The Socio-Cultural and Spiritual Dimensions on Non-marketed Environmental Valuation

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Abstract
The present review aims to strengthen both the theoretical foundation and real-world relevance of environmental valuation methods, especially in regions marked by cultural diversity or spiritual significance. Its goal is to explore how embracing sociocultural pluralism can support more inclusive, meaningful, and accepted environmental decisions, encouraging deeper public engagement, emotional connection, and long-term care for nature. The novelty lies in integrating these qualitative dimensions into environmental valuation by monitoring 103 studies from Scopus and Web of Science databases in the period 2010-2025. The paper follows a structured path, it surveys key literature, outlines the chosen methodology, presents context-specific findings with the comparison of two distinct frameworks (sociocultural and economic), and reflects on implications for both policy and academic frameworks. It offers three main contributions: (i) it highlights the importance of integrating psychological and sociocultural elements into sustainable development framework; (ii) advocates the spiritual capital as a valuable assets through which ecosystems can be understood and supported based on services to ecosystems; and (iii) it demonstrates how values, norms, and perceptions can shape pro-environmental behaviours (PEBs) and policy pathways for sustainable development.

Keywords: environmental psychology, environmental sociology, environmental economics, sustainable consumer behaviour, sustainable development, ethics

JEL Codes: Q01, Q5, D9, M14, Z1

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Compliance with Ethical Standards
Conflict of Interest: The authors declare no conflict of interest.
Research involving human participants and/or animals: Not applicable.
Informed consent: Not applicable.

Highlights
- Spirituality can underpin services towards the protection of ecosystems
- Sociocultural dimensions embrace altruistic, existence, intrinsic and bequest values
- People's quality of life is associated with their spiritual and sociocultural status
- Pathway towards sustainability requires the valuation of sociocultural factors

Structure of the review

Abbreviations

Ability-Motivation-Opportunity (AMO)	Choice experiments (CE)	Conditional logit model (CLM)
Contingent valuation method (CVM)	Ecologically conscious consumer behaviour (ECCB)	Ethically minded consumer behaviour (EMCB)
Independently and identically distributed (IID)	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)	Latent class model (LCM)
Mixed logit models (MiLM)	Mixed multinomial logit models (MiMLM)	Multinomial logit models (MLM)
Nature's contributions to people (NCP)	New Environmental Paradigm (NEP)	Payments for ecosystem services (PES)
Pro-environmental behaviours (PEBs)	Random parameter logit (RPL)	Random utility modelling (RUM)
Services to ecosystems (S2E)	Sustainable development goals (SDGs)	Theory of Planned Behaviour (TPB)
Value-Belief-Norm Theory (VBN)	Willingness to pay (WTP)	

«*For asking people to disclose the value they place on Nature is only the first step towards an understanding of the full value of Nature, including its moral worth*.»
Dasgupta (2021,p. 313)**.**

1. Introduction

Traditionally, valuation methods were economic-oriented, such as contingent valuation method (CVM), and discrete choice experiments (CE), but they often overlook the deeper sociocultural dimensions that influence how people relate to nature (Dasgupta, 2021). The last decades, researchers are recognizing that values tied to cultural identity and spiritual beliefs deeply influence pro-environmental behaviours (PEBs) (Aslanidis et al., 2025; Halkos et al., 2024b). Therefore, the present study would highlight the importance of sociocultural and spiritual dimensions inclusion in environmental valuation.

A healthy ecosystem provides several services to humankind (MEA, 2005), but humans rarely reciprocate. For this reason, Comberti et al. (2015) introduced the "*services to ecosystems*" (S2E) concept that calls for environmental action through the provision of *protecting* (cultural prohibitions), *enhancing*, *restoring*, and *supporting* (eco-cultural integrity) services. Similar to IPBES[1] conclusion that "*the Nature and its contributions to people's (NCP) quality of life are associated with a wide diversity of values*" (Pascual et al., 2017).

