

Mediating Role of Relational Value in Cultural Ecosystem Services Assessment for Subjective Well-being

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Abstract

Rapid urbanization continues to raise concerns about environmental quality, and the concept of cultural ecosystem services (CES) is gaining global attention as a means of maintaining human well-being. This narrative review examines the mediating role of relational value between the relationship of perceived environmental spaces and cultural practices in assessing CES. Using structured qualitative screening, three themes were identified: 1) perceived environmental space as provision of CES, 2) cultural practices as expressions of human-nature relationship, and 3) relational value as a mediating mechanism in wellbeing. This review emphasizes relational value as a mediating mechanism offering a conceptual base for future CES evaluation studies.

Keywords: Cultural ecosystem services; relational value; subjective well-being; sustainable development

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1.0 Introduction

According to the United Nations (2018), 55% of the world's population currently lives in urban areas, projected to rise to 68% by 2050, showing an unprecedented rate of global urbanization (Su C. et al., 2025). As metropolitan areas continue to expand, competition over urban land use often conflicts with conservation needs, restricting opportunities for human-nature interaction (Brill G.C. et al., 2022). Within this context, cultural ecosystem services (CES) provide a critical approach to understanding how nature contributes to well-being by recognizing its intangible benefits, such as social cohesion, identity, emotional connection, and cultural heritage. Although CES research is expanding, relational values such as people's emotional, identity-based and moral responsibility towards nature remain insufficiently integrated into CES assessments (Chan et al., 2016). Ecosystem values perceived by people are acknowledged as a critical dimension in social-ecological systems, yet they are poorly addressed in the study of values in the context of environmental management (Arias-Arévalo et al., 2017). Without the proper integration of people's values into the social-ecological system, the interventions formulated may fail to meet human needs and ultimately be rejected by people (Uehara T. et al., 2022). These gaps highlight an urgent need to incorporate human values, particularly relational value, into CES assessments to ensure that environmental policies remain socially grounded and support the quality of life for people.

1.1 Research Background

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Although CES has been widely recognized for its contribution to human well-being, challenges remain in determining the theoretical foundation for identifying the underlying mechanisms that operate within the complexities of the human-nature relationship. A key challenge is distinguishing relational values from cultural benefits. While cultural benefits denote outcomes (such as enjoyment, happiness or satisfaction), relational values are the drivers that influence how people engage with the environment (such as care, responsibility or identity). Pratson D.F. et al. (2023) highlighted the need to distinguish between services, benefits, and values for intangible cultural dimensions; however, such clarity is notably lacking. Failing to differentiate between the concept of relational value and CES benefits may not only affect the operationalization of CES measurement but also compromise the design strategies of urban green space planning, which should align with people's needs and enhance well-being. Cultural benefits should be regarded as outcomes of the human-nature relationship, such as enjoyment, inspiration, and health value, whereas relational value represents the factors influencing people's behavior in environmental settings, such as sense of place, identity, and stewardship (Himes et al., 2024; Stalhammar S. et al, 2019)

Existing CES frameworks in ecosystem assessment, as developed by Fish et al. (2016) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), indicate that cultural benefits should arise from relational processes resulting from the interplay between environmental settings, cultural practices, and human values. However, empirical studies rarely used relational value as a separate construct that acts as an intermediate mechanism in explaining how environmental settings and cultural practices should contribute to well-being outcomes. To address this gap, this aim of this paper is to provide new insights into the possibility of relational value being regarded as a distinct construct in the CES assessment by clarifying its role in linking environmental experiences and subjective well-being.

1.2 Methodology

The preliminary step in conceptualizing the role of relational value in CES assessments was to synthesize related papers and identify all relevant indicators that assess the relationship between environmental setting, cultural practices, and relational value, which contribute to subjective well-being. Within this process, a search strategy was conducted using two reputable databases, including Web of Science (WoS) and Scopus. Keywords such as 'cultural ecosystem services', 'subjective wellbeing', 'relational value in cultural ecosystem services', and 'cultural ecosystem benefits' were used in this process. More than 5,000 articles were manually screened, resulting in 43 relevant papers focused on the assessment of cultural ecosystem and the role of relational value in subjective well-being. However, not all 43 articles may be mentioned in this paper, as it adheres to the journal's template restrictions. Nevertheless, key insights from these articles were synthesized to derive conceptual patterns and to inform practical implications for integrating relational value in CES assessment.

