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Be.CULTOUR
Beyond cultural tourism

Be.CULTOUR:

"Beyond CULtural TOURism: human-centred innovations for sustainable and circular cultural tourism"

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Design of systemic policy-oriented Be.CULTOUR dashboard

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Author list:	Antonia Gravagnuolo, Francesca Buglione, Ludovica La Rocca, Maria Cerreta, Pasquale De Toro, Luigi Fusco Girard
Contributors:	Maria Tartari (CNR), Evdokia Balamou (ANETEL), Artemis Yordamli, Sevina Floridou, Eleni Panayiotou, Costas Orountiotis (LAONA), Vanessa Glindmeier, Andrew Hunter (Historic Environment Scotland), Patrizia Riganti (University of Glasgow), Viviana Rizzuto, Anna Salvagio, Desiree Li Bassi (Cooperativa di Comunità Identità e Bellezza, Sciacca), Antonio Nicoletti, Rossana Mancaniello, Amodio Parmentola (APT Bas)
Reviewers:	Peter Nijkamp, Karima Kourtit (OUNL)

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Dissemination Level

☒	**PU:**	Public
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Abstract

This document presents a policy-oriented Dashboard based on multidimensional and spatial evaluation framework to assess sustainable and circular tourism performances in touristic destinations. This framework is designed to assist stakeholders and decision-makers in making effective choices that promote sustainable regional development through cultural tourism. It aims to transform lesser-known and remote heritage sites into sustainable, circular, and human-centered cultural tourism destinations. The policy-oriented Dashboard - Local Impact Indicators for Circular Cultural Tourism is based on urban metabolism assessment method, analysing the flows of people, materials, energy, water and wastes, identifying cultural tourism dimensions and indicators in the perspective of the circular economy and circular city/territory policy models focusing particularly on the human dimension.

The competitiveness of the tourism sector is intrinsically linked to its sustainability, as the quality of tourist destinations depends on their natural and cultural environments and community integration. Sustainable tourism involves responsible use of natural resources, environmental impact management, clean energy use, heritage protection, job quality and sustainability, local economic benefits, and customer care. Addressing these challenges requires intelligent decisions based on comprehensive information from specific indicators that go beyond simple metrics like visitor numbers or daily expenditure. For these reasons, evaluation in tourism is crucial for assessing the efficiency and effectiveness of strategic decisions both short-term and long-term, and for strengthening interinstitutional and intersectoral relationships. A human-centered evaluation approach focuses on people's needs to enhance well-being, health, and quality of life, requiring dynamic, interactive, iterative, and participatory processes.

The Be.CULTOUR Dashboard was developed from a review of scientific literature on sustainable and circular tourism and major international tourism assessment tools (ETIS, EU Tourism Dashboard, UN Tourism Data Dashboard, UNESCO World Heritage Sustainable Tourism Toolkit, OECD Tourism Statistics, etc.) essential for identifying the dashboard's dimensions, criteria, and indicators. It was designed also in synergy with on-going European projects like SMARTCULTOUR, IMPACTOUR and CEnTOUR.

The Be.CULTOUR Dashboard is a self-assessment framework allowing users to select indicators and collect data with provided tools. It supports the evaluation of policy strategies through a user-friendly, multi-dimensional interface that guides users in defining the impacts of tourism strategies over time. The research team revised existing context and impact indicators (see Deliverable 1.2)

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and developed the Dashboard as an operational tool to visualize tourism strategy impacts, including specific indicators, data collection tools, reference targets, and GIS capabilities.

Tourism development and planning are increasingly complex, requiring organizations and communities to balance economic, social, and environmental demands for sustainable development. GIS is crucial for sustainable tourism development, enabling conflict exploration, impact assessment, and decision-making support. It plays a key role in auditing environmental conditions, evaluating site suitability, identifying conflicting interests, and modeling relationships. The concept of the Digital Twin (DT) is pivotal for sustainable urban policy development, and the presented indicators can be a reference for developing DTs for circular tourism regions (see Deliverable 1.5).

The Dashboard was validated and tested in mirror regions (spatial data collected in Basilicata, selected indicators collected in Sciacca, selected indicators data collected in Scotland, selected indicators collected in rural Larnaca).

Acknowledgements: **Antonia Gravagnuolo** coordinated the research, identifying the overall evaluation framework, supervising and coordinating the selection of literature sources and data sources, contributing to indicators selection and Dashboard structuring, cultural landscape mapping and experimentations in pilot and mirror regions. **Francesca Buglione** contributed to literature review, indicators selection, Dashboard structuring, GIS mapping, report writing, scientific publications preparation, coordination with pilot and mirror regions, overall writing and review of the Deliverable. **Ludovica La Rocca** contributed to literature review, indicators selection and Dashboard structuring. **Maria Cerreta** and **Pasquale De Toro** coordinated the working group of UNINA, and contributed to indicators selection and Dashboard structuring. **Luigi Fusco Girard** contributed as co-coordinator of the Project, supervising the evaluation framework and indicators operationalization.

Contributors collaborated in the experimentation and structuring of data collection tools, data collection in different pilot areas and elaboration of specific thematic reports included as Annex.

Partners involved in the document

Participant No	Participant organisation name	Short Name	Check if involved
1 Coordinator	CONSIGLIO NAZIONALE DELLE RICERCHE, Institute of Heritage Science	CNR	X
1.1	University of Naples Federico II – DiARC (Linked Third Party)	UNINA	X
2	European Regions Research and Innovation Network	ERRIN	
3	ICLEI Europe – Local governments for Sustainability	ICLEI	
4	Iniziativa Cube S.r.l.	INI	
5	Uppsala University	UU	
6	Haute Ecole ICHEC - ECAM - ISFSC	ICHEC	
7	Open University of the Netherlands	OUNL	X
8	APT Basilicata	APT-BAS	X
9	Diputación Provincial de Teruel	PGT	
10	Larnaca and Famagusta Districts Development Agency	ANETEL	X
11	Laona Foundation	LAONA	X
12	Västra Götaland region	VGR	
13	Stalna Konferencija Gradova I Opstina	SCTM	
14	Agentia Pentru Dezvoltare Regionala Nord-Est	NERDA	
15	Verde e Moldova	VEM	

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1. Description of the Project

Be.CULTOUR stands for "Beyond CULtural TOURism: heritage innovation networks as drivers of Europeanisation towards a human-centred and circular tourism economy". It expresses the goal to move beyond tourism through a longer-term *human-centred* development perspective, enhancing cultural heritage and landscape values.

Cultural tourism entails opportunities but also risks. Tourism as a whole can be a highly volatile economic sector. If not managed properly, cultural tourism can also easily turn into a "value extractive" industry, generating negative environmental, social and cultural impacts on local communities and ecosystems. This project will develop specific strategies to promote an understanding of cultural tourism, which moves away from a "stop-and-go" consumer-oriented approach towards one that puts humans and circular economy models at its centre, paying attention to nature, communities and cultural diversity. "Place", intended as the *genius loci*, the ancient spirit of the site expressing its "intrinsic value" and "people" as co-creators of its uniqueness, culture, art, tradition, folklore, productivity, spirituality, as well as its "time space routine", are the focus of Be.CULTOUR, which aims at realizing a longer-term development project for the pilot areas involved.

The overarching goal of Be.CULTOUR is to co-create and test sustainable human-centred innovations for circular cultural tourism through collaborative innovation networks/methodologies and improved investments strategies. Targeting deprived remote, peripheral or deindustrialized areas and cultural landscapes as well as over-exploited areas, local Heritage innovation networks will co-develop a long-term heritage-led development project in the areas involved enhancing inclusive economic growth, communities' wellbeing and resilience, nature regeneration as well as effective cooperation at cross-border, regional and local level.

Wide and diversified partnerships of stakeholders from 18 EU and non-EU regions of Northern-Central and Southern Europe, the Balkans, the Eastern neighbourhood and the Mediterranean will be the driving force of the project. A community of 300 innovators (which includes regional authorities and municipalities, clusters and associations, museums and tourist boards, entrepreneurs, chambers of commerce, citizens, researchers, practitioners as well as project partners) in 6 pilot regions will co-create innovative place-based solutions for human-centred development through *sustainable* and *circular* cultural tourism.

Collaborative "Heritage innovation networks" will be established in 6 European deprived remote, peripheral and deindustrialised areas and cultural landscapes identified as "pilot innovation ecosystems": committed to the project's objectives, they have defined clear cultural tourism-related

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challenges requiring innovation that will serve as the basis for the collaboration with the 16 additional "mirror innovation ecosystems". Mutual learning and up-scaling of business solutions will be the objectives of the collaboration between pilot and mirror ecosystems, building the sustainability of the project's results beyond its lifetime.

By adopting a human-centred quadruple/quintuple helix approach to co-design, Be.CULTOUR will result in 6 community-led Action Plans, 18 innovative human-centred solutions and 6 close-to-market prototypes of new cultural tourism integrated services and products: these will directly contribute to inclusive economic growth, communities' wellbeing and resilience, and nature regeneration in pilot and mirror regions, stimulating effective cooperation at a cross-border, regional and local level. The core partners of the Consortium will progressively build Be.CULTOUR sustainability by broadening the interregional collaboration while anchoring it to relevant EU initiatives in the academic, business and institutional realms.

1.1 Be.CULTOUR specific objectives

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

Objective 1 – To assess the impacts and market potential of sustainable and circular cultural tourism at national, regional and local level through multidimensional quantitative and qualitative indicators, innovative statistical methods and advanced smart data management systems;

Objective 2 – To build a Community of Practice of 6 pilot regional ecosystems and a Community of Interest with 16 "mirror ecosystems" in EU and non-EU countries actively engaged in knowledge-sharing and exploitation of Be.CULTOUR's approach, methodology, tools, and innovative solutions for sustainable and circular cultural tourism;

Objective 3 – To co-develop 6 Action Plans for sustainable and circular cultural tourism by establishing collaborative "Heritage innovation networks" in 6 pilot regions in Northern-Central and Southern Europe, the Balkans, the Eastern neighbourhood and the Mediterranean;

Objective 4 – To co-develop, prototype and test human-centred and place-specific product, process and service innovations for sustainable and circular cultural tourism in pilot heritage sites;

Objective 5 – To provide policy recommendations for more effective use of European Structural Investment Funds (ESIFs) and other EU funds to support cultural tourism innovation ecosystems in pilot and mirror regions, and develop a proposal of evolution of ESIFs through synergies with other public funds;

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Objective 6 – To contribute to deepen cultural Europeanisation through information and educational activities focused on the European history, identity and culture expressed in tangible and intangible cultural heritage and cultural landscapes, developing European Cultural Routes and European Heritage Labels in pilot heritage sites.

All partners have wide experience in developing and testing the Be.CULTOUR proposed approach, methodology and tools, ensuring the effective and time-constrained achievement of all the above-mentioned specific goals.

2. Introduction

This document presents the sustainable cultural tourism impacts assessment framework based on urban metabolism developed in the Be.CULTOUR project to support stakeholders and decision-makers taking effective choices towards sustainable regional development through cultural tourism, focusing on turning less-known and remote heritage sites into sustainable, circular and human-centred cultural tourism destinations.

The starting point is the consideration that sustainable regional development can be achieved through higher self-sufficiency and better management of environmental resources (energy, water, soil, materials, biodiversity) and reduction of wastes and greenhouse gas emissions, but also the recovery, reuse and regeneration of cultural heritage, particularly considering abandoned and underused heritage sites and cultural landscapes, and intangible heritage. This leads to the integration of a "cultural" and immaterial dimension within the circular economy, as highlighted also by previous European research projects (CLIC project - Circular models Leveraging Investments in Cultural heritage adaptive reuse, 2017; Cirtoinno project - Destination: A circular tourism economy, 2018; "Herit-data" project, 2018; CEnTOUR project, 2020).

To describe territorial circularity – at city or regional scale, the urban metabolism (UM) concept is introduced. The urban metabolism framework is employed in regional studies to enable the assessment of efficiency in the use of territorial resources, considering the "input" and "output" of materials, energy, wastes and emissions in a specific territorial area. Moreover, the concept of "circular metabolism" introduces the need of reducing the waste of materials, energy, water, soil and other natural resources in the territorial area, promoting the re-generation of resources and the collaboration between diverse actors to "close the loops", using residual wastes and energy of diverse production and consumption processes for new cycles ("cradle-to-cradle").

However, urban metabolism studies currently consider only environmental resources, while cultural resources, tangible and intangible, human and social capital could be integrated. While it is clear that the reduction of negative environmental impacts of human activity is key for sustainable regional development and to contribute to address climate change, the broader concept of sustainability is not limited to environmental aspects as it includes the social, economic and also cultural dimension, as well as the governance dimension in the territory.

Thus, the Be.CULTOUR project develops an assessment framework which includes cultural resources and cultural tourism flows as integral part of the urban metabolism of cities and regions, applicable to the target pilot heritage sites.

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The results will provide decision-makers and stakeholders with better understanding of diverse flows of tangible and intangible resources, supporting more effective decisions towards sustainable, circular and human-centred cultural tourism destinations.

2.1 Document structure

This document is structured as follows:

- Section 1 introduced the Be.CULTOUR project aims and overall approach;
- Section 2 presented the specific objective of this report, describing the rationale of the Sustainable Tourism Local Impact Indicators Dashboard;
- Section 3 provides an overview of the Be.CULTOUR approaches for Circular Cultural Tourism assessment framework based on urban metabolism concept as developed in scientific literature, linked to the circular city/region model, highlighting the need of a multidimensional urban metabolism framework related to cultural resources and of a impact assessment approach in a human-centred perspective;
- Section 4 provides an overview of the self and co-assessment for impact design touristic strategies;
- Section 5 identifies a the be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism with a set of multidimensional criteria and indicators, aiming at assessing the impacts of cultural tourism for the sustainable development of cultural destinations;
- Section 6 drafts discussion and conclusions.

3. Be.CULTOUR approaches for Circular Cultural Tourism Assessment Framework

In recent decades, addressing unprecedented environmental, climatic, and sustainability challenges - such as biodiversity loss, climate change, resource use, and pollution -has become imperative. These issues are evident not only in urban planning but also in the tourism sector, necessitating a shift from the linear tourism paradigm towards more sustainable systems. The World Tourism Organization (WTO) defines sustainable tourism as "tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities" (UNEP & UNWTO, 2005). Sustainable tourism should aim to: manage environmental resources effectively, preserve vital ecological processes, and promote biodiversity and the conservation of natural heritage; preserve the tangible and intangible cultural heritage and traditional values of host communities, respect their socio-cultural uniqueness, and promote intercultural tolerance and understanding; ensure long-term economic viability, equitable distribution of socio-economic benefits among all stakeholders, stability of employment and income opportunities, social services for host communities, and poverty reduction (UNEP & UNWTO, 2005). To achieve long-term sustainability, the tourism industry should balance the different sustainability components (environmental, economic, and socio-cultural dimensions) (Fusco Girard & Nocca, 2017).

The European Union recognizes the relevance of cultural tourism for its economy, society, culture, and ways of living. Tourism and culture are closely interconnected, evolving together and complementing each other (Routes4U Project, 2020). According to the definition adopted by the United Nations World Tourism Organization (UNWTO) General Assembly at its 22nd session (UNDP, 2017), cultural tourism can be defined as "a type of tourism activity in which the visitor's essential motivation is to learn, discover, experience, and consume the tangible and intangible cultural attractions/products in a tourism destination. These attractions/products relate to a set of distinctive material, intellectual, spiritual, and emotional features of a society that encompasses arts and architecture, historical and cultural heritage, culinary heritage, literature, music, creative industries, and the living cultures with their lifestyles, value systems, beliefs, and traditions." Cultural heritage is an asset for tourism, and, in turn, tourism is an opportunity for cultural heritage (Panzera, 2022).

To encourage sustainable tourism that meets the objectives of the UN SDGs, the UN New Urban Agenda, and the EU Urban Agenda, an "integrated management of cultural heritage and tourism activities in partnership with the local community, creating social, environmental, and economic

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benefits for all stakeholders" is necessary (European Commission, 2019). This should be supported by specific criteria and indicators for sustainable cultural tourism directed at destination managers (European Commission, 2017). Therefore, place-based and participatory approaches are essential to investigate the impacts of circular cultural tourism strategies on the identities and sense of belonging of local communities, while also comparing micro-scale practices with European best practices (European Commission, 2022). To achieve sustainable cultural tourism, new approaches and tools aimed at promoting the development of tourist destinations and assessing the production of positive impacts through the application of circular economy approaches to the tourism sector are emerging. The Be.CULTOUR assessment framework is based on the following main concepts: 1) Human-centred design and development; 2) Circular economy in cultural tourism; 3) Urban Metabolism; 4) Sustainable Cultural Tourism (Figure 1). Such approaches, when considered holistically and integrated, can reconfigure the way we perceive the tourism system, particularly cultural tourism, leading to Sustainable Cultural Tourism. To assess the impacts and market potential of sustainable and circular cultural tourism at national, regional, and local levels in remote destinations through multidimensional quantitative and qualitative indicators, these approaches have been combined within the Be.CULTOUR assessment framework.

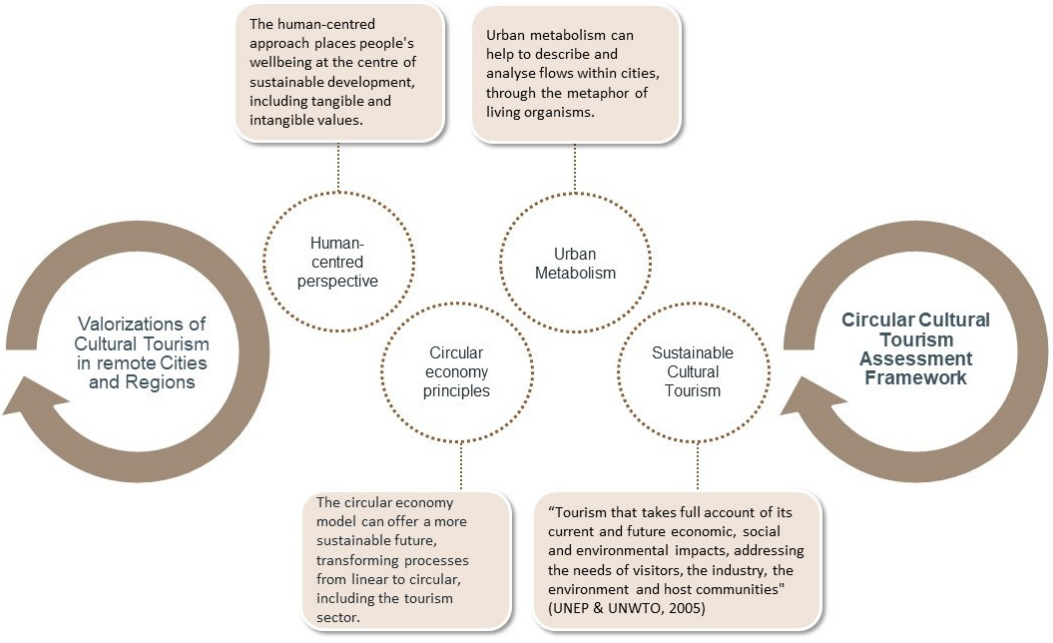


Figure 1 - The Be.CULTOUR framework approaches

Source: Author's elaboration

3.1 Human-Centred design and development

The Be.CULTOUR project embraces this human dimension of sustainable development, focusing on long-term heritage-led strategies for city and territory development through cultural tourism. A human-centred city approach involves urban and territorial planning that considers the multidimensional wellbeing of citizens, fostering their sense of belonging, responsibility, identity, and civic pride. This participatory governance and human-centred design enable citizens to become active participants, transforming spaces into meaningful places. The challenge lies in promoting economic and technological development without fracturing community bonds, achievable through stakeholder involvement in co-creating services and products. This empowers individuals to become active shapers, makers, and co-creators of their evolving city (European Commission, 2020). It focuses on the 'user', engaging final users in the co-design and co-development phases to ensure their needs, wants, expectations, and limitations are extensively considered. In Be.CULTOUR project, the human-centred approach places real people and communities, rather than consumers, at the center of co-developing new services, products, policies, and practices tailored to long-term integrated development strategies. Furthermore, the human-centred approach is significant for social impact assessment in the tourism sector, particularly concerning human rights.

3.2 Circular Economy in Cultural Tourism

The circular economy aims to transform the economy by making it regenerative, minimizing resource use, and avoiding waste (Dişli & Ankaralıgil, 2022). The fundamental principles of the circular economy (systems thinking, optimization, efficiency, collaboration, transparency, responsibility, inclusion) can also be applied to the tourism sector. Due to its complexity, cultural tourism can have a significant impact on society, the environment, and the economy. Indeed, the tourism sector is not only an economic activity but also a blend of culture, nature, and historical heritage, contributing to the uniqueness, distinctiveness, and competitive potential of each destination (Abouelmagd, 2023). Without the necessary balance and attention to these aspects, tourism can harm or degrade the quality of life of local communities and exert pressure on natural resources. Therefore, new models must be designed to generate well-being and contribute to ecosystem and human health, both locally and globally. Circular tourism can be defined as a model capable of creating a virtuous cycle to achieve objectives and provide services without wasting the planet's non-renewable resources, such as raw materials, water, and energy (Girard & Nocca, 2017). Furthermore, circular tourism proposes a model in which each actor involved adopts an eco-sustainable approach (Sgambati et al.,

2021). By applying circular economy principles, tourism and hospitality operators can accelerate the growth of their activities and advance conceptually and practically to provide a more sustainable experience for all stakeholders involved (Van Rheede, 2012). Circular tourism refers to its capacity to trigger and stimulate circular flows, aiming to reconcile the tourism sector with sustainable resource management (Neves & Marques, 2022). Many definitions of Circular Tourism have been proposed from scientific literature: according to the Ecobnb Guide (Palmitessa, 2019), it is an economic system that seeks to make the tourism sector, in all its manifestations, capable of supporting the economic development of tourist destinations without risking planetary sustainability by reducing the use of energy factors and natural resources, reusing waste generated in activities either directly as products or as components of other products, and using waste as raw material after a recycling process. According to Naydenov (Naydenov, 2018), its objective is to produce goods and tourist services while significantly limiting environmental impact (including the consumption and waste of non-renewable energy sources). Circular tourism proposes a model in which each tourism actor (traveler, host, tour operator, supplier) adopts an eco-friendly approach (Naydenov, 2018). Generally, it is a model capable of creating a virtuous circle, producing "goods and services without wasting the limited resources of the planet, which are raw materials, water, and energy" (CEnTOUR project, 2020). Promoting the principles of the circular economy in heritage rehabilitation and conservation initiatives is crucial for the sustainable continuity of this sector (Rodríguez et al., 2020). Although studies on implementing circular economy principles for the adaptive reuse of cultural heritage (Fusco Girard & Gravagnuolo, 2017) and sustainable tourism (Manniche et al., 2017; Patti & Messina, 2019; Grah et al., 2020) are already underway, innovative strategies for circular cultural tourism that can adapt to the diverse supply and demand conditions of destinations with varying levels of tourism development have yet to be developed and tested. These varying conditions also present different challenges for sustainable heritage management and development. In particular, for remote or lesser-known cultural destinations, it is crucial to preserve the existing values of authenticity and integrity while ensuring tourism development and revitalization dynamics that bring benefits in terms of new economic flows and improved quality of life and welfare conditions (Commission of the European Communities, 2007). Sustainable and circular tourism practices promote the idea that responsibility refers to both visitors and local communities, ensuring the protection and preservation of the natural environment and cultural heritage and contributing to a better quality of life. The role of “sustainability” in a tourism development strategy is to protect and reveal what already exists (“reuse, recycle, renew”) rather than to consume. In these terms, cultural

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routes can serve as valuable tourism resources that can attract visitors and generate economic activity while protecting environmental and cultural heritage (Fafouti et al., 2023).

3.3 Urban Metabolism for Circular Cities and Regions

To describe territorial circularity at the city or regional scale, the concept of urban metabolism (UM) is introduced. The urban metabolism framework is used in regional studies to assess the efficiency of resource use by examining the "input" and "output" of materials, energy, waste, and emissions within a specific area. Furthermore, the concept of "circular metabolism" emphasizes reducing waste and promoting the regeneration of resources, fostering collaboration between diverse actors to "close the loops," and using residual waste and energy from various production and consumption processes for new cycles ("cradle-to-cradle").

However, traditional urban metabolism studies typically focus only on environmental resources, overlooking cultural resources, tangible and intangible, as well as human and social capital. While reducing the negative environmental impacts of human activity is crucial for sustainable regional development and addressing climate change, sustainability encompasses social, economic, cultural, and governance dimensions.

Therefore, the Be.CULTOUR project develops an assessment framework that incorporates cultural resources and cultural tourism flows as integral parts of the urban metabolism of cities and regions. This framework is applicable to the target pilot heritage sites and will provide decision-makers and stakeholders with a better understanding of the diverse flows of tangible and intangible resources, aiding in making more effective decisions towards creating sustainable, circular, and human-centered cultural tourism destinations.

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4. Self and co-assessment for impact design touristic strategies

When seeking a standardized set of indicators to evaluate the effectiveness of circular, cultural, sustainable, and responsible tourism strategies, it was crucial to carefully consider the construction and implementation of these indicators within complex and collaborative evaluation processes. Special attention was dedicated to exploring the methods of self-assessment and co-assessment.

Self-assessment involves an internal evaluation process undertaken by the individuals responsible for implementing the strategies. This process enables the monitoring of progress and the assessment of impacts based on a predefined evaluation model. It is important to note that individuals directly involved in tourism projects may possess an extensive understanding of local processes and dynamics, which could potentially impact the objectivity of their assessments. The described method promotes self-reflection, self-determination, and personal responsibility, fostering a heightened awareness of oneself and one's capabilities (Falchikov & Boud, 1989). According to Patton (Patton, 2003). self-assessment can enhance internal awareness and commitment to change. These attributes are particularly valuable in contexts where the objective is to enhance organizational effectiveness and planned strategies. On the other hand, the co-evaluation, as a multi-actor process, entails the involvement of multiple parties in the evaluation process. This collaborative approach involves jointly defining the evaluation approach and the most pertinent indicators. Commonly observed in educational settings, co-assessment aims to establish a mutually agreed-upon evaluation (Dochy et al., 1999).

The co-evaluation approach promotes shared responsibility and stimulates a sense of ownership among all participants, thereby enhancing the accuracy and relevance of the results (Pawson & Tilley, 1997). Furthermore, ongoing feedback (Topping, 1998) throughout the evaluation process fosters a co-learning dynamic, enabling stakeholders to learn from one another. Co-evaluation serves as a tool for involving users in a constructive manner, requiring them to refine observations, differentiate perceptions, select relevant elements for judgment, and attribute meaning, sense, and value to actions (Tessaro, 2005). Therefore, co-assessment, with its transparent procedures and formative guidance, represents a collaborative approach of considerable interest in establishing a democratic system of assessment that encourages participation and informed decision-making (Gómez-Ruiz & Quesada Serra, 2020).

From this perspective, the approach aligns with a reflexive and adaptive evaluation framework that places the user at the centre. This involves the informal participation of the user in a collective

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reflection on the experience, aimed at understanding its limitations and potential to proceed in a best-shared way.

Conderman (Conderman & Hedin, 2012) delineates four primary phases of a co-assessment cycle within the context of collaborative urban regeneration processes, involving active engagement of stakeholders throughout the process: Co-plan; Co-collect; Co-analyse; Co-reflect. The initial phase encompasses the co-design of the evaluation system, entailing the identification of pertinent criteria and indicators to fulfill the objectives. Subsequently, the "co-collect" phase involves the structured monitoring and analysis of qualitative and quantitative data. The resultant evaluation is then scrutinized in the third phase, "co-evaluate," to disseminate preference rankings and accomplishments among stakeholders. Finally, the "co-reflect" phase provides an opportunity for collective reflection to comprehend motivations, effects of decisions, emergent needs, and serves as a strategic juncture to translate findings into actions that can effectively guide the undertaken strategy. Co-evaluation techniques and tools include documentation of the ongoing process, evaluation interviews with key stakeholders, online and offline evaluation questionnaires, and reflection workshops.

In several European-wide initiatives, self- and co-assessment methodologies have been explored as part of the formulation and execution of sustainable tourism strategies.

In the Canary Islands, a sustainable tourism monitoring and evaluation system was established, engaging residents, tourism enterprises, and local authorities. This comprehensive effort encompassed co-assessment workshops, allowing participants to exchange data and perspectives on the impacts of tourism, thereby contributing to the identification of sustainability metrics and the ongoing monitoring of tourism performance.

The NECSTouR (Network of European Regions for a Sustainable and Competitive Tourism) project was established in 2007 with the aim of creating a network of European regions dedicated to promoting sustainable and competitive tourism. The project focuses on the strategic approach of the 'Five S's of tomorrow's sustainable tourism': Smart destinations, Sociocultural balance, Skills and talent, Safety and resilience, and Statistics and measurability. NECSTouR encompasses 71 members, including 36 regional tourism authorities and 35 associate members, such as universities, research institutes, tourism enterprises, and sustainable tourism associations. The project implemented a co-assessment approach among participating regions, involving self-assessment processes and exchanges of good practices to establish a shared and comparative monitoring system. This system enabled the assessment of the impacts of tourism strategies on economic, environmental, and social dimensions.

The UNESCO Dolomites site has embraced a participatory approach to monitoring the impacts of tourism. Key stakeholders, including local residents, tour operators, and relevant institutions, have actively participated in self- and co-assessment processes and utilized various tools to develop an integrated management plan. This comprehensive initiative involved the collection of data through questionnaires and interviews, and subsequent deliberation of the results in public forums. The outcome has been a shared understanding of the effects of tourism and collaborative solutions to mitigate any adverse consequences.

The EDEN (European Destinations of Excellence) initiative, launched in 2007, is dedicated to recognizing destinations that champion sustainable tourism. Specifically, selected destinations are tasked with monitoring the impacts of tourism within their regions through self- and co-assessment processes. Notably, the Adamello Brenta Nature Park in Italy has engaged local stakeholders in collaborative processes to monitor the influence of tourism and its impacts on the environment. The Park has implemented an adaptive and shared management system for this purpose. Furthermore, self- and co-assessment methods have been applied in the Tuscany region of Italy in sustainable rural tourism projects. Farmers, restaurateurs, and institutions collaborated within the framework of the 'Vetrina Toscana' project to evaluate the effects of rural and gastronomic tourism in the region. The gathering and dissemination of data among the different stakeholders have supported tourism strategies in adapting to the region's needs, ultimately aiming to reduce negative impacts.

The aforementioned experiences indicate that within the context of impact evaluation of tourism strategies, self- and co-assessment can serve as pivotal components. Self-assessment affords organizations the capacity to consistently monitor their progression and modify strategies in real-time, while co-assessment ensures the inclusion of perspectives and requirements of all stakeholders. Co-evaluation guarantees the consideration of all stakeholders' perspectives and needs. Simultaneously, self-assessment empowers organizations to oversee their progress and continuously adapt strategies in real time. This amalgamation of methodologies enhances the transparency and caliber of evaluations and fosters a culture of perpetual learning and enhancement. Both methods are indispensable for efficiently and sustainably addressing social challenges (Ebrahim & Rangan, 2014).

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5. Proposal for the Be.CULTOUR Circular Cultural Tourism Dashboard

The Be.CULTOUR evaluation framework, an updated version of the one proposed in Deliverable D1.2 "Sustainable cultural tourism impacts assessment framework based on urban metabolism," aims to provide an operational assessment and self-assessment tool for tourism decision-makers. Its goal is to guide tourism strategies towards a human-centred and circular cultural tourism. The indicators proposed in Deliverable D1.2 underwent a revision and update process involving the review of sources and a co-design phase with stakeholders of the Be.CULTOUR project. Specifically, the indicator framework outlined in Deliverable D1.2 was refined through a series of stages that primarily engaged the CNR-UNINA research team, followed by project pilots and mirrors. This process aimed to operationalize the tool by constructing a dashboard that guides users step-by-step in defining the impacts of tourism strategies over the short and long term through ongoing and ex-post monitoring. Building upon the context and impact indicators previously proposed (see Deliverable 1.2), the research team revised these indicators, specifying their measurement unit, data collection tool, sources, targets, and spatial data visualization through Geographic Information System (GIS).

In the tourism sector, evaluation is essential for assessing the efficiency and effectiveness of strategic decisions from both short-term and long-term perspectives, and for strengthening interinstitutional and intersectoral relationships. Interpreting the role of evaluation from a human-centred perspective means starting from the expressed needs of people and aiming to improve their wellbeing, health, and quality of life. Since human needs change over time, evaluation processes must be dynamic to effectively capture these changes. Evaluation should also be interactive, iterative, and participatory. Direct involvement of people and dialogue among them facilitate the identification of the needs, interests, and values involved in the evaluation process.

Some international studies in the tourism sector (INCIRCLE project, 2020; European Tourism Indicators System for sustainable destination management, 2016.) have proposed evaluation frameworks, emphasizing the importance of evaluation methods and tools both to support decision-making processes (planning phase, ex-ante) and to assess the impacts produced (on-going and ex-post phases). However, most studies focus on identifying tourism policies and practices, with few concentrating on how to evaluate and monitor multidimensional impacts (both as expected outcomes in the ex-ante phase and as actual impacts during the on-going and ex-post phases).

