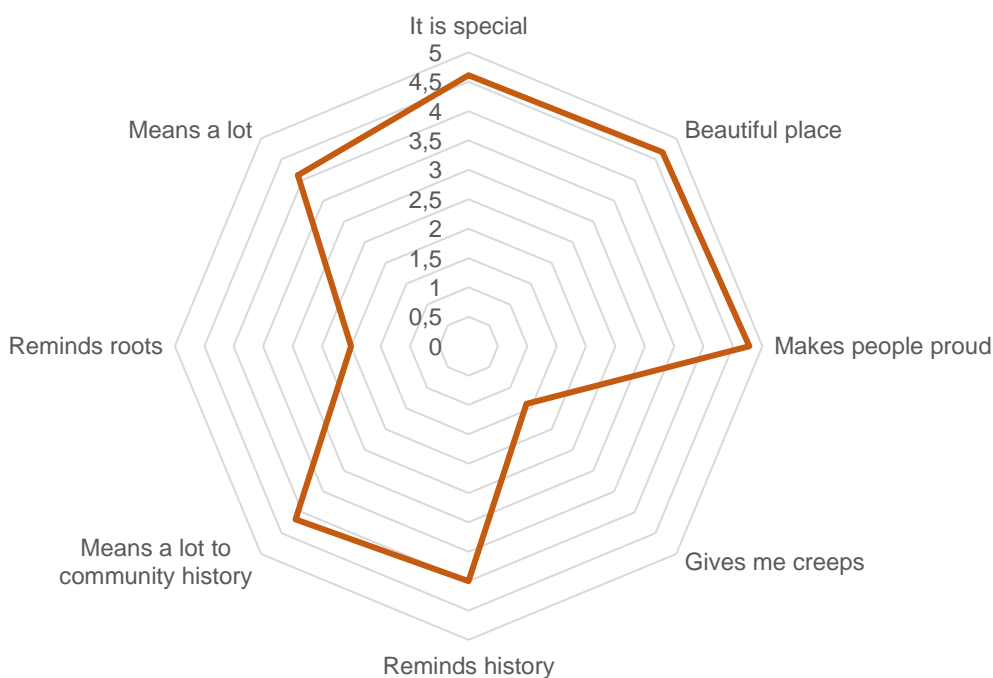


Figure 32. The intrinsic value of Not Quite site on a scale of 1-5 points

As shown in the chart above, respondents declared that the cultural center affects their sense of local pride (4.7 points), which may be related to the fact that they recognize this place as beautiful and special (both 4.6 points). Respondents did not reveal any negative emotional reactions to this site (1.3 points). On average, survey participants emphasized that the place meant a lot to them (4.1 points). Aesthetics and meaning are not all the components of intrinsic value, this place is also important because of historical reasons – it reminds the respondents both of the history of the local community (4.1 points), but also brings back memories in a general sense (4 points).

However, historical significance does not translate to individual or family history (2 points). As many as 83% of respondents said that Not Quite does not remind them of their roots, which may be related to the recent renovation or general mobility of our respondents.

Emotions

The visit to Not Quite elicited mostly positive emotions in respondents. As we can see on the chart below, people felt mostly inspired, engaged, sociable, and generally happy when visiting the place. For many the visit aroused their curiosity, gave them a sense of pride and more energy and triggered entrepreneurial attitude. Almost none of the respondents experienced negative emotions – it didn't make them sad, frustrated or bored.

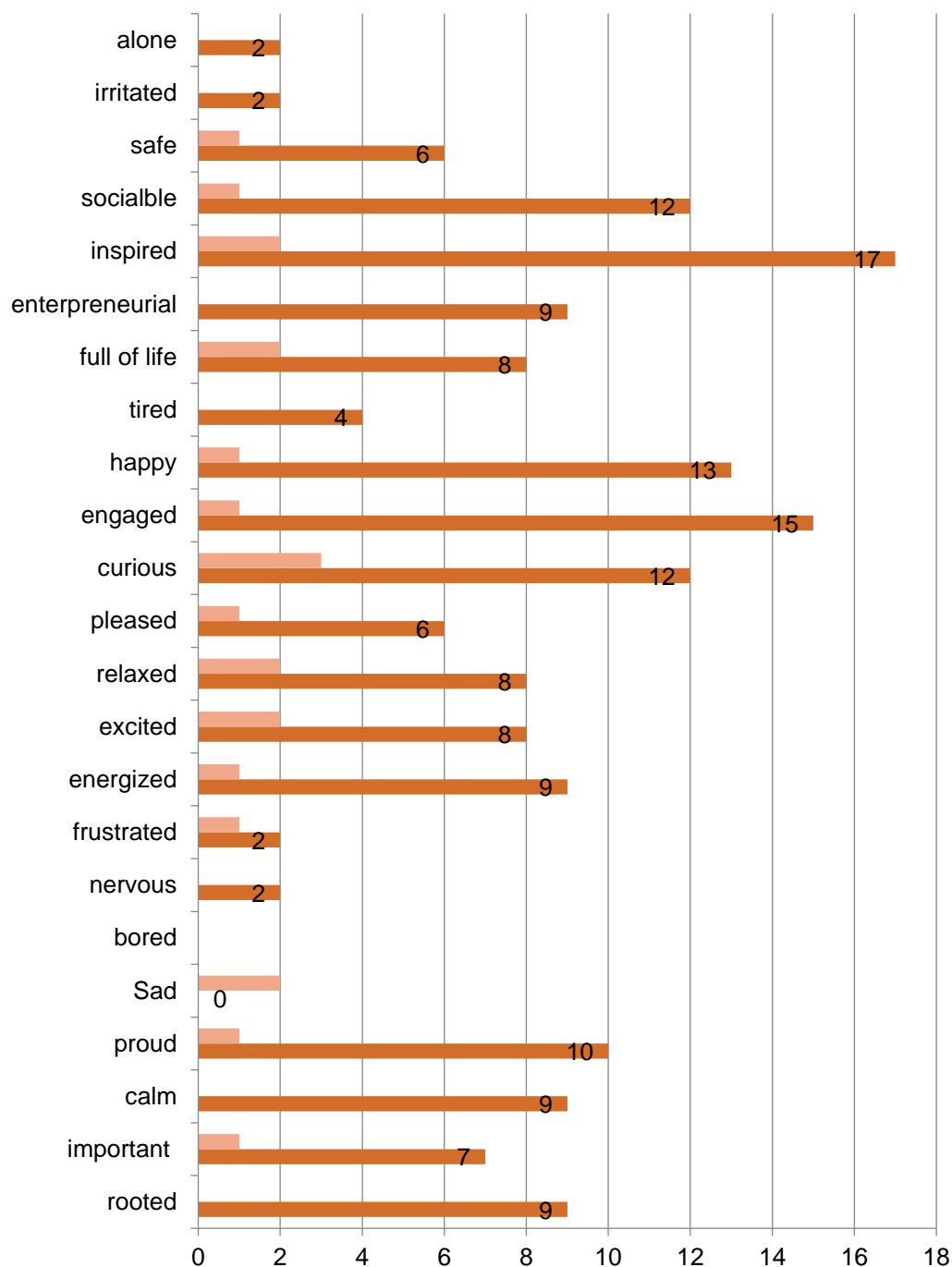


Figure 33. The emotions elicited by the visit in the Not Quite (before and after), multiple choice answer

The source of enjoyment

In the cultural center, respondents declared that art, networking opportunities, food, and general atmosphere were the most enjoyable characteristics of the place. The company of other people, as well as entrepreneurial environment and the space for work were also considered important. As we mentioned before, the generally pleasant atmosphere of the place and the fact that this is a place with networking and leisure opportunities added to the positive reception of the Fengersfors' cultural center.