2.0 Conceptualizing Subjective Wellbeing in Cultural Ecosystem Services (CES)

Cultural ecosystem services (CES) are defined as non-material benefits that people derive from ecosystems (Chan et al., 2016). These benefits include experiences, meaning, and relationships that enhance happiness, life satisfaction and overall quality of life. In this context, the integration of subjective well-being into CES research enables an investigation into how engagement with nature can contribute to people's quality of life.

2.1 Cultural Ecosystem Services Framework

Figure 1 shows dominant reliance on the framework developed by the Millennium Ecosystem Assessment (MEA, 2005). MEA's framework reflects its broad conceptualization of ecosystem services, categorizing ecosystems into four main categories: provisioning, regulating, supporting, and cultural ecosystem services. The framework plays a crucial role in shaping prior works on ecosystem assessment by identifying benefits and their contributions to the quality of life dimensions. However, its framework offers broad operationalization, leading to the economic measurement of the ecosystem, thereby ignoring the social-ecological valuation of intangible services, such as cultural ecosystem services. The TEEB framework (2008) is the second most frequently used in ecosystem assessments, providing an economic and socio-cultural valuation of ecosystems that focuses on human wellbeing. However, the socio-cultural context did not explicitly mention relational value as a separate construct.

Other frameworks, such as the Fish et al. (2016) framework, the supply-demand model (Burkhard et al., 2012), and the cascade model developed by Haines-Young & Potschin (2010), offer refined pathways in determining CES supply and demand by determining the linkage between environmental space and cultural practices that contribute to the social dimension of human wellbeing (Fish et al., 2016). Haines-Young et al. (2010) highlighted the linear relationship that begins with ecosystems, functions, services, benefits, and values, illustrating the flow of ecological structure into human wellbeing. The IPBES framework offers explicit measurement of intrinsic, instrumental, and relational value in cultural ecosystem services by capturing both instrumental and relational aspects, aligning with the concept of nature's contribution to people (NCP). However, empirical use of IPBES remains limited compared to the MEA and TEEB. Meanwhile, Drivers-Pressure-State-Impact-Response (DPSIR), developed by the European Environment Agency (EEA) and Connectedness to Nature Scale (CNS), recorded lower application. At the same time, the DPSIR framework primarily focuses on the cause and effects of the human-nature relationship, and CNS integrates the connectedness to nature dimension as one of the relational constructs within the CES assessment.

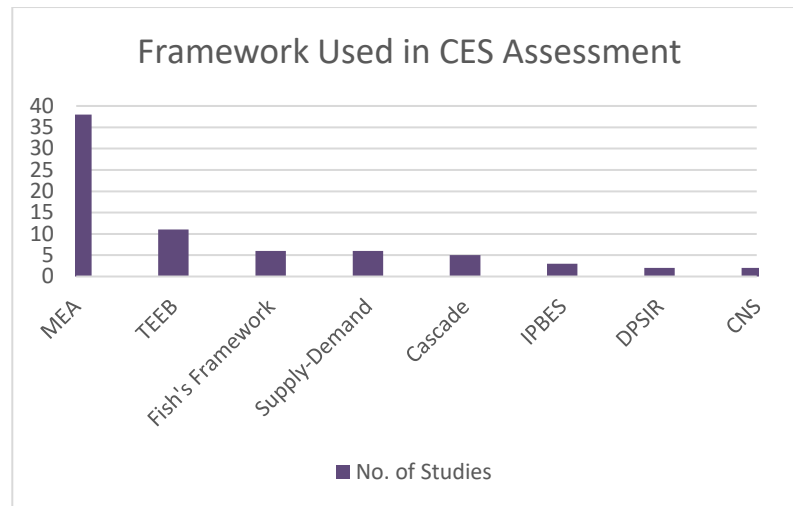


Fig. 1: Number of frameworks used from previous empirical studies in CES assessment