Researchers use various – qualitative and quantitative – methodologies to estimate spiritual capital to correlate it with the adoption of PEBs, wellbeing, and potentially, less eco-anxiety under the scope of new environmental paradigm (NEP) (Dunlap et al., 2000; Dunlap and Van Liere, 1978)**.** Conventionally, moral philosophy theories include consequentialism (outcome-oriented), deontology (duty), and virtue ethics (Alexander and Moore, 2007; Baron et al., 1997), while theoretically, the link between environmental science and psychology can be traced in theory of planned behaviour (TPB)[2] and the value-belief-norm (VBN) theory, which can explain PEBs (Gkargkavouzi et al., 2019; Gkargkavouzi and Halkos, 2025). Overall, the challenges in the valuation of spirituality is due to *intangibility* and *subjectivity*.

Regarding the *intangibility*, the assessment of intangible assets require the estimation of both individualistic and communal beliefs; for example, bird-watchers or divers might build a communal bonding (Grove-White, 1992). Dasgupta (2021,p. 309-313) refer to this, as nature's "*sacredness*" and "*moral standing*" that are linked to existence and intrinsic values. Additionally, the sociocultural factors are connected with threatened and rare species' preservation, such as the notions of "*wild law"* and "*earth jurisprudence*" that allow to go beyond conventional concepts of environmental conservation (Filgueira, Begonia ; Mason, 2009). Hence, spirituality can reform the traditional economic conceptualisation.

Moreover, the *subjective* nature of spirituality is burdened with cultural barriers, complicating standardized assessments. This is what the "Ethics in Action" initiative tried to solve through multireligious action for sustainable development goals (SDGs) by highlighting

[1] The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) embraces this diversity of values, as well as the need to integrate and bridge them in its assessments (Pascual et al., 2017).

[2] The TPB is linked to behavioural decision-making for both monetary and non-monetary issues (Ajzen, 1991), additionally, the TPB can underpin subjective norms, and ultimately, incentivise the adoption of PEBs, ecologically conscious consumer behaviour (ECCB) or ethically minded consumer behaviour (EMCB) (Chen et al., 2022; Ishaq et al., 2025; Le and Kieu, 2019; Zollo et al., 2018).

the significance of spirituality on human dignity and social justice (Sachs and Flanagan, 2022). Spirituality has a dual form, i.e., religious and non-religious. Vitell et al. (2016) termed spirituality as the "intrinsic view of religiosity", whereas, Hyland et al. (2010) highlighted also the secular spirituality under the scope of "New Age" philosophies that overcome religious doctrines. Hence, despite these challenges, the evaluation of spirituality is crucial for achieving sustainable development, especially on how spirituality is an intrinsic aspect of SDG 3 (well-being), SDG 4 (education), SDG 11 (communities), and SDG 13 (climate action).

The review's scope is to enhance both theoretical robustness and practical applicability of environmental valuation tools, particularly in culturally rich or spiritually significant natural landscapes. The paper proceeds by reviewing relevant literature, outlining the methodological approach, analysing case-specific findings, and discussing implications for both policy and theory. Furthermore, the review provides three contributions: (i) it shows how crucial it is to incorporate psychological and sociocultural factors into sustainable development plans; (ii) it promotes the value of spirituality as a way to offer S2E; and (iii) it shows how human values, norms, and perceptions can influence PEBs and policy actions for sustainable development. The review is structured as: Section 2 presents the literature review on environmental economics valuation methods, Section 3 refers to the methodology, Section 4 presents the results and discusses the impact of sociocultural aspects in environmental valuation, and Section 5 concludes the paper and offers policy implications.

2. The historic background of environmental valuation

The total capital consists of three forms of capital[3], i.e., natural, human, and man-made (or produced) capital (Dasgupta, 2021; Halkos, 2023; Nijkamp, 2012), which are interconnected under the scope of human welfare; however, Dasgupta (2021) necessitated the inclusion of cultural and social capital[4] in the total capital. However, the notion of spiritual capital is relatively abstract, but termed by Palmer and Wong (2013) as "*the individual and collective capacities generated through affirming and nurturing people as having intrinsic spiritual value*".

Figure 1 illustrates a combination of sociocultural and spiritual dimension with the concept of total economic value. The theory of total economic value is based on Pearce and Moran (1994) and can be decomposed into *use values* (direct, indirect and future use), *non-use values* (i.e., existence etc.), and (quasi) *option* values. Moreover, the cultural value consists of important – tangible and intangible – aspects such as spirituality and pro-sociality (Throsby, 2012; UNESCO, 2003). Moreover, the cultural impact on use values can be estimated via market-based methods, while the non-use values can be evaluated by applying either revealed preference methods (e.g. travel cost method etc.) or stated preference methods (e.g. discrete choice experiments etc.) (Halkos, 2023).