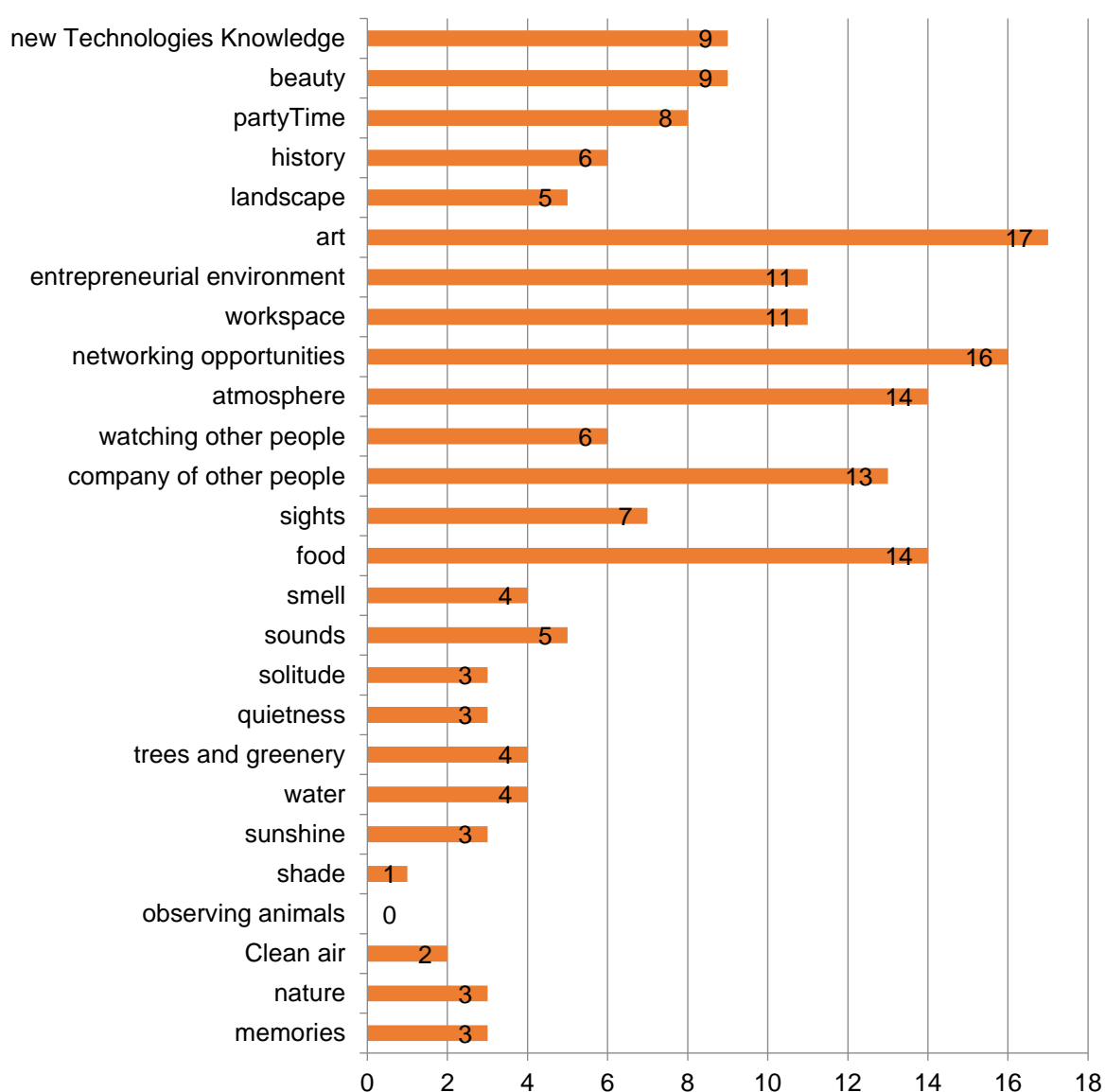
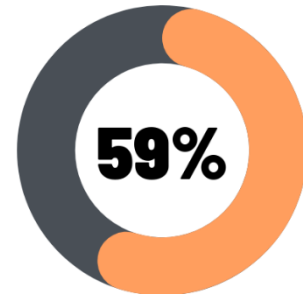


Figure 34. The sources of enjoyment in Not Quite

Satisfaction

As the cultural center recently underwent a process of renovation, we asked the respondents if they noticed changes in the area. Over half of the respondents noticed them. In the group that noticed the changes, the process was evaluated rather positively (3.5 out of 5 points).

Not Quite was considered an asset to the neighbourhood, which would be perceived as less attractive if the place disappeared (4.8 points out of 5). Respondents would generally recommend this place for their friends (4.9 points), and consider it a good place to run their own business (4 points). Moreover, they expressed a desire to spend their money here (4.1 points) and they could support the development of the whole initiative with their money, e.g. through a crowdfunding campaign (3.7 points). The overall positive impression is expressed by respondents' belief that Not Quite is well cared for (3.6 points).



Yes, I've noticed the change.

General expectations from adaptive reuse of built heritage – who should do it and how should it be implemented

There are two general expectations regarding the qualities of built heritage adaptation reuse process. In the opinion of visitors, the **renovation should be resource efficient** or reduce waste (4.2 points), as well as **strive to create new jobs** in the local community (4.1 points). Therefore, the adaptive reuse of cultural heritage should stimulate the development of the local job market and not harm the environment.

Respondents were asked to indicate who should be responsible for keeping the cultural heritage alive. As we can see below, in our respondents' opinion, **the local community and experts in the cultural heritage field** are the entities that are most eligible for this job. According to the respondents, the responsibility for the maintenance of heritage sites should not only be in the hands of those who have the most knowledge in this area - namely the local community itself, local organizations and experts - but also in the hands of public sector actors in the country (such as local municipality and state administration). Private sector entities – both local and national – were considered to be the least eligible. It can be concluded that local community is eager to ensure their right to voice their opinion in adaptive reuse process and might be unwilling to give away control over cultural heritage to private hands (rich people and big companies).

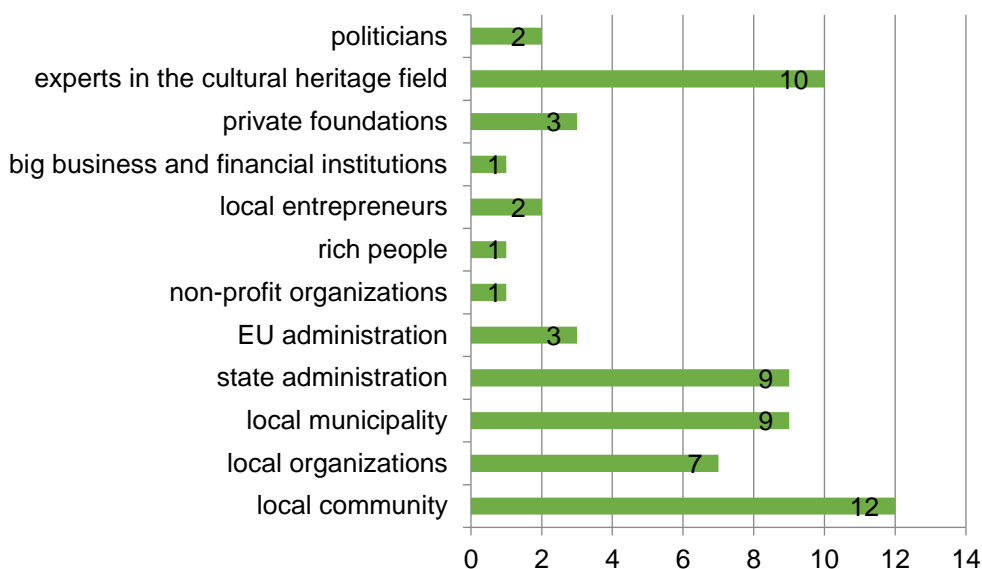


Figure 35. Who should be responsible for keeping cultural heritage alive?

According to the visitors, mostly public institutions should be responsible for making cultural heritage circular – local municipality, state administration and EU administration. In this case, local community and heritage experts have a much smaller role, however still larger than the private sector.