The framework developed by Fish et al. (2016) is one of the most comprehensive approaches that conceptualises CES as not a static flow of benefits from the ecosystem but captures a relational process that occurs from the interaction between environmental settings, cultural practices as activities performed by people in that setting and the cultural ecosystem benefits derived from the interaction. Within this framework, environmental spaces provide the biophysical setting of nature that allows opportunities for cultural practices such as playing, exercising and socializing, which collectively contribute to the cultural ecosystem benefits. These benefits are further conceptualized as wellbeing dimensions, including identities, experiences and capabilities (Fish et al., 2016). However, this framework does not explicitly operationalize relational value as a distinct construct and may be embedded within the cultural benefits categories such as identities. This conceptual overlap makes it challenging to differentiate between the factors people hold to engage in cultural practices (relational value) and the outcomes they experience from human-nature interactions (cultural benefits).

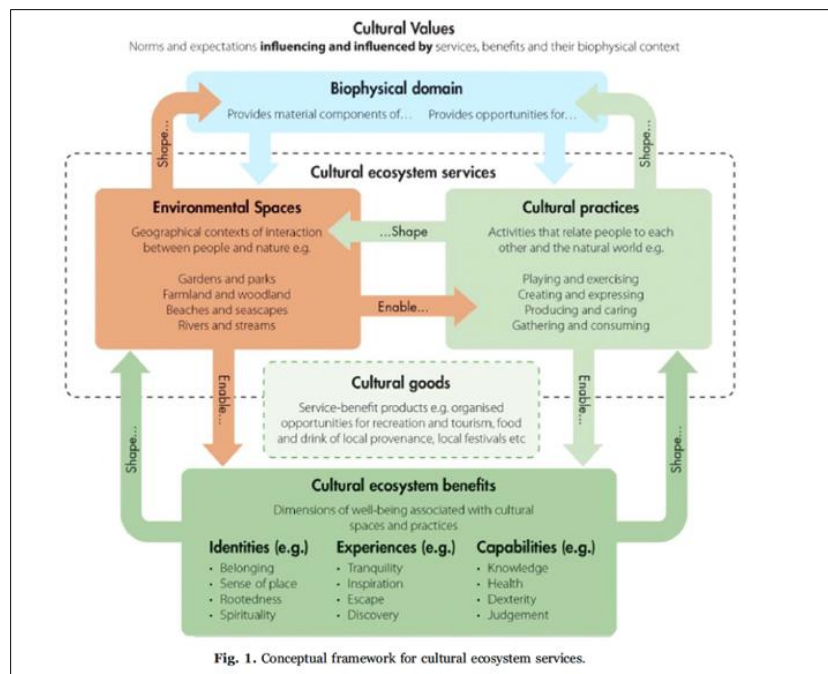


Fig. 2: Cultural ecosystem services conceptual framework
(Source: Fish et al., 2018)

Additionally, Zoeller and Cumming (2024) extend the IPBES model by illustrating how CES are being examined through the dynamic interaction between nature, socio-cultural contexts, anthropogenic assets and multiple drivers. This framework emphasizes the co-production of ecological and cultural functions of nature towards cultural ecosystem services, which eventually contribute to the quality of life, while considering the co-construction by external factors such as anthropogenic assets, direct and indirect drivers. A key contribution of this framework is its distinction of the relational value concept from cultural benefits and being placed under "nature's contribution to people's concept. This separation reveals that relational values are not outcomes, but rather factors that influence how people engage in natural settings.