Be.CULTOUR's assessment framework involves a series of operations ranging from the identification of indicators to specific case, to data collection to even the assessment of impacts in multiple

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dimensions. As a self-assessment framework, users select their indicators within the Dashboard and proceed to collect data using the tools provided by the Dashboard itself.

Figure 2 describes the process of the Be.CULTOUR evaluation framework.

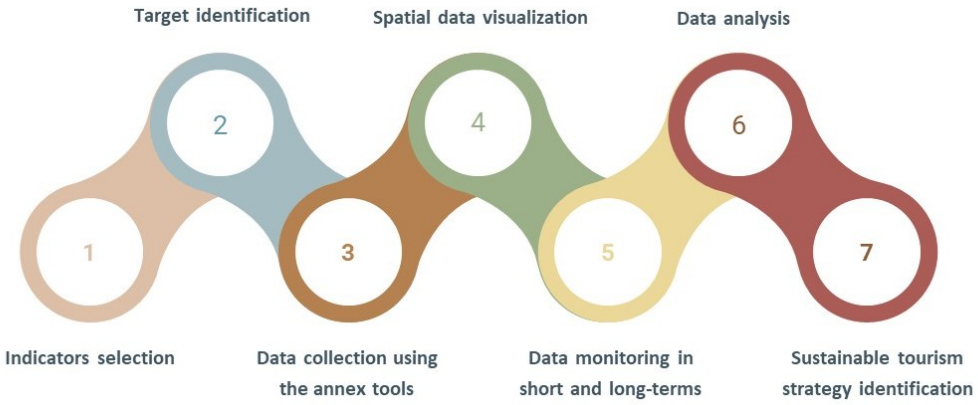


Figure 2 - Description of the Be.CULTOUR Evaluation Framework process

Source: Author's elaboration

- Step 1: Selection of multidimensional Indicators
- Step 2: Understanding the Target
- Step 3: Understanding the Data Collection Tool
- Step 4: Spatialization of Impacts
- Step 5: Data Collection and Recording
- Step 6: Short and long-term Monitoring
- Step 7: Analysis of Results
- Step 8: Definition of a Sustainable Tourism Strategy

For the indicator selection and data collection phases, the CNR-UNINA research team created the Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism (see Annex 7). An operational tool that can guide the user in collecting data and monitoring the impacts of tourism strategies. In the following paragraphs, the operational aspects of the dashboard are described: the sources of the indicators, the dimensions, the criteria and sub-criteria, the indicators with their respective units of measurement, the targets, the data collection tools, and the possibility of spatializing the tourism impacts using GIS and Digital Twins.

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5.1 The sources of the Be.CULTOUR Dashboard

The Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism was built based on a review of scientific literature in the field of sustainable and circular tourism, as well as from the main international tourism assessment tools. These sources are essential for identifying the dimensions, criteria, and indicators of the dashboard.

One of the main sources for constructing the Be.CULTOUR Sustainable Tourism Local Impact Indicators Dashboard is The European Tourism Indicator System (ETIS), proposed by the European Commission in 2013 and revised in 2016. The ETIS dashboard serves as a toolkit for assessing tourism impacts in destinations. It is not a certification or eco-labeling system but rather a highly effective management tool provided by the European Commission. ETIS is specifically designed for tourist destinations to monitor performance and assist them in developing and implementing long-term sustainability plans. Through ETIS, destinations can use an indicator system to collect data and analyze results for continuous improvement. The initial version of ETIS was based on 27 core indicators and 40 optional indicators, categorized into four groups: 1) destination management, 2) social and cultural impacts, 3) economic value, and 4) environmental impact (European Commission, 2013). The updated version in 2016 is based on 43 indicators (European Commission, 2016). Therefore, its design is specifically tailored to gather and analyze data to assess the impact of tourism on a destination. Its implementation process urges destinations to raise awareness, engage stakeholders, define responsibilities, collect data, and analyze results. This process aims to enable destinations to establish their own sustainability indicator systems. ETIS encourages DMOs (Destination Management Organizations) and other stakeholders to look beyond traditional tourism statistics such as tourist numbers, length of stay, and tourist expenditure, providing a framework to reflect on the impact tourism has on the local economy, community, and environment. Thus, ETIS is designed to offer a new perspective on tourism development, allowing DMOs to include new key performance indicators in planning and management processes.

An important added value of ETIS is that destinations can autonomously select the most relevant indicators they wish to adopt and monitor, to meet destination needs, local stakeholder interests, and specific sustainability challenges faced by the destination. This provides additional flexibility to the system and enhances its feasibility and success potential. The implementation of the toolkit should be coordinated by a motivated local "promoter" tasked with initiating the system's implementation in their tourism destination. In October 2022, the EU Tourism Dashboard (European Commission, 2022) was launched to improve access to statistics and policy-relevant indicators for tourism at EU level, and support destinations and public authorities in tracking their progress in the

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green and digital transition in the tourism sector. The dashboard aims to support both competent authorities and businesses to identify vulnerabilities and define strategies for improvement to make European tourism more sustainable. Consistent and evidence-based indicators were developed at national and regional level, in order to recognise vulnerabilities such as high seasonality or high dependence on visitors from few origins, as well as identify key marketing advantages such as excellent bathing waters or diversity of tourism offers.

The data and indicators can be consulted in two ways: through destination, where information is available for one single tourist destination (country or region), and through an indicator map view, where the user can see how a specific indicator varies across tourist destinations.

Within each area/pillar, a set of indicators were developed and mapped as follows. A specific description and method of calculation is provided for each indicator.

The dashboard comprises a total of 19 indicators grouped into the following three policy pillars (Figure 3):

- Green Pillar
- Digital Pillar
- Socioeconomic Pillar

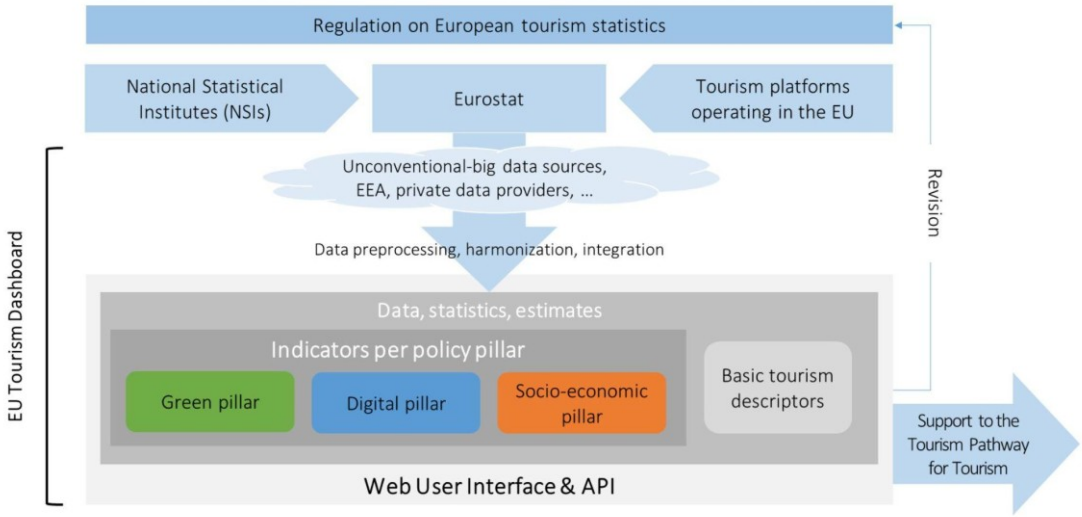


Figure 3 - The structure and main elements of the EU Tourism Dashboard

Source: EU Tourism Dashboard, 2022

Within this conceptual framework, it is assumed that tourist destinations consistently achieving higher results across all pillars are more likely to have a more sustainable and resilient tourism

ecosystem. A fourth pillar, termed Basic Tourism Descriptors, includes additional data and statistics to provide further context and characterization of the tourism activities of countries and regions (e.g., tourism supply, tourism demand, tourism offer). In the current version, the dashboard contains 13 tourism descriptors (Figure 4).

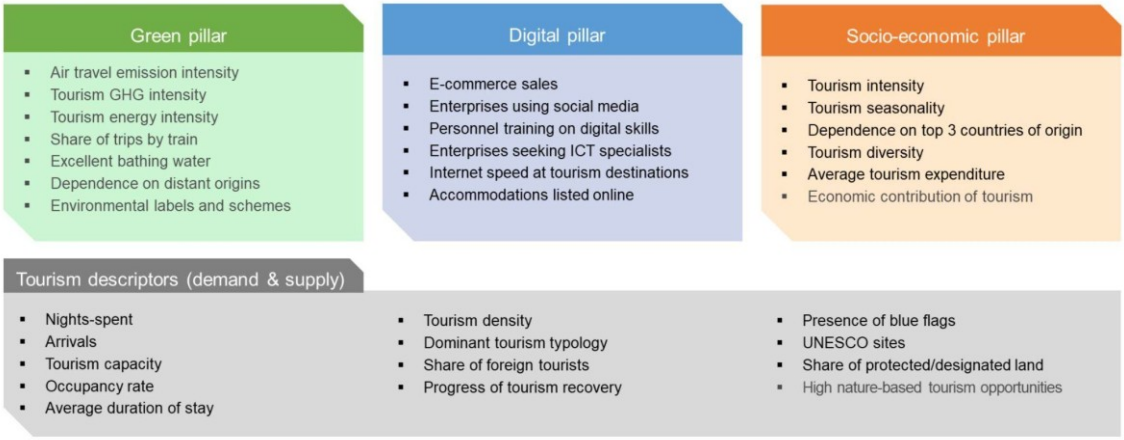


Figure 4 - The indicators of the EU Tourism Dashboard

Source: EU Tourism Dashboard, 2022

The EU Tourism Dashboard was developed as a contribution to the Transition Pathway for Tourism (European Commission, 2022c), which was created in collaboration with public and private EU tourism stakeholders to identify 27 areas of actions for the green and digital transition and for improving the resilience of EU tourism.

The Transition Pathway for Tourism highlights the need of a circular economy transition of the tourism sector, focusing on R&I needs 'beyond tourism'. Particularly, circular tourism and R&I are put in relationship with the development of sustainable fuels and transport technologies, processes and tools to reduce food waste, practices/technologies for efficient use of water resources, energy and resource efficiency, circular food services and hospitality, reduction of disposable materials while ensuring health and safety of visitors, social innovation and governance models for reliable local supply chains including local renewable energy projects, low and zero energy building technologies, new packaging materials, and development of new models for sustainable tourism. Reducing the environmental footprint of tourism sector represents a key policy objective, also promoting the use of PEF (Product Environmental Footprint) and OEF (Organisation Environmental Footprint) methods to better understand and monitor tourism industry impacts.

Specifically, regarding rural and remote regions, target of this project, the document highlights the 2040 vision for rural areas and their importance for European identity, focusing on the particular

dependence of rural areas on tourism activities in terms of GDP (35% at EU level). Especially island (such as Cyprus case study in Be.CULTOUR) are highly dependent on air transport, imported food ingredients, and energy. However, rural areas can be highly attractive and sustainable by regenerating their cultural and landscape heritage, enhancing cultural activities, cultural centres, museums, archaeological sites, theatres, libraries. Also, rural areas are naturally rich of local identity specialities and healthy food productions. Finally, quality craftsmanship, local knowledge and traditions, communities hospitality can be highly attractive factors for sustainable travellers, stimulating local economic development and the enhancement of economic, social and cultural opportunities for local communities, youths, women and minorities, if well managed.

The UN Tourism Data Dashboard (World Tourism Organization, 2023) provides statistics and insights on key indicators for inbound and outbound tourism at the global, regional and national levels. Data covers tourist arrivals, tourism share of exports and contribution to GDP, source markets, seasonality and accommodation (data on number of rooms, guest and nights).

The UNWTO Tourism Dashboard consists of 4 panels covering the following concepts:

1) Seasonality
2) Origin & Destination
3) Accommodation
4) Employment

This dashboard is a web platform that allows visualization of data related to the aforementioned areas in the form of maps and tables. It also displays trends and historical series, enabling comparison of data to assess improvements or changes in tourism sustainability levels.

In particular, the UNWTO has also published the report "Measuring Employment in the Tourism Industries – Guide with Best Practices," which closely pertains to employment data within tourism. Statistical data are indispensable tools for sound evidence-based decision-making, planning, implementation and monitoring of any policies and programmes. Consequently, the level of detail and the reliability of data, as well as of its interpretation and use, have a direct impact on the effectiveness of such policies and programmes. Among these are tourism statistics and tourism employment-related data which are fundamental to understand tourism labour markets, and device adequate job creation policies, promote employment opportunities, plan workforce needs and the development of human resources through education and relevant training. However, data on tourism-related employment is still fragmented, lacks quality and international comparability. In order to strengthen and harmonise data collection tools and the measurement framework of

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employment in the tourism industries, the International Labour Organization (ILO) and the World Tourism Organization (UNWTO) have been collaborating in measuring employment in tourism.

UNESCO World Heritage Sustainable Tourism Toolkit. Sustainable planning and management of tourism is one of the most pressing challenges concerning the future of the World Heritage Convention today and is the focus of the UNESCO World Heritage and Sustainable Tourism Programme. These Guide for World Heritage Site managers and other key stakeholders will enable a growing number of World Heritage Site communities to make positive changes to the way they pro-actively manage tourism.

The goal is to stimulate local solutions in communities through capacity-building in best practice. With the immense scale and variation of World Heritage Properties around the globe, coupled with scarce human and financial resources, this is now more important than ever. Site managers and other stakeholders in the tourism sector must have access to these types of innovative sustainability tools in order to develop and formulate their own successful results.

Ideally, site managers and other users will begin to navigate through this system by learning basic ideas and guidance. The system then enables the user to delve deeper into any given subject that falls in line with their local interests, needs, and aspirations.

Our objective for these guidance resources is to enable the growth and success of an entire community of World Heritage Properties, making positive changes to their local surroundings and pro-actively managing tourism in their areas. In parallel, by establishing this community, we aim to facilitate knowledge exchange of the most progressive ideas and encourage their implementation and evolution.

The 'How To' guides bring best practice knowledge to the full WH community, so that site managers, tourism professionals, conservation professionals, and communities around the world understand the possibilities of sustainable tourism and what key issues have already been achieved. These resources are a valuable asset to site managers in particular, who often lack the tools and know-how to effectively manage and maximise tourism benefits, while minimising its negative impacts.

The UNESCO World Heritage Sustainable Tourism Toolkit consists of 10 guides:

- Guide 1: Understanding tourism at your destination
- Guide 2: Developing a strategy for progressive change
- Guide 3: Developing effective governance
- Guide 4: Engaging local communities and businesses
- Guide 5: Communicating with visitors
- Guide 6: Managing the development of tourism infrastructure

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Guide 7: Adding value through products, experiences, and services

Guide 8: Managing visitor behavior

Guide 9: Securing funding and investment

Guide 10: Monitoring success with sustainable tourism

The Global Sustainable Tourism Council (GSTC) establishes and manages global standards for sustainable travel and tourism, known as the GSTC Criteria. There are three sets: Destination Criteria for public policy-makers and destination managers, Industry Criteria for hotels and tour operators, and MICE Criteria for Venues, Event Organizers, and Events & Exhibitions. They are the result of a worldwide effort to develop a common language about sustainability in tourism. They are arranged in four pillars: (A) Sustainable management; (B) Socioeconomic impacts; (C) Cultural impacts; and (D) Environmental impacts. Since tourism destinations each have their own culture, environment, customs, and laws, the Criteria are designed to be adapted to local conditions and supplemented by additional criteria for the specific location and activity.

The GSTC Criteria have been built on decades of prior work and experience around the world, and they take into account the numerous guidelines and standards for sustainable tourism from every continent. During the process of development, they were widely consulted throughout the globe, in both developed and developing countries, in several languages. They reflect our goal in attaining a global consensus on sustainable tourism. The process of developing the Criteria was designed to adhere to the standards-setting code of the ISEAL Alliance, the international body providing guidance for the development and management of sustainability standards for all sectors. That code is informed by relevant ISO standards.

The Criteria are the minimum, not the maximum, which businesses, governments, and destinations should achieve to approach social, environmental, cultural, and economic sustainability. Since tourism destinations each have their own culture, environment, customs, and laws, the Criteria are designed to be adapted to local conditions and supplemented by additional criteria for the specific location and activity.

Three sets of GSTC Criteria:

1. GSTC Industry Criteria. This set of Criteria relates to the sustainable management of private-sector travel industry, focusing currently on Hotels and Tour Operators.
2. GSTC Destination Criteria. This set of Criteria relates to sustainable management of Tourism Destinations.
3. GSTC MICE Criteria. This set of Criteria relates to the sustainable management of Venues, Event Organizers, and Events & Exhibitions.

The OECD Tourism Statistics database contains data on tourism indicators related to domestic travel, international travel, employment and economic data. Tourism can be regarded as a social, cultural and economic phenomenon related to the movement of people outside their usual place of residence.

A further source that, although not closely related to sustainable tourism but provided valuable insights for the indicators of the cultural and socio-human dimensions of the dashboard is the Cultural and Creative Cities Monitor (hereafter 'the monitor'). It is a monitoring and benchmarking tool that was first developed by JRC in 2017 to allow European cities to compare and contrast their areas of excellence and improvement in terms of culture and creativity. Since it was first launched, the monitor has served as a guidance tool for policymakers at the local, national and European levels. The 2023 update of the monitor involved a methodological improvement and a revision of selected indicators, to ensure that the tool remains reliable and coherent, enabling meaningful comparisons of cities' performance over time.

The monitor is a composite indicator and was developed based on the methodology outlined in the Handbook on Constructing Composite Indicators – Methodology and user guide (OECD and JRC, 2008). Since its first edition (2017), the monitor has revolved around three main concepts – or subindices – considered relevant when attempting to measure a city's cultural and creative liveliness: Cultural Vibrancy, Creative Economy and Enabling Environment (Figure 5). The Cultural Vibrancy subindex explores, on the one side, the provision of cultural infrastructure (Cultural Venues & Facilities) and, on the other, the ability of a city to attract visitors and local cultural participation (Cultural Participation & Attractiveness), with the aim of providing a synthetic measure describing how liveable and active the cultural scene is. The second subindex explores the Creative Economy domain, with two dimensions assessing, respectively, the current number and creation of new jobs in the cultural and creative sectors (Creative & Knowledge-based Jobs, and New Jobs in Creative Sectors) and a third dimension synthesising the ability of the city to produce innovative outputs (Intellectual Property & Innovation). The picture provided by the first and second subindices, Cultural Vibrancy and Creative Economy, is completed by the third subindex, Enabling Environment, which provides insights on Human Capital & Education, Openness, Tolerance & Trust, Local & International Connections (transport) and Quality of Governance. The three subindices are aggregated into the 'C3 Index', which provides a synthetic measure that brings together the three underlying concepts.

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Figure 5 - The Cultural and Creative Cities Monitor conceptual framework

Source: JRC Publications Repository - European Union, 2017

In the same vein as the Monitor, the UNESCO Thematic Indicators for Culture in the 2030 Agenda (UNESCO, 2019) have also been studied. This framework comprises thematic indicators designed to measure and monitor the advancement of culture's role in the national and local implementation of the Sustainable Development Goals (SDGs) and targets set forth in the 2030 Agenda for Sustainable Development. These indicators assess both the sectoral impact of culture and its cross-cutting contributions across various SDGs and policy domains. As a thematic set, they complement the global indicators agreed upon within the 2030 Agenda and aim to foster linkages between different goals and targets.

The Culture|2030 Indicators offer a conceptual framework and methodological instruments for countries and cities to evaluate how culture contributes to the SDGs within existing implementation mechanisms at national or local levels. This initiative represents an innovative approach to establishing methodologies that demonstrate and highlight culture's impact on the SDGs, aiding decision-makers. The framework, methodology, and implementation mechanisms of the Culture|2030 Indicators draw extensively on existing data sources, employing both qualitative and quantitative data. They integrate information derived from reporting on UNESCO Culture Conventions and programs, develop instruments applicable at national and urban levels, prioritize capacity-building among relevant agencies, facilitate inter-institutional cooperation, propose adaptable frameworks suited to varying statistical capacities, and serve as an aspirational tool for continuous improvement.

The Culture|2030 Indicators leverage UNESCO's specialized expertise in gathering and analyzing quantitative and qualitative data within the cultural domain. The Culture|2030 Indicators aim to reap the benefits of UNESCO's unique expertise in collecting and analysing quantitative and qualitative

data and supporting evidence-based practice for the development of policies, programmes, and actions in the cultural field. With this in mind, a review was conducted of existing frameworks, methodologies and experience that have been developed and implemented by UNESCO and others partners globally over the last few years in order to measure culture, with a view to facilitating their convergence towards the SDGs and enhance existing instruments and data. The Culture|2030 Indicators are supported by a conceptual framework of four transversal thematic dimensions:

- Environment & Resilience;
- Prosperity & Livelihoods;
- Knowledge & Skills;
- Inclusion & Participation.

Each dimension combines several SDG Goals and Targets to capture the multifaceted and transversal contribution of culture to sustainable development, thus echoing the purpose of the thematic indicators within the 2030 Agenda. The framework gives priority to the areas that are relevant to UNESCO's mandate in Culture and where relevant quantitative or qualitative data are already being collected or are likely to be identified.

The Be.CULTOUR Dashboard was developed through the analysis of ongoing projects focused on innovative data and assessment models in cultural tourism. Among these is the EU-funded SmartCulTour project[1], which aims to redefine the concept of cultural tourism and provide European regions with strategies that engage stakeholders in co-creating smart cultural tourism practices. The project has developed a decision-support system to extensively monitor regions using a combination of traditional and non-traditional data sources.

The SmartCulTour toolkit is designed to assist destinations in implementing local actions for sustainable cultural tourism. It offers a holistic approach to cultural tourism development through a series of creative, visual, and quantitative tools. SmartCulTour aims to support regional development in European regions, with a special focus on rural peripheries and urban fringes, through sustainable cultural tourism. The project redefines cultural tourism from a contemporary perspective and provides a comprehensive measurement framework for supply, demand, and impacts.

To support knowledge-led destination management, a decision-support system (DSS) was developed for widescale monitoring across European regions. The DSS synthesizes both traditional and non-traditional data sources, particularly big data analytics, assisting in smart regional development. Beyond contributing to conceptual development and cultural tourism measurement, the main objective of SmartCulTour is to facilitate community-led rural development through field

[1] Official website: http://www.smartcultour.eu/

experimentation in six living labs. Prior to these living labs, comprehensive desk research identifies significant sustainable cultural tourism policies, their impacts, and critical success factors. These best cases inspire a series of possible local interventions.

Within the living labs, novel creative approaches to stakeholder engagement are tested, including arts-based methods, serious games, and service design, which help provide local context and support. A toolkit was designed to help destinations implement local actions towards sustainable cultural tourism development. Thus, SmartCulTour contributes to theoretical development, empirical validation of best practices within a living labs setting, and procedural development, providing European regions with a set of strategies to optimally engage with stakeholders and co-create sustainable cultural tourism experiences. The primary goals of this SmartCulTour Toolkit is therefore to provide local communities and policy-makers with information and tools to start a collaborative process. Rather than top-down decision-making and strategic formulation, the project wishes to help the integration of local stakeholders in the full process of tourism development.

The IMPACTOUR project[2], funded by the EU, aims to promote strategies for sustainable cultural tourism across Europe. To achieve this goal, the consortium has systematically compared pan-European information on cultural tourism, including strategies influencing urban and regional transformations, both successful and unsuccessful implementation models, and innovative techniques. Central to IMPACTOUR's objectives was the creation of a user-friendly tool to measure the impact of cultural tourism on European economic and social development. This tool was designed and developed to provide site managers with recommendations based on site characterization and objectives, aimed at maximizing the positive impact of cultural tourism.

The CEnTOUR project - Circular Economy in Tourism - aims to foster innovative circular solutions in the tourism sector through transnational cooperation and knowledge transfer, by focusing on SMEs and their local value chains. More specifically, it aims to accelerate and support the capacity of SMEs in tourism to uptake sustainable solutions, proposing a focus on waste in food sector, plastic free offer and rethinking the packaging, and collaborative consumption.

The Interreg MED project INCIRCLE[3] aims to reduce pollution caused by tourism by introducing innovative technologies and processes, to preserve the quality and availability of natural resources, and to improve the quality of life of residents and tourists. But above all, it has had as a tangible result the promulgation of the first law in the EU on the CE applied to tourism, adopted by the Government of the Balearic Islands. The project “defined guidelines to support decision-makers in

[2] Official webpage: https://www.impactour.eu/

[3] Official webpage: https://www.incircle-kp.eu/

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the transition towards a more responsible and circular tourism", with the aim of "developing strategies and action plans containing concrete measures for the transition towards a sustainable and circular regional tourism.

The MITOMED+ project "Integrated Models of Tourism in the Mediterranean" aims to enhance sustainability and responsibility in the Maritime and Coastal (M&C) tourism sector. The partnership includes the Tuscany Region (Lead Partner), ANCI Tuscany (IT), University of Girona (ES), Andalusia Region (ES), Institute of Agriculture and Tourism (HR), Larnaca District Development Agency (CY), Network of European Regions for Sustainable and Competitive Tourism, NECSTouR (BE), Intermediterranean Commission of the Conference of Peripheral Maritime Regions of Europe, CRPM - IMC (FR), and CNR-IBE-Institute of BioEconomy (IT).

The project activities aim to:

- Increase knowledge and social dialogue on M&C tourism development to enhance decision-making processes in partner regions.
- Improve M&C tourism planning at destination level and its coordination at transnational governance level.
- Integrate project outcomes into local, regional, and national policies.
- Establish a model for M&C tourism in the MED area.

In line with the sustainable tourism community of the Interreg MED Program, MITOMED+ has developed a model for sustainable M&C tourism management in collaboration with partners, NECSTouR, CRPM - IMC, the overall partnership, and other relevant project and initiative stakeholders. The goal of this management model is to enhance sustainable and responsible management and planning of maritime and coastal tourism in the Mediterranean area by leveraging the results of past and current EU and MED projects and initiatives, as well as initiatives and policies related to sustainable tourism management.

This model is based on the Athens Declaration of the Sustainable Tourism Community of the INTERREG MED Program (2017). It aims specifically to contribute to achieving its third objective "strengthening planning and management practices towards sustainable tourism" by improving knowledge of data, products, services, and policies through a set of evaluated indicators developed by MITOMED+.

Regarding the sources derived from the scientific literature, the analyses were conducted through the study of scientific articles retrieved from Scopus/WoS, Google Scholar, and indexed international scientific journals. The selection process involved entering specific keywords into the search platforms to facilitate the research. To narrow down the scope of research and update the initial

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findings as much as possible, bibliographic sources were selected with priority given to recent publications within the last five years, from 2020 to 2024. Per ridurre e selezionare le fonti sono state individuate delle parole chiave to identify the most relevant indicators. A keyword search of the title, abstract and keywords was conducted using the terms sustainable cultural tourism, tourism destination, circular economy, urban metabolism, multidimensional indicators, sustainable tourism impact assessment.

5.2 The scale of the Be.CULTOUR Dashboard

The Be.CULTOUR project focuses on circular and Human-centred Cultural Tourism indicators at the sub-regional scale, encompassing groups of municipalities and rural villages across six pilot areas. Additionally, the project targets destinations in non-EU countries with diverse data systems. The primary objective is to develop guidelines and practical tools for collecting, analyzing, and sharing information on destination attractiveness and the impacts of tourism on environmental quality, residents' quality of life, social cohesion, economic growth, and cultural heritage regeneration. The scale at which indicators are assessed is particularly significant, as regional-level assessments can obscure specific performance variations in areas such as rural, remote, and lesser-known destinations. Visitor expectations are increasingly focused on environmental sustainability, social impact, and digital access to services and products. Therefore, a destination's ability to meet high standards of hospitality and experience is crucial for enhancing resilience and ensuring long-term sustainable growth. Data and indicators are vital for supporting the managerial capacity of destination managers and operators, as well as for boosting tourists' trust and satisfaction and improving residents' quality of life. Furthermore, it is essential to recognize that tourism is only one activity/flow within the urban/territorial system metabolism. It is interconnected with and dependent on other activities/flows such as food production chains, energy and mobility systems, transport infrastructure, industrial production, and cultural vibrancy. While tourism contributes to sustainable territorial growth, its impact should be viewed within a broader territorial sustainability context and should not be perceived as an end in itself but as a means to achieve sustainability. Addressing this perspective requires considering the interconnections between tourism flows and other territorial metabolism flows. The Be.CULTOUR project aims to develop a circular and human-centred cultural tourism impact assessment framework based on urban metabolism approaches.

5.3 The dimensions of the Be.CULTOUR Dashboard

The tourism sector's competitiveness is closely linked to its sustainability, as the quality of tourist destinations is strongly influenced by their natural and cultural environment and their integration into a local community.

The sustainability of tourism covers a number of aspects: the responsible use of natural resources, taking account of the environmental impact of activities (production of waste, pressure on water, land and biodiversity, etc.), the use of 'clean' energy, protection of the heritage and preservation of the natural and cultural integrity of destinations, the quality and sustainability of jobs created, local economic fallout or customer care.

To face those challenges, requires us to make intelligent decisions, based on useful information. This information can come from specific indicators that move on from measuring a single aspect of business such as number of visitors or daily spend and instead combine information on relevant local issues. For example, if generating employment is the key aim of a destination or region, but water is the key constraint in that place, then it is sensible to develop an indicator that compares jobs generated against water consumed. If the tourism industry is able to generate a lot of jobs per litre of water consumed, then a rational government would encourage the tourism industry rather than the farming or another industry that could not generate such employment levels with the constrained resource. Monitoring tracks change over time and provides the information which policy makers can then use to make their decisions.

The tourism industry has a great story to tell and developing indicators can help destinations tell their story more convincingly and gather greater support from government. In the process it can identify the areas where it needs to improve, create benchmarks of performance, and make itself more sustainable. Through measuring its performance, the tourism industry can ensure its central role in the green economy of a resource-constrained world.

The data collected in the Be.CULTOUR Sustainable Tourism Local Impact Indicators Dashboard are categorized into six dimensions: cultural, human and social, environmental, economic, man-made, and institutional (Figure 6).

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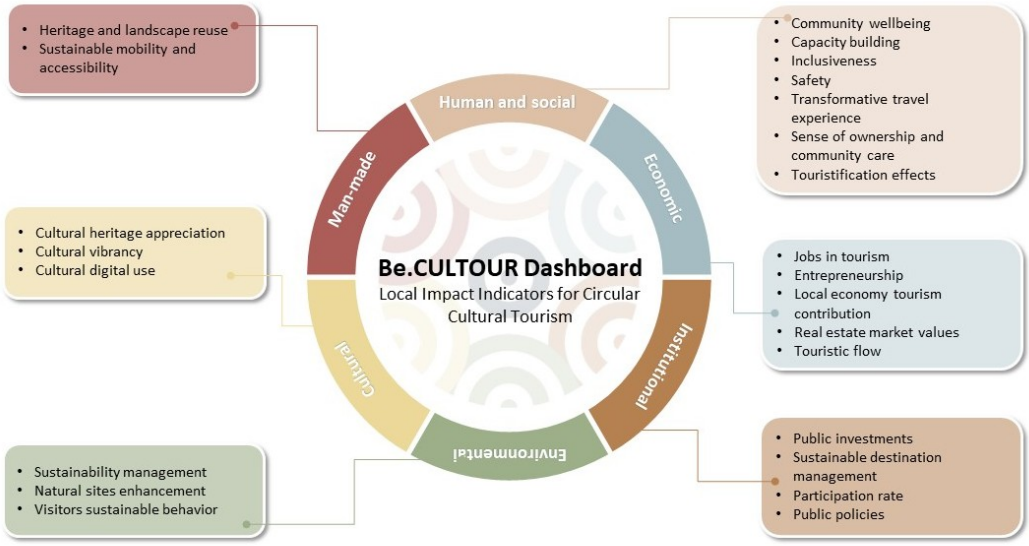


Figure 6 - The Be.CULTOUR Dashboard dimensions and criteria

Source: Authors' elaboration

5.4 The criteria and the indicators of the Be.CULTOUR Dashboard

Table 1 - Cultural dimensions' criteria and indicators

	Criteria		Sub-criteria	Id	Indicators	U.M.	Source
1	Cultural heritage appreciation	1.1	Visitors' cultural heritage appreciation	1.1.1	Level of visitors' appreciation of cultural sites	Likert scale	Revised by authors from ETIS, 2016
				1.1.2	Level of visitors' appreciation of activities implemented to enhance cultural heritage	Likert scale	Revised by authors from van Leeuwen et al., 2013
		1.2	Cultural heritage istitutional appreciation	1.2.1	Number of international awards/labels recognised to local tangible and intangible cultural heritage in the past 10 years	No. in the past 10 years	Reised by authors from Marcotte & Bourdeau, 2012
2	Cultural vibrancy	2.1	Cultural facilities	2.1.1	Level of usability of local cultural facilities	Likert scale	Culture 2030 UNESCO data: UN-Habitat – Public open space strategies SDG 11.7.1

				2.1.2	Number of people visiting cultural sites per year	No./year	Revised by authors from EUROSTAT, 2017
		2.2	Cultural experiences	2.2.1	Number of people participating in cultural experiences per year	No./year	D. A. Jelinˇci´c, 2021
				2.2.2	Number of cultural experiences for the enhancement of local tangible and intangible cultural heritage per year	No./year	Revised by authors from ETIS, 2016
3	Cultural digital use	3.1	Digital services	3.1.1	Number of download of digital tools for the enhancement of local tangible and intangible cultural and natural heritage per year	No./year	Revised by the authors from Katsoni & Spyriadis, 2020
				3.1.2	Number of cultural sites equipped with digital visitor support tools	No.	Revised by the authors from Katsoni & Spyriadis, 2020
				3.2.1	Number of cultural sites equipped with Wi-fi connection	No.	Revised by the authors from Katsoni & Spyriadis, 2020
		3.2	Digital strategies	3.3.1	Number of cultural site equipped with a digital strategy maketing	No.	Revised by the authors from Katsoni & Spyriadis, 2020

Table 2 - Environmental dimensions' criteria and indicators

	Criteria	Id.	Sub-criteria	Id	Indicators	U.M.	Source
4	Sustainability management	4.1	Energy efficiency	4.1.1	Number of cultural sites and accommodations using efficiency systems	No.	Revised by authors from ETIS, 2016
		4.2	Frashwater efficiency	4.2.1	Number of cultural sites and accommodations using systems to reduce water consumption	No.	Revised by authors from ETIS, 2016
				4.2.2	Number of cultural sites and accommodations using recycled water	No.	