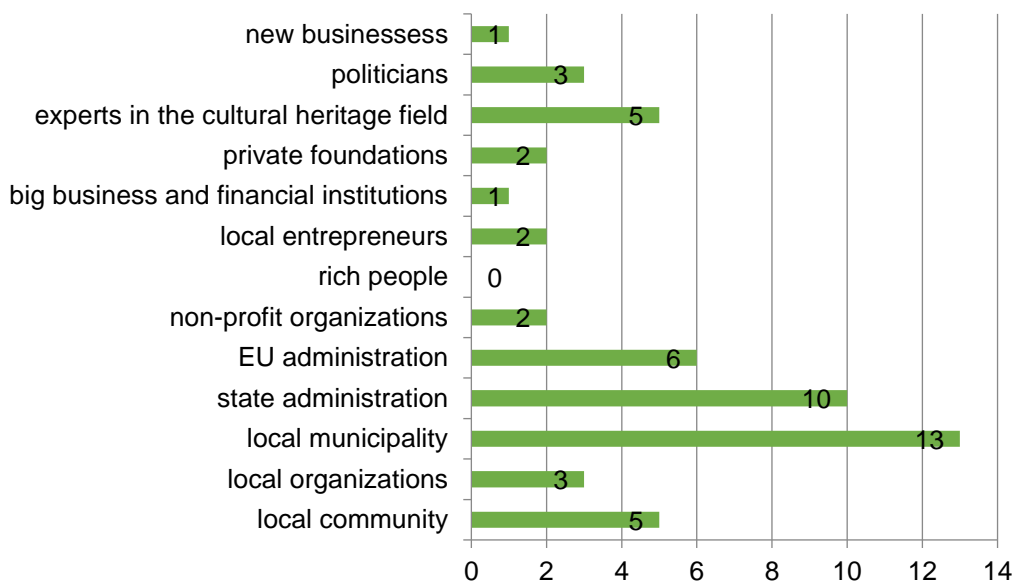


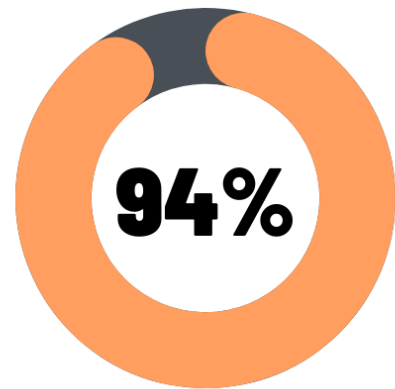
Figure 36. Who should be responsible for making cultural heritage circular?

Recommendations

In the opinion of most of our respondents, the cultural center Not Quite could be further improved to offer new entrepreneurial and networking spaces. **Adding services, like small shops, studios or generally places where visitors and community members could eat or drink** would be welcomed.

Respondents suggested that the space itself could be improved, especially workspaces, offices, and workshops – both in terms of heating and appliances (including a refrigerator). More importantly, **respondents felt that the availability of the cultural center could definitely be better**. Many respondents commented on infrastructural aspects of the residence. Some participants in the study pointed out that new opportunities for businesses to invest in the premises through long term contracts would be beneficial for both parties. Others were focused on the park, **suggesting an improvement of both the garden itself and the residential areas for artists**.

Finally, respondents felt that **the design of the old building should be taken care of**, to emphasize artistic values and aesthetics of the place.



Yes, this place should be improved

Annex 3 – Assessment of social impacts in Open Jazdów, Warsaw (Poland)³⁷

Evaluation of the neighbourhood and the local community

Sixty four residents of Warsaw, who live next to Open Jazdow, took part in the study on the perception of their local community. The questions referred to quality of life in the neighbourhood, respondent's relation to the area and different factors describing the potential for social sustainability in the local community.

Description of respondents

Socio-demographic description of respondents

- Respondents represented the following age groups: 20.3% of respondents were 35-44, 17.2% were 25-34, 9.4% of respondents were 55-64, 7.8% were 65+, 6.3% of respondents were 45-54, and 4.7% of respondents were 18-24. 34.4% provided no answer for the question about their age.
- Women represented 53.1% of respondents, and men – 12,5% of respondents. 34.4% of respondents provided no answer for the question.
- 31.3% have completed a MA degree, 10.9% had a doctoral degree, 7.8% had a Bachelors' degree. 9.4 graduated from high school and 6.1% graduated from a technical school. 3.1% had a professional degree. The remaining 34.4% provided no answer for the question.
- The respondents had different professions. Most represented industry was research (11), then art (7), new technologies (6), media (6) and architecture (3). The remaining group was composed of individuals with diverse occupational background like retail, finances, travelling, education, law, construction industry, environmental protection and other.
- The majority of respondents were employed (27), self-employed (6) and doing unpaid work (6). Several were students (4) and retirees (5). Three people declared they were unemployed. Other respondents provided no answer for the question.
- The financial situation of the majority of respondents, who answered the questions regarding the balance of their household's spending, was good. Respondents reported that their household makes ends meet easily (26.6%) or very easily (14.1%). At the same time, a quarter of respondents declared that they found it hard to make ends meet – with some difficulty or great difficulty.

A self-reported pro-ecological behavior of respondents

The respondents' attitudes toward nature and pro-ecological practices were measured on a scale from 1 to 5 points.

³⁷ This section has been developed by the team of UNIWARSAW - Robert Zajonc Institute for Social Studies, University of Warsaw: Magdalena Roszczyńska-Kurasińska, Anna Domaradzka, Agata Zabłocka, Bartosz Ślosarski. Data have been collected and analysed by UNIWARSAW team.

RESPONDENTS



- **Segregate waste (4.4 points)**
- **Use reusable bags (4.4 points)**
- **Use public transport (4.3 points)**

The respondents generally declared a very positive attitude toward nature. On average, our respondents described themselves as people who enjoy spending time outside in nature (4.6 points on the scale from 1 to 5) and agreed that it is important to preserve nature for future generations (4.5 points).

The respondents also declared that they engage in pro-ecological practices: segregating waste (4.4 points), using reusable bags (4.4 points), using public transport instead of private cars (4.3 points), saving household water (4.0 points). They also tended to repair old things instead of buying new ones (4.0 points). Actions such as

saving household energy (3.9 points) and using second-hand products, such as clothes, furniture and equipment (3.8 points) were a little less common among the respondents.

Respondents' attitude toward neighbourhood

The respondents' relationship with their place of residence was measured by four indicators: place identity, place attachment, urban identity and the attitude toward the neighbourhood.

Place attachment. This measure indicates the level of an emotional bond between respondents and their place of residence, how much they like living in their neighbourhood and how much they feel "at home" there (Lewicka, 2008). On average, respondents declared being attached to the neighbourhood they were living in (4.1 points). There was little variation among respondents. In the surveyed group as many as 64.5% of respondents declared attachment or strong attachment to the place. None of the respondents declared a complete lack of place attachment.

Place attachment (4.1 points)



Place identity (3.7 points)



Place identity. Place identity is related to the concept of community formation. It indicates how much respondents feel a part of their community (Hernández et al., 2007). Place identity of respondents was on average lower than their place attachment (3.7 points). There was some variation among the respondents. 31.2% of respondents identified themselves with the place and 20.8% of respondents reported feeling average identity connection to where they live. Only three survey participants did not identify with this neighbourhood at all.

Urban Identity scale. This measure is used to identify the importance of resident's past experience in the neighbourhood in forming a bond with a place of residence (Lalli, 1992). When respondents were asked to assess how much they feel that their personal history is connected to the neighbourhood where they live or how much they feel connected to the place through past experiences, on average they had a rather low bond (3.2 points). However, the variation of answers between the

Urban Identity scale (3.2 points)



respondents was high. 27.2% of respondents reported feeling connected to the place through past experiences. 12.5% of all respondents reported feeling no connection at all. The rest of the answers were evenly spread between the remaining possible option.