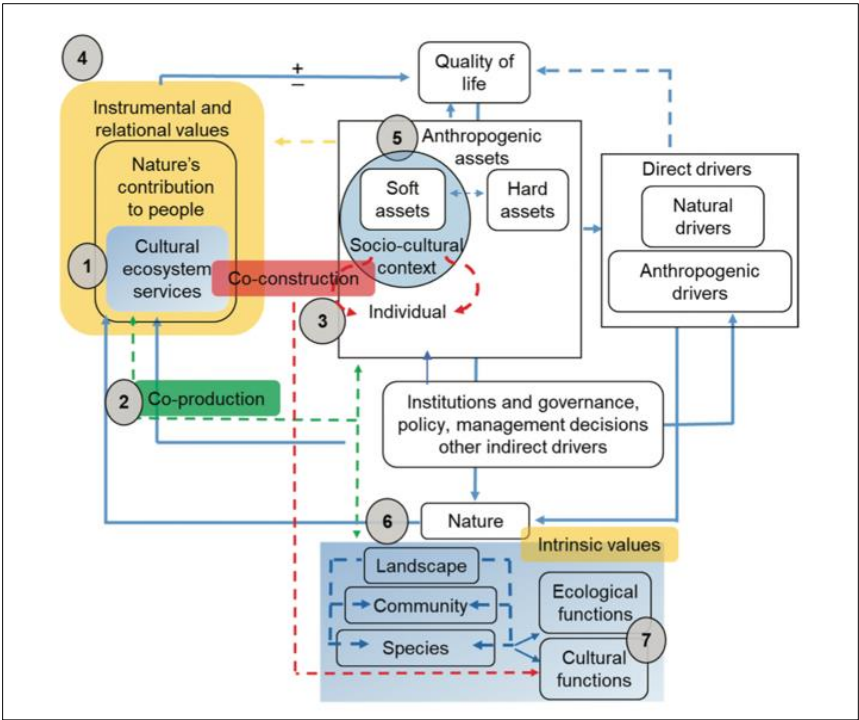


Fig. 3: IPBES framework in human-environment interaction studies
(Source: Zoeller et al., 2024)

2.2 Subjective Wellbeing (SWB) Domain

The theoretical foundation related to subjective well-being is summarized in Table 1, highlighting the concept of cognitive, affective, motivational and restorative processes that directly contribute to subjective well-being. Stress Reduction Theory and Attention Restoration Theory demonstrate how natural settings offer opportunities for emotional recovery and enhance cognitive development, thereby linking environmental spaces to human wellbeing. Self Determination Theory explains how nature experiences fulfill psychological needs, supporting the relational mechanism in the CES assessment. On the other hand, Diener's Subjective Wellbeing theory, the Affective-Cognitive Model and Multiple Discrepancies Theory emphasize how happiness and life satisfaction can be used to measure subjective well-being, which is justified as an outcome for cultural benefits.

Table 1. Theoretical underpinnings of subjective well-being			
No.	Theoretical foundation	Central concept of the theory	Sources
1.	Stress Reduction Theory	Exposure to nature can help recover from psychological stress, enhance cognitive functioning and improve health outcomes.	Ulrich R.S. (2023)
2.	Self Determination Theory	Human motivation and well-being are influenced by autonomy, competence and relatedness	Deci E.L. & Ryan R.M. (2012)
3.	Affective – Cognitive Theory of Subjective Wellbeing	Affective – cognitive constructs positively correlate with the subjective well-being and are primarily driven by Core Affect (state of feelings, cognitive discrepancies and personality)	Davem M.T. et al. (2007)
4.	Attention Restoration Theory	The characteristics of nature lead to benefits such as mental recovery, enhancing cognitive functioning and compatibility.	Kaplan S. (1995)
5.	Multiple Discrepancies Theory (MDT)	Happiness and satisfaction are determined by the perceived gap between an individual's current condition and their expectations, comparison with others, needs and what they believe they deserve.	Michalos, A.C. (1985)
6.	Diener's Subjective Wellbeing Theory	Subjective well-being can be measured through life satisfaction, positive and negative effects that may be influenced by demographic, personality traits, behavioral, social and biological factors.	Diener, E. (1984)

Previous CES studies have illustrated the consistent patterns between environmental attributes, the relational processes and practices that occur when people engage with nature. Park characteristics, environmental quality and perceived CES value correlate positively with subjective well-being but are often mediated by several constructs such as place attachment, sense of place, intrinsic-

extrinsic values and cultural perception. Although not always labelled as relational values, these constructs fall within that domain, supporting a key argument of this paper that relational value plays a mediating role between environmental settings and subjective well-being.