		4.3	Waste reduction	4.3.1	Number of cultural sites and accommodations using systems to reduce plastic and wastes consumption	No.	Revised by authors from Global Sustainable Tourism Council (GSTC), 2019
				4.3.2	Number of cultural sites and accommodations re-using wastes	No.	
		4.4	Sustainable food	4.4.1	Number of commercial activities using sustainable/local foods products	No.	Revised by authors from ETIS, 2016
5	Natural sites enhancement	5.1	Natural experiences	5.1.1	Number of experiences to reconnect people and nature per year	No./year	Revised by authors from Curtin & Kragh, 2014
				5.1.2	Number of people participating in experiences to reconnect people and nature	No./year	Revised by authors from Curtin & Kragh, 2014
		5.2	Visitors' natural heritage appreciation	5.2.1	Level of visitors' appreciation with experiences to reconnect people and nature	Likert scale	Revised by authors from Curtin & Kragh, 2014
				5.2.2	Level of visitors' appreciation of natural sites	Likert scale	Revised by authors from ETIS, 2016
		5.3	Sustainability certification	5.3.1	Number of natural sites receiving a sustainability flagship or label	No.	Revised by authors from Cerqua, 2016
				5.3.2	Number of tourism enterprises in the destination using a voluntary certification/labelling	No.	ETIS 2016

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					for environmental quality/sustainability		
6	Visitors sustainable behavior	6.1	Visitors' responsible behavior	6.1.1	Level of visitors' responsible behavior	Likert scale	Nocca et al., 2023

Table 3 - Human and Social dimensions' criteria and indicators

	Criteria	Id	Sub-criteria	Id	Indicators	U.M.	Source
7	Community wellbeing	7.1	Residents' appreciation of tourism effects	7.1.1	Level of residents appreciation for the improvement of the area due to tourism	Likert scale	Revised by authors from ETIS, 2016
8	Capacity building	8.1	Training and educational activities	8.1.2	Level of skills acquired by the local community in the field of tourism	Likert scale	Revised by authors from Bare et al., 2021
9	Inclusiveness	9.1	Physical inclusiveness	9.1.1	Number of cultural sites and accommodations without architectural barriers	No.	Revised by authors from ETIS, 2016
				9.1.2	Number of cultural sites and accomodations offering supporting tools and services for people with diverse needs	No.	Revised by authors from ETIS, 2016
		9.2	Language inclusivness	9.2.1	Number of accommodations, culture and tourism structures offering supporting tools and services to	No.	Revised by authors from Global Sustainable Tourism Council (GSTC) 2019

					breaking down language barriers		
		9.3	Entrepreneurship inclusivness	9.3.1	Level of perception of inclusion of women, youth, people with special needs and minority cultures in enterprises	Likert scale	Revised by authors from Pechlaner et al.,2012
10	Safety	10.1	Visitors' safety perception	10.1.1	Level of safety perceived by visitors	Likert scale	Revised by authors from Li et al, 2023
11	Transformative travel experience	11.1	Learning experiences	11.1.1	Level of citizens and visitors' satisfaction about what they learned during the trip	Likert scale	Revised by authors from Zhao & Agyeiwaah, 2023
		11.2	Hospitality experiences	11.2.1	Percentage of visitors declaring they have established meaningful relationships in the destination	%	Revised by authors from Zhao & Agyeiwaah, 2023
				11.2.2	Level of visitors satisfaction for the host community hospitality	Likert scale	Revised by authors from Zhao & Agyeiwaah, 2023
12	Sense of ownership and community care	12.1	Visitors' committment	12.1.1	Number of residents actively involved for the care of cultural and natural heritage per year	No./year	Revised by authors from Nam & Thanh, 2024
				12.1.2	Number of partnership activated for the care and valorizzation of cultural and natural heritage per year	No./year	Revides by authors from El-Khadrawy et al., 2022
		12.2	Visitors' donations	12.2.1	Number of donations received for the management, enhancement, preservation and valorization on tangible and intangible cultural heritage per year	No./year	Revised by authors from Hunter-Jones P., 2011

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				12.2.2	Volume of donations received for the management, enhancement, preservation and valorization on tangible and intangible cultural heritage per year	€./year	
13	Touristification effects	13.1	Overcrowding	13.1.1	Number of tourists per 100 residents	%	ETIS, 2016
		13.2	Housing issue	13.2.1	Number of beds available in commercial accommodation establishments per 100 residents per year	No./year	ETIS, 2016
				13.2.2	Number of second homes used for tourist activities or facilities per year	No./year	ETIS, 2016

Table 4 - Economic dimensions' criteria and indicators

	Criteria	Id	Sub-criteria	Id	Indicators	U.M.	Source
14	Jobs in tourism	14.1	Tourism jobs	14.1.1	Number of jobs in tourism and culture sector	No./year	Revised by authors from ETIS, 2016
		14.2	Tourism seasonal jobs	14.2.1	Percentage of tourism seasonal jobs per year	%/year	ETIS, 2016
15	Entrepreneurship	15.1	Tourism enterprises	15.1.1	Number of new touristic enterprises in the last three year	No./3 years	Revised by authors from World Tourism Organization (UNWTO), 2023
		15.2	Tourism enterprises responsability	15.2.1	Percentage of locally products sourced by the destination's	%	ETIS, 2016

					tourism enterprises		
		15.3	Innovation in tourism enterprises	15.3.1	Number of patents and intellectual property creation about tourism field in the last ten years	No./10 years	Revised by authors from Cavalheiro et al., 2021
16	Local economy tourism contribution	16.1	Contribution of visitors to the local economy	16.1.1	Daily average spending per visitors	€/day	Revised by authors from ETIS, 2016
		16.2	Social-cultural reinvestment of tourism revenue	16.2.1	Volume of tourism revenue reinvested in local socio-cultural initiatives per year	€/year	Revised by authors from Melita & Mendlinger, 2013
17	Real estate market values	17.1	Selling prices	17.1.1	Residential average selling prices in touristic areas	€/sqm	Revised by authors from Brandejs & Klika, 2023
		17.2	Rental prices	17.1.2	Touristic facilities average rental prices in touristic areas	€/sqm	Revised by authors from Brandejs & Klika, 2023
18	Touristic flow	18.1	Tourism stay	18.1.1	Number of overnight stays per year	No./year	ESPON Database, 2017
				18.1.2	Average length of stay of visitors	No. of nights (average)	ETIS, 2016
		18.2	Tourism seasonality	18.2.1	Percentage of visitors per season per year	%	Revised by authors from World Tourism Organization (UNWTO), 2023

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		18.3	Tourism returning	18.3.1	Percentage of returning loyal visitors in the last five years	No./tot. visitors in 5 year	ETIS, 2016

Table 5 - Man-made dimensions' criteria and indicators

	Criteria	Id	Sub-criteria	Id	Indicators	U.M.	Source
19	Heritage and landscape reuse	19.1	Heritage reuse	19.1.1	Number of heritage goods reused for cultural and tourist activities in the last five years	No. in 5 year	Revised by authors from Rudan, 2023
		19.2	Landscape reuse	19.2.1	Surface of heritage landscape recovered for cultural and tourist activities	Sqkm	Revised by authors from Pintossi et al., 2021
20	Sustainable mobility and accessibility	20.1	Eco-friendly mobility	20.1.1	Number of visitors using soft and clean mobility per year	No./year	Revised by authors from ETIS, 2016
				20.1.2	Number of visitors using shared transport per year	No./year	
		20.2	Accessibility	20.2.1	Kilometers of routes improved or constructed to connect the heritage area through sustainable mobility in the last five year	Km/5years	Revised by authors from Maltese et al., 2017

Table 6 - Institutional dimensions' criteria and indicators

	Criteria	Id	Sub-criteria	Id	Output indicators	U.M.	Source
21	Public investments	21.1	Tourism services	21.1.1	Volume of public expenditure for tourism services per year	€/year	Revised by authors from Global Sustainable Tourism Council (GSTC) 2019
		21.2	Heritage preservation	21.2.1	Volume of public expenditure for the heritage	€/year/inhabitants	UNESCO, 2019. Thematic Indicators for
						€/year/inhabitants	

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					preservation and enhancement		Culture in the 2030 Agenda
		21.3	Sustainable mobility	21.3.1	Volume of public expenditure for sustainable mobility per year	€/year	Revised by authors from Global Sustainable Tourism Council (GSTC) 2019
22	Sustainable destination management	22.1	Presence of Destination Managment Organizations (DMO)	22.1.1	Number of new Destination Management Organizations (DMO) active	No.	Revised by authors from S. Reinhold & P. Beritelli, 2022
		22.2	Presence of monitoring plans	22.2.1	Percentage of destinations with a sustainable tourism strategy/action plan	%	ETIS, 2013
23	Participation rate	23.1	Private-public partnerships	23.1.1	Number of social partnerships (public-private, public-public) activated in the tourism destination for the heritage and landscape enhancement per year	No./year	Revised by authors from UNWTO Global Report on Public-Private Partnerships: Tourism Development, 2015
		23.2	Participants engagement	23.2.1	Number of residents and organisations actively involved in the co-design of tourism activities and strategies	No.	Revised by authors from Serban et al., 2021
24	Public policies	24.1	Touristic flow regulation	24.1.1	Presence of norms to regulate short-term rentals	Yes/No	Revides by authors from Bei & Celata, 2023
				24.1.2	Presence of policies to regulate the overcrowding	Yes/No	European Parlament, Research for TRAN Committee - Overtourism: impact and possible

							policy responses, 2018
		24.2	Natural sites and landscape preservation	24.2.1	Presence of policies to preserve the natural ecosystems and landscape	Yes/No	ETIS, 2013

5.5 Data collection tools and targets

The Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism functions as a self-assessment tool, aiding users in collecting the required data from indicators to measure the impacts of tourist destinations, providing appropriate tools. Each indicator in the Be.CULTOUR Dashboard includes a Data Collection Tool marked with a "#" to facilitate users (Destination Management Organizations, urban planners, decision-makers, touristic operators, etc.) in using the dashboard and identifying the data collection method. Additionally, it specifies the Target Reference for data collection requests. The Be.CULTOUR Dashboard refers to the following targets (Figure 7):

- Visitors
- Residents
- Local cultural sites
- Accommodations
- Destination Management Organizations (DMOs)
- Commercial activities
- Tourism enterprises
- Local government
- Official database

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Figure 7 - Targets of the Be.CULTOUR Dashboard

Source: Author's elaboration

Each target corresponds to a series of surveys, checklists, databases, or mapping actions that the user must administer, process, and/or review to collect the necessary data for impact assessment (Figure 8). For surveys, users can utilize questionnaires with questions categorized by target and indicator (see Annex 1). In some cases, a survey can be directed at multiple targets simultaneously. Once the most useful, coherent, accessible, and significant indicators have been selected to meet the specific sustainability goals for the tourist destination, the user proceeds with data collection using the tools provided by the Be.CULTOUR Dashboard.

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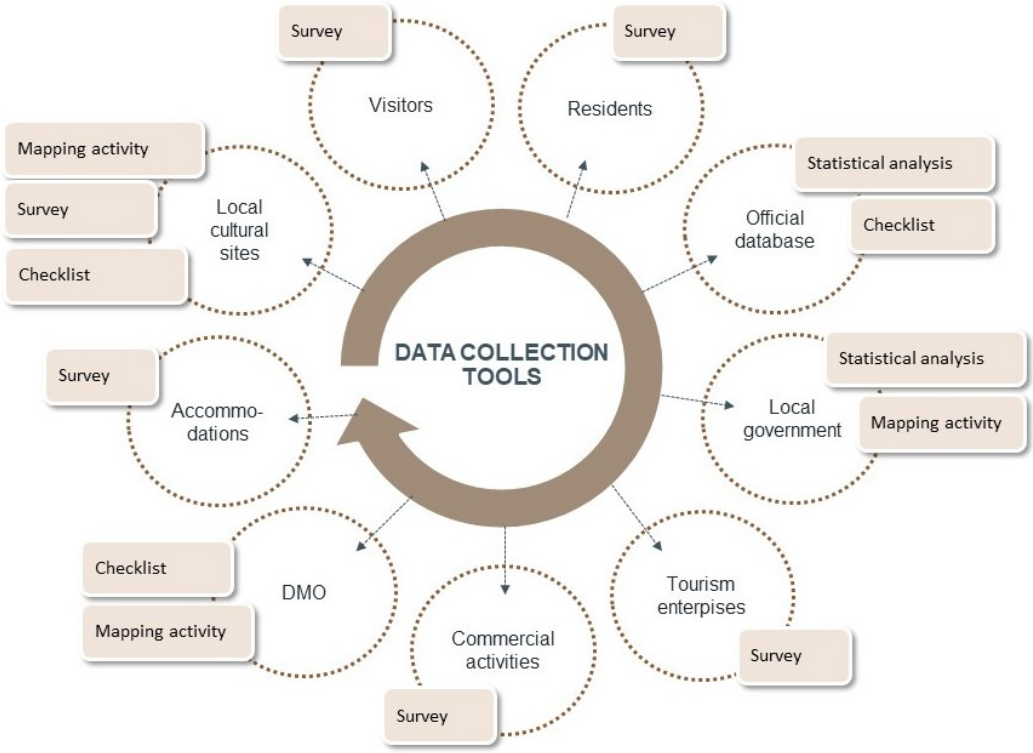


Figure 8 - Data Collection Tools of the Be.CULTOUR Dashboard

Source: Author's elaboration

Specific data related to the presented Dashboard were collected in some pilot and mirror regions: selected indicators collected in Sciacca (Sicily), selected indicators data collected in Doune Castle (Scotland), selected indicators collected in rural Larnaca (Cyprus).

In particular, regarding data collection in the mirror areas, the project has worked with two mirror Ecosystem representatives: the Community Cooperative - Cooperativa di Comunità Identità e Bellezza (Sciacca, Italy) and Historc Environment Scotland (Scotland, UK).

Specifically, the involved partner is the Museo Diffuso dei 5 Sensi Sciacca, operated by the Cooperativa di Comunità Identità e Bellezza. A consultation was conducted with this partner to test the Be.CULTOUR assessment Dashboard and evaluate the impacts of sustainable and circular cultural tourism in the city of Sciacca (see Annex 2) .

The other mirror area where indicator collection and impact monitoring was tested is the cultural heritage site of Doune Castle in Scotland, in collaboration with Historic Environment Scotland (HES). In this case, the use of the Dashboard was carried out in collaboration with the University of Glasgow within the Course on Tourism led by prof. Patrizia Riganti, involving students in the experimentation.

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Using Be.CULTOUR's Indicators of Circular Cultural Tourism, the students analyzed the circularity of Doune Castle's tourism (see Annex 3).

During the first stage of the Be.CULTOUR project, a usable indicators were developed for measuring the sustainability of a destination rural Larnaca. Specifically, in this early experimental stage of the project, based on MITOMED+ list of 33 indicators divided into economic, environmental, social, and global indicators coming from the ETIS system, a subset of indicators was selected for experimentation (see Annex 4). This set of indicators included also guidelines on the collected data and method. Also, a platform was developed that was using the traffic light system, a threshold system that could help policymakers in the interpretation of each indicator. A quartile threshold was defined as follow:

- Red: From 0% to 33% Poor
- Yellow: From 34% to 66% Good
- Green: From 67% to 100% Very Good

The selected indicators were also used as a reference for the construction of the Be.CULTOUR Dashboard. Based on this initial experimentation, the Be.CULTOUR Dashboard could be further developed by identifying an appropriate threshold to provide additional support to policymakers, enabling them to easily assess certain developments in destination growth at the local level.

5.6 Spatial visualization of Circular Cultural Tourism impacts

The decision-making process in tourism development and planning has become increasingly intricate as organizations and communities grapple with competing economic, social, and environmental demands for sustainable development. Geographical Information Systems (GIS) are recognized as a versatile toolbox of techniques and technologies crucial for achieving sustainable tourism development. Spatial data enables the exploration of conflicts, assessment of impacts, and support for decision-making. Impact assessment and simulation are growing in importance within tourism development, where GIS plays a pivotal role in auditing environmental conditions, evaluating site suitability for proposed developments, identifying conflicting interests, and modeling relationships.

The concept of the Digital Twin (DT) applied to cities, sustainable urban policy development, and governance is currently a leading and extensively debated topic. To contextualize the DT concept, the following comprehensive definition borrowed from Bolton et al., (2018) encapsulates DT as "... a dynamic virtual representation of a physical object or system throughout its lifecycle, utilizing real-time data to enable understanding, learning, and reasoning." This virtual representation made feasible by advancements in digital technology, particularly in geomatics, computer science, and

spatial information (Geographical Information System, GIS), underscores the urban planning application of this tool. Experimented primarily in other disciplines, its application in urban planning is driven by the need to analyze urban dynamics and proactively assess them to optimize efficiency and the impact of new projects on the urban landscape (Caprari et al., 2022).

Naturally, having a virtual replica of a city does not automatically resolve deeply rooted issues, but it serves as an experimental 3D cyberspace for monitoring, multi-stakeholder collaboration, and action research toward more adaptive, healthy, and livable urban forms. Developing a city-DT involves adhering to principles of safety, sustainability, and equity as envisioned by future urban policies (SDG, 11), while also addressing climate change impacts stemming from urban form and increasing anthropogenic pressure on the city-landscape-inhabitant system.

The data collected in the Be.CULTOUR Sustainable Tourism Local Impact Indicators Dashboard are categorized into six dimensions: cultural, human and social, environmental, economic, man-made, and institutional. These data can be incorporated into a Geographical Information System (GIS). In the GIS model, the data are two-dimensional, representing parameters such as width and length to identify the surface area of a building. However, these data can be transformed into a 3D model by adding a third dimension, such as the height of buildings, to create a digital model that accurately reflects the real world. This transformation allows for the anticipation of future impacts of tourism activities and actions on destinations, enabling modifications to achieve more sustainable tourism, as developed by the Dutch partner for the city of Limburg (see Deliverable 1.5).

Not all indicators from the Be.CULTOUR Dashboard can be visualized spatially. Below is a list of indicators that can be spatially visualized, organized by each dimension, along with a table detailing the data collection methods for each indicator.

- Cultural dimension

Indicator	Spatial visualisation
Level of visitors' appreciation of cultural sites	Mapping of total cultural sites. Ranking of them with a gradient scale by the average number of the appreciation.
Number of international awards/label recognised to local tangible and intangible cultural heritage in the past 10 years	Mapping of total cultural heritage. Using a binar scale YES / NO to understand which of them obtained the international awards/label.

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Level of usability of local cultural facilities	Mapping of total cultural facilities. Ranking of them by gradient scale: ● Green: all year ● Yellow: partially open in a year (seasonal or daily) ● Red: closed sites
Number of people visiting cultural sites per year	Mapping of total cultural sites. Ranking of them by the number of visitors.
Number of people participating in cultural experiences per year	Mapping of activities/events/experiences ranked by the number of participants.
Number of cultural experiences for the enhancement of local tangible and intangible cultural heritage per year	
Number of cultural sites equipped with digital visitor support tools	Mapping of total cultural sites. Using a binar scale YES / NO to understand which of them is equipped with digital tools.
Number of cultural sites equipped with Wi-fi connection	Mapping of total cultural sites. Using a binar scale YES / NO to understand which of them is equipped with WI-FI connection.
Number of cultural site equipped with a digital strategy maketing	Mapping of total cultural sites. Using a binar scale YES / NO to understand which of them is equipped with digital strategy marketing.

- Environmental dimension

Indicator	Spatial visualisation
Number of cultural sites and accommodations using efficiency systems	Mapping of total cultural sites and accommodations. Using a binar scale YES / NO to understand which of them using efficiency systems.
Number of cultural sites and accommodations using systems to reduce water consumption	Mapping of total cultural sites and accommodations. Using a binar scale YES / NO to understand which of them using systems to reduce water consumption.
Number of cultural sites, accommodations using recycled water	Mapping of total cultural sites and accommodations. Using a binar scale YES / NO to understand which of them using recycled water.

Number of cultural sites and accommodations using systems to reduce plastic and wastes consumption	Mapping of total cultural sites and accommodations. Using a binar scale YES / NO to understand which of them using systems to reduce plastic and wastes consumption.
Number of cultural sites and accommodations re-using wastes	Mapping of total cultural sites and accommodations. Using a binar scale YES / NO to understand which of them re-using wastes.
Number of commercial activities using sustainable/local foods products	Mapping of total cultural commercial activities. Using a binar scale YES / NO to understand which of themusing sustainable/local foods products.
Number of experiences to reconnect people and nature per year	Mapping of the place of experiences to reconnect people and nature ranked by the number of participants.
Number of people participating in experiences to reconnect people and nature	
Level of visitors' appreciation with experiences to reconnect people and nature	Mapping of the place of experiences to reconnect people and nature ranked by the average number of participants' satisfaction.
Level of visitors' appreciation of natural sites	Natural sites ranked by average number of the appreciation.
Number of natural sites receiving a sustainability flagship or label	Mapping of natural sites. Using a binar scale YES / NO to understand which of them have a sustainability flagship or label.
Number of tourism enterprises in the destination using a voluntary certification/labelling for environmental quality/sustainability	Mapping of tourism enterprises. Using a binar scale YES / NO to understand which of them using a voluntary certification/labelling for environmental quality/sustainability.

- Human and social dimension

Indicator	Spatial visualisation
Number of cultural sites and accomodations without architectural barriers	Mapping of cultural sites and accommodations. Using a binar scale YES / NO to understand which of them are without architectural barriers.
Number of cultural sites and accomodations offering supporting tools and services for	Mapping of cultural sites and accommodations. Using a binar scale YES /

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people with diverse needs	NO to understand which of them offer supporting tools and services for people with diverse needs.
Number of accomodations, culture and tourism structures offering supporting tools and services to breaking down language barriers	Mapping of cultural sites and accommodations. Using a binar scale YES / NO to understand which of them offer offering supporting tools and services to breaking down language barriers.
Number of second homes used for tourist activities or facilities per year	Mapping of the second homes used for tourists activities.

- Economic dimension

Indicator	Spatial visualisation
Number of new touristic enterprises in the last three year	Mapping of new touristic enterprises.
Residential average selling prices in touristic areas	Residential building area ranked by average selling prices.
Touristic facilities average rental prices in touristic areas	Touristic facilities ranked by average rental prices.

- Man-made dimension

Indicator	Spatial visualisation
Number of heritage goods reused for cultural and tourist activities in the last five years	Mapping of sqm of heritage good reused.
Surface of heritage landscape recovered for cultural and tourist activities	Mapping of sqkm of heritage landscape recovered.
Kilometers of routes improved or constructed to connect the heritage area through sustainable mobility in the last five year	Mapping of km of routes.

- Institutional dimension

Indicator	Spatial visualisation

Number of new Destination Management Organizations (DMO) active	Mapping of Destination Management Organizations (DMO).

Data is generally collected through a territorial mapping effort of quantitative data that reports the location and thus the number of cultural sites, accommodations, tourist facilities, commercial activities, etc. However, some data are more complex and detailed, such as qualitative data related to tourists' perceptions. In this case, visitor appreciation is indicated with a gradient scale that clusters cultural sites based on the average appreciation expressed by visitors. Another example is the level of usability of local cultural facilities, which is expressed through a three-color scale (red, yellow, and green) to indicate to what extent a particular cultural site is accessible to visitors in terms of time, i.e., whether the site is open all year round, only during certain periods, or completely inaccessible to the public.

The environmental dimension is the easiest to spatialize, with indicators related to the use or non-use by cultural sites and accommodations of systems for energy efficiency, waste reduction, and water conservation, etc. The cultural dimension translates qualitative data into spatial data related to tourists' appreciation, activities, and cultural sites. In contrast, the economic, man-made, and institutional dimensions are more difficult to visualize in a GIS model because they report economic information, stakeholder participation, policies, etc.

Spatial data of the Be.CULTOUR Dashboard were collected for the Vulture Alto Bradano area, in Basilicata (see Annex 5). In this area, contextual data were initially collected to construct the territorial model, which will subsequently be used to gather data for evaluating the impact of cultural circular tourism. For this purpose, and by referring to the context indicators previously identified by the Be.CULTOUR project (see Deliverable D1.2), a digital model of the Vulture Alto Bradano area (comprising 19 municipalities) and specifically focused of the city of Venosa was developed. The framework of context indicators is an initial evaluation set for constructing the Digital Twin of the Vulture Alto Bradano area. The indicators proposed below represent an initial research step, which will be complemented by the impact indicators of the Be.CULTOUR Dashboard. The context indicators refer to cadastral data, territorial data (roads, etc.), environmental data (green areas, protected areas, parks, nature reserves, quarries, dumps, agro-forestry areas), tourist attractions (monuments, museums, theatres, etc.), infrastructures (transport), and building artefacts. The digital model was constructed using the OpenSource Q-GIS platform. In addition to contextual data, some impact indicators were collected in the cultural dimension, such as cultural events for the enhancement of cultural heritage, and in the environmental dimension, like the existing cycling paths

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in the Vulture Alto Bradano area, particularly thanks to the development of the "FREE TO MOVE" app by APT.

The collection of spatial data revealed some necessary considerations regarding the difficulties users may encounter when using the Dashboard and the interoperability of the data. Non-open-source data are difficult to obtain because they require requests or incur costs to access. Moreover, the time required to obtain these data is often excessively long, which hinders their availability and the short-term monitoring of impacts.

An additional site-specific territorial mapping proposal was conducted by the partners in Cyprus, using the administrative area of Ayii Vavatsinias village as a case study (Annex 6). The aim was to propose a method of interactive mapping and understanding cultural landscape empirically. These maps enable the spatial visualization of data, which is crucial for understanding landscape heritage and ensuring its protection, preservation, and restoration. This approach allows landscape resources to be utilized in projects that can offer alternative funding and investment opportunities for heritage development in rural communities (Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, Figure 14).



Figure 9 - Ayii Vavtsinias community

Source: Sevina Floridou, 2024

The objective of the mapping work was to identify and assess the terrain, particularly the condition of historical trails, in order to suggest their rehabilitation. This aims to provide monitored landscape accessibility for cultural hiking.

The topographical study of a selected part of the study area utilized spatial recording tools such as GPS and UAVs, as well as cartographic data processing. The maps produced are compatible with the administrative maps available to Cypriot government professionals, so they can be used as contemporary decision-making planning tools. The digitized maps allow for the examination of the historical landscape in the contemporary context and the identification and quantification of its terrace expanses.

A map was also created for one of the abandoned trails: the 1917 trail to the waterfall. Local access to the waterfall is now via a recently opened wide dirt road, which raises concerns about encouraging vehicular traffic if the site becomes popular, potentially ruining the pristine natural environment. Therefore, the mapping work suggests restoring the old historical trail, which is narrower and accessible only to hikers. The maps also identified other sites of historical interest, including terraced areas and historical or abandoned clusters of water infrastructure developed between the 18th and 20th centuries.

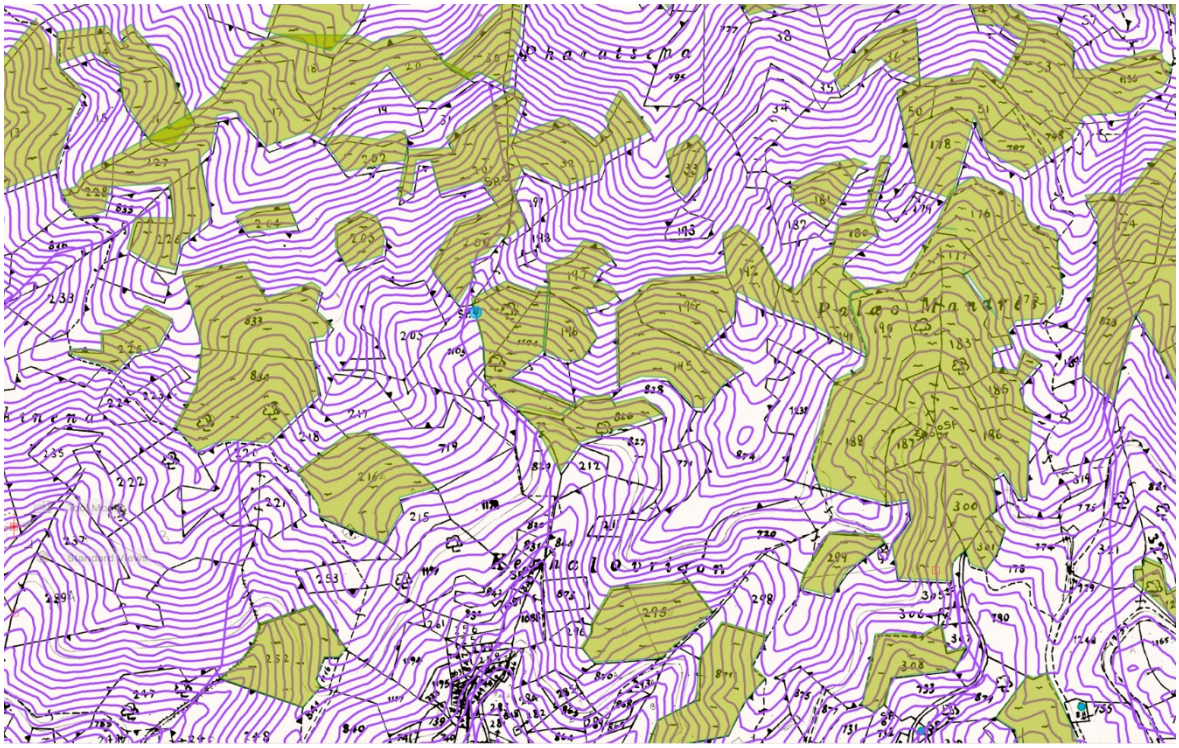


Figure 10 - Historic terraces in the Ayii Vavtsinias area

Source: Sevina Floridou, 2024

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The colored areas on the maps represent vineyard terraces. Analyzing the historical maps allows us to understand their location, structure, territoriality, and distance from the village. Additionally, we can see the orientation, exposure, and slope of each terrace. Mapping the terraces can provide greater knowledge of the history, orography, and ancient techniques, guiding planners, residents, and visitors toward an authentic experience and the revitalization of the landscape.