I would like to move out (2.0 points)



Attitude towards the neighbourhood. Respondents were also asked to express their attitudes towards the neighbourhood by indicating how much they would like to move out of this neighbourhood and how much they believe this neighbourhood is a good place for kids to grow up. On average, respondents reported that although they are not strongly attached to the place of residence, they would not like to move out (2.0 points). The area seemed also to be perceived as rather appealing to families with young children (3.6 points). 44% of respondents agreed with

the statement that their neighbourhood was a good place for children to grow up. 13.6% of the survey participants had the opposite opinion, while 42.4% of respondents did not take a clear position on this issue.

Job opportunities in the place of residence

Respondents rated the opportunities for **creating new jobs** and **developing new businesses** in their **neighbourhood** as average, 3.6 points out of 5. The respondents saw themselves as entrepreneurial individuals – 53% of respondents thought of themselves as very or pretty entrepreneurial. Only 30,6% of respondents did not perceive themselves at all as entrepreneurial, while the rest (13,6%) neither agreed or disagreed.

Social sustainability – description of the neighbourhood

One of the main aims of the survey was to assess the potential for social sustainability in the Open Jazdow area. Social sustainability is a factor that can be measured as a combination of several characteristics concerning the people living in the area and their relations with each other, i.e., diversity of residents, trust between the people and organizations, common understanding of the community's challenges and goals, the ability to learn and to self-organize. According to the literature (Missimer et al., 2017; Roszczyńska-Kurasinska et al., 2019), this combination of characteristics is a good foundation for the embracement of change, which is inevitable in life of every community.

Diversity and openness

First of all, the potential for social sustainability in a given neighbourhood lies in the diversity of the community members and their openness towards other people. In a diverse community, different needs of its members can be addressed locally by the people who have different skills and knowledge. Residents of such communities do not have to spend much time and effort to search for a provider of services or goods that they need. In the case of low diversity, rich social relations outside of the neighbourhood can make up for lack of skills and knowledge within the community itself. The needed knowledge can be easily brought into the community through personal links of their residents.

The respondents see themselves mostly as sociable people – 72% of respondents enjoy meeting new people. The respondents perceive their community as diverse in terms of lifestyle (3.9 out of 5 points) and skills (4.0 out of 5 points). They perceive their neighbourhood as averagely welcoming to newcomers (3.6 points). People living in this community are perceived by respondents as having fairly wide social relations (3.5 points). This result suggests that respondents see themselves as those who enjoy meeting new people and have diverse skills and expertise, but that they perceive their neighbors as less opened to diversity.

COMMUNITY MEMBERS



- **enjoy meeting new people**
- **have diverse skills and lifestyles**
- **see their community as less opened to diversity**

Common vision

For a diverse community to be socially sustainable, it has to have a common vision of values among its members. Effective cooperation and engagement need a clear vision that is shared by all involved. Without common vision, members of local communities tend to focus on their own interests that can be often contradictory. In such a situation, members of the community will find it difficult to collaborate in a longer run. The data shows that less than a quarter of residents of the Open Jazdow

COMMUNITY MEMBERS



- **do not share one vision of the community**
- **do not share the same values**
- **a quarter doesn't feel like a part of the community**

area felt that they share one vision of their neighbourhood with other residents (22.7% respondents agreed with the statement that they had similar vision of the neighbourhood with their neighbors, 25.8% did not agree with the statement and 24.2% didn't have an opinion one way or the other). Moreover, only 19.7% of respondents agreed that their neighbors share the same values. Despite a low similarity of views within the neighbourhood, they seem to feel like a part of the local community to some extent (on average 3.1 points on a scale from 1 to 5). But a quarter does not agree with the statement that they are part of the local community.

A successful implementation of circular economy and sustainable development requires that the members of a community are sensitive to the matters connected with ecology and nature; their common vision should somehow reflect the need to protect these areas. According to respondents, the community's awareness of the need for protecting natural resources is average (3.0 points). The variation of answers is high in this case, with as many as 26.1% of respondents disagreeing with this statement and 24.2% of respondents agreeing with it. It might be explained by the fact that local jobs are not seen as dependent on natural resources (1.9 points), and local culture does not seem to relate to natural resources such as rivers, forests, and local animals (2.1 points).

Trust

Trust ensures smooth and fast interactions between people. It makes things work without the need to implement costly and time-consuming measures of control. In that way, trust contributes to social sustainability. Here we asked respondents to indicate their level of trust for particular groups and institutions (other residents, local businesses and local authorities).



People in this neighbourhood can be trusted (3.3 points).

The level of trust is average in the studied community (3.3 points). Over one third of respondents (37.8%) believe that people in their neighbourhood can be trusted, and 18.7% claim that people from their community can't be trusted. The remaining 15.2% could not decide whether other members of their community could be trusted or not.

Local business owners can be trusted (3.5 points).



The trust towards local business owners is also average (3.5 points out of 5). Respondents felt like there is some need for more local businesses to be created in the area (3.5 out of 5 points).



Local administration can be trusted (2.5 points).

The perception of trustworthiness of local administration was much lower (average of 2.5 points). Over one third of respondents (36.3%) did not agree that local authorities can be trusted, with only 15.2% seeing them as trustworthy. Local authorities are also not perceived as skillful or competent (average of 2.6), with 34.9% of respondents considering them unskillful and incompetent, and only 12.1% of people believing otherwise.

Capacity for Learning

Social sustainability means that the society is capable of adapting to changing conditions. The adaptation cannot happen without acquiring new knowledge and skills, therefore the capacity for learning is an important indicator in assessing the potential for social sustainability. We found that there are differences between individual learning capabilities and structural ones as well as social constraints in this particular matter.

Respondents declared that they like developing new ideas and activities (average of 4.0 points out of 5) and learning new things (average of 4.6 out of 5). It would also seem that they see their neighbourhood as rather supportive in the area of learning.

They rated the learning opportunities in the area high, with an average score of 4.3 out of 5, and declared that it is not too hard to bring new ideas to the neighbourhood (3.1 points). Other community members are seen by respondents as fairly eager to learn (3.3 points), with 39.6% of respondents

LEARNING



- Respondents like developing **new ideas and activities (4.0 out of 5)**
- Respondents rate **learning opportunities highly (4.3 out of 5)**

thinking people from the neighbourhood learn new things willingly, and 16% convinced this statement is not true. The remaining 43.7% didn't have strong inclinations towards one option or the other.

Capacity for self-organization



Opportunities for social activism in the neighborhood (4.2 points).

Level of volunteering among friends and acquaintances (3.2)



The ability of the local community to address potential difficulties (2.7)

The final component of social sustainability is the category associated with the capacity for self-organization. Respondents rated opportunities for social activity and civic self-organization rather well. They rated opportunities for social activism in the neighbourhood as good (average of 4.2 out of 5 points). Respondents did not think that there are many people in the neighbourhood who participate in civic activities (3.2). A third of respondents (28.8%) agreed that other members of the community participate in civic activities, while 16.7% did not think this was the case.

The respondents however were not convinced that the ability of the local community to address potential difficulties in the near future is high (2.7 on the scale from 1 to 5), with only 16.6% of respondents being sure of the ability of the local community to solve problems, and a third being convinced otherwise. A quarter of respondents (25.8%) did not agree that local authorities supported local organizations and civil initiatives, and 22.8% saw local authorities as supportive.

Engagement and participation

In this section, we focus on opportunities for participation, interest in community life and events, types of events in which community members participate, and major constraints for participation. We measured levels of engagement with Open Jazdow heritage site and participation in neighbourhood and community-wide events.

Opportunities for participation. The respondents on average were satisfied with the opportunities to participate in cultural activities and events that were held in the Open Jazdow neighbourhood. The overall score for all survey participants was 4.6 points out of 5.

The opportunity to participate in community-related activities can be linked to the availability of places in which such events could be held for free. Therefore, we asked participants what did they know about the possibilities of organizing civic-related events in a space free of charge. Most respondents (35.9%) said that it would be possible, while only 9% were of the opinion that it would not be possible. Almost half (43.8%) of the respondents stated that they are convinced there is such a place, but they did not know it for sure.