Table 2. Previous empirical studies on subjective wellbeing in CES context

Author (Year)	Independent variables (IVs)	Mediator/ Moderator Used	Dependent Variables (DVs)	Findings
Su C. et al. (2025)	Park physical characteristics	Cultural perception, place attachment	Well-being (individual, environment, social)	Park's physical characteristics positively contribute to well-being; cultural perception and place attachment have significant mediation effect towards well-being.
van Dinter, M. et al. (2022)	Park characteristics, park use	Sense of place (identity, emotional bonding)	Subjective well-being (life satisfaction)	Park characteristic influence sense of place and park use behavior thus contributing to the life satisfaction.
Brown, K.W. et al. (2005)	Mindfulness, lifestyle	Value (Intrinsic and extrinsic)	Subjective well-being, ecologically responsible behavior (ERB)	ERB has significant effect towards subjective well-being and values (extrinsic and intrinsic) positively correlated with subjective well-being
Zhang, H. et al. (2022)	Perceived value of CES in national park and flower expo	Place and event attachment	Subjective well-being	Perceived CES value has strong direct effects on subjective well-being and mediating through the effects of place and event attachment
Dade, M. et al. (2020)	Environmental, park facilities and amenities	Cultural practices	Subjective well-being	Park facility and amenities influence cultural activities such as social interaction and affect subjective well-being.
Pedersen, E. et al. (2019)	Types of green area (wetland, park, urban forest)	Accessibilities, proximities, needs	Quality of life aspects (safety, aesthetic, beauty, health, environmental quality, etc)	Wetland positively perceived as the most important green area that contributes to the quality of life

2.3 The Role of relational Value

The definition of relational value was recorded in Table 3 across all chosen articles, demonstrating that relational value reflects the meaningful association of humans towards nature that is grounded in principles and virtues such as care, responsibility, cultural heritage, stewardship and shared social meanings. Relational value is consistently portrayed as a personal connection that individuals use to interpret their natural surroundings, engage with the environmental setting, and thus contribute to their well-being.

Table 3. Definition of relational and their relevance to CES

Author (Year)	Definition of Relational Value	Relevance to CES
Kleemies, M.W. et al. (2025)	The meaningful relationship derived from human-nature interaction and with each other through identity, cultural heritage and moral responsibility.	Relational value shapes how people value environmental settings and enhances their practices that bringing cultural benefits.
Pape, T.W. (2024)	A person's value for a specific natural setting is expressed personally through their relationship with it.	Personal valuation of ecosystems influences person's engagement with nature, which is tied to subjective well-being.
Himes, A. et al. (2024)	A relationship resulting from the interaction of human and nature, contributing to the identity that influences people's quality of life and is associated with moral, social cohesion, reciprocity and a sense of place.	Collective meaning and shared value bring cultural benefits such as social cohesion and a sense of place.
Riechers M. et al. (2020)	Value emphasizing the relationship between people and nature and mediating social relationships with nature.	Relational value mediates cultural practices that contribute to social well-being.
Chan et al. (2018)	Preferences, principles and virtues associated with the human-nature relationship and are a distinct category from instrumental and intrinsic value.	Relational value identifies the emotional and identity-based dimensions in human-nature interactions for cultural services ecosystems.

Figure 4 illustrates the central position of relational value within environmental and CES discourse, with dominant keywords such as 'nature', 'people', 'environmental', 'value' and 'ecosystem' that emphasize recent research on the core concepts of human-nature relationships. Other terms, such as 'care', 'responsibility', 'stewardship', 'identity', 'place' and 'connectedness', highlight the diversity of relational dimensions in which people derive meaning from their ecosystems. The presence of 'intrinsic' and 'instrumental' keywords indicates the ongoing efforts to distinguish these three value domains. Additionally, words such as 'biodiversity', 'sustainability', 'conservation' and 'management' demonstrate how relational perspectives are being embedded in policies and the decision-making process for maintaining sustainable natural resource management.