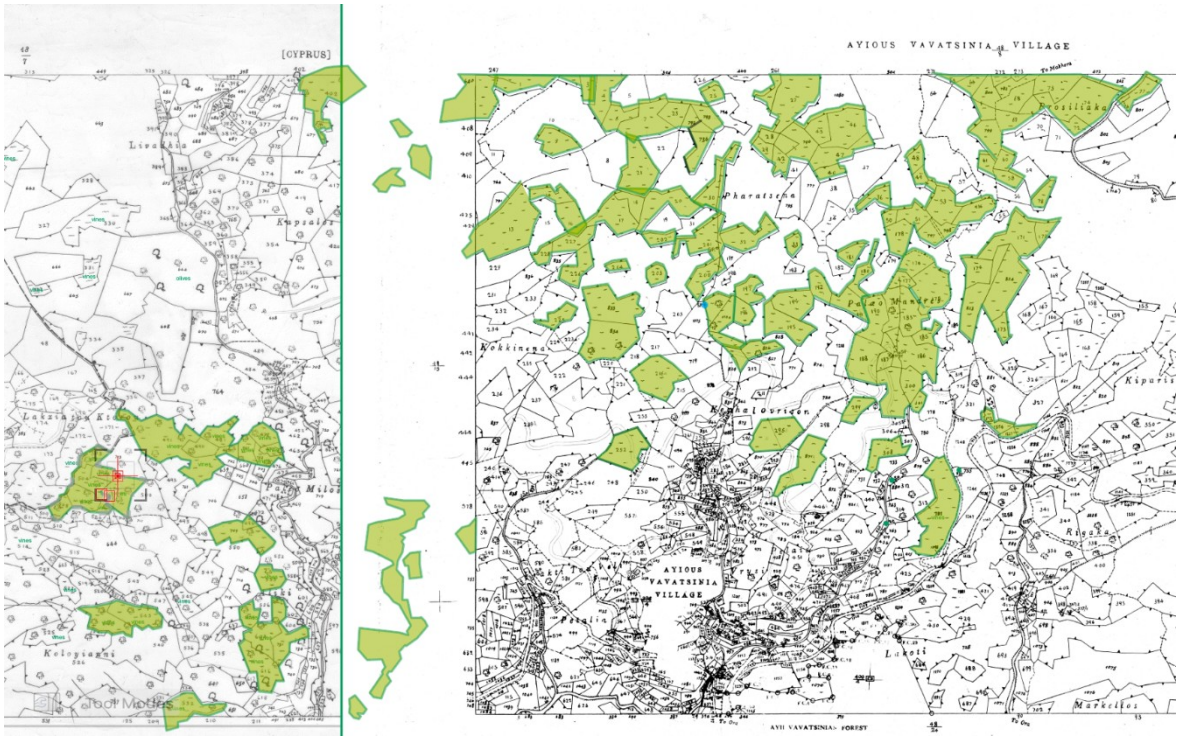


Figure 11 - Vine terraces of 1917 and the wider landscape of Ayii Vavtsinias

Source: Sevina Floridou, 2024

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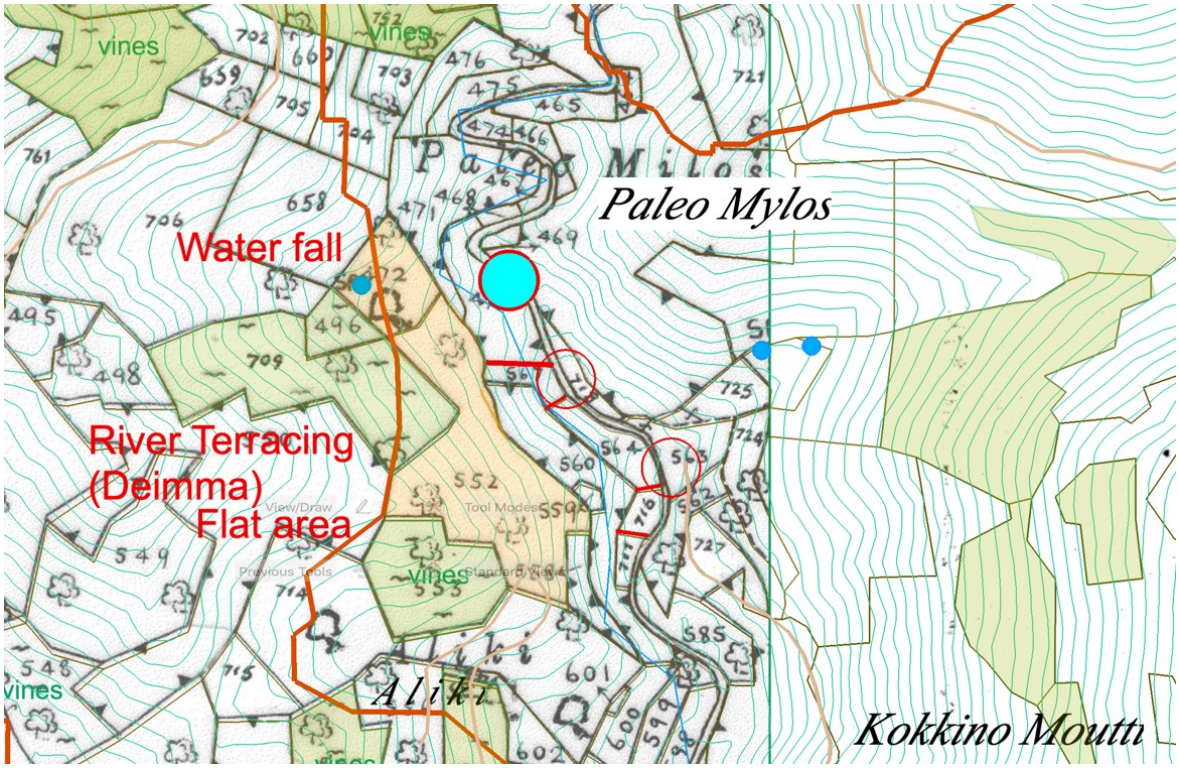


Figure 12 - Map contours and vineyards of Ayii Vavtsinias

Source: Sevina Floridou, 2024

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Figure 13 - Ayii Vavtsinias part of the route towards waterfall

Source: Sevina Floridou, 2024



Figure 14 - Terraces in Ayii Vavtsinias

Source: Sevina Floridou, 2024

6. Discussion and conclusions

Tourism sector has increasingly been recognized as a potential driver of regional development, with a primary emphasis on the economic benefits of generating foreign income and creating employment opportunities. However, in the pursuit of economic growth, environmental and social impacts were often overlooked. Over the past two decades, the adverse effects of this specific economic focus have become evident, including the destruction or degradation of natural environments, the loss and commercialization of local cultural identities, and the pressure on local resources from rising visitor numbers. Although these challenges are not solely the result of past planning decisions and policies, local destination management has undeniably played a role in the current problems faced by certain tourist areas.

By acknowledging the limitations of a growth-centric approach and the negative impacts it has had on certain destinations and tourist attractions, emerging regions and less-known/remote destinations can learn from these experiences and adopt alternative strategies to foster a visitor economy that promotes multidimensional prosperity rather than merely profit. A crucial element in achieving a balance among social, economic, and environmental factors is the integration and collaboration of diverse stakeholders, each bringing their unique interests, opportunities, and specialized knowledge.

The context of a destination must be taken into account, as different participatory models and support tools are needed depending on the type and vulnerability of resources, the scope and scale of tourism, the maturity of the destination, and the established policy framework. It is essential to support local stakeholders in identifying collective opportunities, achieving synergies, and developing successful interventions for future development. This will ensure that cultural tourism contributes substantially and sustainably to local communities across Europe.

This document presents a policy-oriented dashboard based on multidimensional and spatial evaluation framework to assess sustainable and circular tourism performances in touristic destinations. This framework is designed to assist stakeholders and decision-makers in making effective choices that promote sustainable regional development through cultural tourism. It aims to transform lesser-known and remote heritage sites into sustainable, circular, and human-centered cultural tourism destinations. The policy-oriented dashboard is based on urban metabolism assessment method, analysing the flows of people, materials, energy, water and wastes, identifying cultural tourism dimensions and indicators in the perspective of the circular economy and circular city/territory policy models focusing particularly on the human dimension.

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The tourism sector's competitiveness is closely linked to its sustainability, as the quality and the attractiveness of tourist destinations is strongly influenced by their natural and cultural environment and their integration into a local community. The sustainability of tourism covers a number of aspects: the responsible use of natural resources, taking account of the environmental impact of activities (production of waste, pressure on water, land and biodiversity, etc.), the use of 'clean' energy, protection of the heritage and preservation of the natural and cultural integrity of destinations, the quality and sustainability of jobs created, local economic prosperity or customer care. To face those challenges, requires us to make intelligent decisions, based on useful information. This information can come from specific indicators that move beyond from measuring a single aspect of business such as number of visitors or daily expenditure and instead combine information on relevant local issues through multidimensional and multi-criteria indicators.

In the tourism sector, evaluation is essential for assessing the efficiency and effectiveness of strategic decisions from both short-term and long-term perspectives, and for strengthening interinstitutional and intersectoral relationships. Interpreting the role of evaluation from a human-centred perspective means starting from the expressed needs of people and aiming to improve their wellbeing, health, and quality of life. Since human needs change over time, evaluation processes must be dynamic to effectively capture these changes. Evaluation should also be interactive, iterative, and participatory. Direct involvement of people and dialogue among them facilitate the identification of the needs, interests, and values involved in the evaluation process. For these reasons, the Be.CULTOUR dashboard serves as a self-assessment framework through which users select their indicators and proceed to collect data using the tools provided by the dashboard itself.

The operational evaluation of alternative policy strategies takes place through the design and use of user-friendly multi-dimensional policy dashboards. The dashboard interface proposed and available to decision-makers is both simple and detailed. It guides users step-by-step in defining the impacts of tourism strategies over the short and long term through ongoing and ex-post monitoring.

Building upon the context and impact indicators proposed (see Deliverable 1.2), the research team revised these indicators and developed an operational tool, such as the Dashboard, which guides users in visualizing the impacts of tourism strategies. This tool can be used in the strategy development phase to orient actions to create circular and human-centred destinations, as well as in the monitoring phase to assess impacts and adjust strategies, actions and policies over time.

The Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism was built based on a review of scientific literature in the field of sustainable and circular tourism, as well as from the main international tourism assessment tools. These sources have been essential for identifying the

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dimensions, criteria, and indicators of the dashboard. The dashboard was designed also based on the results of EU-funded projects such as SMARTCULTOUR, IMPACTOUR, and other initiatives focusing on innovative data and assessment models in cultural tourism.

As described in this report, the dashboard is structured into six dimensions (cultural, environmental, human and social, economic, institutional, man-made) each identifying criteria, sub-criteria, and indicators to assess the impacts of tourism strategies through a self-monitoring tool for both short and long-term periods. It serves as a tool to guide policymakers in making more informed and sustainable decisions in the tourism sector. The dashboard can be used as a self-assessment tool, providing end-users with all the necessary resources to collect data. To this end, specific data collection tools have been identified, including tailored surveys for each target group, enabling users to gather data in a structured and comparable way and monitor the positive and negative impacts of their tourism strategies (see Annex 1).

The Cultural Circular Tourism Impact Assessment Dashboard is an evaluation tool based on multidimensional and spatially adaptable indicators. The decision-making process in tourism development and planning has become increasingly intricate as organizations and communities grapple with competing economic, social, and environmental demands for sustainable development. Geographic Information Systems (GIS), and their evolution as Digital Twins (DT) of the territory, are today recognized as versatile toolbox of techniques and technologies crucial for supporting sustainable tourism development. Spatial data enables the exploration of tourism impacts in the geographical and landscape dimensions, supporting decision-makers in the conservation and valorisation of cultural landscapes. In particular, DTs and other virtual reality tools can help in visualizing spatial impacts and promoting the involvement of communities in co-evaluation processes, thanks to visual tools that can be understood by everyone.

Impact assessment and simulation are growing in importance within tourism development, where GIS and DTs play a pivotal role in auditing environmental conditions, evaluating site suitability for proposed developments, identifying conflicting interests, and modelling relationships. The concept of the Digital Twin applied to cities, sustainable urban policy development, and governance is currently a leading and extensively debated topic. The indicator presented here can indeed be used as a reference base for the development of Digital Twins for circular tourism regions (see Deliverable 1.5).

Baseline data was collected in all pilot regions in the start of the project (see Deliverable 1.1) and specific data more related to the presented Dashboard were collected in some pilot and mirror regions: spatial data collected in Vulture Alto Bradano area (Basilicata, Italy), cultural landscape

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mapping conducted in Larnaca rural area (Cyprus) identifying the main cultural elements of the traditional terraced landscape and historic villages, selected indicators collected in Sciacca (Sicily, Italy), selected indicators data collected in Doune Castle (Scotland, UK), social network data collected in all pilot areas (see Deliverable 5.10).

In particular, regarding data collection in the mirror areas, the project has worked with two mirror Ecosystem representatives: the Community Cooperative - Cooperativa di Comunità Identità e Bellezza (Sciacca, Italy) and Historc Environment Scotland (Scotland, UK).

Specifically, the involved partner is the Museo Diffuso dei 5 Sensi Sciacca, operated by the Cooperativa di Comunità Identità e Bellezza. A consultation was conducted with this partner to test the Be.CULTOUR assessment Dashboard and evaluate the impacts of sustainable and circular cultural tourism in the city of Sciacca (see Annex 2) .

The other mirror area where indicator collection and impact monitoring was tested is the cultural heritage site of Doune Castle in Scotland, in collaboration with Historic Environment Scotland (HES). In this case, the use of the Dashboard was carried out in collaboration with the University of Glasgow within the Course on Tourism led by prof. Patrizia Riganti, involving students in the experimentation. Using Be.CULTOUR's Indicators of Circular Cultural Tourism, the students analyzed the circularity of Doune Castle's tourism (see Annex 3).

Regarding spatial data of the Be.CULTOUR Dashboard, they were collected for the Vulture Alto Bradano area, in Basilicata (see Annex 5). In this area, contextual data were initially collected to construct the territorial model. For this purpose, and by referring to the context indicators identified by the Be.CULTOUR project (see Deliverable D1.2), a digital GIS model of the Vulture Alto Bradano area (comprising 19 municipalities) and specifically focused of the city of Venosa was developed. The framework of context indicators is an initial set that can be used for constructing the Digital Twin of the Vulture Alto Bradano area following the guidelines provided in D1.5 - Development of interactive user-oriented Be.CULTOUR App. The collection of spatial data revealed some necessary considerations regarding the difficulties users may encounter in data collection with regard to the accessibility and the interoperability of the data, also according to FAIR data principles. Many databases are not open-source and they are aggregated at national and regional level, making them difficult to obtain and use, because they require specific authorizations or require additional costs to access them. Moreover, the time required to obtain these data is often excessively long, which hinders their availability and the short-term monitoring of impacts. Additionally, some data collection tools rely on the perception or knowledge of various target groups (e.g. tourists, residents), making it challenging to involve stakeholders and the community in data collection. On

the other hand, some of these indicators already suggest some data that could be collected from open-source platforms, social media platforms, and even from sensors/IoT systems linked with Digital Twin technology if available.

A positive aspect of the Be.CULTOUR Dashboard as a self-assessment tool is that policymakers can choose the most useful and significant indicators for their specific case. Policymakers often opt for quantitative indicators to more easily quantify the impact of tourism on a destination. However, the Dashboard includes also relevant qualitative indicators, leveraging the human and social dimension, for which data collection tools were identified, mainly surveys and eventually social media reactions. These data are crucial for the paradigm shift towards more circular and sustainable tourism. This change of mindset, and thus priorities, should not only come from policymakers identifying sustainable and circular tourism strategies, but also involve a change in the behaviour and habits of tourists.

To develop a circular and more sustainable tourism, intangible cultural and social values and the diverse perspectives of tourism stakeholders are essential. To positively enhance user awareness, it is necessary to move beyond stop-and-go tourism models towards more authentic ways of enjoyment, where values are enhanced through travellers' immersive participation in activities and experiences implemented by and with local communities. This relational dynamic between tourists, communities, and places can strengthen their sense of attachment and common interest in the conservation and care of heritage, stimulating more respectful dynamics towards places and people, and therefore, more sustainable practices.

The indicators presented in the Dashboard can be very useful for evaluating also the impacts of public and private investments. Furthermore, they can serve as a guiding tool for the use of European Structural Investment Funds (ESIF) in synergy with the outcomes of WP2. Similarly, the Dashboard indicators can be used by businesses and start-ups across various European territories to assess the results of entrepreneurial initiatives that adopt a circular business model, in line with the innovations developed in WP.

In conclusion, the Be.CULTOUR Dashboard is presented as a self-assessment framework supporting policymakers, private entrepreneurs, local governments, regional promotion agencies, and organizations through a user-friendly, multi-dimensional interface in defining the impacts of tourism strategies over time.

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Acronyms

[CCT]	[Circular Cultural Tourism]
[CE]	[Circular Economy]
[CEnTOUR]	[Circular Economy in Tourism]
[CLIC]	[Circular models Leveraging Investments in Cultural heritage adaptive reuse]
[CUM]	[Circular Urban Metabolism]
[DMO]	[Destination Management Organization]
[DT]	[Digital Twin]
[EDEN]	[European Destinations of Excellence]
[EIA]	[Environmental Impact Assessment]
[ETIS]	[European Tourism Indicators System]
[EU]	[European Union]
[EU]	[European Union]
[GDP]	[Gross Domestic Product]
[GIS]	[Geographic Information System]
[GSTC]	[Global Sustainable Tourism Council]
[ILO]	[International Labour Organization]
[ISO]	[International Organization for Standardization]
[NECSTouR]	[Network of European Regions for a Sustainable and Competitive Tourism]
[OECD]	[Organisation for Economic Co-operation and Development]
[OEF]	[Organisation Environmental Footprint]
[PEF]	[Product Environmental Footprint]
[SCT]	[Sustainable Cultural Tourism]
[SD]	[Sustainable Development]
[SDGs]	[Sustainable development goals]
[UE]	[Urban Ecosystem]
[UM]	[Urban Metabolism]
[UNESCO]	[United Nations Educational, Scientific and Cultural Organization]
[UNWTO]	[United Nations World Tourism Organization]
[WTO]	[World Tourism Organization]

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ANNEX 1 – Data Collection Tools

Be.CULTOUR Circular Cultural Tourism visitors' survey	
1.1.1 Level of visitors' appreciation of cultural sites	On a scale of 1 to 5, how satisfied are you with the valorisation of cultural sites? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied
1.1.2 Level of visitors' appreciation of activities implemented to enhance cultural heritage	On a scale of 1 to 5, how satisfied are you with the activities implemented to enhance the integrity and authenticity of the cultural heritage? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied
5.2.2 Level of visitors' appreciation of natural sites	a) Overall Appreciation of Natural Sites: On a scale of 1 to 5, how would you rate your overall appreciation of the natural sites you visited during your experience (e.g., parks, beaches, rivers, lakes, forests, etc.)? 1: Very low appreciation 2: Low appreciation 3: Moderate appreciation 4: High appreciation 5: Very high appreciation b) Cleanliness: On a scale of 1 to 5, how would you rate the cleanliness of the natural sites you visited? 1: Very poor cleanliness 2: Poor cleanliness 3: Average cleanliness 4: Good cleanliness 5: Excellent cleanliness c) Safety: On a scale of 1 to 5, how would you rate the feeling of safety at the natural sites you visited? 1: Very unsafe 2: Unsafe 3: Neutral 4: Safe 5: Very safe d) Accessibility:

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	On a scale of 1 to 5, how would you rate the accessibility of the natural sites you visited? 1: Very poor accessibility 2: Poor accessibility 3: Average accessibility 4: Good accessibility 5: Excellent accessibility
6.1.1 Level of visitors' responsible behavior	a) Use of Recyclable Products: On a scale of 1 to 3, how often do you use recyclable products during your travels (e.g., glass, water bottles, etc.)? 1: Rarely or never 2: Occasionally 3: Frequently or always b) Purchase of Minimally Packaged Goods or Plastic-Free Products: On a scale of 1 to 3, how often do you buy minimally packaged goods or plastic-free products while traveling? 1: Rarely or never 2: Occasionally 3: Frequently or always c) Attention to Resource Consumption: On a scale of 1 to 3, how much attention do you pay to resource consumption (e.g., energy, water, wastes) during your travels? 1: Little to no attention 2: Moderate attention 3: Significant attention d) Booking Eco-Friendly Facilities: On a scale of 1 to 3, how often do you book accommodations that are eco-friendly or have sustainability initiatives in place? 1: Rarely or never 2: Occasionally 3: Frequently or always
10.1.1 Level of safety perceived by visitors	How safe did you feel in the tourist destination during your stay? 1 = Not at all safe 2 = Partly safe 3 = Safe 4 = More than safe 5 = Very safe
11.1.1 Level of visitors' satisfaction about what they learned during the trip	On a scale of 1 to 5, how satisfied are you with what you learned during your trip about the local culture, customs, traditions, language, etc.? 1: Very dissatisfied 2: Dissatisfied 3: Neutral 4: Satisfied 5: Very satisfied

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11.2.1 Percentage of visitors declaring they have established meaningful relationships in the destination	Do you have established meaningful relationship in the destination? □ Yes □ No
11.2.2 Level of visitors satisfaction for the host community hospitality	a) Friendliness of Locals: On a scale of 1 to 5, how would you rate the friendliness of the locals in the host community? 1: Very unfriendly 2: Unfriendly 3: Neutral 4: Friendly 5: Very friendly b) Quality of Services: On a scale of 1 to 5, how satisfied are you with the quality of services provided by the host community (e.g., accommodations, restaurants, tour operators)? 1: Very dissatisfied 2: Dissatisfied 3: Neutral 4: Satisfied 5: Very satisfied c) Cultural Immersion: On a scale of 1 to 5, how immersed did you feel in the local culture during your visit to the host community? 1: Not immersed at all 2: Slightly immersed 3: Moderately immersed 4: Immersed 5: Very immersed d) Safety Perception: On a scale of 1 to 5, how safe did you feel in the host community? 1: Very unsafe 2: Unsafe 3: Neutral 4: Safe 5: Very safe e) Willingness to Revisit or Recommend: On a scale of 1 to 5, how likely are you to revisit the host community? 1: Very unlikely 2: Unlikely 3: Neutral 4: Likely 5: Very likely

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	f) On a scale of 1 to 5, how likely are you to recommend the host community to others? 1: Very unlikely 2: Unlikely 3: Neutral 4: Likely 5: Very likely
16.1.1 Daily average spending per visitors	1. How much did you spent on average per day? 2. Compared to the total expense of your trip, how much did you spend for each category, from 1 to 5? - In locally-made handcrafts and products - In food - On overnight stay - On transports - On culture (museums, events, ecc.)
18.3.1 Percentage of returning loyal visitors in the last five years	Was this your first visit to this destination? □ Yes □ No If No, how many times have you visited this destination in the last five years?

Be.CULTOUR Circular Cultural Tourism residents' survey	
1.1.1 Level of residents' appreciation of cultural sites	On a scale of 1 to 5, how satisfied are you with the valorisation of cultural sites? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied
1.1.2 Level of residents' appreciation of activities implemented to enhance cultural heritage	On a scale of 1 to 5, how satisfied are you with the activities implemented to enhance the integrity and authenticity of the cultural heritage? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied
7.1.1 Level of residents' appreciation for the improvement of the area due to tourism	On a scale of 1 to 5, how satisfied are you with the improvement of the area due to tourism? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied
8.1.1 Level of skills acquired by the local	On a scale of 1 to 5, assign a score on how satisfied you feel in acquiring skills in the following areas:

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community in the field of tourism	- Creative - Relationale - Linguistic - Professionals - Digital - Enterpreneurship - Cultural knowledge - Environmental 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied
11.1.1 Level of residents' satisfaction about what they learned during the trip	On a scale of 1 to 5, how satisfied are you with what you learned during your trip about the local culture, customs, traditions, language, etc.? 1: Very dissatisfied 2: Dissatisfied 3: Neutral 4: Satisfied 5: Very satisfied

Be.CULTOUR Circular Cultural Tourism local cultural sites' survey	
2.1.1 Level of usability of local cultural facilities	On a scale 1 to 3, which facilities are open all year, partially open, or closed at different times? 1 = closed sites 2 = partially open in a year 3 = open all year
2.2.1 Number of people participating in cultural experiences per year	How many people participate in cultural experiences per year? Can you split the percentage per target? (residents and tourists). Collect the data by individual year.
2.2.2 Number of cultural experiences for the enhancement of local tangible and intangible cultural heritage per year	How many activities have you realized per year? Can you split them by type? Collect the data by individual year.
3.1.2 Number of cultural sites equipped with digital visitor support tools	Do you provide any digital visitor support tools at your cultural site, such as Augmented Reality (AR) or Virtual Reality (VR) experiences? If yes, how many cultural sites are equipped with AR or VR technology for visitor engagement? Can you provide a list of the cultural sites equipped with digital visitor support tools?

	Are these tools available for all visitors, or are they limited to certain exhibits or areas within the cultural site?
3.3.1 Number of cultural site equipped with a digital strategy maketing	Does your cultural site have a digital marketing strategy in place? If yes, which digital marketing platforms or tools are included in your strategy (e.g., Tripadvisor, social media channels, Google Analytics, etc.)? How many cultural sites are actively implementing a digital marketing strategy? Can you provide details or examples of how these digital marketing tools are utilized to promote the cultural site and engage with visitors? Have you observed any impacts or benefits from implementing digital marketing strategies at your cultural site?"
4.1.1 Number of cultural sites and accommodations using efficiency systems	Does your cultural site use renewable energy sources such as solar, wind, hydro, or biomass? If yes, please specify the renewable energy sources used (e.g., solar panels, wind turbines, hydroelectric power). What energy-saving systems are implemented at your cultural site (e.g., micro-wind turbines, solar panels for lighting)?
4.2.1 Number of cultural sites and accommodations using systems to reduce water consumption	Does your cultural site have systems in place to reduce water consumption? If yes, please specify the water-saving measures implemented (e.g., low-flow faucets, water consumption monitoring systems).
4.2.2 Number of cultural sites and accommodations using recycled water	Does your cultural site utilize recycled water for any purposes? If yes, please specify how recycled water is used (e.g., graywater reuse for gardening, irrigation, cooling systems).
4.3.1 Number of cultural sites and accommodations using systems to reduce plastic and wastes consumption	Does your cultural site have systems to reduce waste consumption? If yes, please specify the waste reduction measures implemented (e.g., minimizing single-use plastic products, using recyclable packaging).
4.3.2 Number of cultural sites and accommodations re-using wastes	Does your cultural site engage in waste reuse practices? If yes, please specify how waste is reused (e.g., composting organic waste from kitchens and gardens).
5.1.1 Number of experiences to reconnect people and nature per year	How many experiences to reconnect people and nature have you organized in a year? Collect the data by individual year.
5.1.2 Number of people participating in experiences to reconnect people and nature	How many people participate in cultural experiences per year? Can you split the percentage per target? (residents and tourists) Collect the data by individual year.
9.1.1 Number of cultural sites and accommodations	Have your location architectural barriers, as stairs, ramps, ecc.?

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without architectural barriers	
9.1.2 Number of cultural sites and accomodations offering supporting tools and services for people with diverse needs	Do you offer support tools and services for people with diverse needs, as priority seating, special tours and programs, ecc?
9.2.1 Number of accomodations, culture and tourism structures offering supporting tools and services to breaking down language barriers	Do you offer supporting tools and services to breaking down language barriers like audio guides, braille directions, multilingual books/guides/info or other?
12.2.1 Number of donations received for the management, enhancement, preservation and valorization on tangible and intangible cultural heritage per year	How many donations did your institution receive for the management, enhancement, preservation, and valorization of cultural heritage in the past year? Can you provide a breakdown of donations received from tourists and citizens separately? Please, link/write your Donation pathway. Collect the data by individual year.

Be.CULTOUR Circular Cultural Tourism accommodations' survey	
4.1.1 Number of cultural sites and accommodations using efficiency systems	Does your accommodation use renewable energy sources such as solar, wind, hydro, or biomass? If yes, please specify the renewable energy sources used (e.g., solar panels, wind turbines, hydroelectric power). What energy-saving systems are implemented at your cultural site/accommodation (e.g., micro-wind turbines, solar panels for lighting)?
4.2.1 Number of cultural sites and accommodations using systems to reduce water consumption	Does your accommodation have systems in place to reduce water consumption? If yes, please specify the water-saving measures implemented (e.g., low-flow faucets, water consumption monitoring systems).
4.2.2 Number of cultural sites and accommodations using recycled water	Does your accommodation utilize recycled water for any purposes? If yes, please specify how recycled water is used (e.g., graywater reuse for gardening, irrigation, cooling systems).
4.3.1 Number of cultural sites and	Does your accommodation have systems to reduce waste consumption?

accommodations using systems to reduce plastic and wastes consumption	If yes, please specify the waste reduction measures implemented (e.g., minimizing single-use plastic products, using recyclable packaging).
4.3.2 Number of cultural sites and accommodations re-using wastes	Does your accommodation engage in waste reuse practices? If yes, please specify how waste is reused (e.g., composting organic waste from kitchens and gardens).
9.1.1 Number of cultural sites and accommodations without architectural barriers	Have your location architectural barriers, as stairs, ramps, ecc.?
9.1.2 Number of cultural sites and accomodations offering supporting tools and services for people with diverse needs	Do you offer support tools and services for people with diverse needs, as priority seating, special tours and programs, ecc?
9.2.1 Number of accommodations, culture and tourism structures offering supporting tools and services to breaking down language barriers	Do you offer supporting tools and services to breaking down language barriers like audio guides, braille directions, multilingual books/guides/info or other?
15.2.1 Percentage of locally products sourced by the destination's tourism enterprises	What percentage of your services, goods, food and drinks are sourced locally? □ < 10 % □ 10 – 25 % □ 25 – 50 % □ > 50 %
18.1.2 Average length of stay of visitors	How much do tourists stay overnight at your facility on average per year?
18.2.1 Percentage of visitors per season per year	What is the percentage of visitors per season per year?

Be.CULTOUR Circular Cultural Tourism Destination Management Organizations (DMOs) survey	
2.2.1 Number of people participating in cultural experiences per year	How many people participate in cultural experiences per year? Can you split the percentage per target? (residents and turists). Collect the data by individual year.

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2.2.2 Number of cultural experiences for the enhancement of local tangible and intangible cultural heritage per year	How many activities have you realized per year? Can you split them by type? Collect the data by individual year.
5.1.1 "Number of experiences to reconnect people and nature per year	How many experiences (spontaneous/officinalis herb recognition, forest bathing, yoga experience, astroturism, educational and self-made workshops, bird watching, foliage experience) to reconnect people and nature have you organized in a year? Collect the data by individual year.
5.1.2 Number of people participating in experiences to reconnect people and nature	How many people participate in experiences to reconnect people and nature per year? Can you split the percentage per target? (residents and tourists) Collect the data by individual year.
12.1.1 Number of residents actively involved for the care of cultural and natural heritage per year	How many residents have been involved per year?
12.1.2 Number of partnership activated for the care and valorizzation of cultural and natural heritage per year	How many partnerships have been activated?
12.2.1 Number of donations received for the management, enhancement, preservation and valorization on tangible and intangible cultural heritage per year	How many donations did your institution receive for the management, enhancement, preservation, and valorisation of cultural heritage in the past year? Can you provide a breakdown of donations received from tourists and citizens separately? Please, link/write your Donation pathway. Collect the data by individual year.
19.1.1 Number of heritage goods reused for cultural and tourist activities in the last five years	List and contact heritage management agencies, preservation societies, or cultural heritage organizations responsible for overseeing heritage sites: Question: Do you maintain records or databases of heritage sites that have undergone restoration, renovation, or activation?
19.2.1 Surface of heritage landscape recovered for cultural and tourist activities	Do you have details on the smq surface area of renovated or activated spaces within the heritage site?"
22.2.1 Percentage of destinations with a sustainable tourism strategy/action plan	Do your destination have a strategic action plan?

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23.1.1 Number of social partnerships (public-private, public-public) activated in the tourism destination for the heritage and landscape enhancement per year	How many social partnerships have been activated in the tourism destination for heritage and landscape enhancement? Collect the data by individual year.
23.2.1 Number of residents and organisations actively involved in the co-design of tourism activities and strategies	How many residents and organizations actively participate in co-designing tourism activities and strategies each year?

Be.CULTOUR Circular Cultural Tourism commercial activities' survey	
4.4.1 Number of commercial activities using sustainable/local foods products	1) Do you use biological or organic food products in your establishment? If yes, please specify the types of biological food products used and the percentage of your menu that consists of biological options. 2) How do you source your biological food products? 3) Do you have any certification?

Be.CULTOUR Circular Cultural Tourism enterprises' survey	
5.3.2 Number of tourism enterprises in the destination using a voluntary certification/labelling for environmental quality/sustainability	Does your tourism enterprises have a voluntary certification/labelling or environmental quality/sustainability?
9.3.1 Level of perception of inclusion of women, youth, people with special needs and minority cultures in enterprises	a) On a scale of 1 to 5, how do you perceive your work environment toward women, special needs, and youth? 1 = Not at all inclusive 2 = Partly inclusive 3 = inclusive 4 = More than inclusive 5 = Very inclusive

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Be.CULTOUR Circular Cultural Tourism local government's survey	
16.2.1 Volume of tourism revenue reinvested in local socio-cultural initiatives per year	Does your institution reinvest revenue in local socio-cultural initiatives? If yes, what is the volume?
20.2.1 Kilometers of routes improved or constructed to connect the heritage area through sustainable mobility in the last five year	1) Do you have data on the kilometers of routes improved or constructed within the specified timeframe? If yes 2) Rail routes □ Yes □ No Bicycle routes □ Yes □ No Pedestrian routes □ Yes □ No
24.1.1 Presence of norms to regulate short-term rentals	Are there regulation/strategy to regulate short-term rentals. □ Yes □ No
24.1.2 Presence of policies to regulate the overcrowding	Are there regulation/strategy to regulate the overcrowding. □ Yes □ No
24.2.1 Presence of policies to preserve the natural ecosystems and landscape	Are there regulation/strategy to preserve the natural ecosystems □ Yes □ No

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ANNEX 2 – Evaluation of tourism impacts strategies in Sciacca, Italy. Testing and validating the Be.CULTOUR Dashboard

The Be.CULTOUR evaluation framework, an updated version of the one proposed in Deliverable D1.2 "Sustainable cultural tourism impacts assessment framework based on urban metabolism," aims to provide an operational assessment and self-assessment tool for tourism decision-makers. Its goal is to guide tourism strategies towards a human-centred and circular cultural tourism. The indicators proposed in Deliverable D1.2 underwent a revision and update process involving the review of sources and a co-design phase with stakeholders of the Be.CULTOUR project. Specifically, the indicator framework outlined in Deliverable D1.2 was refined through a series of stages that primarily engaged the CNR-UNINA research team, followed by project pilots and mirrors. This process aimed to operationalize the tool by constructing a dashboard that guides users step-by-step in defining the impacts of tourism strategies over the short and long term through ongoing and ex-post monitoring. Building upon the context and impact indicators previously proposed (see Deliverable 1.2), the research team revised these indicators, specifying their measurement unit, data collection tool, sources, targets, and spatial data visualization through Geographic Information System (GIS).

