Exploring Approaches to Define Cultural Ecosystem Services in Planning Support System

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Abstract. Cultural ecosystem services (CES) play a crucial role in enhancing human well-being by providing intangible benefits such as spiritual enrichment, aesthetic enjoyment, and cultural identity. However, defining and categorizing CES presents a significant challenge due to their subjective nature and multi-faceted dimensions. This paper critically examines various approaches adopted in defining and conceptualizing CES within the realm of ecosystem services research. Through a review of existing literature, we explore the diversity of perspectives and methodologies used to identify, assess, and classify cultural services provided by ecosystems. Various approaches exist for spatial identification of CES, ranging from territorial indicator-based methods to philosophical theories. However, literature analysis reveals the difficulty in universally defining evaluation methods applicable to all cases. While macrolevel guidelines aid in recognizing potential CES, contextual analysis of structural elements is necessary. Integrating a system for assessing immaterial values can track both material and non-material benefits of CES within the territory. This suggests a context-based approach for both identification and evaluation of CES, essential for effective planning processes. By synthesizing diverse conceptualizations and methodological approaches, this paper aims to contribute to a deeper comprehension of the complexities inherent in defining and valuing cultural ecosystem services, ultimately fostering more effective conservation and sustainable management strategies.

Keywords: Cultural ecosystem services · sustainable development · territorial analysis

1 Cultural Ecosystem Services in Policy Making: The Debate

The Cultural Ecosystem Services (CES) thinking represents a significant advancement in academic debate, particularly within the field of planning. This framework offers a robust methodological approach that holds the potential to greatly enrich our understanding of various aspects of planning for sustainable exploitation of territorial cultural, landscape

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and intangible assets [1–4]. One of its key strengths lies in its ability to highlight environmental performance, allowing for a more comprehensive evaluation of the impacts of land use and transformation policies. Moreover, CES thinking facilitates the ex-ante assessment impacts resulting from these policies. By incorporating considerations of cultural and natural resources, it provides a nuanced understanding of sustainability and efficiency, which are crucial concepts in contemporary planning practices [2, 5, 6]. This aspect has gathered increasing attention within the planning discipline, as it aligns with the growing emphasis on sustainability and responsible resource management. The necessity to incorporate a recognition of cultural ecosystem services into the policy cycle is crucial.

Firstly, the rigidity inherent in traditional planning methods severely requires the adoption of a holistic approach [7]. Instead of acknowledging the components system in the human-territory environment, conventional planning tends to focus strictly on assessing the suitability of specific areas based on assumptions. This perspective overlooks the complex relationships between human activities and the environment (numbering multiple perspectives and scopes cfr. [8–18]), thereby neglecting the potential contributions of cultural ecosystem services. Secondly, the fragmentation process prevalent in the traditional planning system presents a significant obstacle. With plans and responsibilities dispersed across different levels of hierarchy and sectors, efforts become fragmented, leading to inconsistent outcomes. This fragmentation not only undermines the coherence and effectiveness of planning initiatives but also limits the identification and integration of cultural ecosystem services into policy frameworks. Without a cohesive approach, the full range of cultural benefits derived from ecosystems may remain overlooked or undervalued in decision making processes.

Lastly, the traditional planning paradigm struggles with evaluating its own performance effectively [19–21]. Despite the existence of goals and targets, there is often a lack of robust mechanisms for assessing whether these objectives are being met. This deficiency extends to the evaluation of resource utilization efficiency and the quality of territorial transformations. Without adequate evaluation mechanisms, it becomes challenging to recognize and incorporate the diverse selection of cultural ecosystem services into policy cycles, continuing the limitations of the conventional planning paradigm. In summary, integrating a comprehensive understanding of cultural ecosystem services into the policy cycle is essential to address the shortcomings of traditional planning approaches. By recognizing and valuing the cultural benefits derived from ecosystems, policymakers can foster more inclusive, resilient, and sustainable planning practices that prioritize the interconnected well-being of both human societies and the environment.