Opportunities for participation (4.6 points)



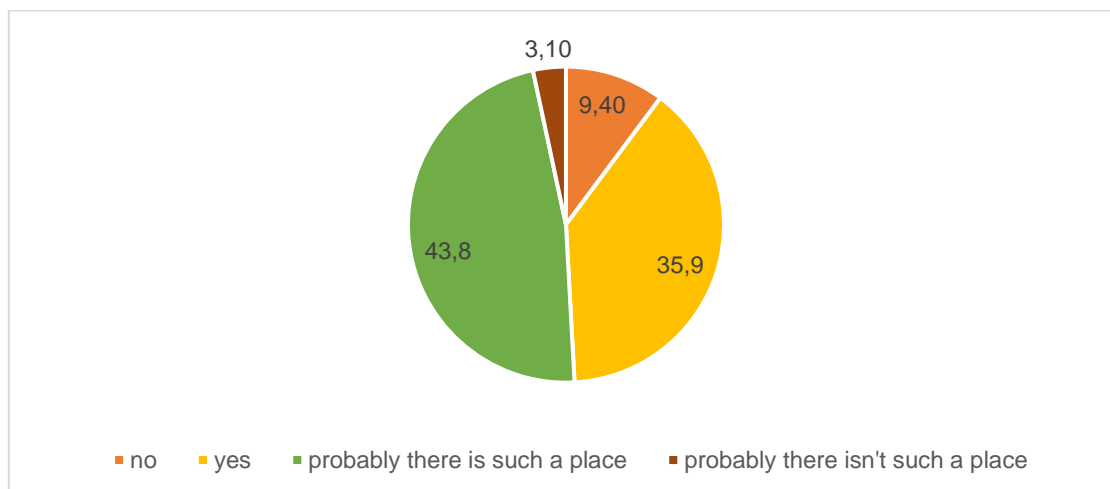


Figure 37. The availability of a place for organizing civic-related events for free in Open Jazdow

Interest in local activities. Respondents were interested in community affairs and they were systematically searching for news about the community. Many respondents (57.8%) showed interest in local issues by declaring they searched for information regarding their neighbourhood in local press (online or on paper).

Types of activities. Respondents were highly active and interested in their community life. On the macro level, the majority of respondents (87.5%) took part in last local election. On the local level, they were also interested in participating in different types of events that took place within the neighbourhood community of Open Jazdow.

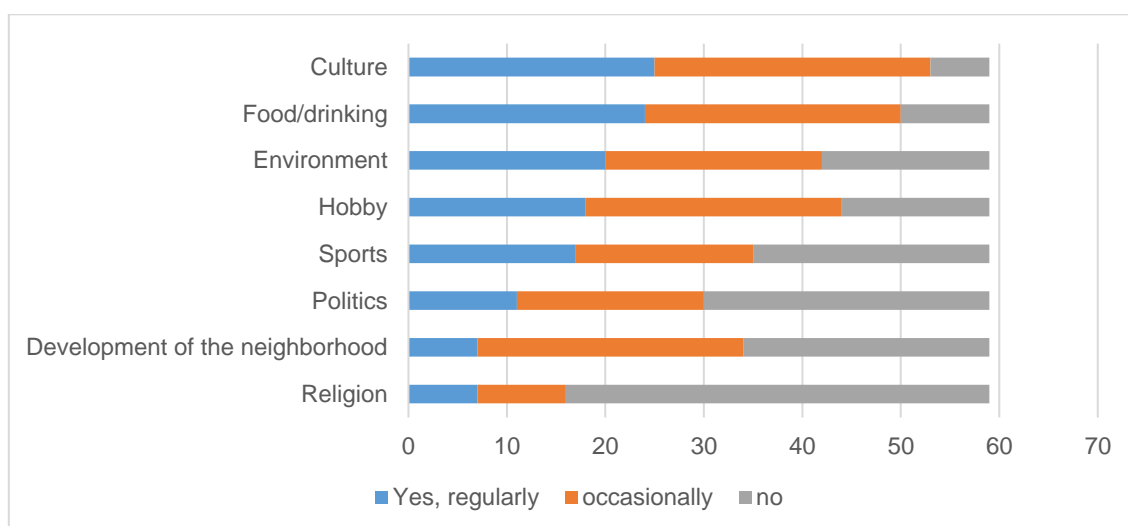


Figure 38. Participation in different types of activities in the neighbourhood within last 12 months in Open Jazdow.

Multiple choice answer

Respondents reported that they most frequently participated in cultural activities, events related to food, environmental activities and hobbies. They participated in sports and politics at a slightly lower rate. Activities that attracted the least people were those related to politics, development of the neighbourhood and religion.

Participation constraints. Some of our respondents declared that they did not participate in activities around the Open Jazdow. The main reason for non-participation was lack of interest in the events happening in the neighbourhood and lack of time.

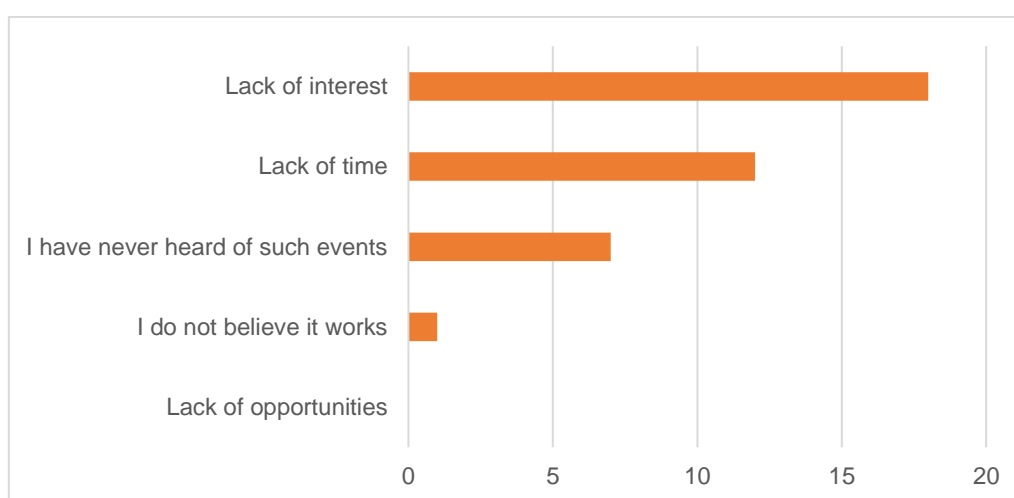


Figure 39. Reasons for not participating in activities around Open Jazdow. Multiple choice answer

Evaluation of the heritage site

Description of respondents

Fifty visitors of the Open Jazdow took part in the survey. The majority of them were in two age groups – 25 to 34 and 35 to 44 years old. Most respondents were women (34 women compared to 10 men, 6 people did not provide an answer to this question) with post-secondary or university education level (68%).

Financial situation of the respondents was rather good. Only 10% answered that they had significant trouble in making ends meet, and 54% said they had no problem in that area. Most the respondents were also employed or self-employed, working in areas such as research (13 respondents), art (8 respondents), new

RESPONDENTS



- Are mostly **women**
- Age group: **25-44**
- Have **a higher education degree**
- Are **employed or self-employed**

technologies (7 respondents) and media (6 respondents). Less common answers were also architecture (4), environment protection (4), education (3), finances (2), administration (2) and retail (2). Other respondents were working in travel industry, local services, law and medicine.

96% (48) of all respondents lived in the same district as Open Jazdow or in the city of Warsaw and only one came from another part of the country.

Means of transport

Most respondents (82%) took less than an hour to get to Open Jazdow from where they lived; over one third (34%) lived within a walking distance of the place.

Respondents used different means of transport. 36% said that they reached the place solely on foot and 36% came by public transport. 32% used some kind of soft mobility transport (bicycle, electric vehicles) and only 12% came by car.