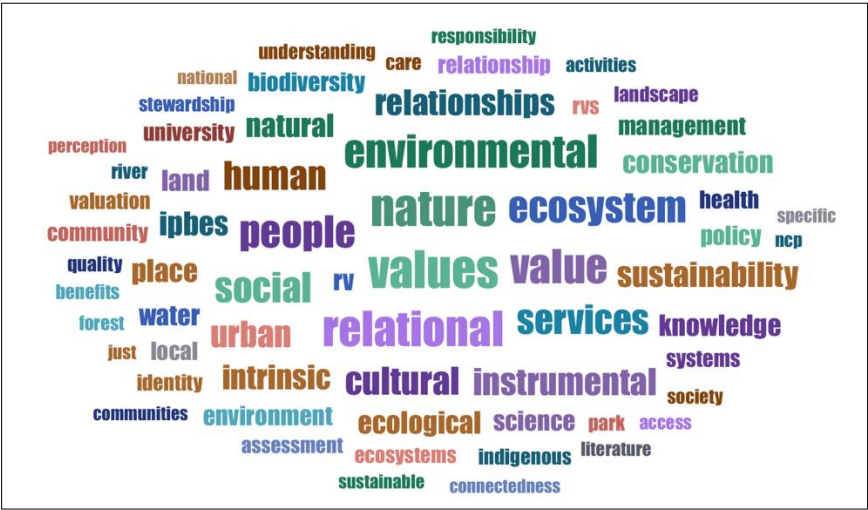


Fig. 4: Word cloud of relational value-related keywords

Table 4 demonstrates that the relational value plays a central role in shaping both pro-environmental behavior and subjective well-being, confirming its relevance as a key construct within human-nature interactions. The relational value that can be expressed through place attachment, identity, connection to nature and stewardship influences the meaningful engagement of people within an environmental setting and consistently mediates the effects of environmental attributes on subjective well-being outcomes.

Table 4. Justification of relational value in behavior and well-being constructs

Author (Year)	Findings	Key Aspects
Su, C. et al. (2025)	People's well-being is positively influenced by park characteristics though place attachment serves as a mediating effect.	People well-being, park characteristics, place attachment (relational value)
Kleepies, M.W. et al. (2025)	Connection to nature, as one of the relational values, influences pro-environment behavior that contributes to people's well-being.	Connection to nature (relational value), pro-environment behavior, people well-being
Tajima, Y. et al. (2025)	Relational value significantly influenced the number of activities conducted in an environmental setting, thus promoting people's quality of life.	Relational value, environmental setting, number of activities, quality of life.
Zoeller & Cumming (2024)	Components of people's identity shaped their behavior towards nature.	Identity, behavior
Pratson, D.F. et al. (2023)	Relational value derived during or after the human-nature interaction and is positively associated with pro-environmental behavior.	Relational value, pro-environment behavior