The Be.CULTOUR project has selected sixteen applicants as 'Mirror Innovation Ecosystems', including the city of Sciacca, Sicily, Italy. Specifically, the partner involved is the Museo Diffuso dei 5 Sensi Sciacca, operated by the Cooperativa di Comunità Identità e Bellezza. A consultation was initiated with this partner for the validation and testing of the Be.CULTOUR assessment dashboard. This process spanned several months and involved various regular meetings where the evaluation framework was tested alongside the engaged stakeholders. Representatives from the cooperative followed the outlined steps of the Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism, summarized as follows:

1) Selection of the most relevant and significant indicators for the specific case;
2) Identification of the reference targets to collect the required data;
3) Data collection;
4) Short-term monitoring (on-going);
5) Evaluation of the impacts of tourism strategies.

The comparison with other project mirrors provided valuable support in verifying the functionality of the tool, its user-friendliness, and identifying any issues associated with its use. This comparison was instrumental in optimizing the dashboard and making adjustments both to the indicators and the tool interface. Specifically, the interface of the dashboard has been streamlined since its

inception to make it more user-friendly, aligning with the purpose of self-assessment of tourism strategy impacts.

2.1 The territorial context of Sciacca, Southern Italy

Sciacca is a city in the province of Agrigento on the southwestern coast of Sicily, Italy. The city, developed from its medieval territorial arrangement consolidated after the earlier Greek-Roman settlement, has evolved into a central reference point for the surrounding agricultural settlements. These include Menfi, Montevago, Santa Margherita di Belice, Sambuca, Giuliana, Chiusa Sclafani, Burgio, Villafranca, Lucca Sicula, Calamonaci, Ribera, Cianciana, and Cattolica Eraclea, collectively known as the Terre Sicane region. Geographically, Sciacca is bounded by the Platani River to the east, the Belice River to the west, the Sicani Mountains to the north, and the Mediterranean Sea to the south.

In this territorial context, Sciacca has developed commercial relationships with external areas, earning its status as an "intermediate city." This is evidenced by its sustained demographic stability over time. Its role as a convergence center extends beyond its immediate region due to factors such as a port system, tertiary tourism services, cultural and environmental heritage, and radial infrastructure. Situated on a terrace overlooking the sea and dominated by Mount S. Calogero (Kronio) to the east (386 meters above sea level), Sciacca lies at an elevation of 60 meters above sea level with a population of 39.263 residents as per the 2021 census. The municipal territory covers approximately 19,101 hectares, stretching along a 33-kilometer coastline along the Mediterranean. Bounded by the Carboj River to the west and the Verdura River to the east, it includes part of the artificial Lake Arancio to the north, primarily within Sambuca di Sicilia's municipal territory. Several streams (Bellapietra and Tranchina) and valleys (Caricagiache, Foce di Mezzo, Baiata, Cansalamone, Carabollace, Portolana, and Lazzarino) traverse the territory from north to south.

Sciacca holds the distinction of being Sicily's oldest thermal locality and one of the most significant centers along the southwestern coast, historically attracting tourists primarily for thermal treatments, leisure stays, and bathing. It also serves as Sicily's second-largest fishing port and the largest within the Porto Empedocle area.

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2.2 Museo Diffuso dei 5 Sensi Sciacca Cooperativa di Comunità Identità e Bellezza

The Museo Diffuso dei 5 Sensi aims to transform individuals from passive spectators into active inhabitants through an inclusive and bottom-up tourism innovation project managed by a non-profit community cooperative. This initiative seeks to turn the city of Sciacca, located in Sicily, into a tourist destination by emphasizing the enhancement of the local territory and its residents. The Museo Diffuso dei 5 Sensi is an open-air museum where the collections are the products and beauties of the area, its immense historical, artisanal, artistic, and cultural heritage. The citizens of Sciacca are no longer mere residents but true inhabitants who love their territory and collectively decide to address a chronic and dramatic employment and development situation through the systematic management of their immense human, natural, and identity heritage.

Thus, a virtuous "economy of beauty" is born from the community, enduring and sustainable, where usefulness and ethics are not in conflict but contribute to collective well-being and happiness. It is a circular economy, without waste, locally sourced, but also horizontal, aimed at sharing investments with the community and distributing the revenues. The focus is on experiential, emotional, empathetic, and transformative tourism.

The territory of Sciacca boasts an extensive heritage encompassing history, art, archaeology, landscape, crafts, architecture, agriculture, food and wine, environment, and traditions, all deserving rediscovery, protection, and valorisation. The initiative aimed to raise awareness of this heritage's value, stimulate action to make it accessible through storytelling, and foster an economy where usefulness and ethics converge—the Economy of Beautifulness. Central to this effort were the identities and competencies of local residents. Each day, more people engaged in the project, contributing new ideas, stories, experiences, and initiatives that narrate the area's history, traditions, and cultural richness. These resources, transformed through storytelling and experiential activities, benefit the entire community.

The vision is to cultivate a community actively involved in the sustainable and responsible development of its territory. Such engagement ensures sustainable economic activities over the long term, providing socio-economic benefits that are equitably distributed among stakeholders, including stable employment, income opportunities, and contributing to equality and poverty alleviation. The project aims to raise awareness, valorize cultural heritage, and make it accessible to tourists, whom they regard as temporary citizens. By meaningfully connecting people and responsibly utilizing existing resources, the project refrains from constructing new sites or

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attractions. Instead, it connects diverse individuals within the community who share a commitment to thriving in their place of birth, thereby valorising existing resources and making them accessible to visitors. The tourism experience offered is grounded in the local knowledge possessed by residents, requiring minimal additional resources to share their identities and enrich visitors' experiences.

2.3 Tourism impact assessment of Museo Diffuso dei 5 Sensi

Regular meetings were held with the cooperative team, and through a co-design process, the most relevant indicators for the specific case of Sciacca were identified. These indicators were collected with the aim of identifying the impacts of the strategic actions that the Cooperative has implemented over the years. The dimensions predominantly involved were cultural and human-social. This selection underscores the significance of engaging local community members and cultural heritage within the Cooperative's project. The following table presents the selected indicators, with data collected for the years 2022 and 2023. The selection process was based on the project's objectives and two criteria: (a) the relevance of the indicator to the touristic destination and (b) the feasibility of collecting and applying the indicator at the local level to enable experimentation. By comparing these two years, it was possible to assess the growth or decline of certain activities and the impacts of the strategic tourism initiatives implemented by the Cooperative.

Table 7 - Selected indicators in cultural dimension for Sciacca case study

Criteria	Sub-criteria	Indicator	Unite of Measure
Cultural vibrancy	Cultural experiences	Number of cultural experiences for the enhancement of local tangible and intangible cultural heritage per year	No./year
Cultural vibrancy	Cultural experiences	Number of people participating in cultural experiences per year	No./year
Cultural heritage appreciation	Cultural heritage istitutional appreciation	Number of international awards/labels recognised to local tangible and intangible cultural heritage in the past 10 years	No. in the past 10 years
Cultural digital use	Digital services	Number of download of digital tools for the enhancement of local tangible and intangible cultural and natural heritage per year	No./year

Table 8 - Selected indicators in man-made dimension Sciacca case study

Criteria	Sub-criteria	Indicator	Unite of Measure
Heritage and landscape reuse	Heritage reuse	Number of heritage goods reused for cultural and tourist activities in the last five years	No. in 5 year

Table 9 - Selected indicators in human and social dimension Sciacca case study

Criteria	Sub-criteria	Indicator	Unite of Measure
Sense of ownership and community care	Visitors' committment	Number of residents actively involved for the care of cultural and natural heritage per year	No./year
Sense of ownership and community care	Visitors' committment	Number of partnership activated for the care and valorizzation of cultural and natural heritage per year	No./year
Inclusiveness	Language inclusivness	Number of accommodations, culture and tourism structures offering supporting tools and services to breaking down language barriers	No.
Capacity building	Training and educational activities	Level of skills acquired by the local community in the field of tourism	Likert scale

Figures 9 and 10 show the data and impacts (2022-2023) of the 5 Senses Diffuse Museum.

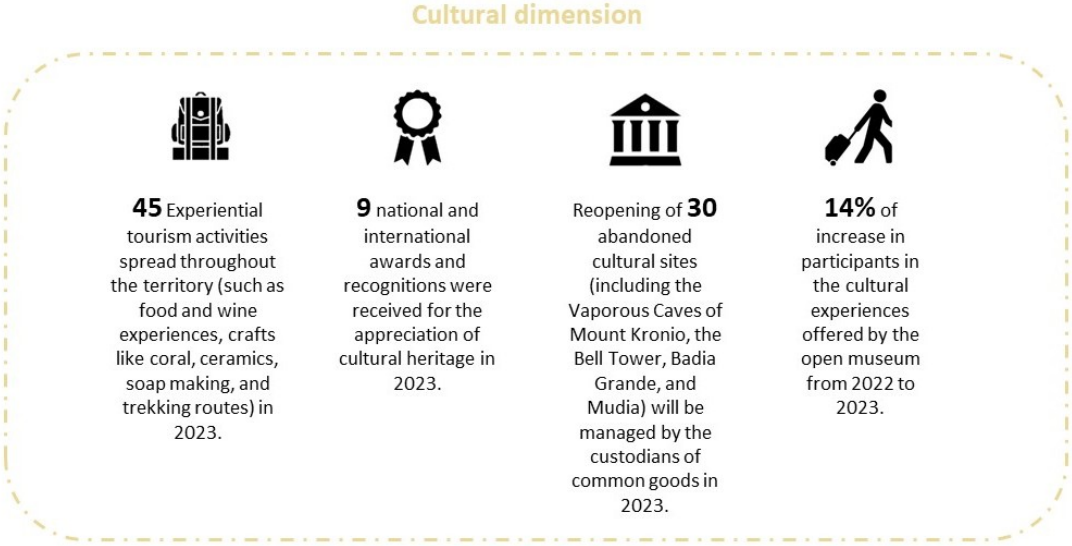


Figure 15 - Chart of touristic impacts of the Museo Diffuso dei 5 Sensi for the cultural dimension

Source: Authors' elaboration

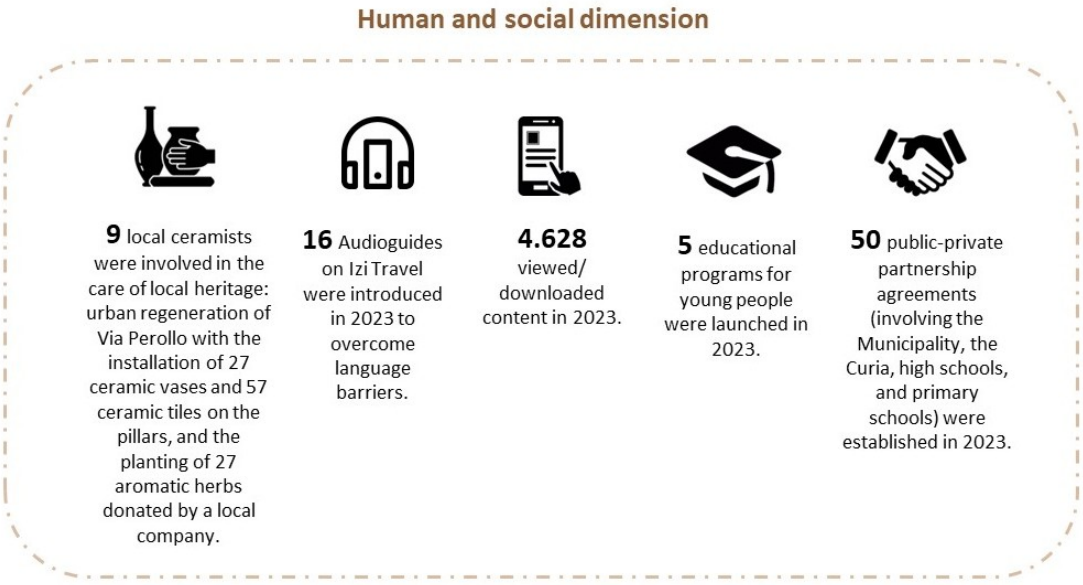


Figure 16 – Chart of touristic impacts of the Museo Diffuso dei 5 Sensi for the human and social dimension

Source: Authors' elaboration

To evaluate the impacts of the Cooperative's actions for the Museo Diffuso dei 5 Sensi between 2022 and 2023, nine indicators were identified. However, the assessment is ongoing, and the Cooperative will continue to use the Be.CULTOUR Dashboard to monitor impacts in the coming years. The selection of indicators was based on both their significance and data availability.

From the consultation with the Cooperative and the test of the evaluation framework in Sciacca, it became evident that data collection was challenging because often there was uncertainty about whom to request the data from and how to request it. This prompted the research team to refine the evaluation tool by also providing target guidelines and questionnaires to distribute to various targets for data collection.

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ANNEX 3 – Report on the Economics of Circular Tourism for Doune Castle

Introduction

The historic environment in Scotland plays a pivotal role in its cultural heritage, significantly contributing to the tourism sector. Doune Castle, located in Stirling, is a medieval fortress that exemplifies this contribution. Constructed in the early fifteenth century by Robert Stewart, Duke of Albany, Doune Castle is one of Scotland's largest medieval castles and has gained international fame as a filming location for popular movies and television series, such as "Monty Python and the Holy Grail" and "Outlander."

The surge in visitor numbers, drawn by both its historical significance and media presence, has underscored the need for a shift towards sustainable tourism practices based on circular economy principles. The circular economy aims to minimize waste and make the most of resources by creating closed-loop systems where products, materials, and resources are reused, recycled, and regenerated. Applying these principles to tourism management at Doune Castle can help ensure the long-term preservation of this cultural asset while promoting environmental, economic, and social sustainability.

The experimentation of proposed indicators developed by the Horizon 2020 Be.CULTOUR project was conducted at Doune Castle in Scotland, UK. The analysis was performed by a group of students from the University of Glasgow, under the guidance of Professor Patrizia Riganti and the supervision of Historic Environment Scotland, one of the mirror regions collaborating with the Be.CULTOUR project as an advisor.

This report analyzes the tourism impacts on Doune Castle from a circular economy perspective, providing insights and recommendations for sustainable practices. By addressing issues such as seasonality, environmental degradation, cultural oversaturation, and infrastructural strain, this analysis seeks to outline a path towards a more sustainable and resilient tourism model for Doune Castle.

Background and Key Aspects of Doune Castle

Doune Castle's significance extends beyond its architectural grandeur. It has been a witness to Scotland's tumultuous history and now serves as a major tourist attraction. The castle's dual role as a historical monument and a modern cultural icon has led to substantial increases in visitor numbers. For example, in 2018, Doune Castle welcomed over 142,091 visitors, up from 38,081 in 2013, reflecting the growing interest fueled by its appearances in popular media.

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Aims and Objectives of the Analysis

The primary aim of this analysis was to evaluate the tourism impacts on Doune Castle through the lens of a circular economy. Specific objectives include:

1. Assessing the current state of tourism and its effects on the castle and surrounding areas.
2. Identifying key sustainability indicators and their implications.
3. Proposing recommendations for transitioning to a circular tourism model.

Key Results and Analysis

1. **Tourism Seasonality and Economic Impact**
    - Doune Castle experiences high seasonality, with peak visitor numbers in the summer months. For instance, July and August alone accounted for nearly 40% of the annual visitors in 2019.
    - Seasonal tourism jobs make up a significant portion of the local economy, with many businesses reliant on the influx of tourists during these peak months. However, this seasonality can lead to economic instability during off-peak periods.

    Chart 1: Visitor Seasonality at Doune Castle (2019)

2. **Environmental Impacts**
    - The environmental impact of tourism is evident in the estimated greenhouse gas emissions associated with travel to Doune Castle. In 2019, the average carbon footprint per visitor was estimated at 0.1 metric tons, contributing to a total of 14,209 metric tons for that year.
    - Urban green areas and natural protected areas around Doune Castle are under pressure from increased tourist footfall, leading to soil erosion and habitat disruption. Efforts to mitigate these impacts include the creation of designated pathways and the promotion of eco-friendly tourism practices.

    Chart 2: Estimated Carbon Footprint per Visitor (2019)

3. **Cultural and Social Impacts**
    - The number of cultural activities and creative industries in the area has increased in response to the tourism boom. However, the density of cultural events can sometimes lead to cultural oversaturation, where the frequency and scale of events impact the local community's quality of life.

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- Visitor participation rates in local cultural events have been high, but there is a need for better management to ensure these activities do not detract from the authenticity of the cultural heritage.

Chart 3: Number of Cultural Events and Visitor Participation Rates

4. Infrastructure and Mobility
    - The current infrastructure, including narrow streets and limited parking, struggles to accommodate the high volumes of tourists, leading to traffic congestion and dissatisfaction among locals. The introduction of new pedestrian pathways and improved public transport options is crucial for alleviating these issues.
    - Sustainable mobility systems, such as bike rentals and electric shuttle services, can reduce the environmental impact of tourist transportation.

Chart 4: Visitor Satisfaction with Current Infrastructure (2019)

5. Heritage Conservation
    - Doune Castle's state of conservation is at risk due to the increased wear and tear from visitor numbers. Structural stress and soil erosion are significant concerns that need to be addressed through conservation efforts and visitor management strategies.
    - Recent initiatives, such as the construction of a new pedestrian bridge and the planning of additional toilet facilities, aim to improve visitor experience while balancing the need for heritage preservation.

Chart 5: Heritage Conservation Initiatives and Their Impact

Work Organization within the Group

The group was divided into sub-teams focusing on specific aspects of the analysis, including economic, environmental, cultural, and infrastructural impacts. Each sub-team collected data on selected indicators from the Be.CULTOUR list, ensuring a comprehensive evaluation of the tourism impacts on Doune Castle.

Recommendations for Sustainable Tourism Management

1. Implementing Circular Economy Practices

- **Encourage Local Sourcing**: Use locally sourced goods and services to enhance the local economy. This includes local food vendors, craft artisans, and service providers.
- **Promote Off-Season Tourism**: Distribute visitor numbers more evenly throughout the year. Marketing campaigns can highlight the unique aspects of visiting Doune Castle during winter or spring.

Chart 6: Economic Impact of Local Sourcing Initiatives

2. **Enhancing Environmental Conservation**
   - **Carbon Offset Program**: Develop and implement a carbon offset program for visitors to mitigate greenhouse gas emissions. This could involve planting trees or investing in renewable energy projects.
   - **Increase Green Spaces**: Support biodiversity and reduce environmental degradation by increasing green spaces and protected areas. Educational programs can raise awareness about the importance of these areas.

Chart 7: Potential Impact of Carbon Offset Initiatives

3. **Cultural Heritage Preservation**
   - **Limit Visitor Numbers**: During peak seasons to prevent overcrowding and preserve the castle's authenticity. This can be achieved through advanced booking systems and visitor quotas.
   - **Organize Community Events**: Reflect the local heritage and involve the community to foster a sense of ownership and care. Local artisans and performers can be featured in events that celebrate traditional crafts and performances.

Chart 8: Effects of Visitor Number Limitation on Heritage Preservation

4. **Improving Infrastructure and Mobility**
   - **Expand Public Transport Options**: Promote sustainable mobility solutions to reduce traffic and parking issues. Collaborations with transport companies to provide discounted or free transport for ticket holders can encourage the use of public transportation.

- **Upgrade Infrastructure**: Construct facilities that blend with the historical context and use sustainable building materials to better accommodate tourists without compromising the site's historical integrity.

Chart 9: Visitor Satisfaction with Expanded Public Transport Options

5. **Community Engagement and Education**
    - **Engage Local Communities**: In tourism planning and decision-making processes to ensure their needs and perspectives are considered. Community forums and surveys can gather input on tourism management plans.
    - **Educate Tourists**: About the cultural and environmental significance of Doune Castle to promote responsible behavior. Information kiosks, guided tours, and interactive exhibits can enhance visitor understanding and appreciation.

Chart 10: Impact of Community Engagement on Tourism Management

Local Workshop with Stakeholders: 21st of November, 2023

Workshop Overview

In an effort to advance the understanding and implementation of sustainable tourism practices, a collaborative workshop was organized by the University of Glasgow with the backing of Historic Environment Scotland (HES) and the Italian National Research Council (CNR). This initiative was a significant part of the ongoing endeavors to explore innovative approaches to circular tourism, specifically tailored for historic sites like Doune Castle.

Objectives and Focus

The primary aim of the workshop was to foster a robust dialogue among key stakeholders about the practical applications of circular economy principles in tourism. Participants included postgraduate students from the University of Glasgow, members of the Be.CULTOUR project consortium, local community representatives, and experts from HES and CNR. The focus was to collectively examine and refine indicators of sustainable tourism that not only mitigate environmental impacts but also enhance local community wellbeing and preserve cultural heritage.



Figure 17 - Participants at Doune Castle's workshop on 21st November 2023



Figure 18 - Introduction of prof. Patrizia Riganti at Doune Castle's workshop on 21st November 2023

Key Activities

During the workshop, held at the Rural Hall in Doune, various activities were undertaken to ensure a comprehensive understanding of the challenges and opportunities associated with sustainable tourism at Doune Castle:

1. **Data Presentation and Analysis**: Students from the 'Economics of Circular Tourism' course presented their findings from the fieldwork conducted at Doune Castle. They provided insights into tourism seasonality, the environmental footprint of tourism activities, and the socio-economic impacts on the local community.
2. **Stakeholder Discussions**: Facilitated by Andrew Hunter, Responsible Tourism Trainee at HES, these discussions allowed stakeholders to share their perspectives and propose actionable strategies. Topics included enhancing sustainable transport options, managing visitor flows to prevent overcrowding, and integrating digital tools to promote inclusivity.
3. **Collaborative Brainstorming**: Participants engaged in brainstorming sessions to develop practical recommendations. These included introducing off-season tourism campaigns, implementing carbon offset programs, and improving infrastructure to support sustainable visitor experiences.

Outcomes and Next Steps

The workshop successfully highlighted the importance of collaborative efforts in achieving sustainable tourism goals. Key recommendations from the workshop included:

- **Encouraging Local Sourcing**: Promoting the use of local goods and services to support the local economy.
- **Managing Visitor Numbers**: Implementing advanced booking systems and visitor quotas to manage peak season crowds.
- **Enhancing Green Spaces**: Increasing urban green areas and protected natural sites to support biodiversity.
- **Improving Public Transport**: Expanding sustainable transport options to reduce environmental impact and traffic congestion.

These insights and proposals were well-received by the stakeholders, with several initiatives already being planned for implementation. The workshop underscored the ongoing commitment of the University of Glasgow, HES, and CNR to foster sustainable tourism practices that safeguard cultural heritage while benefiting the local community.

This workshop was a pivotal step in the collaborative journey towards responsible tourism at Doune Castle. By leveraging academic research, local expertise, and international collaboration, it paved the way for innovative solutions that can serve as a model for other heritage sites. The partnership between educational institutions, heritage organizations, and local communities continues to be instrumental in promoting a sustainable and inclusive approach to tourism.

Conclusion

The analysis of Doune Castle through the lens of a circular economy highlights the importance of sustainable tourism practices. By addressing the economic, environmental, cultural, and infrastructural impacts of tourism, Doune Castle can transition to a more sustainable model, ensuring its preservation for future generations while continuing to contribute to the local economy. Implementing the recommended strategies will aid in achieving this balance, promoting a more resilient and inclusive tourism ecosystem.

By adopting a circular economy approach, Doune Castle can become a model for other historic sites facing similar challenges. The emphasis on sustainability not only protects the cultural and natural heritage but also enhances the visitor experience, creating a positive cycle of benefits for all stakeholders involved. This model of sustainable tourism can foster a deeper appreciation for cultural heritage sites, ensuring their protection and enjoyment for years to come.

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ANNEX 4 – Indicators experimentation in Rural Larnaca

Evdokia Balamou, ANETEL

In the context of the Be.Cultour project and in an effort to create a sustainable indicators system for measuring the sustainability of the destination in rural Larnaca we reinforced the collaboration and synergies between Be.CULTOUR and the project MITOMED+, an Interreg Med project that aimed to enhance sustainability and responsibility in costal tourism, by improving local and regional strategies and policy actions and coordinating them at a wider MED transnational level. During the implementation of the MITOMED+ project, and in synergy with the experimentation of Be.CULTOUR, a early stage usable indicators were developed for measuring the sustainability of a destination rural Larnaca.

During the workshops for the development of the Action plan for Rural Larnaca in the first year of the project, one issue that was widely discussed with the stakeholders was the fact that we do not have for our area a set of specific indicators for collecting relevant data for the destination and be able to assess them and establish a monitoring system that can help us to get insight and information on how to manage better Rural Larnaca. After discussions we had with the Deputy Ministry of Tourism, the Larnaca Tourism Board and the Statistical Service of Cyprus, there is some data that are collected, however, if we want to go in a more localized collection, we need to collect data from the scratch. Based on that we decided to add to the action plan the activity 1.2: Create a sustainable indicators system for measuring the sustainability of the destination and to test some of the indicators that were more relevant for Rural Larnaca and collect data for two consequent years, so we have something to compare. This activity has provided useful insight for the development of project level indicators in Be.CULTOUR, based on the results achieved in Larnaca.

Specifically, in this early experimental stage of the project, based on MITOMED+ list of 33 indicators divided into economic, environmental, social, and global indicators coming from the ETIS system, a subset of indicators was selected for experimentation. This set of indicators included also guidelines on the collected data and method. Also, a platform was developed that was using the traffic light system, a threshold system that could help us in the interpretation of each indicator. A quartile threshold was defined as follow:

- Red: From 0% to 33% Poor
- Yellow: From 34% to 66% Good
- Green: From 67% to 100% Very Good

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The relevant platform and set of indicators were tested with the MITOMED+ project at the national level (Cyprus) and at the regional level (districts).

For the Be.Cultour project, after discussions with the relevant stakeholders (Larnaca Tourism Board, Deputy Ministry of Tourism, UCLAN University, Cyprus University of Technology, and the local communities), from the list of the 33 indicators we choose the following indicators (17 in total):

General Indicators

- Percentage of destinations with a sustainable tourism strategy/action plan, with agreed monitoring, development control and evaluation arrangement.
- Percentage of visitors that are satisfied with their overall experience in the destination.

Economic Indicators:

- Percentage of tourism establishments in the destination using a verified certification/label for environmental/quality/sustainability and/or CSR measures
- Contribution of tourism to the destination's economy
- Average length of stay of tourists (nights)
- Number of overnight stays per month
- Occupancy rate in commercial accommodation per year
- Seasonality of jobs: Direct tourism employment as percentage of total employment per month.
- Daily spending per tourist (accommodation, food and drinks, other services)

Social Indicators

- Number of beds available in commercial visitor accommodation in relation to residents
- Number of tourists per resident
- Percentage of tourist attractions that are accessible to people with disabilities
- Average wage in tourism for women compared to men.

Environmental Indicators:

- Solid urban waste produced by destination (relation of tons per person between low and high season)
- Volume of solid urban waste recycled
- Water consumption (litre) per person (relation between low season and high season)
- Energy consumption (KWh) per person per day (relation between low and high season)

Below the data for Rural Larnaca for the year 2022. In general, the collection of data took some time since data are available by the governmental services, but they are aggregate at District and National Level. We had to communicate a lot with the relevant services and to request the data bases for the local authority's level. For water data we had to go to every village and give us their data which was

not easy since they have lot of water leakages and the water that is reported is far lower than the actual consumption. For waste we were lucky enough since ANETEL is managing the waste management plan of the district (also do the billing of waste) and we have access to data for each month on kg of waste and recycle material.

Concluding, data are available but need time and effort to collect for local communities, need a lot of disaggregation and also need a good collaboration with all communities as well the relevant governmental departments to get the data.

Below the data for Rural Larnaca for year 2022.

Name			
	Rural Larnaca	*Source*	*Traffic Light*
Percentage of destinations with a sustainable tourism strategy/action plan, with agreed monitoring, development control and evaluation arrangement.	100%	Strategy Plan for from the Larnaca Tourism Board for all the Larnaca District. Updated on a yearly basis	Green
Percentage of visitors that are satisfied with their overall experience in the destination.	82.5%	survey contacted in the Rural Larnaca	Green
Percentage of tourism establishments in the destination using a verified certification/label for environmental/quality/sustainability and/or CSR measures	22%	In Cyprus Quality and environmental systems/mechanisms are being encouraged, with - incentives for the adoption of quality and environmental standards in tourist establishments (ISO 9001, 14001, HACCP, Green Globe , Eco-label, EMAS, Green Key). Available data from Deputy Ministry of Tourism	Red
Contribution of tourism to the destination's economy	9.7%	Data from Statistical Service of Cyprus and the local strategy of Rural Larnaca (ANETEL)	Yellow
Average length of stay of tourists (nights)	3.5	Statistical Service of Cyprus and Deputy Ministry	Red
Number of overnight stays per month	17.40%	Statistical Service of Cyprus and Deputy Ministry	Yellow

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Occupancy rate in commercial accommodation per month and average for the year.	year 53,2% monthly 15,2 17,3 19 32,8 49,4 65,4 71,4 68,5 56,3 45,2 27,4 15,9	Statistical Service of Cyprus and Statistics o Deputy Ministry Data also available per district and per type of accommodation, per Cypriots and foreigners	Red
Seasonality of jobs: Direct tourism employment as percentage of total employment per month.	9.70%	Statistical Service of Cyprus	Red
Daily spending per tourist (accommodation, food and drinks, other services)	95.0	Statistical Service of Cyprus	Green
Number of beds available in commercial visitor accommodation in relation to residents (1 on 1 proportion)	0.02	Data from Statistical Service of Cyprus and the local strategy of Rural Larnaca (ANETEL)	Yellow
Number of tourists per resident (1 on 1 proportion)	2.76	Statistical Service of Cyprus	Yellow
Percentage of tourist attractions that are accessible to people with disabilities and/or participating in recognized accessibility schemes.	20.00%		Red
Average wage in tourism for women compared to men's employment	yearly 17,95 Q1 = 17,3% Q2 = 18,4% Q3= 18,2 Q4 =17,9	Statistical Service of Cyprus (Quarterly data available)	Yellow
Solid urban waste produced by destination (relation of tons per person between low and high season)	1.50	ANETEL	Yellow
Volume of solid urban waste recycled (relation betweenlow and high season)	1.11	ANETEL	Yellow
Water consumption (litre) per person (relation between low season and high season)	1.12	Community councils	Yellow

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Energy consumption (KWh) per person per day (relation between low and high season)season)	1.10	EAC Authority	Yellow

Defining this set of indicators and see the first results it gave as a clearer picture of where we are standing as a destination and also which things, we should pay focus. It gave us the opportunity to have all the necessary information for effective development and management of tourism in a sustainable direction in our area.

ANNEX 5 – Spatial visualisation of the Municipality of Venosa, in Vulture Alto Bradano area (Italy), through the Q-GIS platform

The spatial visualization of impact indicators is tested with the pilot of Basilicata, Italy. In this specific case, the Vulture Alto Bradano area that is the northeastern area of Basilicata nestled between Puglia, Campania and the Potenza area. The territory, dominated by Vulture (1326 mt an extinct volcano) is characterized by alternating mountains covered with chestnut and oak forests and plateaus with olive groves, vineyards and Mediterranean scrub. This area of Basilicata has sites of considerable tourist interest including: the lakes of Monticchio, Castel Lagopesole, and the historic centers of Melfi and Venosa. It is an area renowned for its natural beauty and landscape, for the quality of its wines particularly Aglianico del Vulture, and of many typical products such as marroncino di Melfi (chestnuts), pecorino di Filiano, and organic olive oil.

In the Vulture Alto Bradano area, contextual data were initially collected to construct the territorial model, which will subsequently be used to gather data for evaluating the impact of cultural circular tourism. For this purpose, and by referring to the context indicators previously identified by the Be.CULTOUR project (see Deliverable D1.2), a digital model of the Vulture Alto Bradano area (comprising 19 municipalities) and specifically of the city of Venosa was developed. The selection of this municipality was made in agreement with the Basilicata pilot through several meetings (online and in person meetings) with the APT. Venosa was selected for its historical and cultural significance as well as the APT's interest in conducting specific tourist activities and developing gaming applications within the Be.CULTOUR project.

The Dashboard operational model for assessing the impacts of circular cultural tourism can be utilized by the Basilicata pilot even after the conclusion of the Be.CULTOUR project. This will enable continuous monitoring of the short- and long-term impacts that the project has produced on the territory, using the data already collected.

The framework of context indicators is an initial evaluation set for constructing the Digital Twin of the Vulture Alto Bradano area. The indicators proposed below represent an initial research step, which will be complemented by the impact indicators of the Be.CULTOUR Dashboard. The context indicators refer to cadastral data, territorial data (roads, etc.), environmental data (green areas, protected areas, parks, nature reserves, quarries, dumps, agro-forestry areas), tourist attractions (monuments, museums, theatres, etc.), infrastructures (transport), and building artefacts. The digital model constructed using the OpenSource Q-GIS platform will be made available upon request on the Be.CULTOUR project website.

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Below are some maps taken from the Q-GIS software with which the 2D model was built.