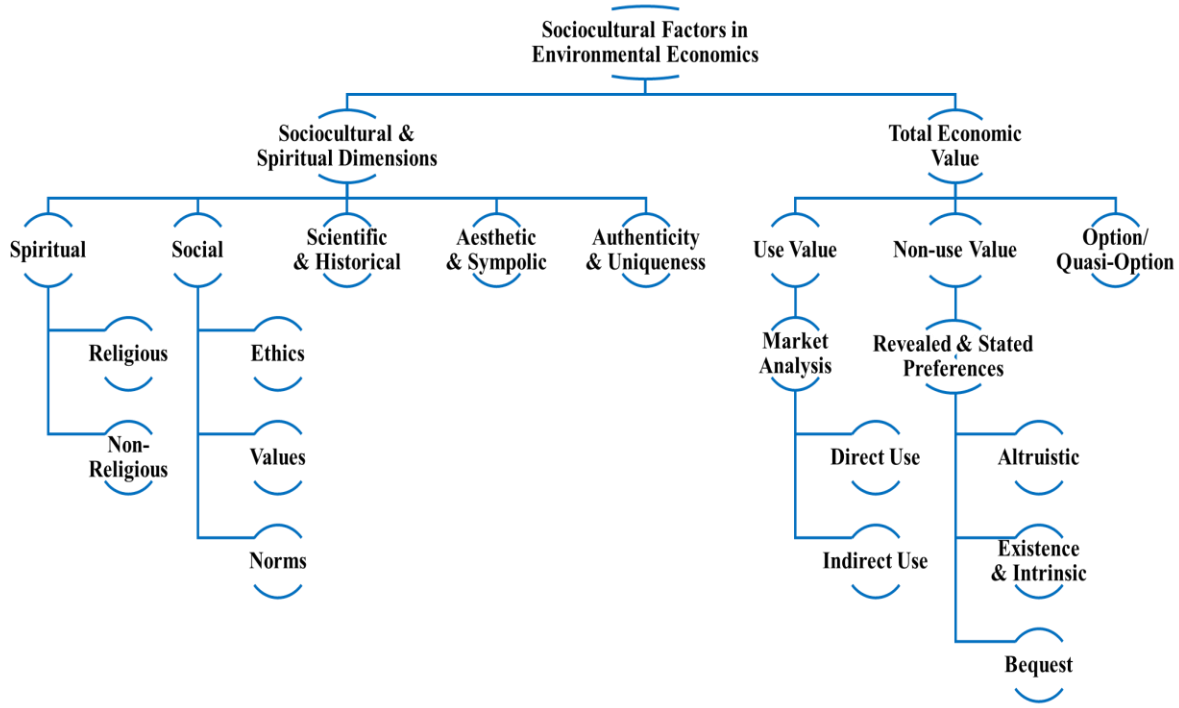
Lacking proper ownership rights and reliable pricing, researchers require methodological alternatives in order to estimate individuals' preferences for environmental goods and services (Lipton et al., 1995, p.42). In environmental economics there are two categories of an

[3] N*atural capital refers to* all stocks and flows of renewable and non-renewable resources, the h*uman capital includes notions such as* human knowledge, skills, abilities, and experiences, and the *man-made* or produced capital refers to infrastructure, telecommunications etc (Halkos et al., 2024b).

[4] Social capital includes, inter alia, trust, and volunteerism in democratic societies, additionally cultural capital incorporates cultural value, knowledge, history, language visions, myths, and people's view of the world and its function. (Dasgupta, 2021, p. 38).