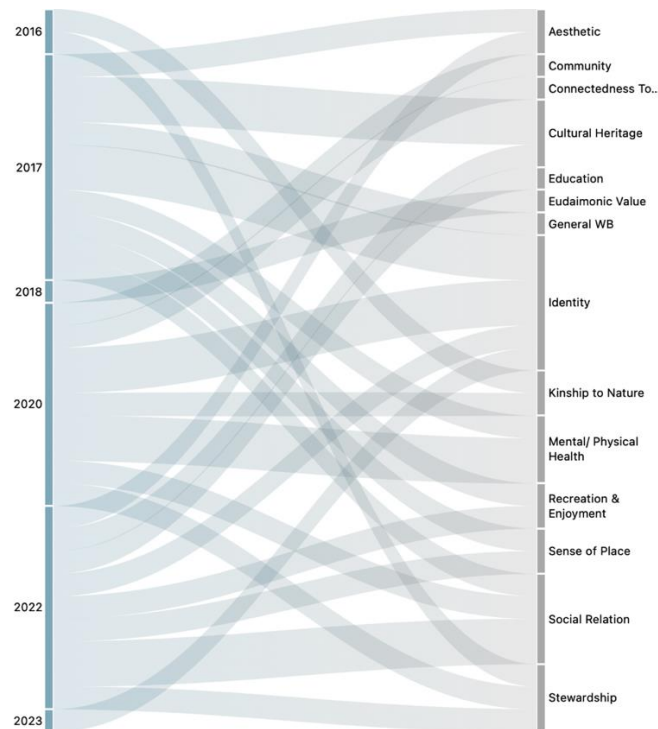


Fig. 5: Sankey diagram on the dimension of relational value over the years

The Sankey diagram in Figure 5 illustrates how the conceptualization of relational value has diversified across studies from 2016 to 2023, showing different themes of dimensions such as identity, sense of place and social relations including broad dimensions such as stewardship, kinship to nature, mental and physical health and eudemonic wellbeing. This evolution highlights growing recognition of relational value as a multidimensional approach to assessing CES and enhancing its importance as a mediating mechanism that links environmental experiences to wellbeing outcomes.

3.0 Discussion

3.1 Environmental Setting as CES Provision

Environmental space setting plays a critical role as the primary provision of CES, facilitating how people perceive, experience and engage with nature. The narrative review shows that park characteristics such as landscape quality, accessibility, infrastructure, natural features and aesthetic value continuously place positive effects towards psychological experience, cognitive development and emotional response. Studies have also proven that the perceived quality of environmental quality steadily contributes to higher subjective well-being as supported by several theoretical foundations, such as the Stress Reduction Theory and Attention Restoration Theory. Therefore, the environmental setting should be taken into consideration when assessing the cultural benefits of the ecosystem as the primary founder in delivering conditions that foster positive relational value among people.

3.2 Cultural Practices as Human-Nature Expression

In the context of CES assessment, cultural practices represent the behavioral and experiential expressions that portray how people interact with and utilize the perceived environmental setting, including a variety of activities such as social interaction, nature-based learning, recreation, community events or simply enjoying the natural setting. The review revealed that these practices are particularly influenced by both the perceived qualities of the environmental setting and the meaning individuals associate with them. In the context of CES assessment, cultural practices operate as an important construct in relating the environmental setting to subjective well-being.

3.3. Relational Value as Mediating Mechanism

The concept of relational value emerges as a central mediating construct that explains how people perceive the provision of CES (environmental setting) and translates it into cultural practices that ultimately contribute to subjective well-being. The dimensions of relational value represent the factors that motivate people to engage with nature, including a sense of place, moral responsibility, identity, kinship with nature and stewardship, which positively correlate with pro-environmental behavior. This is an important role played by relational value, which utilizes the value held by people to ensure that cultural practices performed would support any environmental management strategies being formulated. Therefore, relational value provides the conceptual bridge that integrates environmental settings, cultural practices and subjective human wellbeing in CES assessment.

4.0 Conclusion & Recommendations

This review highlights the importance of incorporating attributes of environmental settings, cultural practices and relational value in providing a comprehensive assessment of how CES should contribute to human well-being. High-quality of environmental settings provide opportunities for meaningful experience, while cultural practices are seen as expressions of human-nature interaction. Relational value plays a mediator role in the pathway of CES that influences subjective well-being. However, this review may be limited by its narrative approach, which may introduce selection bias and restrict coverage to accessible related studies. Nevertheless, this synthesis offers insights into an advanced understanding of the relational value concept in CES research. The findings suggest practical implications for park planners to incorporate relational dimensions into the decision-making process, thereby creating a meaningful human-nature relationship that can enhance community well-being and support socially responsive urban green space planning.

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Paper Contribution to the Related Field of Study

This paper offers new insights by emphasizing the significance of relational value in assessing CES and highlighting key gaps that call for further empirical studies. This study synthesizes previous empirical findings on relational value research and offers practical implications for urban green space planning strategies that enhance human well-being in support of sustainable development goals.

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