The Q-GIS map shows the boundaries of the Vulture Alto Bradano area (Figure 19). Details of the 19 municipality are shown in the Table 10.



Figure 19 - Municipality of Vulture Alto Bradano area

Table 10 - Municipality of Vulture Alto Bradano area

	Available data of Vulture Alto Bradano area		Description
Map with municipalities	Territorial model	Boundaries of the 19 municipalities in the Vulture Alto Bradano area	Atella Banzi Barile Forenza Genzano Di Lucania Ginestra Lavello Maschito Melfi Montemilone Palazzo San Gervasio Pescopagano Rapolla Rapone Rionero in Vulture Ripacandida Ruvo del Monte San Fele Venosa

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Contest indicators were collected in different dimensions. For the environmental dimension, the following data are collected (Figure 20 and Table 11):

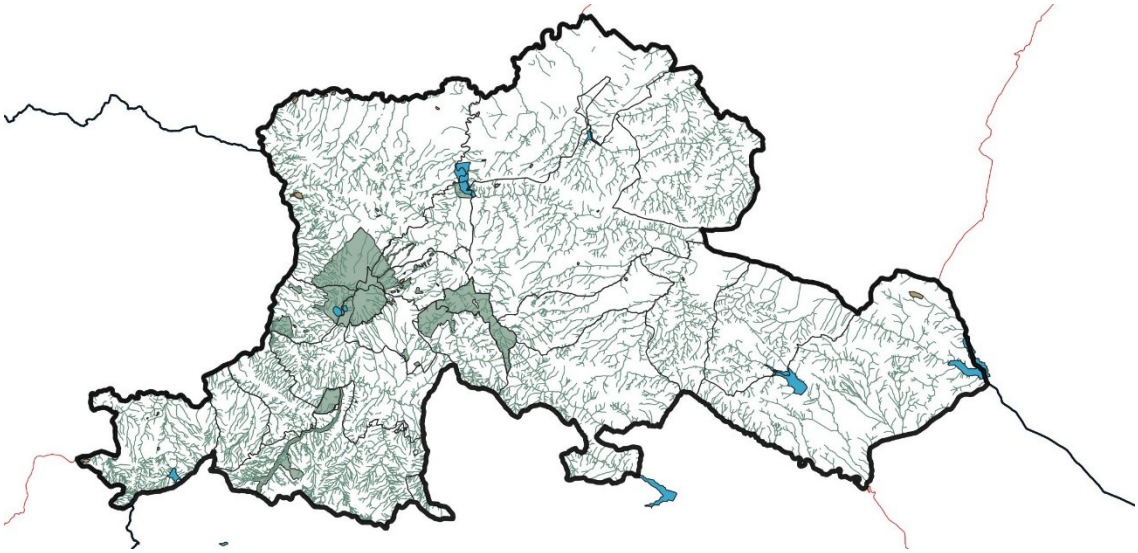


Figure 20 - Environmental indicators of Vulture Alto Bradano area

Table 11 - Environmental indicators of Vulture Alto Bradano area

Indicator		Description	Year	Source
SCI - Sites of Community Interest	SCI - Sites of Community Interest	Sites of Community interest (Directive 92/43/EEC) are areas particularly suitable for the conservation or restoration of habitats useful for maintaining the biodiversity of flora and fauna and are subject to special prescriptive rules to be considered at the planning stage.	2013	http://ccambiente.rsdi.regione.basilicata.it/CoreMetadata/files_progetti/691/risorse/SIC.zip
SPA - Special Protection Areas	SPA - Special Protection Areas	Special Protection Areas are areas established under the Birds Directive 79/409/EEC, later replaced by Directive 09/147/EC, and are intended to ensure the conservation of bird species of Community interest.	2014	http://ccambiente.rsdi.regione.basilicata.it/CoreMetadata/files_progetti/573/risorse/zps_2012_uff.zip

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SAC - Special Areas of Conservation	SAC - Special Areas of Conservation	A Special Area of Conservation, within the meaning of the European Commission's Habitats Directive, is a Site of Community Importance (SCI) where the conservation measures necessary to maintain or restore natural habitats and species populations have been implemented.	2019	http://rsdi.regione.basilicata.it/rbgeoserver2016/rete_natura_2000/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=rete_natura_2000:zsc&outputFormat=SHAPE-ZIP
Trees	Trees - rows	Trees arranged in a line on the edge or traffic island in road areas.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/filare_alberi.zip
	Monumental trees	The vector file concerns the set of points representing the monumental specimens (single, terraced or in groups) of the Basilicata Region.	2019	http://rsdi.regione.basilicata.it/downloadProd/PianoPaesaggisticoRegionale/DownloadLayers/beni_paesaggistici_art143_alberi_monumentali.zip
	Isolated trees	Isolated trees of monumental and non-monumental nature that at large scales constitute landmarks in the territory and in the urban environment because they correspond to a measured survey.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/albero_isolato.zip
Lakes	Lakes	The vector file concerns the delimitation of territories bordering lakes and reservoirs.	2018	http://rsdi.regione.basilicata.it/downloadProd/PianoPaesaggisticoRegionale/DownloadLayers/beni_paesaggistici_art142b_laghi_ed_invasi_artificiali_buffer.zip
Green areas	Green areas	Areas used as green for ornamental purposes or included in recreational areas. Areas of flowerbeds, gardens, lawns, tree areas included in urban areas for public use or even private gardens belong to this class.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/area_verde.zip

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Hydrographic network	Hydrographic network	The set of courses of natural watercourses draining a first-order catchment area, i.e. the natural watercourse flowing into the sea plus the set of all its tributaries, constitutes an occurrence of this class; this set is a connected, oriented and ordered network.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/retic_idrograf_naturale_grafo.zip
	Natural waterway	Representation of a natural watercourse (river rod) with a constant and/or torrential regime, which collects water from a catchment area and flows into another watercourse, a body of water or the sea. A 'natural watercourse' is defined as a naturally occurring, running surface water body.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/asta_fluviale.zip
Agro-forestry areas	Forest	This is defined as land covered with tree and/or shrub vegetation and/or shrubs of forest species, of natural or artificial origin, at any stage of development, whose area of insidence (projection on the ground of the foliage of the plants) is not less than 20%, with an extension of not less than 2,000 square metres and a width of more than 20 metres, measured at the foot of the boundary plants.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/bosco_aree.zip
	Area without vegetation	Areas of agro-forestry interest but which on the date of the survey are devoid of topsoil either because of use or because they have been affected by fire, or other causes.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/area_priva_vegetaz.zip
	Pasture	Portion of land characterised mainly by the presence of herbaceous and shrub vegetation intended for the free grazing of domestic	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/pascolo_incolto.zip

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		animals, whether or not governed by man.		
	Agricultural cultivation	Portion of land, delimited by crop boundaries or artefacts and land features (ditches, drainage ditches, etc.), destined for both seasonal and annual agricultural activities.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/coltura_agricola.zip
Parks and nature reserves	Parks and nature reserves	The vector file concerns the delimitation of national or regional parks and reserves pursuant to Article 142 of Legislative Decree 42/2004 - Cultural Heritage and Landscape Code.	2018	http://rsdi.regione.basilicata.it/downloadProd/PianoPaesaggisticoRegionale/DownloadLayers/beni_paesaggistici_art142f_parchi_riserve.zip
Quarries	Quarries	Quarries and mines, both opencast and not, are defined in this class.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/area_estrattiva.zip
Landfills	Landfills	Area used for the dumping of waste of various kinds, including the occupation areas of the buildings, artefacts and works forming an integral part thereof.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/discarica.zip

Specifically for the environmental dimension, the following table shows the focus on the city of Venosa. Data were collected regarding trees, green areas, cultivated areas, lakes, parks and nature reserves (Figure 21, Figure 22 and Figure 23).

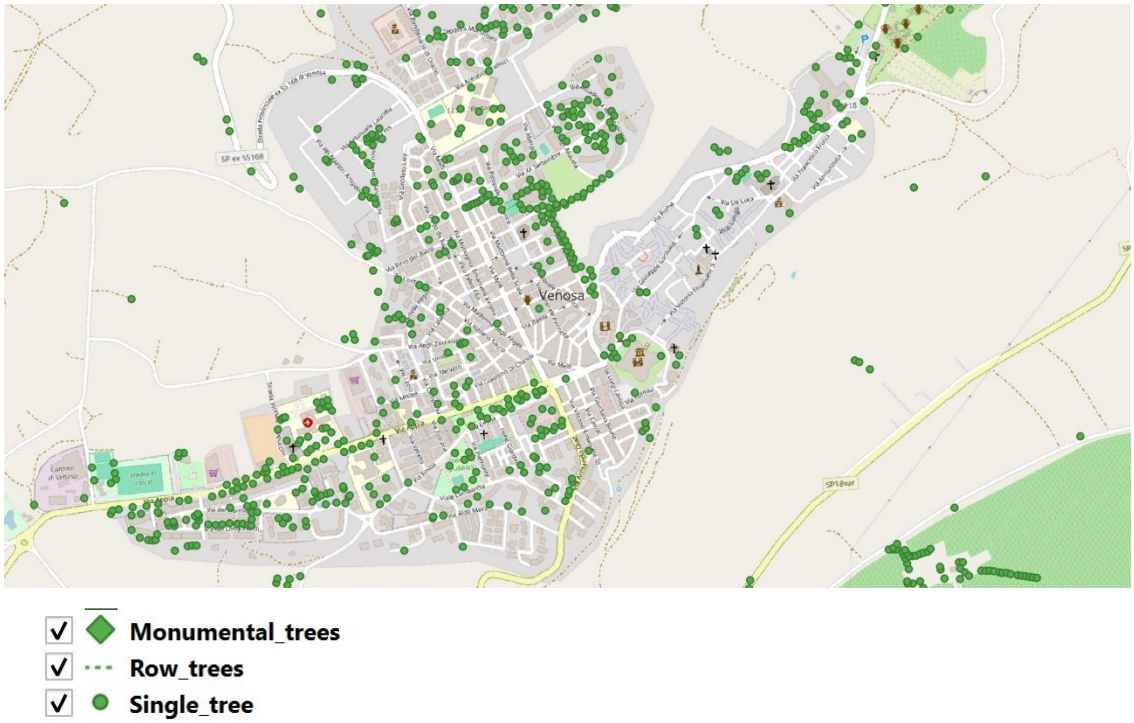


Figure 21 - Monumental trees, Single tree, Row trees of the Municipality of Venosa



Figure 22 - Fallow pasture, Agricultural, Forest, Green areas of the Municipality of Venosa

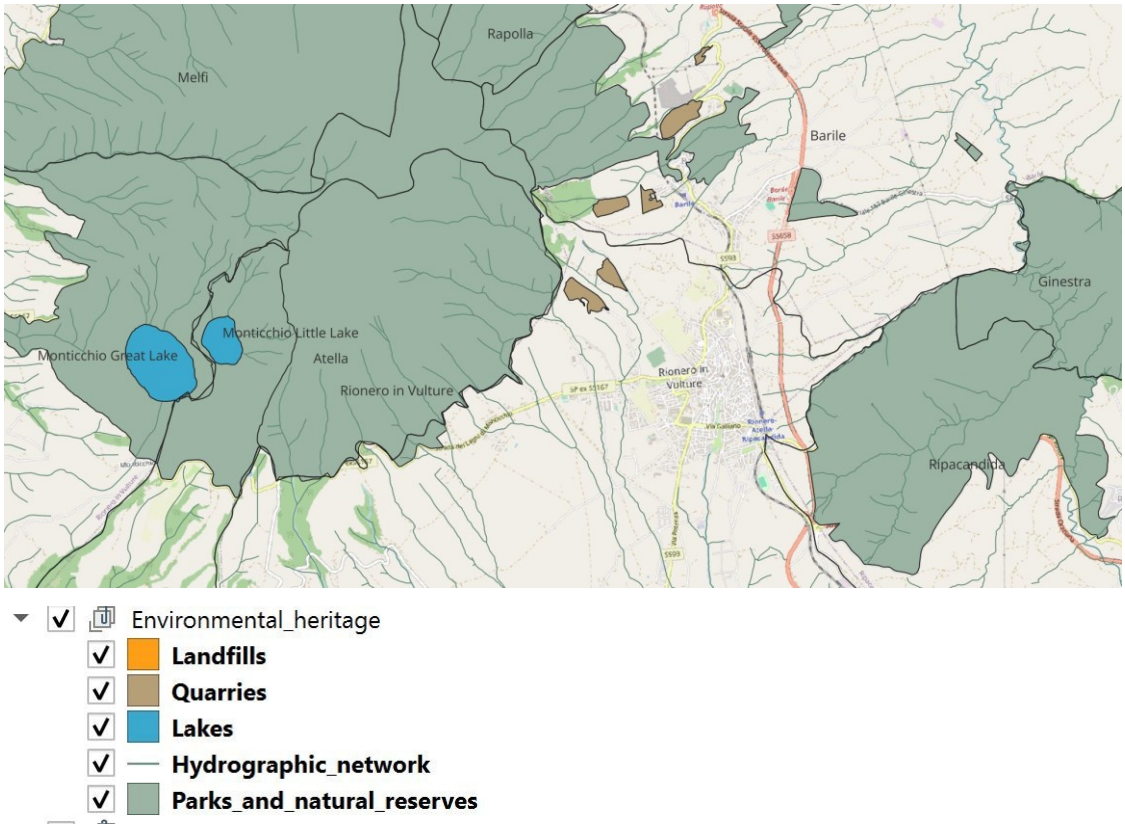


Figure 23 - Landfilss, Quarries, Lakes, Hydrographic networks, Parks and natral reserves of the Municipality of Venosa

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The following data are collected for the **cultural dimension** (Figure 24 and Table 12):

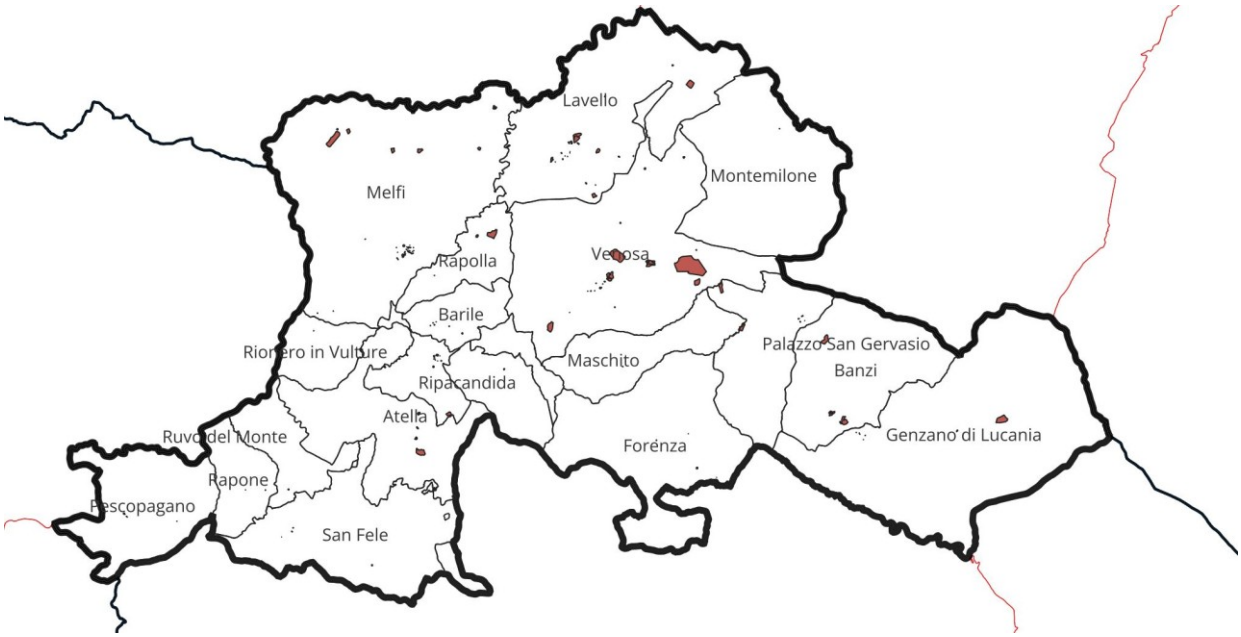


Figure 24 - Cultural indicators of the Vulture Alto Bradano area

Table 12 - Cultural indicators of the Vulture Alto Bradano area

	Indicator		Description	
POI (point of interest)	Cultural Heritage	Cultural and Monumental Heritage	The vector file concerns the delimitation of buildings of archaeological interest and their buffer zones subject to declaration of cultural interest, pursuant to Articles 10 and 14 of Legislative Decree 42/2004 - Cultural Heritage and Landscape Code.	
	Monuments and archaeological areas	Archaeological area or park	The vector file concerns the delimitation of properties of archaeological interest.	
	Cultural point of interest	Brochure POI tourism map	historical heritage points (churches, castles), historical landscapes, cultural facilities (e.g. museums, theatres, etc.), and cultural services.	
		Natural history Museum of Vulture	museum	Rionero in Vulture
		The Abbey of St Michele Arcangelo	church	Monticchio
		The Sanctuary of Sacro	church	Avigliano

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		Monte del Carmine		
		The Norman Castle of Melfi	castle	Melfi
		Venosina Gate	ancient walls	Melfi
		Museo Diocesano and Palazzo Vescovile	museum	Melfi
		Cathedral of Santa Maria Assunta	church	Melfi
		Church of Sant'Antonio	church	Melfi
		Church of San Lorenzo	church	Melfi
		Church of the Madonna del Carmelo	church	Melfi
		Convent of Santa Maria La Nova	church	Melfi
		Santa Margherita rock church	church	Melfi
		Saint Lucia rock church	church	Melfi
		National Archaeological Museum of "Massimo Pallottino"	museum	Melfi
		Diocesan Museum	museum	Melfi
		Church of San Domenico	church	Venosa
		Church of San Biagio	church	Venosa
		Church of the Purgatorio	church	Venosa
		Church of San Filippo Neri	church	Venosa
		Church of San Martino	church	Venosa
		Cathedral of Sant'Andrea	church	Venosa
		Jewish catacombs	cultural site	Venosa

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		Pirro del Balzo Castle/National Archaeological Museum	museum	Venosa
		Archaeology Museum	museum	Venosa
		Archaeological Park, the Incompiuta and the Abbey of the SS Trinità	museum	Venosa
		Paleolithic site of Notarchirico	cultural site	Venosa
		Grotticelle Nature Reserve	cultural site	Rionero in Vulture
		Church of the SS. Sacramento	church	Rionero in Vulture
		Churches of the Annunziata and San Nicola	church	Rionero in Vulture
		Church of Sant'Antonio Abate	church	Rionero in Vulture
		Church of Madonna Caudata	church	Rionero in Vulture
		Benedictine Abbey of San Michele Arcangelo	church	Rionero in Vulture
		Vulture Natural History Museum	museum	Rionero in Vulture
		The Museo del Brigantaggio (Brigandage Museum)	museum	Rionero in Vulture
		Fortunato Palace	historic building	Rionero in Vulture
		Former Prefecture	historic building	Acerenza
		Palazzo Gala	historic building	Acerenza
		Museum of carved woods	museum	Acerenza
		Diocesan Museum	museum	Acerenza

		Cathedral of Santa Maria Assunta and San Canio	church	Acerenza
		Cathedral of Santa Maria ad Nives	church	Atella
		Church of Santa Lucia	church	Atella
		Fortress-monastery of Santa Maria degli Angeli	church	Atella
		Benedictine abbey dedicated to Saint Mary	church	Banzi
		Tuppo dei Sassi (cave paintings)	museum	Filiano
		Church of San Giuseppe	church	Filiano
		Church of Santa Maria del Rosario	church	Filiano
		Steccato Fountain	fountain	Barile
		Cantine dello Scescio	museum	Barile
		Angevin walls	ancient walls	Forenza
		Medieval Church of the Annunziata	church	Forenza
		Church of San Nicola	church	Forenza
		Church of the Crocifisso	church	Forenza
		Church of San Pietro	church	Forenza
		Convent complex of Santa Maria della Stella	church	Forenza
		Rock church of San Biagio	church	Forenza
		Casa Contadina" (Rural House),	museum	Forenza

		a “house-museum		
		Church of the Annunziata	church	Genzano di Lucania
		Church of Santa Maria della Platea	church	Genzano di Lucania
		Palazzo de Marinis	historic building	Genzano di Lucania
		Cavallina Fountain	fountain	Genzano di Lucania
		Monteserico Castle	castle	Genzano di Lucania
		Allamprese Palace	historic building	Ginestra
		Church of Madonna di Costantinopoli	church	Ginestra
		Chiesa Madre of San Nicola	church	Ginestra
		Chiesa Madre of Sant’Elia	church	Maschito
		Church of the Madonna del Caroseno	church	Maschito
		Sanctuary of the Gloriosa	church	Montemilone
		Mother Church dedicated to Santo Stefano	church	Montemilone
		Roman aqueduct	cultural site	Montemilone
		Chiancone fountain	fountain	Montemilone
		Schiaffone fountain	fountain	Montemilone
		Nicolais Palace	historic building	Rapone
		Patrissi House	historic building	Rapone
		Chiesa Madre of San Nicola Vescovo	church	Rapone
		Church of Santa Maria ad Nive	church	Rapone
		Chirch of Santa Maria dei Santi	church	Rapone
		Marchesal Palace	historic building	Palazzo San Gervasio

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		Picture Gallery of Palazzo d'Errico	museum	Palazzo San Gervasio
		Church of San Rocco	church	Palazzo San Gervasio
		Church of SS Crocifisso	church	Palazzo San Gervasio
		Church of San Sebastiano	church	Palazzo San Gervasio
		Chiesa Madre di San Nicola	church	Palazzo San Gervasio
		Angevin Tower	cultural site	Ruvo del Monte
		Civic Archaeological Museum	museum	Ruvo del Monte
		Mother Church of Santa Maria Assunta	church	Ruvo del Monte
		Civic art gallery	museum	Ripacandida
		Church of San Donato	church	Ripacandida
		Church of Santa Maria del Sepolcro	church	Ripacandida
		Church of San Giuseppe	church	Ripacandida
		San Fele waterfalls	natural site	San Fele
		Church of Santa Maria della Quercia	church	San Fele
		Sanctuary of Madonna di Pierno	church	San Fele
		Norman Swabian castle	castle	Lavello
		Cathedral of San Mauro	church	Lavello
		Porta del Forno and Porta Nuova	ancient walls	Lavello
		Church of Sant'Anna	church	Lavello
		Museum of rural civilization in Palazzo Ducale	museum	Lavello

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		Sanctuary of the Gavetta	church	Lavello
		Cathedral of the Assunta	church	Rapolla
		Church of Santa Lucia	church	Rapolla
		Church of the Crocifisso	church	Rapolla

In order to show the points of interest, it is decided to show the Q-GIS map of a Municipality of Venosa. This map shows the points of interest of Venosa (Figure 25). Table 13 shows some impact indicators collected as events and cultural experiences of the Municipality of Venosa.



Figure 25 - Church, Archeological area, Castel, farm, fountain, palace of the Municipality of Venosa

Table 13 - Events and cultural experiences of the Municipality of Venosa

Events and cultural experiences	The Sacred performance of Rionero in Vulture	This is a custom heading element. The cycle of ceremonies of Lucanian Sacred Performances concludes with the Passion of Christ of Rionero in Vulture. The costumes reflect the historical context in which Jesus lived, taking close account of the reading of the Sacred Scriptures.	https://www.basilicataturistica.it/en/discover-basilicata/art-and-culture-in-basilicata/faith-and-art/religious-rites/sacred-performances-during-

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			holy-week/the-sacred-performance-of-rionero-in-vulture/
	Autumn flavors and aromas (cooking experience)	In Autumn, Basilicata is filled with new scents, tasty products and delicious dishes to be prepared at home or enjoyed in restaurants and farmhouses in the area. Mushrooms, chestnuts and homemade pasta make the Lucanian tables rich and inviting. Prepare the “Autumn Menu” with a Lucanian flavor with our recipes!	https://www.basilicataturistica.it/en/discover-basilicata/food-wine/seasonal-menu/autumn-flavors-and-aromas-in-basilicata/
	The Marroncino of Melfi (Varola Festival)	The city of Melfi is also known for being the home of the marroncino, a chestnut grown in the Vulture area, in particular in the Melfi area. It is thought that the chestnut tree, an integral part of the landscape of the whole area, was imported from Turkey by Frederick II. This ruler was closely linked to the city of Melfi, where he also promulgated the famous Frederician Constitutions. Marrancio is a variety of chestnuts that can be eaten fresh, therefore highly sought after for making marrons-glacés. It is a large fruit, with a rounded shape and a glossy brown colour with evident stripes. The harvest takes place in the months of September and October. The Varola festival celebrates this food, which is the symbol of autumn in Melfi. The name of the festival comes from the large perforated iron pan that is used to roast chestnuts over the fire. For the occasion, the city becomes a large forest, with stands in the shape of typical mountain huts, showcasing many foods produced with this fruit. The festival is therefore an	https://www.basilicataturistica.it/en/discover-basilicata/food-wine/the-marroncino-of-melfi/

		opportunity to taste chestnuts not only as roasted chestnuts, but in numerous sweet and savoury recipes strictly accompanied by the robust Aglianico del Vulture wine.	
	Sacred performances during Holy Week	Sacred performances during Holy Week The drama of the Passion of Christ is performed in the streets and piazzas of Vulture-Melfese where Holy Week is marked by a succession of Sacred Performances.	https://www.basilicataturistica.it/en/discover-basilicata/art-and-culture-in-basilicata/faith-and-art/religious-rites/sacred-performances-during-holy-week/
	Sweet Lucanian nectar: honey	With its crystalline colour, sometimes darker, and with a delicate or more bitter taste, honey in Basilicata is often combined with cheeses, such as pecorino or ricotta, a mutual exaltation of taste. Produced in most of the region, different types and qualities of sweet nectar can be tasted according to your preferences. The Millefiori is renowned, whose flavour varies according to the flower essences used, but you will also enjoy orange blossom honey, especially typical of the Metapontino area, chestnut honey, dark in colour and intense in flavour, and eucalyptus, very similar to the essence of liquorice. Made following the most traditional processes, in Basilicata honey is the undisputed protagonist of taste in ancient and modern recipes. A precious and sought-after product, it gives its title to the Lucanian Honey Exhibition, staged in Ripacandida, a small and charming village in the Vulture Melfese area, every year in August.	https://www.basilicataturistica.it/en/discover-basilicata/food-wine/sweet-lucanian-nectar-honey/

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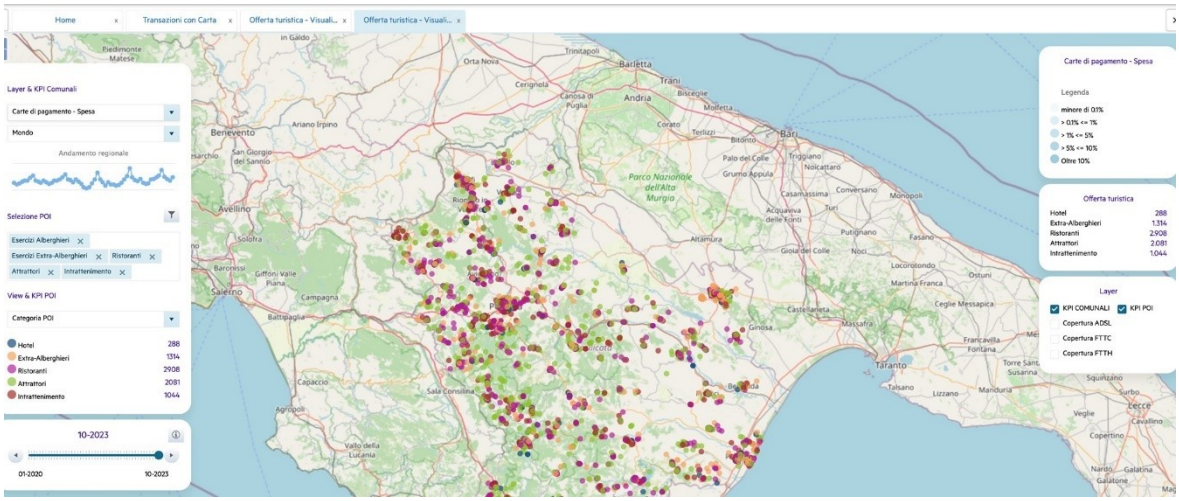


Figure 26 - Points of interest of the Basilicata region

Source: Basilicata region, 2023

Regarding cultural data related to points of interest, the Basilicata region's portal possesses some data such as hotels, restaurants, tourist attractions, and the average daily tourist expenditure (Figure 26). These data are available at the regional level but are not open, leading to an issue of limited data accessibility. This problem could be resolved in the future to improve destination management, even on a micro scale (from regional scale to destination scale).

The indicators for the man-made dimension are as follows (Figure 27 and Table 14):

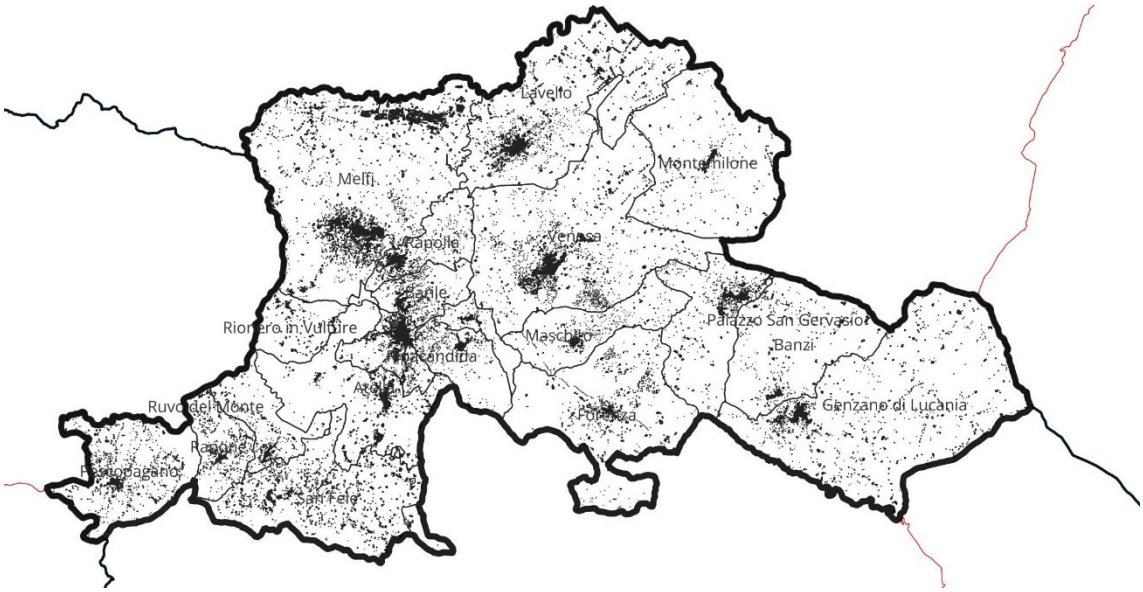


Figure 27 - Man-made indicators of the Vulture Alto Bradano area

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Table 14 - Man-made indicators of the Vulture Alto Bradano area

Indicator		Description	Year	Source
Manufactures	Industrial buildings	Manufactures of various kinds accessory to the development of industrial activities or services, within specific areas or suitably fenced in, are defined in this class.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/manufatto_industriale.zip
	Monumental and street furniture	Monumental and street furniture artefacts with important spatial occupation traceable to the description by elementary volumes and the proposed three-dimensional model are identified here.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/manufatto_monum_arredo_urb.zip
	Sports equipment	The equipment of the ground for the performance of sports activities is defined, so for example the types of tracks and playing fields as well as swimming pools.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/attrezzatura_sportiva.zip
	Equipped soil area	Areas pertaining to a given settlement unit, ancillary to the built-up area (courtyards, fences, farmyards ...)	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/area_attrezz_suolo.zip
Buildings	Roofing element	It describes one of the various roofing parts of a building, i.e. pitches, terraces, domes, etc., but also elements that complement roofs.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/elemento_copertura.zip
	Volumetric unit of buildings	It is the elementary volume referred to a building.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/unita_volumetrica.zip
	Buildings	Representation of the built-up area (floor space)	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/edifici_is.zip

To show the artefacts, which are on a smaller scale, the Q-GIS maps of the Municipality of Venosa was built (Figure 28).