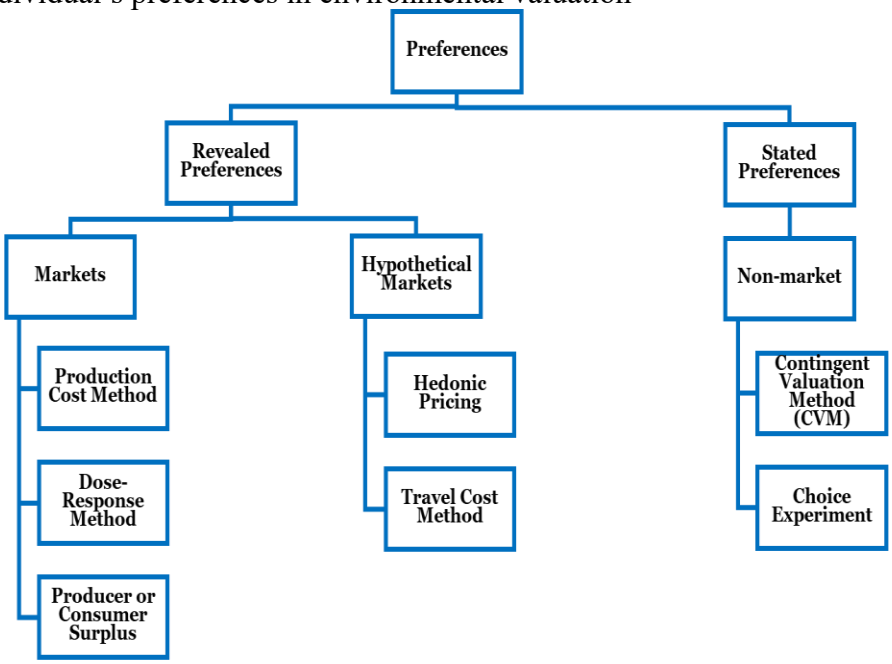
individual's preferences (see Fig. 2). The first category includes the revealed preferences that can be further categorized into the market-based methods (e.g., consumer surplus) and the hypothetical (or surrogate) markets (e.g., travel cost and hedonic pricing method), in the present review only a handful of publications are covering the hypothetical markets approach.

Fig. 1. Sociocultural factors in environmental valuation



Source: Figure created by the authors based on Halkos (2023) and Halkos et al. (2024).

Fig. 2. An individual's preferences in environmental valuation



Source: Halkos (2023)

Additionally, the second category refers to the non-marketed valuation methods that include the CVM and CE. Lastly, there is also the benefit transfer that even though it is not a typical environmental valuation method, it is based on the analysis of several results from CVM or CE studies in order to obtain individuals' WTP for environmental goods or services.

Regarding CVM, it has an appeal due to its core *democratic values*, as people should be invited to share their thoughts and disclose not only their WTP of an amenity, but also their personal perceptions regarding species' existence and intrinsic values (Dasgupta, 2021, p. 304). In the present review there are some examples of CVM, but the main focus is on CE studies. In general, researchers should be aware of several challenges that would affect negatively the estimation of WTP in environmental valuation, as there is a potential uncertainty of results as people might not know the environmental good or service for several reasons. To exemplify, there is ignorance or inability to make a choice between an environmental and a monetary good; moreover, there might be lack of study's understanding due to improper structure on the questionnaire's design (Shaikh et al., 2007; Wakamatsu et al., 2018). Interestingly, in CVM is important to measure distance-decay models that estimate the underestimation of individuals' preferences for an environmental good because they live away from it (Bateman et al., 2000).

The CE method is a powerful tool used in environmental valuation, grounded in foundational economic theories. It builds on McFadden's (1973) random utility model (RUM), which is itself based on Luce's (1959) choice axiom and Lancaster's (1966) consumer theory. CE also draws from Louviere and Woodworth (1983) work on preference modeling and Hanemann (1984) discrete choice models. At its core, CE measures individuals' WTP by presenting them with hypothetical alternatives reflecting different environmental conditions—for instance, the status quo versus environmental degradation (Chen et al., 2017; Muñoz-Muñoz et al., 2025; Train, 2003).

Within the RUM framework, utility is divided into an observable and a stochastic (random) component. The commonly used conditional logit model (CLM) focuses on fixed effects and assumes these random elements are independently and identically distributed (IID), which can lead to overly rigid assumptions (Zander et al., 2022). To address this, multinomial logit models (MLMs) offer more flexibility and assume the stochastic element, although they fail to capture heterogeneity in preferences (Train, 2003). A simpler version, the binary logit, can sometimes yield similar results in binary CE formats (Tagliafierro et al., 2016).