The Millennium Ecosystem Assessment (MEA) stands out as one of the most relevant frameworks that laid the groundwork for understanding CES within the broader context of ecosystem services.

The MEA categorizes cultural services into several dimensions, including spiritual and religious values, aesthetic values, and cultural heritage, emphasizing the diverse ways ecosystems contribute to human well-being beyond instrumental benefits [22].

Additionally, the Common International Classification of Ecosystem Services (CICES) offers a comprehensive classification system that includes cultural services

as one of its core categories [23]. CICES recognizes cultural services as essential components of human-environment interactions, encompassing elements such as cultural identity, cultural heritage, and recreational experiences.

Moreover, the Cultural Ecosystem Services Framework (CESF) provides an integrated understanding of cultural services by emphasizing the socio-cultural context and perceptions associated with ecosystem benefits. CESF highlights the importance of incorporating stakeholder perspectives and local knowledge systems in assessing and valuing cultural services, recognizing the inherent diversity and complexity of human nature relationships. Overall, these conceptual frameworks offer valuable insights into the multifaceted nature of CES, guiding researchers and practitioners in their efforts to recognize, evaluate, and manage cultural contributions of ecosystems to human wellbeing.

The research focuses on the evaluation of CES through a systematic literature review in order to identify suitable domains for concepts related to landscape, cultural heritage, identity, aesthetic and spiritual values.

The paper is structured into three main sections. First, the method & material illustrates the structure of the scientific literature selected for the analysis. Second, it examines the limitations and challenges of using territorial indicators for spatially identifying Cultural Ecosystem Services (CES) and attempts to identify CES based on territorial aesthetic and immaterial values, drawing from philosophical theories and other relevant literature. Third, it discusses various methods and approaches for spatially identifying CES, highlighting the difficulty in establishing a universally applicable evaluation method and the importance of considering contextual elements. The paper concludes by advocating for a context-based approach to CES identification and evaluation, emphasizing its relevance for effective planning processes.

2 Method and Materials

This paper starts with a synthetic appraisal of selected scientific literature on how CESs are evaluated by assessing selected research papers discussing the methodological directions taken in the CES field.

The method adopted to set up the research work involved a simple and systematic approach. A literature review was conducted using Google Scholar (https://scholar.google.com/), a freely accessible search engine that uses specific keywords to locate texts from the academic literature. The above-mentioned search engine was adopted because it enables the retrieval of articles from a wide range of publishers and from the set of scientific and cultural articles distributed on the Web.

Studies written in languages other than English were not considered at this initial stage of bibliographic evaluation. Studies without open access or not available through the subscription offered by the authors' university library system were not considered. In addition, articles focusing on a very specific area were discarded to avoid complicated comparisons between case studies that differ in type, relevance and historical, cultural and social context.

The procedure adopted for the elaboration of this contribution involved five consequential research phases:

1. phase 1 was aimed at identifying articles focused exclusively on conceptual analysis and an initial evaluation of CES only;
2. phase 2 envisaged a deepening of the analysis conducted on the CES thanks to the identification and selection of specific search terms in the titles, abstracts and keywords of the articles, including "conceptual analysis of cultural ecosystem services", "analysis of cultural ecosystem services linked to the concept of cultural heritage", "analysis of cultural ecosystem services linked to the concept of landscape", "analysis of cultural ecosystem services linked to the concept of identity"; "analysis of aesthetic and spiritual values of ecosystems";
3. phase 3 focused on the deepening and clarification of certain approaches and methods of analysis and evaluation identified within the previously selected articles;
4. phase 4 involved the description of the analysis method adopted for the evaluation of a specific CES linked to the concepts of landscape, cultural heritage, identity, aesthetic and spiritual values
5. phase 5 involved a comparison of the different approaches described above, adopted for the analysis and evaluation of CES.