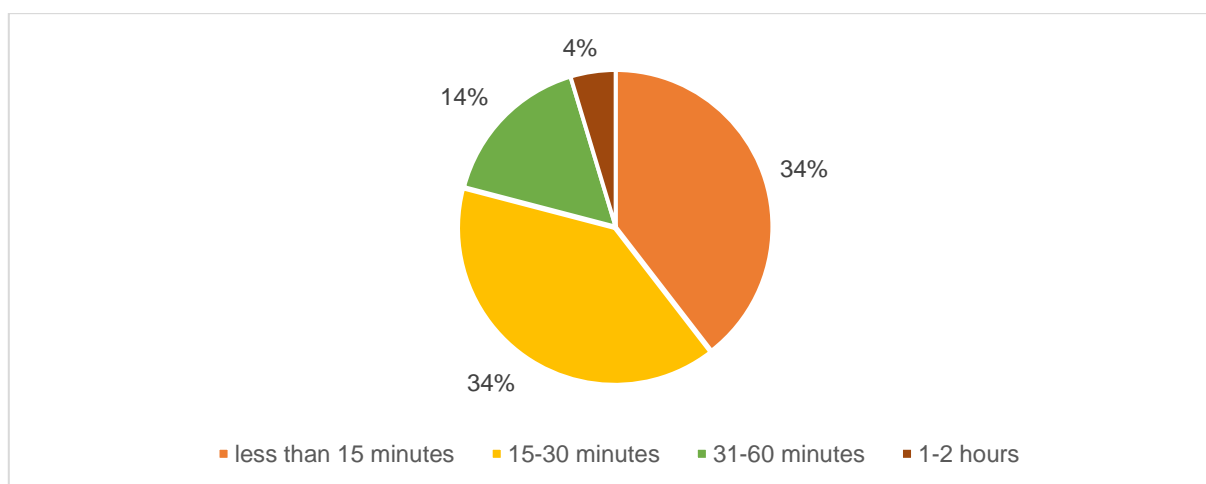


Figure 40. Travel time to Open Jazdow from home

Diversity and accessibility

The respondents' opinions on diversity and accessibility of the place were measured on a scale from 1 to 5 points. Open Jazdow was considered to be a fairly friendly place.

The place was assessed as good for tourists (4.0 points) and very good for local residents (4.6 points out of 5), which might indicate that the touristic activity in the area does not affect the local community. Moreover, Open Jazdow was also considered to be a place adding to the diversity of local activities (4.3 points). At the same time, it was perceived as a place accessible to everyone (4.2 points). In the opinion of the respondents, local entrepreneurs could find this place as an average location to run their businesses (3.1 points), though there was a fairly large group of respondents (31.8%) who thought it would be a very good place to run a business and the group that thought it is not the case was smaller (22.7%).

Activities in Open Jazdow

In general, Open Jazdow was appreciated mostly for aspects connected to community activities and social meetings (36 out of 50 respondents – 72%), experiencing nature and scenic beauty (70%), fresh air (66%), relaxation (66%) and leisure time activities (62%). Respondents also liked the fact that it's a place that provides educational activities, allows for observing animals and birds (54% of respondents pointed it as their preferred activity on the site). Many respondents thought it was a good place to meet with friends and family (50%). The area was also considered by the respondents as a good place to engage with cultural heritage (44%).

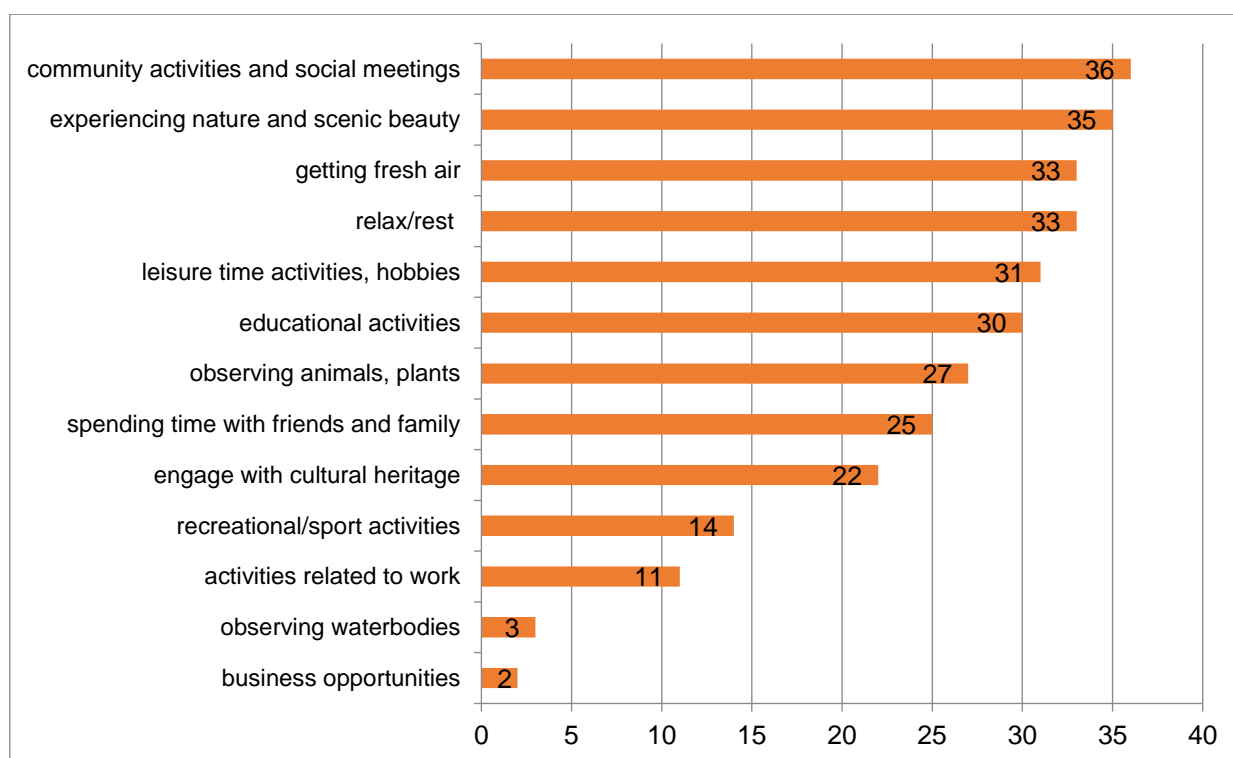


Figure 41. The most favourite activities in the Open Jazdow, multiple choice answer

On average respondents considered Open Jazdow to be a very good place to meet with other people (4.3 points out of 5) and relax (4.6 points). It was considered a very safe place (4.4 points), in which people can be trusted (4.1 points).

Learning opportunities in the Open Jazdow

Most respondents evaluated Open Jazdow as a good place for learning new things (4.4 out of 5 points). It was considered to be an area that inspires creativity (4.5 out of 5 points) and is intellectually stimulating (an average of 4.3 points).

Social value

Cultural heritage sites can be important to people for different reasons. Some will appreciate the beauty of it, others will focus on their economic potential or ecological value. In the case of Open Jazdow, we measured whether it was a place that had special value for the respondents and if yes, why.

The respondents considered the area a beautiful and special place. The meaning of Open Jazdow in their personal lives was quite high (3.9 out of 5 points) – maybe some significant events happened in the area, so they had reason to value it as an especially important place in their lives. Certainly, the place was making people proud (4.4 points) and for some of them it was an important part of their own history – they felt it connected them to their roots (32% of respondents stated it reminded them of their roots). The park seemed to make people reflective; many considered it a spiritual place (3.9 points).

Moreover, the area reminded people of the history of the neighbourhood (4.4 points), but not as much about the history of the country (3.8), which is not surprising, considering that it is a fairly unknown local landmark.