To overcome these shortcomings, mixed logit models (MiLM), also known as random parameter logit (RPL) models, are widely used. They allow researchers to account for preferences heterogeneity and include both fixed and random effects (Hensher and Greene, 2003; McFadden and Train, 2000; Sharma and Kreye, 2022), but are sensitive to incorrect assumptions about parameter distributions. Still, they offer greater flexibility than CLMs and MLMs and are ideal for studies involving multiple choices per respondent (Birol and Cox, 2007; Hensher et al., 2015; Hoyos, 2010; Kaffashi et al., 2013; McFadden and Train, 2000; Sato et al., 2021; Sharma and Kreye, 2022; Train, 2003; Viteri Mejía and Brandt, 2015).

Another variant, the flexible mixed multinomial logit model (MiMLM), can relax the assumption of independence from irrelevant alternatives and capture preference heterogeneity more precisely (Mariel and Meyerhoff, 2018; Revelt and Train, 1998). Similarly, latent class models (LCMs) divide respondents into groups based on shared traits like age or gender, identifying patterns of homogeneous preferences (Boxall and Adamowicz, 2002; Chen et al., 2018; Cheng et al., 2021; Kaczan et al., 2013; Peng and Oleson, 2017; Scarpa and Thiene, 2005;

Zander et al., 2022). However, for broader heterogeneity analyses, MiLMs are often preferred (Viteri Mejía and Brandt, 2015).

While CE is considered more robust than CVM for environmental assessments (Hanley et al., 2001), it requires careful experimental design to ensure public understanding (Carson and Louviere, 2011; Koo et al., 2013; Segerstedt and Grote, 2015). On the contrary, some econometric limitations are, inter alia, the non-attendance of respondents, learning fatigue effects, and the influence of personal behaviours on the CE (Campbell et al., 2015; Hoyos et al., 2015; Scarpa et al., 2009), these econometric challenges are at the core of the present review. Moreover, in order to deal with social desirability bias[5] in CE studies, it is possible to employ an inferred valuation approach in order to evaluate the benefits from aquatic ecosystems (Lopez-Becerra and Alcon, 2021).

3. Methodology

A review gathers, evaluates, and offers appropriate policy recommendations based on solid and comprehensive arguments that meet numerous eligibility requirements in order to address a variety of research objectives. As noted above, the aim of the present review is to combine and disseminate the importance of socio-cultural and spiritual impacts on environmental economics, mainly on non-use valuation under the scope of WTP for environmental preservation, protection, or conservation.

3.1. Context of the study

The context of the study is to find relevant studies that focus on sociocultural and spiritual factors in environmental valuation. Therefore, a representative sample of 103 publications has been collected that is further categorized into the socio-cultural and spiritual parameters (n=44) and to pure environmental economics studies (n=59 studies), all the 103 publications and their information are presented in Supplementary Material. The review provided insight on three objectives, (i) the mapping of different social, psychological, and ethical aspects, (ii) the observation of socio-cultural and spiritual factors on valuation studies, and (iii) the overall monitoring of the impacts derived from socio-cultural and spiritual elements on environmental economics literature, especially on non-marketed values. Furthermore, to eliminate any post-hoc decision bias, the researchers developed and chose the most relevant main parameters influencing environmental economic valuation.

3.2. Guidelines, eligibility criteria, and search plan

As previously stated, the review uses a standardised mapping to promote an appropriate framework for the influence of sociocultural and spiritual factors in environmental economic valuation. Moreover, an exhaustive review has been undertaken in the current work based on the Scopus and Web of Science databases. Both databases have been utilized in order to find the most representative and reliable studies that can provide the necessary context for further synthesis. It should be noted that Scopus and Web of Science are widely recognized and dependable databases that contain empirical valuation studies with wide coverage of environmental assets, sociocultural and spiritual aspects, and case studies.

[5] This social desirability bias causes participants to respond to questions in ways that are socially desirable or that reflect the interviewer's desires, rather than providing true responses (Lopez-Becerra and Alcon, 2021).