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Figure 28 - Industrial buildings, Monument, street and furniture, Equipped soil area, Sports equipment, Buildings volume of the Municipality of Venosa

The infrastructure indicators are as follows (Figure 29 and Table 15):

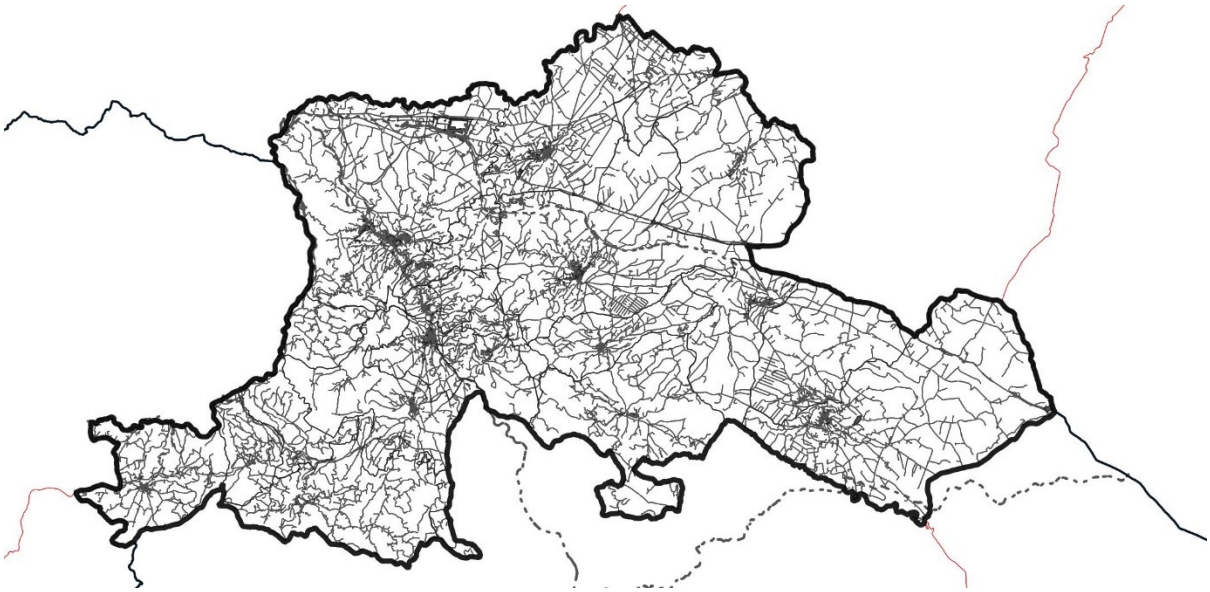


Figure 29 - Infrastructure indicators of the Vulture Alto Bradano area

Table 15 - Infrastructure indicators of the Vulture Alto Bradano area

Indicator		Description	Year	Source
Infrastructures	Routes	Surface area within the road boundaries. This is the plane formed by the carriageway and the pertaining strips, i.e. platforms, pavements and lanes; it may include different types of roads, whether pedestrian, road or other, such as tramways.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/area_stradale.zip
	Cycle paths	Longitudinal part of the road, appropriately delimited, reserved for the circulation of bicycles.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/area_circolaz_ciclabile.zip
	Transport infrastructure	Objects generally associated with transport infrastructures are defined in this class because they insist on the roadway and have an accessory function in regulating traffic. They include traffic dividers, roundabouts, pavements, churchyards, etc. Other structures connected to the transport infrastructure but inhabitable and accessible are defined in the built-up area (motorway barrier, service stations, etc.).	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/manufatto_infrast_trasporto_aree.zip
	Road service area	Road service areas, i.e. areas used for road transport service such as refuelling areas, rest areas, truck stops, etc.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/area_serv_stradale.zip
	Railway network	Railway track obtained by acquiring the centreline of any physical track or bundle of tracks.	2015	http://rsdi.regione.basilicata.it/webGis/shape-zip/elemento_ferroviario.zip

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Specifically, an infrastructure map of the Municipality of Venosa was constructed (Figure 30).



Figure 30 - Parking, Railway, Road service area, Transport infrastructure areas, Street of the Municipality of Venosa

An application "FREE TO MOVE"[4] was built by the APT Basilicata for cycle routes (Figure 31). Other existing pedestrian and cycle routes in the Vulture Alto Bradano area are also highlighted in the table below (Table 16).

[4] APT Basilicata has developed an interactive application for smartphones and tablets with the aim of enhancing the area through sustainable use with the 21 bicycle and pedestrian routes in Basilicata. Available for download at:
https://www.basilicataturistica.it/scopri-la-basilicata/sport-e-outdoor-in-basilicata/cicloturismo/app-basilicata-freetomove-negli-store-android-e-ios/

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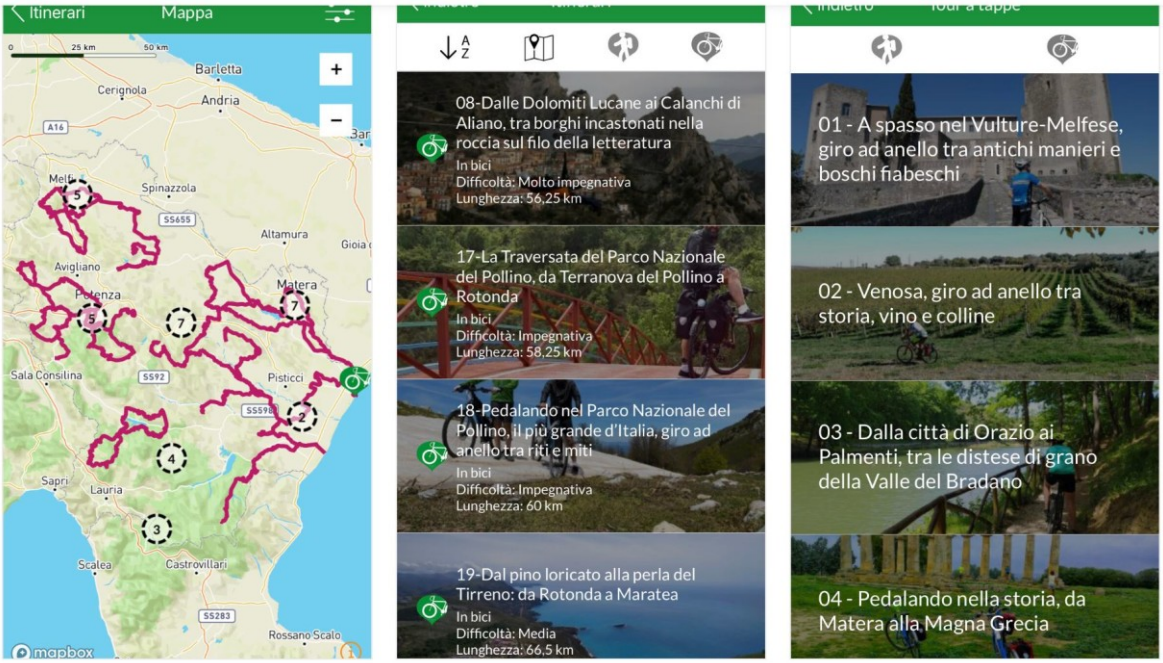


Figure 31 - FREE TO MOVE App's interface

Table 16 - Routes and tours (walking and cycling) of the Vulture Alto Bradano area

Indicator		Description	Source
Routes and tours (walking and cycling)	Aglianico and the Castles of Vulture (bike tour)	Vulture is an area in the north of Basilicata, rich in artistic and cultural treasures but above all a DOC production area of Aglianico wine. A perfect place to ride, full of ups and downs, and ideal for relaxing surrounded by nature and history	https://www.bikebasilicata.it/it/aglianico-e-castelli-del-vulture/
	Walking in Vulture-Melfese, a ring-route among ancient castles and fairy-tale woods	Bike tour	https://www.basilicatauristica.it/en/discover-basilicata/sports-and-outdoor/bike-and-mountain-bike/01-walking-in-vulture-melfese-a-ring-route-among-ancient-castles-and-fairy-tale-woods/
	OUTDOOR ENVIRONMENTAL ACTIVITIES FOR GROUPS in the Vulture area	Activity for groups who want to discover the Monticchio lakes and the forests of the Vulture through outdoor activities. Depending on the themes that the group asks to investigate,	https://www.basilicatauristica.it/en/bepa/outdoor-environmental-activities-for-groups-in-the-vulture-area/

		educational workshops, workshops or excursions are offered where they observe, collect and then manipulate objects of Nature.	
	HIKING GUIDE ENVIRONMENTAL SERVICE AND ACCOMPANYING ON THE PATHS OF THE VULTURE PARK	Guided tours, hiking and day/night trips in the territory of the Vulture park, aimed at experiencing the biodiversity of the natural places, landscapes, people, farmers, craftsmen.	https://www.basilicatauristica.it/en/bepa/hiking-guide-environmental-service-and-accompanying-on-the-paths-of-the-vulture-park/
	BOTANICAL WALKS IN THE VULTURE AREA	Monthly courses of 4 appointments or single outings that are used to discover the spontaneous herbs of Vulture, their characteristics, their uses in herbal medicine and ethnomedicine, or even in the home gardens. Each participant is then given detailed information on their possible use, which can also be downloaded free of charge from the Facebook group "Flora del Vulture with Naturavventura".	https://www.basilicatauristica.it/en/bepa/botanical-walks-in-the-vulture-area/
	Urban walking in the Vulture-melfese area	Several walks through the alleys or in the nearby towns of the Vulture area, where silence and atmosphere help getting the day's tensions away. They end with phrases by literature artists that become food for thought. They are aimed at tourists and walking enthusiasts who want to discover the charm of the small villages of Vulture.	https://www.basilicatauristica.it/en/bepa/urban-walking-in-the-vulture-melfese-area/
	CYCLING TOURISM IN BASILICATA: 'FREE TO MOVE' IS AN APP WITH 21 ITINERARIES	App with 21 cycle routes	https://www.basilicatauristica.it/scopri-la-basilicata/sport-e-outdoor-in-basilicata/cicloturismo/app-basilicata-freetomove-negli-store-android-e-ios/

	ON HORSEBACK ALONG THE ROUTES OF BRIGANDS	In the heart of the Italian brigandage, between the castle of Lagopesole and Mount Vulture, a lush valley opens up between woods, rivers and waterfalls. Let our expert guides take you to discover the history of brigandage in Lucania, along wonderful paths, caressed by the breeze in summer and amazed by the snow in winter. An experience for the whole family, riding our beautiful horses	https://www.basilicatauristica.it/en/bepa/on-horseback-along-the-routes-of-brigands/
	A Day in Rionero for a Tour in a Wine House	Wine tour	https://www.basilicatauristica.it/en/offerta/una-giornata-a-rionero-per-una-visita-in-cantina/
	Venosa, a ring-route through history, wine and hills	Bike tour	https://www.basilicatauristica.it/en/discover-basilicata/sports-and-outdoor/bike-and-mountain-bike/2-venosa-a-ring-route-through-history-wine-and-hills/
	From Horace's town to the Palmenti, among the wheat fields of the Bradano Valley	Bike tour	https://www.basilicatauristica.it/en/discover-basilicata/sports-and-outdoor/bike-and-mountain-bike/03-from-horaces-town-to-the-palmenti-among-the-wheat-fields-of-the-bradano-valley/
	The Quad4x4 adventure	The guided excursion lasts about 3 hours and is perfect for those who want to try the thrill of a wild experience in contact with nature. For greater safety, the passenger must be at least 12 years of age and tall enough to touch the platform with their feet.	https://www.basilicatauristica.it/en/bepa/the-quad4x4-adventure/

ANNEX 6 – Cultural landscape mapping in Rural Larnaca

Sevina Floridou

Together with cartographer Vasilis Tringas, and supported by Laona Foundation, we have just completed a 5-month innovative site-specific territorial mapping proposal, using the administrative area of Ayii Vavatsinias village as a case study. The village is located in the south-eastern foothills of the Troodos mountain range in the administrative area of Larnaca, at an altitude of 690 m above sea level. At the Community Administrative District level, the full administrative territory measures roughly 5.6 x 4.6 sq. km. The area is further characterised by many landmark peaks with intensive but abandoned terracing along their multitude of slopes, criss-crossed with deep torrential river valleys. The size of the area in question inferred that the architectural heritage study informing mappings would require deliverables at a territorial level of design.

The aim was to propose a method of interactive mapping and understanding cultural landscape empirically, since such a method is not available at present. There is urgent need for such interactive maps as a means of both documenting landscape heritage features as well as documenting the surrounding topography for the preservation of both. This can in turn provide a way of transferring such layered data as assets onto an interactive contemporary mapping platform. This is necessary so that landscape heritage can be both understood as it has been handed down, so that it can be protected, conserved and restored, in order for it to become available for projects which may provide alternative funding and investment for heritage development of rural communities. Larnaca administration, through the Be.Cultour project, has indicated that there is a growing interest in preserving heritage landscape and use it in the service of sustainable authentic experiences for alternative tourism. Indeed, Agioi Vavatsinas bears remarkable authentic heritage landscape assets and chiefly terraces, arrayed along the mountain slopes. At the closing conference I presented steps taken in how we approached the innovative design of our joint cartographic-territorial documentation method.

I first identified historic sites and routes (through bibliographic research, oral interviews of local

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community members, field-research but also collected both defunct topographic maps of the late 19th and early 20th c. as well as printed maps of the mid to late 20th c.). Together with the specialist cartographer Vasilis Tringas , we next visited sites of interest and collected GPS points at each locality which the cartographer transferred onto a cartographic map of the area. All cartographic information was uploaded to the Arcgis online platform, which Tringas describes as follows:

"…As part of the program, my colleague and Architect Sevina Floridou and I undertook fieldwork involving location recording in the administrative area of Agioi Vavatsinias village. This included capturing historic landmarks as points of interest both within and outside the village. These have included an old watermill, a waterfall, as well as others. We utilized GPS for recording significant points within the village and accessible key areas outside it. Subsequently, I employed UAV technology to conduct a faster and more comprehensive survey of the wider study area, given that the overall landscape had been shaped both by recent fires as well as by a slow abandonment since the 1970ties, which crucially influenced our study. Our focus, integral to the program, centered on first identifying and next assessing the terrain and particularly the condition of historic pathways, in order to suggest their upgrade for providing monitored landscape accessibility for cultural hiking use. The comprehensive documentation of these aspects facilitated our final conclusions. Because the area is very difficult and with steep gradients, particularly to the north, and due to the time-constraints of the project, having to work during the winter months at this altitude, it was only possible to map parts of the southern areas of the village territory.

The topographic study therefore, of a selected part of the study area used spatial recording tools such as GPS and UAV, but also involved cartographic data processing. Drone usage was deemed most appropriate due to the challenging terrain we encountered, which restricted access to areas on foot or by vehicle. Additionally, the drone's capabilities in high spatial resolution allowed exceptional object recognition for objects sized 2.5 centimeters and larger. This capability enabled detailed surface recording of areas that were not currently feasible to access directly, providing us with a much clearer picture of the study area. The process of capturing, photographing, and integrating photos into a unified orthophoto was

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conducted using photogrammetry[5]*. Resulting data was registered and processed into maps using GIS, either by myself or Sevina.*

The equipment used was:

UAV (Unmanned aerial vehicle) : Model DJI Mavic 3E

https://www.dji.com/global/mavic-3-enterprise

GPS (Global Positioning System): Garmin

GIS Software (Geographic Information Systems): computer-based tools used to store, visualize, analize, and interpret geographic data.

Once our focus was established, to identify the value of landscape heritage to promote its preservation but also convivial regeneration, developed through a 'Heritage of Care', it was decided that our mappings should tally with whatever administrative mappings were available for professionals by the Cyprus Government, as contemporary decision making planning tools. This narrowed our focus down to the regional Administrative Zoning map, depicting the administrative border of the village, as well as outlines of numbered private properties. This map is available online to planners, as a pdf file, to a scale of 1/1000. The base data of this map was digitised in 2015, from former Colonial era cadastral maps of 1917-1918 and is also available in autocad format. Zones of permitted building density are overlayed onto the properties outline which form the base layer, but unfortunately no historic information from the former 1917 cadastral maps has been transferred despite the fact that three years later, in 2018, the drystone terraces landscape of Cyprus was awarded Intangible Heritage status by UNESCO.

In the subsequent years, the Department of Lands and Surveys has upgraded its portal to include an aerial map of the whole island, overlayed with the same private plot data. Co-ordinates are measured off the ArcGis system, and this map corelates information at a wide Europan territorial level through various programs such as "COPERNICUS Emergency Management Service – Mapping"[6] which provides amongst others, details of the extent of the 55 sq.km. fires of 2021 affecting the area. The programme also covers the wildfire which

[5] Photogrammetry is the technology of obtaining measurements and spatial data from photographs, applied in various fields like cartography and architecture. Drone photogrammetry uses UAVs to capture high-resolution images for geospatial analysis, offering advantages in cost and accessibility. This method creates 3D models and maps and facilitates precise measurements. However, successful drone operations depend on favorable weather conditions to ensure safety and quality.

6 https://emergency.copernicus.eu/mapping/list-of-components/EMSR515,
format SHP (Shapefile) and Coordinate System WGS, 1984, Event Type: Wildfire (Forest fire), July 03-05, 2024

occurred in the area occurred in July 2021. The service includes delineation and grading maps that assess the extent of the fire, damage to infrastructure, and impacted areas. Another platform is CORINE Land Cover (CLC), which details general expanses land use.[7] The CORINE Land Cover (CLC) dataset, initiated by the European Commission in the 1980s, provides a comprehensive, detailed, and harmonized land cover and land use inventory for Europe. CLC includes 44 thematic classes, updated every six years, with the latest update in 2018.

While Laona Foundation focused on presenting the built heritage within the village, and while Vasilis was conducting on-site cartographic drone recordings, he began extracting data and forwarding me autocad versions of the terrain gradients, its rivers, and roads, as well as the autocad version of the administrative zoning map which I transferred to Vectorworks, an architectural landscape program, which became our topographic base layer. We thus began transferring cartographic data onto a digitised topographic mapping, preparing it to receive data that could then be re-transferred from the 1917 maps in order to examine the wider historic landscape within the contemporary context, and also to identify and quantify, its expanses of terraces.

The administrative territorial boundary was the edge upon which all of our additional layers could corelate. At the same time, I began working on entering the topographic data as this accumulated (Map 01). Contours were overlayed onto the private plot outlines, mountain peaks were identified, as were the sites of interest we had visited and which related to historic structures of water use for farming. Contemporary roads were added, identifying main tarred roads but also dirt tracks, which are also missing from the administrative zoning map. The Natura 2000 border was added, identifying in fact how forest terrain has been zoned from farming areas (but this line needs more careful study since historic terracing is seen to overlap into both zones).

The edge of the fire was also transferred, allowing for many observations, chief of which is that the fire appears to have skirted cultivated terraces, which deterred its expanse.

In effect, we created the map which we needed and could use and measure distances from, in order to identify how we moved back in history into the landscape, identifying where we

[7] https://land.copernicus.eu/en/products/corine-land-cover?tab=main
format SHP (Shapefile) and Coordinate System ETRS 1989 LAEA, 1984. Data collected: 2018.

wanted next wanted to go. Unfortunately, the memories of locals were fragmented, since they were unable to have a comprehensive understanding of the whole village territory, having lost the memory of older pathways which have become overgrown, but which, for example, we could identify from the 1882 and 1917 maps.

Since time constrains meant that we could not produce an overall map of all abandoned pathways, so we focused on an example of how to uncover the 1917 path towards the waterfall (which is seen to trace the same route as on the 1882 map, indicating that it is much older). Local's access to the waterfall is now along a newly opened wide dirt road, which they are afraid will encourage vehicular traffic if the spot becomes well known, and will ruin its pristine natural surroundings. We suggested reviving the former historic path, which would be kept narrow and only accessible to hikers, and the dirt road should be barred for all traffic except for local orchard owners.

We were now at a point where we could transfer historic pathways onto our new topography mapping, by also identifying its formally legal route through the overlayed administrative and GPS measurements.

We located further historic sites of interest which we were re-discovering both from oral and fieldresearch, and which included terraced areas or abandoned or historic clusters of water infrastructure, developed from the 18th to the 20th c. We could now accurately locate these on the cartographic layers and transfer them to the topographic map, while also identifying former 1917 tracings which provided historic content to the surrounds of each site. The 1917 maps, when closely looked at, contain many more historic structures of former farming activities such as springs, sheepfolds, orchards and vine terraces, which a more comprehensive study could identify.

By also meeting with locals who were permanent residents, both men and women, and in their own spaces I conducted an informal questionnaire of how they could describe the landscape surrounding their village to me. On my behalf, I went prepared with questions (from Goodwin's, 1973 Toponymy of Cyprus) and also shared my gathered mapping data with them on my laptop, showing them the historic maps, as well as current online cartographies Three conclusions transpired from their descriptions, which led to the overlaying of toponyms (place-names) onto our topographic map. The first layer of

toponyms concerns how place-names appear on the former maps, but also as these are recorded in oral memory. Some of the toponyms of 100 years ago, particularly to the south have been forgotten (shown in small black script). The mountain peaks immediately surrounding the village are still very active as landmarks in current descriptions (shown in large black script). However, the current residents also have their own toponyms, which are different from the official colonial era mapping. Whether new or modified from older placenames (indicated in red script), these show current terrace farming, which has mainly shifted to the northern areas and within the forest range.

The digitized topographic map became enriched with even more terrain data from the cartographic transfer; an overlay of all rivers mapped by drone, was transferred to the Vectorworks map and set over the 1917 numerous rivers seen traversing or surrounding the village. This provides information of how many river traces were turned to hard roads in subsequent decades, providing insight into flooding problems, also mentioned by the community.

The cartographic map can then go on to become a very dynamic tool since it can be cut along any line to reveal terrain sections, identify the varied topography, and provide through 3D imagery bird's-eye views of any selected site, which can be overlayed with further historic information. Finally, by underlaying a sample of the pdf archive images of the cadastral plans (provided at a scale of 1/5000) then colouring in the areas shown as vine terraces, and next overlaying these onto the contours map, an image of historic relief has emerged, allowing us to see not only where the vine terraces were concentrated in 1917, but also their fabric, their territoriality and distance from the village (Map 02). The old paths (some now turned into tarred roads) indicate how the terraces were accessed in the past, perhaps providing answers for future integrated and innovative access-design solutions. Furthermore, we can also see the orientation, exposure and gradient of each terrace, and since Vectorworks (which is also autocad compatible) allows for each colour shape to display its area, it will be possible to quantify the 1917 terraces (but also orchards, or fallow lands which are also historically indicated) once all the cultivation data is mapped topographically. Once complete it could be exported and be uploaded to the online chartography ArcGis data[8].

[8] The cost to keep this information as open-access, or whether another open-access platform will be available, and long term is something that requires very considerate debate with planning authorities.

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Other historic field data of subsequent developments which is also important in the evolution but also devolution of the terraced landscape could also follow. The shapes of the vine terrace plots, which appear haphazard and somewhat psychedelic, laid flat onto the 1917 cadastrals, with no indication of landscape gradients, once overlayed on to the contours, reveal their link to the topography, but also possibly to orientation for different types of cultivation. Many more inferences are waiting to be understood and mapped so as to reveal and be shared as knowledge products with planners, but also locals and visitors alike, in an authentic landscape experience and revival.

Conclusion

Re-arranging layers to show multiple correlations (eg. the fire edge in relation to historic terraces, the natura edge in relation to terracing, how the fire affected the waterfall, etc) and then enriching the map with further field research, can provide the basis of future documentation that will assist in historically developing the area, safeguarding heritage, funding terrace restoration, and preventing the current situation whereby the Department of Agriculture funds farmers for maximum planting of new varieties, encouraging them to flatten their undocumented historic terraces in order to have easier loading access[9]. Funding farmers as curators of the landscape is imperative if they are to be encouraged to safeguard this environment as partners in sustainable farming, heritage and tourism. The level of this innovative mapping, providing cartographic information on an island wide scale, but zooming in and enriching already established administrative mappings can also provide solutions to design issues concerning location of roads to assist farmers, limiting damage to the landscape. Allowing access to farmers, but safeguarding it from unruly, extractive development.

[9] Alternatively, the D of A should be encouraged to finance new loading methods employed in terraced Vineyards.

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ANNEX 7 – Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism

This document presents a policy-oriented Dashboard based on multidimensional and spatial evaluation framework to assess sustainable and circular tourism performances in touristic destinations. This framework is designed to assist stakeholders and decision-makers in making effective choices that promote sustainable regional development through cultural tourism. It aims to transform lesser-known and remote heritage sites into sustainable, circular, and human-centered cultural tourism destinations. The policy-oriented Dashboard - Local Impact Indicators for Circular Cultural Tourism is based on urban metabolism assessment method, analysing the flows of people, materials, energy, water and wastes, identifying cultural tourism dimensions and indicators in the perspective of the circular economy and circular city/territory policy models focusing particularly on the human dimension.

La Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism is open access in Google Excel format and freely searchable and downloadable by the users available at the following link:

https://docs.google.com/spreadsheets/d/1tWQuWnKefSO1U5-1VHWXoMi5T7383Spt/edit?gid=445046190#gid=445046190

Be.CULTOUR Dashboard - Local Impact Indicators for Circular Cultural Tourism

	Cultural dimension												
	What criteria would you use to evaluate the impact of your strategy, in this specific dimension?					*Have your strategies produced results, in the short term, in the direction indicated by the indicators, or is intent on achieving these results?*	*If you have a chance, try to differentiate the data collected*	*Unit of Measurement*	*Use this column to know something more about the indicators*	*Use the tools suggested for collect data*	*Use this column to easily identify the target*	*If you have a chance use this column to know how to spatialize the data on Geographic Information Sysitem*	
	Criteria	**Criteria description**		**Sub-criteria**	**Id**	**Indicators**	**Indicators specification**	**U.M.**	**Indicators description**	**Data collection tools**	**Targets**	**Spatial visualization**	**Source**
1	**Cultural heritage appreciation**	It expresses the recognition, understanding, and valuation of the cultural, historical, artistic, natural and social significance of various elements of a particular	1.1	Visitors' cultural heritage appreciation	1.1.1	Level of visitors' appreciation of cultural sites	-	Likert scale	It is calculated with a survey on a likert scale of 1 to 5. The average is calculated by making the sum of the values/tot. responses. The data is collected for residents and tourists.	**#Residents and visitors Survey** Question 1: Are you a resident or a visitors? Question 2: On a scale of 1 to 5, how satisfied are you with the valorisation of cultural sites? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied You can also use: **#TripAdvisor** On TripAdvisor look for the site of your interest and calculate the percentage resulting from the ratio of the number of excellent reviews to the total reviews.	Residents/ visitors	Cultural sites ranked by average number of the appreciation	Revised by authors from ETIS, 2016

		culture's heritage. This concept involves acknowledging the value and importance of heritage resources and artifacts, as well as the broader cultural traditions and practices associated with them.			1.1.2	Level of visitors' appreciation of activities implemented to enhance cultural heritage	-	Likert scale	It is calculated with a survey on a likert scale of 1 to 5. The average is calculated by making the sum of the values/tot. responses. The data is collected for residents and tourists.	**#Residents and visitors Survey** Question 1: Are you a resident or a visitors? Question 2: On a scale of 1 to 5, how satisfied are you with the activities implemented to enhance the integrity and authenticity of the cultural heritage? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied	Residents/ visitors	Cultural sites ranked by average number of the appreciation	Revised by authors from van Leeuwen et al., 2013
			1.2	Cultural heritage istitutional appreciation	1.2.1	Number of international awards/labels recognised to local tangible and intangible cultural heritage in the past 10 years	-	No. in the past 10 years	International awards/labels are e.g. UNESCO, European Heritage Label	**#Checklist** Search on the sites "European Heritage Label Sites" and "Unesco Heritage Sites" the places of the international heritage or the indications to nominate your heritage. https://whc.unesco.org/en/list/ https://culture.ec.europa.eu/cultural-heritage/initiatives-and-success-stories/european-heritage-label	Official database	Yes, No	Reised by authors from Marcotte & Bourdeau, 2012
2	**Cultural vibrancy**	It expresses the vitality, energy, and dynamism within a culture or community, particularly in relation to its artistic,	2.1	Cultural facilities	2.1.1	Level of usability of local cultural facilities	Museums and art galleries Theatres Cinemas Sights and landmarks Cultural centers Concert and music halles Libraries Other	Likert scale	It is calculated on tree levels during the year: 1 = closed sites 2 = partially open in a year 3 = open all year	**#Local cultural sites Survey** Question: On a scale 1 to 3, which facilities are open all year, partially open, or closed at different times? 1 = closed sites 2 = partially open in a year 3 = open all year	Local cultural sites	Green: all year Yellow: partially open in a year (seasonal or daily) Red: closed sites	Culture 2030 UNESCO data: UN-Habitat – Public open space strategies SDG 11.7.1

		creative, and cultural expressions. It signifies the liveliness and robustness of cultural activities, traditions, and artistic endeavors within a society.			2.1.2	Number of people visiting cultural sites per year	Visitors (national or international) Residents	No./year	-	**#Local cultural sites Survey** Survey and data collection from aggregator (according to the specific site/local/regional scale) . Collect the data by individual year.	Local cultural sites	Cultural sites ranked by the number of visitors	Revised by authors from EUROSTAT, 2017
			2.2	Cultural experiences	2.2.1	Number of people participating in cultural experiences per year	Visitors Residents	No./year	-	**#Local cultural sites/DMO Survey** Question: How many people participate in cultural experiences per year? Can you split the percentage per target ?(residents and turists). Collect the data by individual year.	Local cultural sites/DMO	Mapping of activities/events/experiences ranked by the number of participants	D. A. Jelinˇci´c, 2021
					2.2.2	Number of cultural experiences for the enhancement of local tangible and intangible cultural heritage per year	Local traditional foods enhancement Traditional crafts enhancement Arts and entertainement enhancement Landscape enhancement	No./year	-	**#Local cultural sites/DMO Survey** Question: How many activities have you realized per year? Can you split them by type? Collect the data by individual year.	Local cultural sites/DMO		Revised by authors from ETIS, 2016
3	**Cultural digital use**	It refers to the use of digital tools for the enjoyment or promotion of cultural sites.	3.1	Digital services	3.1.1	Number of download of digital tools for the enhancement of local tangible and intangible cultural and natural	-	No./year	The digital tools are app, games, ecc.	**#DMO Mapping Activity** Look for relevant data sources that track downloads of digital tools. This may include app stores (e.g., Apple App Store, Google Play Store), game distribution platforms (e.g., Steam), websites of cultural institutions, and government agencies responsible for cultural heritage or tourism. Gather data on the number of downloads for each digital tool within your defined scope. This may involve	DMO	-	Revised by the authors from Katsoni & Spyriadis, 2020

						heritage per year				accessing download statistics provided by app stores or game distribution platforms, obtaining data from cultural institutions that offer digital tools, or accessing reports from government agencies. Utilize geographic information systems (GIS) or mapping software to visualize the distribution of downloads geographically. You can plot the locations of digital tool downloads on a map to see where they are concentrated and identify any patterns or trends. Analyze the data over time to track changes in download trends. Collect the data by individual year.			
					3.1.2	Number of cultural sites equipped with digital visitor support tools	-	No.	The digital visitor support tools are e.g. Augmented Reality and Virtual Reality, etc.	**#Local cultural sites Mapping Activity** Do you provide any digital visitor support tools at your cultural site, such as Augmented Reality (AR) or Virtual Reality (VR) experiences? If yes, how many cultural sites are equipped with AR or VR technology for visitor engagement? Can you provide a list of the cultural sites equipped with digital visitor support tools? Are these tools available for all visitors, or are they limited to certain exhibits or areas within the cultural site?	Local cultural sites	Yes, No	Revised by the authors from Katsoni & Spyriadis, 2020
					3.2.1	Number of cultural sites equipped with Wi-fi connection	-	No.	-	**#Local cultural sites Mapping Activity** Do you offer free Wi-Fi connection for visitors at your cultural site? If yes, how many cultural sites are equipped with free Wi-Fi access? Can you provide a list of the cultural sites with free Wi-Fi for visitors?	Local cultural sites	Yes, No	Revised by the authors from Katsoni & Spyriadis, 2020

									Is the Wi-Fi access available throughout the entire cultural site, or are there specific areas where it is accessible?			
			3.2	Digital strategies	3.3.1	Number of cultural site equipped with a digital strategy maketing	-	No.	The digital strategy maketing coul be trought trip advisor, social, google analytics. etc.	**#Local cultural sites Mapping Activity** Does your cultural site have a digital marketing strategy in place? If yes, which digital marketing platforms or tools are included in your strategy (e.g., Tripadvisor, social media channels, Google Analytics, etc.)? How many cultural sites are actively implementing a digital marketing strategy? Can you provide details or examples of how these digital marketing tools are utilized to promote the cultural site and engage with visitors? Have you observed any impacts or benefits from implementing digital marketing strategies at your cultural site?	Local cultural sites	Yes, No	Revised by the authors from Katsoni & Spyriadis, 2020