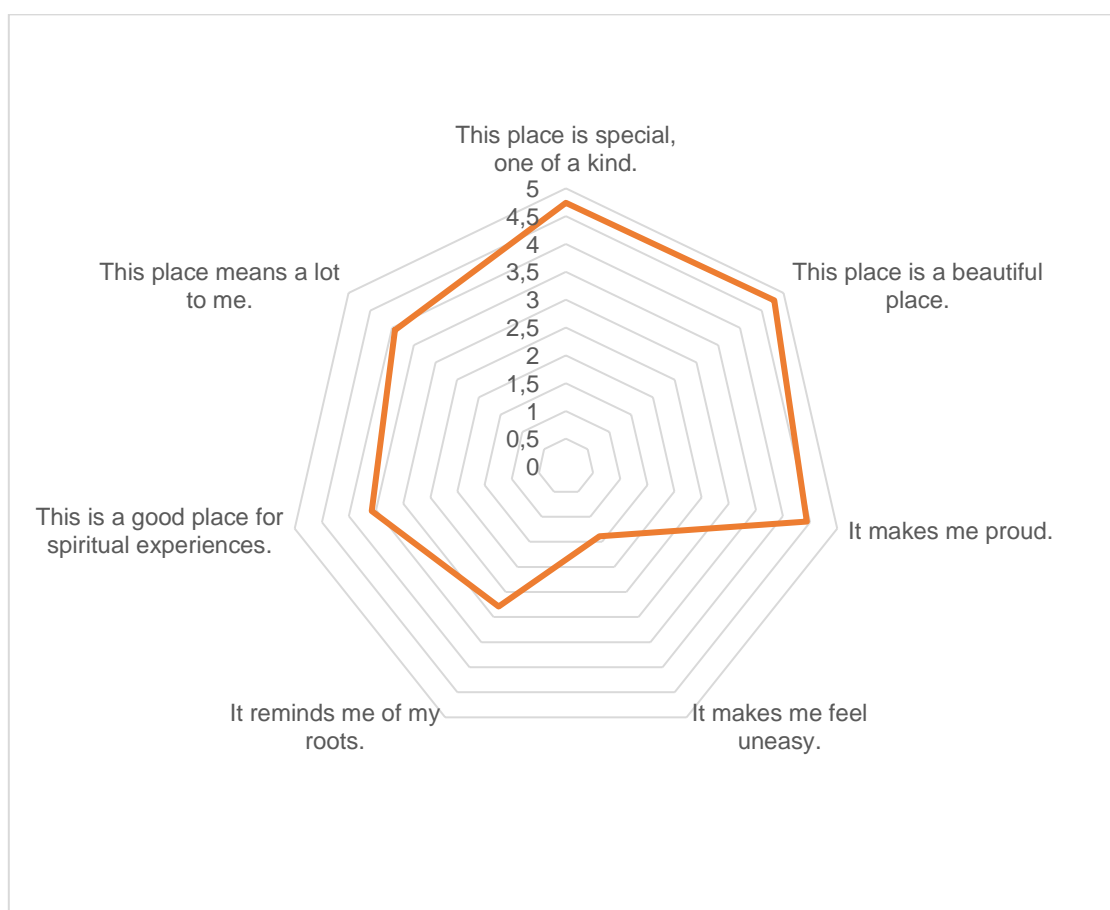


Figure 42. Social value of the Open Jazdow on a scale of 0-5 points

In general, our respondents felt that the area is a place worth protecting and evokes positive feelings. As we can see on the chart above, very few people felt uneasy there.

Emotion

The visit to the Open Jazdow elicited mostly positive emotions in respondents. As we can see on the chart below, people felt mostly relaxed, curious and pleased or happy when visiting the place. For many the visit was exiting or engaging. Almost none of the respondents experienced negative emotions – it didn't make them sad, frustrated or bored.

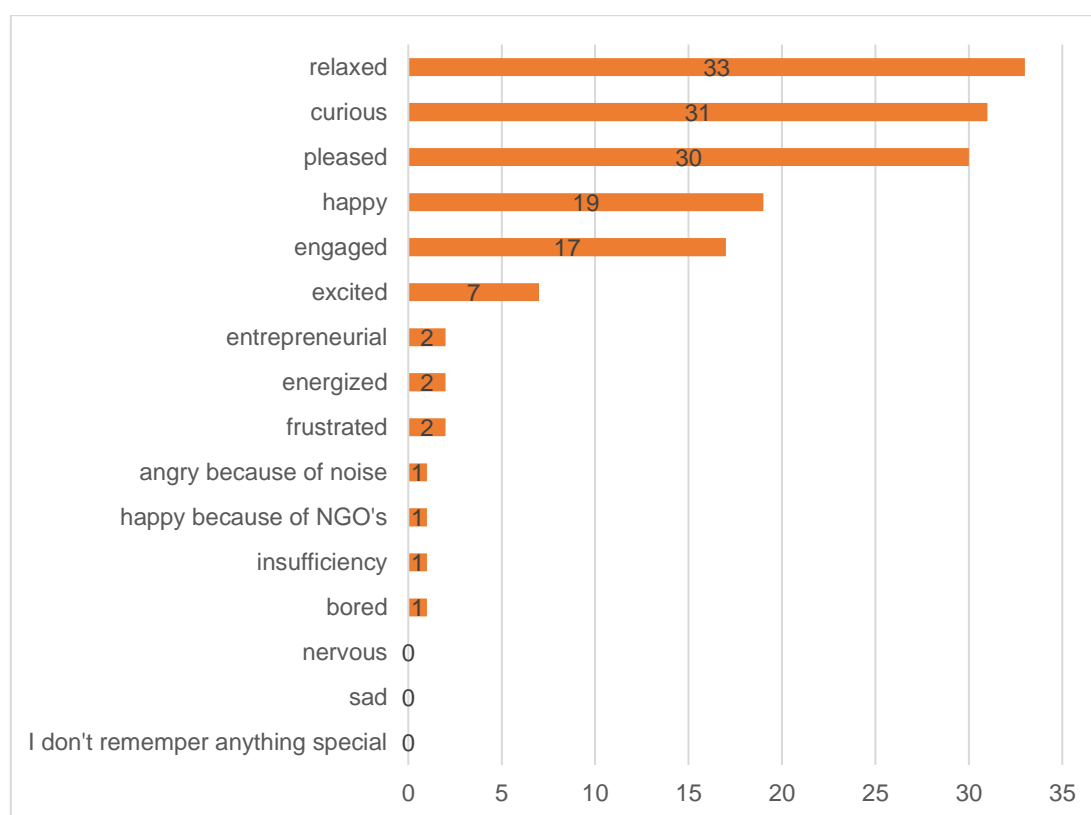


Figure 43. The emotions elicited by the visit in the Garden in Open Jazdow, multiple choice answer

The source of enjoyment

In the Open Jazdow, respondents declared that trees, greenery, atmosphere, quietness and clean air were the most enjoyable characteristics of the place. The landscape and shade were also considered important. Respondents appreciated the company of other people and networking opportunities. The sights and contact with art were considered important, as well as the fact that this is a place with history.