For the eligibility criteria, the final 103 recent publications have been cross-checked independently by the authors, leading to reliable and accurate results. Furthermore, the time period restriction allows for the analysis and comparison only of the state-of-the-art research frameworks, focusing on the period 2010 – 2025 (till April). Lastly, a joint decision of the final studies' classification led to the final sample. For the data screening, comparison, and results explanation, the following parameters were identified: environmental-related thematic, year of publication, number of citations, journal, country (and if available: case study), aim of the study, methodology, and sample size.

Regarding the screening and search plan, from the 2289 initial published papers based on Boolean search in the databases, the time period customization between 2010 and 2025 showed that only 647 studies meet these criteria (see Table 1). Next, the databases were undergone an advanced screening, based on the exclusion of several papers for (i) being articles in press, (ii) due to being in different language than English, (iii) for being duplicate, and (iv) for not meeting the general selection criteria, leaving 600 studies in the pre-final classification. Ultimately, the final classification left 103 studies for the review analysis. For the studies that exhibit a relevant WTP for sociocultural or spiritual characteristics, for comparison reasons, the values have been converted from their initial price into Euro (as of May 2025 or based on last available data), the impact of inflation has also been measured.

Table 1. Identification of studies methodology steps.

Step	**Identification of studies**
Scope	Research on socio-cultural and spiritual factors in environmental valuation
Keywords	WTP, spirituality, cultural factors, environmental valuation
Records identified from	Databases (n=2) Scopus* (n=602) Web of Science** (n=1687)
Records removed before screening	Duplicate records (n=13) Articles in Press (n=31) Articles in different language (n=6) Do not meet the general selection criteria (n=3)
Pre-final Classification	Most recent and suitable publications (n=600)
Final Classification	Studies included in the review (n=103)

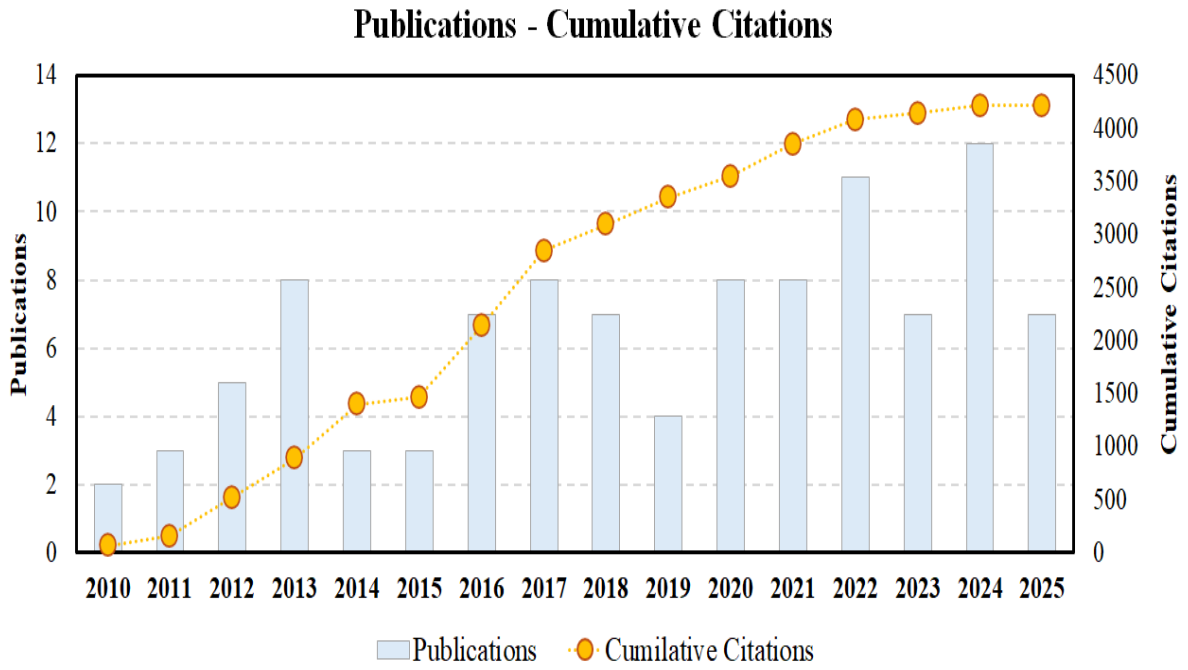
*Boolean search in Scopus: ALL ("spirituality") AND ("willingness to pay") AND PUBYEAR > 2009 AND PUBYEAR < 2026 AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "bk") OR LIMIT-TO (DOCTYPE , "ch")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ENVI") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "PSYC") OR LIMIT-TO (SUBJAREA , "ENER") OR LIMIT-TO (SUBJAREA , "DECI"))