	Environmental dimension												
	Criteria	**Criteria description**	**Id.**	**Sub-criteria**	**Id**	**Indicators**	**Indicators specification**	**U.M.**	**Indicators description**	**Data collection tools**	**Targets**	**Spatial visualization**	**Source**
4	**Sustainability management**	It refers to resource saving and recovery systems in relation to energy, water and waste. It refers to how effectively energy is converted and used in various processes, systems, or devices. It measures how effectively water is utilized to achieve a particular goal or produce a specific outcome while minimizing water wastage. It refers to the	4.1	Energy efficiency	4.1.1	Number of cultural sites and accommodations using efficiency systems	Cultural sites	No.	Renewable energy sources could be solar, wind, hydro, and biomass, and energy-saving system could be micro-wind, solar panels, solar panel lighting, etc.	**#Cultural site/Accommodation Sustainability Survey** To gather data on the sustainability practices, first of all make a list and contact cultural sites and accommodations. Questions: Does your cultural site/accommodation use renewable energy sources such as solar, wind, hydro, or biomass? If yes, please specify the renewable energy sources used (e.g., solar panels, wind turbines, hydroelectric power). What energy-saving systems are implemented at your cultural site/accommodation (e.g., micro-wind turbines, solar panels for lighting)?	Local cultural sites/accommodations	Yes, No	Revised by authors from ETIS, 2016
							Accommodation facilities						
			4.2	Frashwater efficiency	4.2.1	Number of cultural sites and accommodations using systems to reduce water consumption	Cultural sites	No.	Systems to reduce water consumption could be low-flow faucets, water consumption monitoring systems, etc.	**#Cultural site/Accommodation Sustainability Survey** To gather data on the sustainability practices, first of all make a list and contact cultural sites, accommodations, and infrastructure. Questions: 1) Water Consumption Reduction: Does your cultural site/accommodation have systems in place to reduce water consumption? If yes, please specify the water-saving measures implemented (e.g., low-flow faucets, water consumption monitoring systems). 2) Recycled Water Usage: Does your cultural site/accommodation utilize recycled	Local cultural sites/accommodations	Yes, No	Revised by authors from ETIS, 2016
							Accommodations						
					4.2.2	Number of cultural sites and accommodatio	Cultural sites	No.	Recycled water (system could be graywater			Yes, No	

		practice of minimizing or decreasing the amount of waste generated in various processes, systems, or activities.				ns using recycled water	Accommodations		reuse for gardening or toilet refill, irrigation, cooling systems, in-room toilets, etc.	water for any purposes? If yes, please specify how recycled water is used (e.g., graywater reuse for gardening, irrigation, cooling systems).			
			4.3	Waste reduction	4.3.1	Number of cultural sites and accommodations using systems to reduce plastic and wastes consumption	Cultural sites	No.	Systems to reduce wastes consumption coul be minimizing the use of single-use plastic products; using products and merchandise with minimal or recyclable packaging, etc.	**#Cultural site/Accommodation Sustainability Survey** To gather data on the sustainability practices, first of all make a list and contact cultural sites, accommodations, and infrastructure. Questions: 1) Waste Reduction Systems: Does your cultural site/accommodation have systems to reduce waste consumption? If yes, please specify the waste reduction measures implemented (e.g., minimizing single-use plastic products, using recyclable packaging). 2) Waste Reuse Practices: Does your cultural site/accommodation engage in waste reuse practices? If yes, please specify how waste is reused (e.g., composting organic waste from kitchens and gardens).	Local cultural sites/accommodations	Yes, No	Revised by authors from Global Sustainable Tourism Council (GSTC), 2019
							Accommodations						
					4.3.2	Number of cultural sites and accommodations re-using wastes	Cultural sites	No.	System to re-using waste could be using organic waste from kitchens and gardens for composting, etc.			Yes, No	
							Accomodations						
			4.4	Sustainable food	4.4.1	Number of commercial activities using sustainable/local foods products	Biological products certificated	No.	-	**#Commercial activities Survey** Make a list of hotels, restaurants, and other establishments. Questions: 1) Do you use biological or organic food products in your establishment? If yes, please specify the types of biological food products used and the percentage of your menu that consists of biological options. 2) How do you source your biological food products? 3) Do you have any certification?	Commercial activities	Yes, No	Revised by authors from ETIS, 2016
							Local						

5	**Natural sites enhancement**	It refers to efforts or activities aimed at improving, preserving, or restoring natural areas or environments. Overall, it encompasses various strategies and actions aimed at improving the condition, value, and sustainability of natural areas for both ecological health and human benefit.	5.1	Natural experiences	5.1.1	Number of experiences to reconnect people and nature per year	Spontaneous/officinalis herb recognition	No./year	-	**#Local cultural sites/DMO Survey** Question: 1) How many experiences to reconnect people and nature have you organized in a year? 2) How many people participate in cultural experiences per year? Can you split the percentage per target ?(residents and turists) Collect the data by individual year.	Local cultural sites/DMO	Mapping of the place of experiences to reconnect people and nature ranked by the number of participants.	Revised by authors from Curtin & Kragh, 2014
							Forest bathing						
							Yoga experience						
							Astroturism						
							Educational and self-made workshops						
							Bird watching						
							Foliage experience						
					5.1.2	Number of people participating in experiences to reconnect people and nature	-	No./year	-				Revised by authors from Curtin & Kragh, 2014
			5.2	Visitors' natural heritage appreciation	5.2.1	Level of visitors' appreciation with experiences to reconnect people and nature	-	Likert scale	-	**#Visitors Survey** a) Overall Appreciation of Natural Sites: On a scale of 1 to 5, how would you rate your overall appreciation of the natural sites you visited during your experience (e.g., parks, beaches, rivers, lakes, forests, etc.)? 1: Very low appreciation 2: Low appreciation 3: Moderate appreciation 4: High appreciation 5: Very high appreciation b) Cleanliness: On a scale of 1 to 5, how would you	Visitors	Mapping of the place of experiences to reconnect people and nature ranked by the average number of participants' satisfaction	Revised by authors from Curtin & Kragh, 2014
					5.2.2	Level of visitors' appreciation of natural sites	Cleanliness	Likert scale	It is calculated with a survey on a likert scale of 1 to			Natural sites ranked by average number of the appreciation	Revised by authors from ETIS, 2016

							Safety		5. The average is calculated by making the sum of the values/tot. responses.	rate the cleanliness of the natural sites you visited? 1: Very poor cleanliness 2: Poor cleanliness 3: Average cleanliness 4: Good cleanliness 5: Excellent cleanliness c) Safety: On a scale of 1 to 5, how would you rate the feeling of safety at the natural sites you visited? 1: Very unsafe 2: Unsafe 3: Neutral 4: Safe 5: Very safe d) Accessibility: On a scale of 1 to 5, how would you rate the accessibility of the natural sites you visited? 1: Very poor accessibility 2: Poor accessibility 3: Average accessibility 4: Good accessibility 5: Excellent accessibility			
							Accessibility						
			5.3	Sustainability certification	5.3.1	Number of natural sites receiving a sustainability flagship or label	-	No.	Sustainability flagship/label could be e.g. “blue flag” for beaches	**#Checklist** Retrieved from the official webpages of the certification authorities of blue flags, EMAS, ISO 14001 and other national environmental certifications.	Official database	Yes, No	Revised by authors from Cerqua, 2016
					5.3.2	Number of tourism enterprises in the destination using a voluntary certification/labelling for environmental quality/sustainability and/or CSR measures	-	No.	-	**#Tourism enterprises Survey** Question: Does your tourism enterprises have a voluntary certification/labelling or environmental quality/sustainability?	Tourism enterpises	Yes, No	ETIS 2016

6	**Visitors sustainable behavior**	It refers to responsible and sustainable behaviour by tourists to minimise the environmental impact of tourism and ensure the long-term sustainability of destinations.	6.1	Visitors' responsible behavior	6.1.1	Level of visitors' responsible behavior	Use of recyclable products (glass, water, etc.) Buy of minimally packaged goods or plastic free. Pay attention to resources consumption (energy, water, wastes). Book in eco-friendly facilities.	Likert scale	This indicator is calculated with a survey on a likert scale of 1 to 3. The average is calculated by making the sum of the values/tot. responses.	**#Visitors Survey** Questions**:** a) Use of Recyclable Products: On a scale of 1 to 3, how often do you use recyclable products during your travels (e.g., glass, water bottles, etc.)? 1: Rarely or never 2: Occasionally 3: Frequently or always b) Purchase of Minimally Packaged Goods or Plastic-Free Products: On a scale of 1 to 3, how often do you buy minimally packaged goods or plastic-free products while traveling? 1: Rarely or never 2: Occasionally 3: Frequently or always c) Attention to Resource Consumption: On a scale of 1 to 3, how much attention do you pay to resource consumption (e.g., energy, water, wastes) during your travels? 1: Little to no attention 2: Moderate attention 3: Significant attention d) Booking Eco-Friendly Facilities: On a scale of 1 to 3, how often do you book accommodations that are eco-friendly or have sustainability initiatives in place? 1: Rarely or never 2: Occasionally 3: Frequently or always	Visitors	**-**	Nocca et al., 2023

	Human and social dimension												
	Criteria	**Criteria description**	**Id**	**Sub-criteria**	**Id**	**Indicators**	**Indicators specification**	**U.M.**	**Indicators description**	**Data collection tools**	**Targets**	**Spatial visualization**	**Source**
7	**Community wellbeing**	It refers to tourism practices, strategies, initiatives, and approaches that prioritize and enhance the well-being, prosperity, resilience, inclusivity, sustainability, and happiness of local communities, residents, and stakeholders in destinations, regions, and areas impacted by tourism activities. This concept emphasizes the integration of social, cultural,	7.1	Residents' appreciation of tourism effects	7.1.1	Level of residents appreciation for the improvement of the area due to tourism	-	Likert scale	It is calculated with a survey on a likert scale of 1 to 5. The average is calculated by making the sum of the values/tot. responses.	**#Residents Survey** Question: On a scale of 1 to 5, how satisfied are you with the improvement of the area due to tourism? 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied	Residents	-	Revised by authors from ETIS, 2016

		economic, environmental, and governance dimensions to create a harmonious balance between tourism development and community well-being.										
8	**Capacity building**	It refers to the process of developing and strengthening the skills, resources, and abilities of individuals, organizations, or communities to enhance their effectiveness, performance, and sustainability.	8.1	Training and educational activities	8.1.2	Level of skills acquired by the local community in the field of tourism	Creative Relationale Linguistic Professionals Digital Enterpreneurship Cultural knowledge Environmental	Likert scale	It is calculated with a survey on a likert scale of 1 to 5. The average is calculated by making the sum of the values/tot. responses.	**#Residents Survey** Questions: On a scale of 1 to 5, assign a score on how satisfied you feel in acquiring skills in the following areas: - Creative - Relationale - Linguistic - Professionals - Digital - Enterpreneurship - Cultural knowledge - Environmental 1 = Not at all Satisfied 2 = Partly Satisfied 3 = Satisfied 4 = More than Satisfied 5 = Very Satisfied **Background information. Question to tourism operators:** 1) How many activities were organized or facilitated by your	Residents	-	Bare et al, 2021

									organization/community in the tourism sector during the past year? Can you provide a breakdown of these activities based on their focus areas or topics? 2) What types of activities were conducted to train local communities in the tourism sector? (e.g., courses, workshops, seminars, training programs, etc.) 3) Who were the primary target participants for these activities? (e.g., local residents, tourism professionals, entrepreneurs, youth, women, specific community groups) 4) How many individuals participated in each activity? What was the level of attendance or participation in these activities? (e.g., full capacity, partial attendance, etc.) 5) What were the key outcomes or impacts observed as a result of these training activities? (e.g., improved skills, increased awareness, enhanced job opportunities, etc.			
9	**Inclusiveness**	It creates an equitable, accessible and enriching experience for all travellers and ensures respect for local communities and their rights.	9.1	Physical inclusiveness	9.1.1	Number of cultural sites and accommodations without architectural barriers	Cultural sites Accommodations	No.	Architectural barriers are. exclusive presence of stairs, lack of ramps, ecc.	**#Cultural sites and Accomodation Survey** Question: Have your location architectural barriers, as stairs, ramps, ecc.? The total number of cultural sites and accommodations that answered NO is calculated.	Local cultural sites/accommodations	Yes, No	Revised by authors from ETIS, 2016
					9.1.2	Number of cultural sites and accomodations offering supporting tools and services for people with diverse needs	Cultural sites Accommodations	No.	Diverse needs are kids, over 65, people with physical disabilities, pregnant woman, etc.; e.g. priority seating, special tours	**#Cultural sites and Accomodation Survey** Question: Do you offer support tools and services for people with diverse needs, as priority seating, special tours and programs, ecc? The total number of cultural sites and accommodations that answered YES is calculated.	Local cultural sites/accommodations	Yes, No	Revised by authors from ETIS, 2016

									and programs.				
			9.2	Language inclusivness	9.2.1	Number of accommodations, culture and tourism structures offering supporting tools and services to breaking down language barriers	Cultural sites Accomodations	No.	Services to breaking down language barriers (audio guides, braille directions, etc.).	**#Cultural sites and Accomodation Survey** Question: Do you offer supporting tools and services to breaking down language barriers like audio guides, braille directions, multilingual books/guides/info or other?	Local cultural sites/accommodations	Yes, No	Revised by authors from Global Sustainable Tourism Council (GSTC) 2019
			9.3	Entrepreneurship inclusivness	9.3.1	Level of perception of inclusion of women, youth, people with special needs and minority cultures in enterprises	-	Likert scale	-	**#Tourism enteprises Survey** Question a) On a scale of 1 to 5, how do you perceive your work environment toward women, special needs, and youth? 1 = Not at all inclusive 2 = Partly inclusive 3 = inclusive 4 = More than inclusive 5 = Very inclusive	Tourism enterpises	-	Pechlaner et al., 2012
10	**Safety**	It guarantees the well-being of travellers, local communities and the overall sustainability of the tourism industry. By prioritizing safety in tourism, destinations can	10.1	Visitors' safety perception	10.1.1	Level of safety perceived by visitors	-	Likert scale	-	**#Visitors Survey** Question 1: How safe did you feel in the tourist destination during your stay? 1 = Not at all safe 2 = Partly safe 3 = Safe 4 = More than safe 5 = Very safe	Visitors	-	Revised by authors from Li et al, 2023

		create an environment that is attractive to visitors, fosters positive experiences, and contributes to the sustainable development of the tourism industry.											
11	**Transformative travel experience**	It refers to journeys that go beyond the simple act of sightseeing or leisure and instead lead to personal growth and self-discovery. Transformative travel aims to broaden perspectives, enhance empathy, promote self-discovery,	11.1	Learning experiences	11.1.1	Level of citizens and visitors' satisfaction about what they learned during the trip	-	Likert scale	It is alculated with a survey on a likert scale of 1 to 5. The average is calculated by making the sum of the values/tot. responses.	**#Residents and visitors Survey** Question: On a scale of 1 to 5, how satisfied are you with what you learned during your trip about the local culture, customs, traditions, language, etc.? 1: Very dissatisfied 2: Dissatisfied 3: Neutral 4: Satisfied 5: Very satisfied	Residents/visitors	-	Revised by authors from Zhao & Agyeiwaah, 2023
			11.2	Hospitality experiences	11.2.1	Percentage of visitors declaring they have established meaningful relationships in the destination	-	%	The percentage is the result of the ratio of the visitors declaring "yes" to the number of total visitors responding to the survey.	**#Visitors Survey** Question: Do you have established meaningful relationship in the destination?	Visitors	-	Revised by authors from Zhao & Agyeiwaah, 2023

		and create a deeper understanding of oneself and the world.			11.2.2	Level of visitors satisfaction for the host community hospitality	-	Likert scale	It is calculated with a survey on a likert scale of 1 to 5. The average is calculated by making the sum of the values/tot. responses.	**#Visitors Survey** Question: a) Friendliness of Locals: On a scale of 1 to 5, how would you rate the friendliness of the locals in the host community? 1: Very unfriendly 2: Unfriendly 3: Neutral 4: Friendly 5: Very friendly b) Quality of Services: On a scale of 1 to 5, how satisfied are you with the quality of services provided by the host community (e.g., accommodations, restaurants, tour operators)? 1: Very dissatisfied 2: Dissatisfied 3: Neutral 4: Satisfied 5: Very satisfied c) Cultural Immersion: On a scale of 1 to 5, how immersed did you feel in the local culture during your visit to the host community? 1: Not immersed at all 2: Slightly immersed 3: Moderately immersed 4: Immersed 5: Very immersed d) Safety Perception: On a scale of 1 to 5, how safe did you feel in the host community? 1: Very unsafe 2: Unsafe 3: Neutral 4: Safe 5: Very safe e) Willingness to Revisit or Recommend: On a scale of 1 to 5, how likely are you to revisit the host community? 1: Very unlikely	Visitors	-	Revised by authors from Zhao & Agyeiwaah, 2023

									2: Unlikely 3: Neutral 4: Likely 5: Very likely f) On a scale of 1 to 5, how likely are you to recommend the host community to others? 1: Very unlikely 2: Unlikely 3: Neutral 4: Likely 5: Very likely			
12	**Sense of ownership and community care**	It refers to the shared responsibility and emotional connection that a community or group of people has toward preserving, protecting, and promoting their cultural and natural heritage.	12.1	Visitors' committment	12.1.1	Number of residents actively involved for the care of cultural and natural heritage per year	Informal groups Associations	No./year	-	**#DMO Survey** First,make a list of local informal groups, associations, or heritage communities involved in heritage care. Inquire if they maintain records or databases of informal groups, associations, or heritage communities involved in heritage care within the area. If yes: Questions: 1) How many participants have been involved per year? 2) How many partnerships have been activated? Collect the data by individual year.	DMO	-	Revised by authors from Nam & Thanh, 2024
					12.1.2	Number of partnership activated for the care and valorizzation of cultural and natural heritage per year	-	No./year	-			-	Revides by authors from El-Khadrawy et al., 2022
			12.2	Visitors' donations	12.2.1	Number of donations received for the management, enhancement, preservation and valorization on tangible and intangible cultural heritage per year	Visitors Residents	No./year	-	**#Local cultural sites/DMO Survey** How many donations did your institution receive for the management, enhancement, preservation, and valorization of cultural heritage in the past year? Can you provide a breakdown of donations received from tourists and citizens separately? Please, link/write your Donation pathway. Collect the data by individual year.	Local cultural sites/DMO	-	Revised by authors from Hunter-Jones P., 2011

					12.2.2	Volume of donations received for the management, enhancement, preservation and valorization on tangible and intangible cultural heritage per year	-	€./year	-			
13	**Touristification effects**	It refers to situations where destinations experience an excessive number of visitors, leading to negative impacts on the environment, infrastructure, local communities, and visitor experience. This phenomenon has become a growing concern in many parts of the world due to the rapid increase in global	13.1	Overcrowding	13.1.1	Number of tourists per 100 residents	-	%	-	**#Statistical database** Check published report or research who collect statistical data on local scale.	Official database	**-**	ETIS, 2016
			13.2	Housing issue	13.2.1	Number of beds available in commercial accommodation establishments per 100 residents per year	-	No./year	Total number of beds in commercial accommodation ÷ total number of residents * 100 = Number of available beds per 100 residents.	**#Statistical database** Check published report or research who collect statistical data on local scale. Collect the data by individual year.	Official database	**-**	ETIS, 2016
					13.2.2	Number of second homes used for tourist activities or facilities per year	-	No./year	-	**#Statistical database** Check the sources of official municipal statistics, e.g. property census. Collect the data by individual year.	Official database	Mapping of the second homes	ETIS, 2016

		travel, facilitated by factors such as affordable air travel, improved infrastructure, and digital connectivity.											
	Economic dimension												
	Criteria	**Criteria description**	**Id**	**Sub-criteria**	**Id**	**Indicators**	**Indicators specification**	**U.M.**	**Indicators description**	**Data collection tools**	**Targets**	**Spatial visualization**	**Source**
14	**Jobs in tourism**	It contributes significantly to job creation worldwide, embracing a variety of industries and occupations (hospitality industry, tourism and guiding activities, cultural and recreational activities, retail and handicrafts, etc.).	14.1	Tourism jobs	14.1.1	Number of jobs in tourism and culture sector	Entrepreneurs Freelancers Permanent employee	No./year	-	**#Statistical database** Check published report or research who collect statistical data on local scale If not available: **#Institutional Survey** Question to chamber of commerce, tax agency, ecc. How many seasonal tourism jobs are registered per year? How many total tourism jobs are registered per year? Collect the data by individual year.	Official database	-	Revised by authors from ETIS, 2016
			14.2	Tourism seasonal jobs	14.2.1	Percentage of tourism seasonal jobs per year	-	%/year	-	**#Statistical database** Check published report or research who collect statistical data on local scale	Official database	-	ETIS, 2016

15	**Entrepreneurship**	It involves the creation and management of businesses that meet the needs and desires of tourists. These enterprises contribute not only to the economic development of a region but also to the preservation and promotion of cultural heritage.	15.1	Tourism enterprises	15.1.1	Number of new touristic enterprises in the last three year	Social enterprises Cultural enterprises Start-up innovative Start-up innovative a vocazione sociale (SIAVS)	No./3 years	Number of new touristic enterprises recorded in the last 3 years.	**#Statistical database** Check published report or research who collect statistical data on local scale	Official database	Mapping of new touristic enterprises	Revised by authors from World Tourism Organization (UNWTO), 2023
			15.2	Tourism enterprises responsability	15.2.1	Percentage of locally products sourced by the destination's tourism enterprises	-	%	The percentage is the result of the ratio of toursim entraprises "local-friendly" to the total tourism entrerprises.	**#Accomodations Survey** Question: What percentage of your services, goods, food and drinks are sourced locally? □ < 10 % □ 10 – 25 % □ 25 – 50 % □ > 50 %	Accommodations	-	ETIS, 2016
			15.3	Innovation in tourism enterprises	15.3.1	Number of patents and intellectual property creation about tourism field in the last ten years	-	No./10 years	-	**#Patent Databases** Access patent databases such as the United States Patent and Trademark Office (USPTO), European Patent Office (EPO), or other national patent offices. **#Intellectual Property Offices** Contact intellectual property offices or agencies responsible for patent and trademark registration in the relevant jurisdictions. Inquire about the number of patents filed and trademarks registered within the ecosystem over the last 10 years. These offices may provide access to statistical reports or databases containing data on intellectual property filings.	Official database	-	Revised by authors from Cavalheiro et al., 2021
16	**Local economy tourism**	It involves various strategies	16.1	Contribution of visitors to	16.1.1	Daily average spending per visitors	In locally-made handcrafts	€/day	-	**#Statistical database** Check published report or research who collect statistical data on local	Visitors	-	Revised by authors from ETIS, 2016

	contribution	aimed at promoting economic growth, fostering entrepreneurship, and improving the overall prosperity of a community or region.		the local economy			and products			scale If not available: **#Visitors Survey** Question: 1. How much did you spent on average per day? 2. Compared to the total expense of your trip, how much did you spend for each category, from 1 to 5? - In locally-made handcrafts and products - In food - On overnight stay - On transports - On culture (museums, events, ecc.)			
							In food					
							In overnight					
							On transports					
							On culture (museums, events, etc.)					
			16.2	Social-cultural reinvestment of tourism revenue	16.2.1	Volume of tourism revenue reinvested in local socio-cultural initiatives per year	Municipality revenue	€/year	-	**#Institutional Mapping Activity** Local government authorities often track tourism revenue and may have records of funds reinvested in socio-cultural initiatives. Contact relevant government departments responsible for tourism, finance, or cultural affairs to request access to this data. ome enterprises and associations within the tourism sector may publish financial reports that include information on revenue and expenditures related to corporate social responsibility (CSR) or other socio-cultural initiatives. Review these reports to identify the volume of tourism revenue reinvested in local initiatives.Sum the comprehensive data collected per each area on the volume of tourism revenue reinvested in local socio-cultural initiatives recorded in a year.	Local government	**-**	Revised by authors from Melita & Mendlinger, 2013
17	**Real estate market values**	Real estate market values refer to the estimated worth of	17.1	Selling prices	17.1.1	Residential average selling prices in touristic areas	-	€/sqm	It is the sum of market selling values divided by the number of properties	**#Statistical database** Check published report or research who collect statistical data on local scale	Official database	Residential building area ranked by average selling prices	Revised by authors from Brandejs & Klika, 2023

		properties within a particular real estate market. These values are determined by various factors including location, property size, condition, amenities, demand, and supply dynamics. Tourism can have an impact on market prices.						in an urban area.					
			17.2	Rental prices	17.1.2	Touristic facilities average rental prices in touristic areas	-	€/sqm	It is the sum of market rental values divided by the number of properties in an urban area.	**#Statistical database** Check published report or research who collect statistical data on local scale	Official database	Touristic facilities ranked by average rental prices	Revised by authors from Brandejs & Klika, 2023
18	**Touristic flow**	It refers to the movement or influx of tourists or visitors from one place to another for tourism purposes, which may include vacations, leisure visits, cultural trips, business	18.1	Tourism stay	18.1.1	Number of overnight stays per year	National visitors	No./year	A night spent or tourism night is each night a guest / tourist (resident or non-resident) actually spends (sleeps or stays) in a tourist accommodation establishment or non-rented accommodation.	**#Statistical database** Check published report or research who collect statistical data on local scale. Collect the data by individual year.	Official database	-	ESPON Database, 2017
							International visitors						

		trips, or other recreational activities.			18.1.2	Average length of stay of visitors	-	No. of nights (average)	Average length of stay of tourists per year	**#Accomodation Survey** Question: How much do tourists stay overnight at your facility on average per year?	Accommodations	-	ETIS, 2016
			18.2	Tourism seasonality	18.2.1	Percentage of visitors per season per year	-	%	-	**#Accomodations Survey** Question: What is the percentage of visitors per season per year?	Accommodations	-	Revised by authors from World Tourism Organization (UNWTO), 2023
			18.3	Tourism returning	18.3.1	Percentage of returning loyal visitors in the last five years	-	No./tot. visitors in 5 year	Number of returning loyal visitors / number of total visitors (within 5 years)	**#Visitors Survey** Was this your first visit to this destination? □ Yes □ No If No, how many times have you visited this destination in the last five years?	Visitors	-	ETIS, 2016
	Man-made dimension												
	Criteria	**Criteria description**	**Id**	**Sub-criteria**	**Id**	**Indicators**	**Indicators specification**	**U.M.**	**Indicators description**	**Data collection tools and targets**	**Targets**	**Spatial visualization**	**Source**
19	**Heritage and landscape reuse**	It involves repurposing, revitalizing, and transforming existing buildings and structures to accommodate, support, and	19.1	Heritage reuse	19.1.1	Number of heritage goods reused for cultural and tourist activities in the last five years	Historic buildings Historic rural buildings Industrial buildings Religious buildings Other	No. in 5 year	Heritage reuse could means restored, renovated, activated, ecc. through restoration of surfaces, seismic interventions, structural and technological adaptations	**#Chechlist** List and contact heritage management agencies, preservation societies, or cultural heritage organizations responsible for overseeing heritage sites: Question: 1) Do you maintain records or databases of heritage sites that have undergone restoration, renovation, or activation? If yes 2) Do you have details on the smq surface area of renovated or activated spaces within the heritage site?	DMO	Mapping of sqm of heritage good reused	Revised by authors from Rudan, 2023

		enhance tourism-related activities, experiences, services, amenities, attractions, and infrastructure.	19.2	Landscape reuse	19.2.1	Surface of heritage landscape recovered for cultural and tourist activities	-	Sqkm	Surface of heritage landscape made accessible to visitors.			Mapping of sqkm of heritage landscape recovered	Revised by authors from Pintossi et al., 2021
20	**Sustainable mobility and accessibility**	It refers to the development and promotion of transportation solutions that minimize negative environmental, social, and economic impacts while maximizing benefits for destinations, communities, and travelers.	20.1	Eco-friendly mobility	20.1.1	Number of visitors using soft and clean mobility per year	-	No./year	Soft and clean mobility: train, tram, bus, bicycle, electric scooters, ecc.	**#Statistical database** Check report or research who collect statistical data about eco-friendly mobility on local scale. Collect the data by individual year. If not available: **#Visitors Survey** Do you use soft and clean mobility or shared transportation to reach the destination or its surroundings?	Official database/Visitors	-	Revised by authors from ETIS, 2016
					20.1.2	Number of visitors using shared transport per year	-	No./year	Shared transport: sharing app for cars, electric scooters, electic bike, ecc.				
			20.2	Accessibility	20.2.1	Kilometers of routes improved or constructed to connect the heritage area through sustainable mobility in the last five year	Rail routes Bicycle routes Pedestrian routes Other	Km/5years	It refers to rail routes, bicycle routes, pedestrian routes, etc.	**#Local government agencies Survey** Reach out to local government agencies responsible for transportation, urban planning, and heritage conservation. Inquire about any projects or initiatives focused on improving or constructing routes to connect heritage areas through sustainable mobility. Questions: 1) Do you have data on the kilometers of routes improved or constructed within the specified timeframe? If yes 2) Rail routes □ Yes □ No Bicycle routes □ Yes □ No Pedestrian routes □ Yes □ No Other □ Yes □ No	Local government	Mapping of km of routes	Revised by authors from Maltese et al., 2017

	Institutional dimension												
	What criteria would you use to evaluate the impact of your strategy, in this specific dimension?					*Have your strategies produced results, in the short term, in the direction indicated by the indicators, or is intent on achieving these results?*	*If you have a chance, try to differentiate the data collected*	*Uses the specified Unit of Measurement*	*Use this column to know how to measure the data*	*If you collect data by yourself*	*Use this column to easily identify the target*	*If you have a chance use this column to know to spatialize the data on Geographic Information Sysitem*	
	Criteria	**Criteria description**	**Id**	**Sub-criteria**	**Id**	**Output indicators**	**Indicators specification**	**U.M.**	**Indicators description**	**Data collection tools and targets**	**Targets**	**Spatial visualization**	**Source**
21	**Public investments**	It refers to the development and improvement of tourism-related infrastructure, facilities, services, attractions, experiences, destinations, services, marketing, promotion, management, planning, regulation, support, collaboration and sustainability.	21.1	Tourism services	21.1.1	Volume of public expenditure for tourism services per year	-	€/year	-	**#Statistical database** Check Government Budget Reports Tourism Development Plans. Collect the data by individual year.	Local government	-	Revised by authors from Global Sustainable Tourism Council (GSTC) 2019
			21.2	Heritage preservation	21.2.1	Volume of public expenditure for the heritage preservation and enhancement	Cultural heritage	€/year/inhabitants	-	**#Statistical database** Check Government Budget Reports Tourism Development Plans	Local government	-	UNESCO, 2019. Thematic Indicators for Culture in the 2030 Agenda
							Natural heritage	€/year/inhabitants					
			21.3	Sustainable mobility	21.3.1	Volume of public expenditure for sustainable mobility per year	-	€/year	Sustainable mobility refers to the installation of electric charging stations, purchase of	**#Statistical database** Check Government Budget Reports of Transportation and Infrastructure Departments. Collect the data by individual year.	Local government	-	Revised by authors from Global Sustainable Tourism Council (GSTC) 2019

								sustainable public transportation, tax incentives for the purchase of sustainable vehicles, ecc.					
22	**Sustainable destination management**	It refers to a holistic approach that focuses on balancing economic viability, environmental conservation, and socio-cultural preservation to ensure the long-term sustainability and resilience of tourist destinations. It involves planning, developing, managing, promoting, and operating tourism activities, attractions, facilities, services, experience	22.1	Presence of Destination Managment Organizations (DMO)	22.1.1	Number of new Destination Management Organizations (DMO) active	-	No.	Destination Management Organizations are e.g. Regional Tourist Promotion Agencies, Local Tourist Promotion Offices, Destination Management Organisations, Category Organisations.	**#Checklist** Check report or research who collect statistical data about DMO active	Official database	Mapping of DMO	Revised by authors from S. Reinhold & P. Beritelli, 2022
			22.2	Presence of monitoring plans	22.2.1	Percentage of destinations with a sustainable tourism strategy/action plan	-	%	Percentage of destinations with a sustainable tourism strategy/action plan, with agreed monitoring, development control and evaluation arrangement.	**#DMO Survey** Data must be collected by contacting each individual destination. Question: Do your destination have a strategic action plan?	DMO	-	ETIS, 2013

		s, and infrastructure in a responsible and sustainable manner.											
23	**Participation rate**	It refers to the degree or level of involvement, commitment or participation of various stakeholders in specific activities, processes or initiatives.	23.1	Private-public partnerships	23.1.1	Number of social partnerships (public-private, public-public) activated in the tourism destination for the heritage and landscape enhancement per year	-	No./year	Public-private social partnerships are e.g. Tourism Clusters or Alliances, Community-Based Tourism Initiatives, Public-Private Financing Arrangements, ecc.	**#DMO Survey** Question: How many social partnerships have been activated in the tourism destination for heritage and landscape enhancement? Collect the data by individual year.	DMO	-	Revised by authors from UNWTO Global Report on Public-Private Partnerships: Tourism Development, 2015
			23.2	Participants engagement	23.2.1	Number of residents and organisations actively involved in the co-design of tourism activities and strategies	Residents Organizations	No.	-	**#DMO Survey** Question: How many residents and organizations actively participate in co-designing tourism activities and strategies each year?	DMO	-	Revised by authors from Serban et al., 2021
24	**Public policies**	It refers to the existence of rules	24.1	Touristic flow regulation	24.1.1	Presence of norms to regulate short-term rentals	-	Yes/No	-	**#DMO and Local government Survey** 1) Are there regulation/strategy to regulate short-term rentals. □ Yes □	Local government	-	Revides by authors from Bei & Celata, 2023

		and regulations in the tourism sector to protect natural and cultural resources, ensure the safety and well-being of tourists and host communities, promote fair competition and foster positive socio-economic impacts.			24.1.2	Presence of policies to regulate the overcrowding	-	Yes/No	-	No 2) Are there regulation/strategy to regulate the overcrowding. □ Yes □ No 3) Are there regulation/strategy to preserve the natural ecosystems □ Yes □ No		-	European Parlament, Research for TRAN Committee - Overtourism: impact and possible policy responses, 2018
			24.2	Natural sites and landscape preservation	24.2.1	Presence of policies to preserve the natural ecosystems and landscape	-	Yes/No	-			-	ETIS, 2013