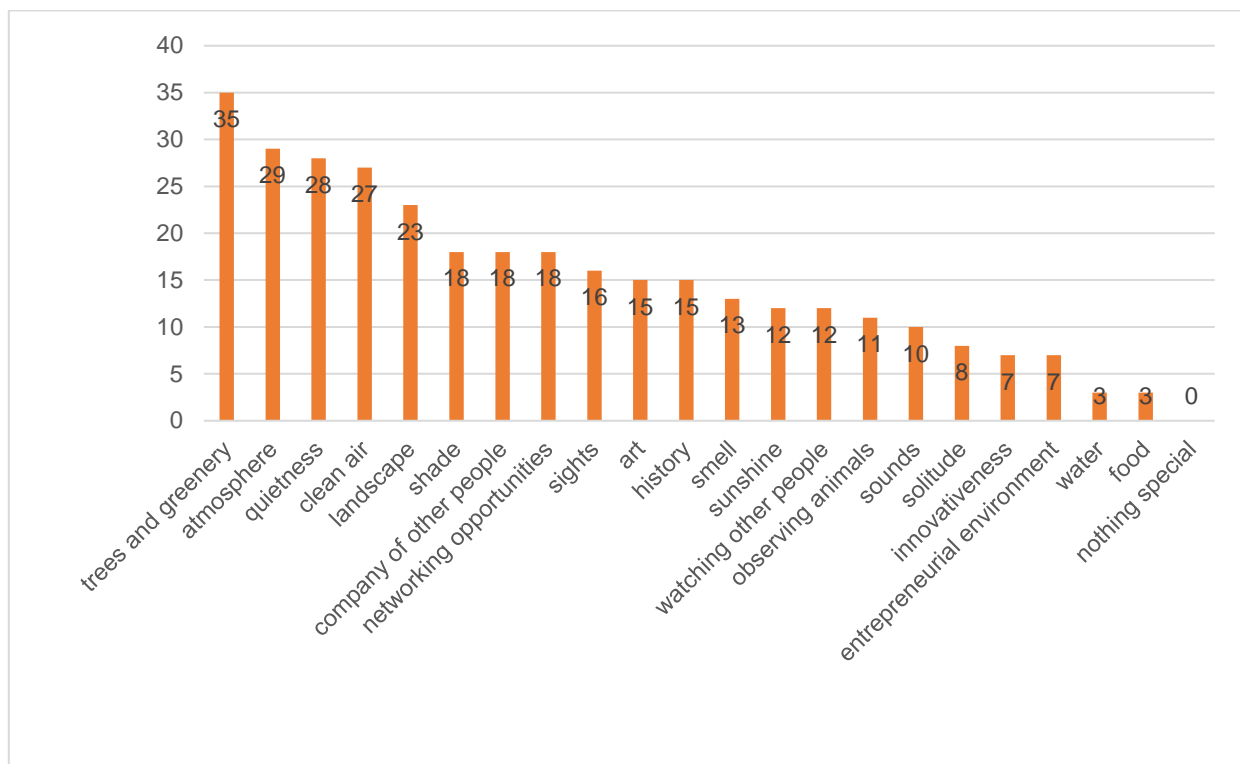


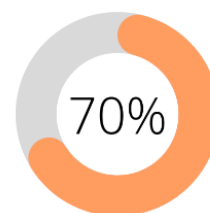
Figure 44. Sources of enjoyment in Open Jazdow, multiple choice answer

Satisfaction

As the Open Jazdow recently underwent a process of renovation, we asked the respondents if they noticed changes in the area. 70% of the respondents noticed them. In the group that noticed the changes, the process was evaluated very positively (4.5 out of 5 points).

The Open Jazdow was considered a great asset to the neighbourhood, which would be perceived as less attractive if the place disappeared (4.8 out of 5 points). This is important, because the general opinion of the neighbourhood varied, with some respondents pointing out that it is not as well-cared for as it could be (3.9 out of 5 points).

Our respondents said that they would recommend the Garden to their friends (4.7 points), but much less to the entrepreneurs looking for a place to set up a business (2.7 out of 5 points), which might mean that they associate this place with beauty and relaxing, but can't see its economic potential.



Yes, I've noticed the change.

General expectations from adaptive reuse of built heritage – who should do it and how should it be implemented

Many of our respondents would be willing to spend money on goods and services in places like Open Jazdow (4.1 points). To understand why this was the case, we tried to establish who – according to visitors – should be responsible for keeping the cultural heritage alive. As we can see below, in our respondents' opinion, **the local municipality, experts and local community** – actors that have the biggest knowledge about the local context – are the entities that are most eligible for this job, while rich people, big businesses and EU institutions, which probably have the lowest level of knowledge about the local cultural heritage sites – are considered to be the least eligible. It's also interesting that local entrepreneurs were not considered to be eligible for the job, even though they would probably profit from the fact that there is a cultural heritage site in the area. The respondents felt that local community should be involved in the adaptive reuse process rather strongly (4.5 out of 5 points). It can be concluded that local community is eager to ensure their right to voice their opinion in adaptive reuse process and might be unwilling to give away control over cultural heritage to private hands (rich people and big companies).

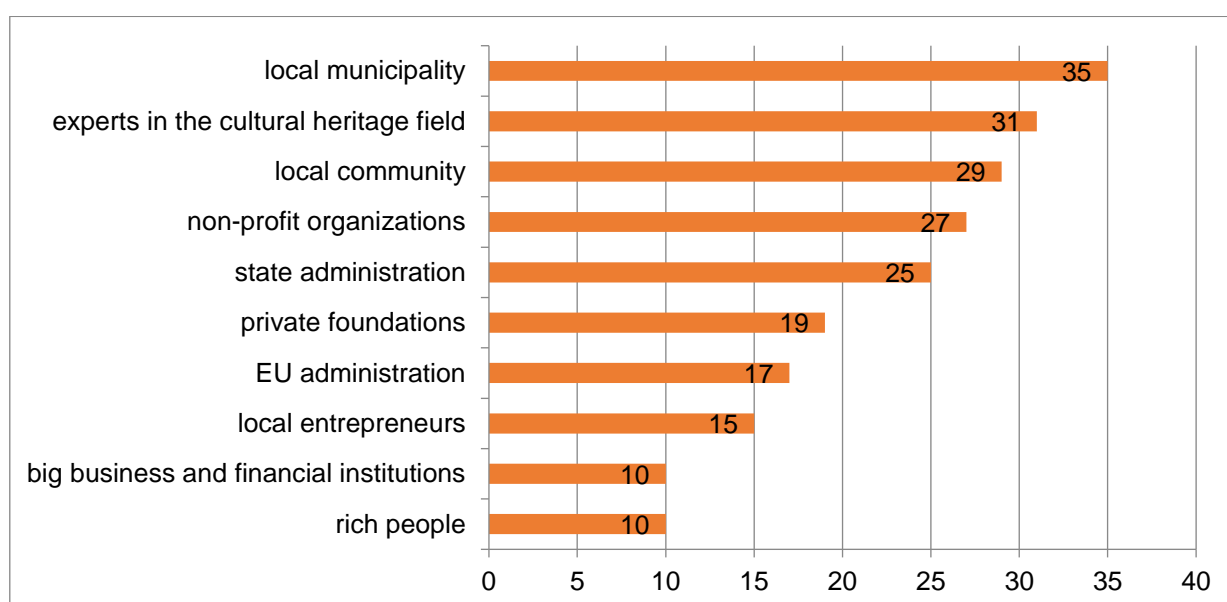


Figure 45. Who should be responsible for keeping cultural heritage alive in Open Jazdow? Multiple choice answer

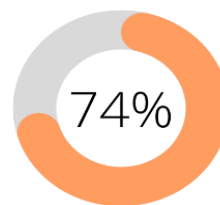
For our respondents it was important that the renovation process uses the resources efficiently and creates as little waste as possible (4.7 points) as well as that strives to create jobs (4.0 points).

Recommendations

In the opinion of most of our respondents, Open Jazdow could be further improved to offer new social and cultural activities, open to the wider public. **Mostly the respondents suggested that the houses in the area should be renovated (many of them are in poor shape)**, and the area should be better taken care for (cleaner, more pavements, more benches etc.). Upgrading the area in terms of quality of flora (adding more plants) as well as making sure that information tabs are clear and well-displayed was also mentioned.

Adding services, like places where visitors could eat or drink (for example vegetarian food) in or around the area would be welcomed. Respondents suggested that there should be more information about both the history of the place and events happening there. In the opinion of some of the respondents, the space could allow for **more cultural and educational events for different age groups**, that would allow for meeting new people more easily.

Some respondents also mentioned the **question of finances**, suggesting a new financial model for social activities or allowing for more money from the taxes to be transferred directly into the Open Jazdow area.



Yes, this place should be improved.