2.1 Analytical Framework: Selected Methodological Approaches for the Evaluation of CES

The articles chosen for the analysis of CES evaluation approaches were limited to a selection of publications from a time span of 2012 to 2020 [24–29]. In this initial phase of bibliographic evaluation, the search was conducted by adopting English-language terms of reference. The relevance of the publications was checked by checking titles, keywords, abstracts and the full text.

A focus on the above-mentioned period is justifiable since the contribution intends to propose a comparison of recent methodological approaches. In this regard, it should be borne in mind that 2005 was the year of publication of the results of the Millennium Ecosystem Assessment (MEA), an international research project focused on the identification of the conditions, trends in ecosystems, the services they provide and the assessment of the changes they undergo and the consequences for human well-being, with the aim of identifying scenarios for the future through conservation actions and sustainable use of ecosystems. Since then, the concept of CES has gained particular attention, as evidenced by numerous scientific publications.

The search for specific terms in the titles, abstracts and keywords of the articles made it possible to select individual publications on the CES evaluation methods linked to the concepts of cultural heritage, landscape, identity, aesthetic and spiritual values of ecosystems. For example, a number of papers focusing on the entirety of the ES evaluation methods were excluded due to the complexity of the indications and information provided.

One of the advantages of a selective review of documents is that it could give rise to a specific comparison and contrast between some of the methodological directions taken in the ESC field, with potential operational utility.

In the following section two issues are pointed out as preliminary discussion of the ongoing research: how to connect CES to the concept of heritage field and cultural landscape and to the concept of Aesthetic and spiritual values.

3 Framework Results

3.1 CES Linked to the Concept of Heritage Field and Cultural Landscape

The approach adopted for the analysis of CES within the concept of role of cultural ecosystem services in heritage research through a set of indicators included a number of consequential research steps:

1. consideration of relevant indicators for the supply-side assessment of CES, i.e. indicators that measure the potential of an area for cultural practices carried out;
2. identification of relevant CES evaluation indicators for decision-making processes; The evaluation of "services" (e.g. cultural and historical sites) generate "*cultural practices in a given ecosystem/landscape*" [24] subject to generally unbiased and easier-to-standardise measurement methods. The service-oriented perspective emphasises the need to produce indicators that are comparable and clear in their measurement, interpretation and interpretation.

These indicators measure the potential of an area for cultural practices (e.g. the number of tourist accommodations). "*Supply-side CES indicators will always be focused on measuring landscape features as it is from them that CES are generated*" [24]. The main objective is to understand the extent to which Cultural Landscapes can serve as social, cultural and economic resources.

The study identifies a list of the most highly evaluated CES indicators cited in the literature in relation to their effectiveness in decision-making processes. The survey shows that: most indicators relate to the aesthetic value and recreational/touristic potential of CES; there is a trend towards the development of non-monetary indicators; the level of consolidation of CES indicators is relatively low, since the existing literature shows highly heterogeneous ways of evaluating CES due to the great variety of terms used and associated measurement methods.

One contribution of the analysis conducted highlights "*Once a CES-rooted synthetic indicator catalogue is obtained, its usability for heritage management and planning is assessed. […] The evaluation is based on an inclusive combination of two criteria: "**communicability**" and "**relevance for Cultural Landscape context**"* [24]. This means that the ability to transfer the results from the indicators to the decision-making process was verified with regard to the Cultural Landscape context, i.e. an area whose main characteristic is that it has been shaped by a relevant process of interaction between man and nature. Thus, the possibility of using indicators in heritage management and planning of Cultural Landscapes was defined.

The main finding of this research is the empirical demonstration of the potential application of a CES-rooted set of indicators in heritage management and planning of Cultural Landscapes. The main indicators selected are listed in the Table 1 below.

"There are good examples in the scientific literature of the application of CES indicators in Cultural Landscapes or in related contexts, but there is a great variety of methods and approaches for addressing similar purposes, which leads to a still unclear panorama concerning concepts, definitions and understanding of the processes to be measured" [24].

Table 1. CES-rooted set of indicators for heritage management and planning of Cultural Landscape

Main CES indicators for heritage management and planning of Cultural Landscapes
Land cover complexity
Land cover naturalness
Distance areas/points of interest - urban settlements
Presence and variety of historically relevant material elements and spaces without protection
Presence of disturbing elements in the viewshed areas
Distance areas/points of interest - arrival points
Presence of water bodies
Presence of mobility infrastructure
Presence of protected natural areas
Presence of facilities
Presence and variety of protected elements and spaces
Landform diversity
Presence of spaces with a current recreation-related use
Presence of vegetation
Accessibility of the areas/points of interest
Presence of viewpoints
Presence of significant elements and species
Presence of view-landmarks in the viewshed areas
Presence of recreational/educational/cultural-related activities
Landscape openness
Land cover rareness
Landscape openness
Land cover rareness
Time Depthness
Presence of scenic backgrounds in the viewshed areas
Presence of walking itineraries
Noise level
Presence of active management system
Viewshed area of viewpoints
Species richness
Presence of networking, relations between activities and/or spaces

(*continued*)

Table 1. (*continued*)

Main CES indicators for heritage management and planning of Cultural Landscapes
Habitat richness
Presence of landform peaks

3.2 CES Linked to the Concept of Aesthetic and Spiritual Values

The approach aiming to identify Cultural Ecosystem Services (CES) for immaterial aesthetic territorial values represents a significant tool in understanding the connection between the environment and human experiences. This approach focuses on identifying and valorizing the services offered by the ecosystem, which goes beyond material benefits and includes aesthetic, emotional, and spiritual aspects. Through a series of methodologies and tools, such as participatory assessment and discourse analysis, scholars seek to capture people's perceptions and experiences regarding the beauty and aesthetic quality of the landscape. This approach not only recognizes the importance of immaterial values in the context of environmental management and conservation but also contributes to promoting greater awareness of the connection between landscape, culture, and human well-being. As Ryfield et al. claim, aesthetic and spiritual values "*are often socially shared values, frequently intersubjective, and the outcome of historical processes in shared cultures"* [24]. Identifying, through a standardized method, the values of each culture related to CES proves problematic given the perceptual-historical-social nature of each context. Therefore, the identification of CES requires a placed-based approach incorporating tools for local information acquisition. Human science studies analyzed and theories on value aggregation show how devising an aggregation of cultural preferences is ineffective and how a specific analysis, starting from participatory processes to sociological studies in an integrative form, is functional to the evaluation of CES but not to their standardized identification.

4 Discussion and Preliminary Conclusions

The findings presented in this study highlights two critical aspects regarding Cultural Ecosystem Services (CES) and their linkage to both the heritage field and aesthetic/spiritual values. Firstly, the analysis delineates the methodological complexities involved in identifying and evaluating CES within the context of heritage research. Through a systematic approach based on a set of indicators, the study explores the intricate landscape of CES assessment, emphasizing the significance of indicators that measure the potential of an area for cultural practices. However, despite efforts to standardize measurement methods, the study reveals a heterogeneous landscape in the evaluation of CES, indicating challenges in achieving a unified understanding. In conclusion, this research underlines that adopting a comprehensive approach to CES assessment, may reinforce the structure of sustainable policy making in cultural exploitation that encompasses both tangible and intangible aspects of cultural heritage. By recognizing the complex interrelation between aesthetic, spiritual, and material values, policymakers

and conservation practitioners can devise holistic strategies for the sustainable management and preservation of Cultural Landscapes. Wider investigation has to extend the specific issues linking planning purposes to CES answering the general question: how cultural ecosystem services may demonstrate the value (or the impact) of planning choices on main territorial assets both in an ex-ante decision making phase and on a scenario building design? Cording to main thematic literature [30, 31].

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