**Boolean search in WoS: Topic: environmental valuation AND spirituality OR Topic: spiritual capital OR Topic: contingent valuation method AND Topic: choice experiment; Publication Date: 2010-01-01 to 2025-03-31.

4. Results and Discussion

The present review extracted 103 relevant publications, aiming to find sociocultural and spiritual factors that should be further investigated under the scope of environmental valuation. From the 103 studies, the 42.72% (44 studies) refers to theoretical psychological, sociological and cultural-related studies, whereas the 57.28% (59 studies) is linked to environmental valuation. According to the studies' relevance, as illustrated at Fig 3, the last sixteen years, and especially after 2019, there is a rising trend both in terms of published papers and on cumulative citations. Next in order, the Sections 4.1 and 4.2 are going to present the theoretical and the practical studies on the inclusion of sociocultural and spiritual dimensions in environmental literature.

Fig. 3. The summary of present's review publications and their cumulative citations in the period 2010 – 2025



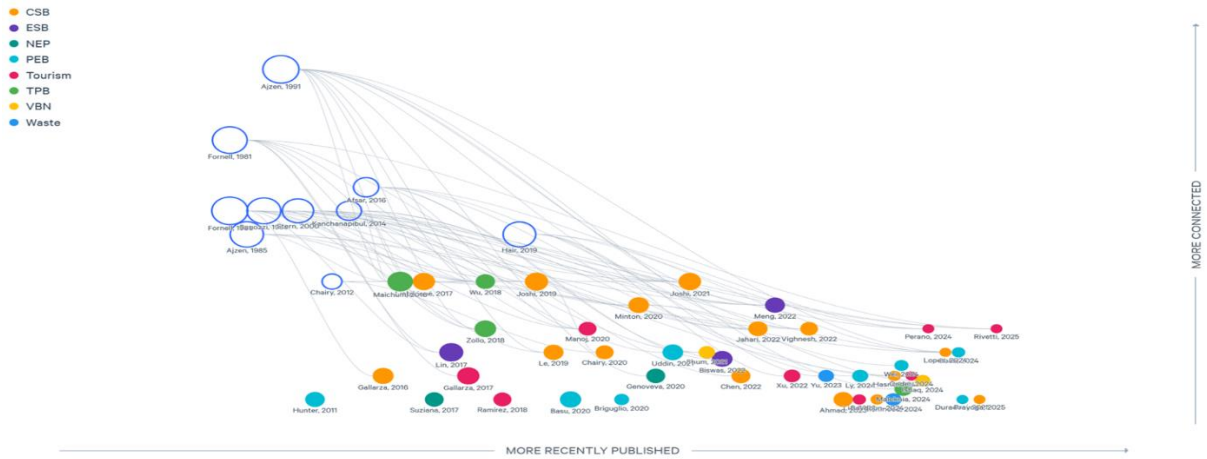
4.1. Results on the influence of sociocultural and spiritual aspects in environmental science

For the 44 studies on sociocultural and spiritual dimensions in environmental science (see Fig 4), the majority is linked to customer sustainable behaviour with 34.09% (15 studies). The rest studies are on the adoption of PEBs and tourism, both being the 18.18% (8 studies each category) of the sub-sample, the extension of TPB studies are 9.09% (4 studies), employee sustainable behaviour studies are 6.82% (3 studies), and then for NEP, VBN and waste-related studies on circular economy with each category to cover the 4.55% (2 studies in each category). Furthermore, it is interesting to mention the source of the studies based on the journal in which they have been published as well as the cumulative citations from these studies.

Additionally, the cumulative citations of studies that focus on sociocultural and spiritual aspects and the relevant journals are presented at Fig 5. Several studies have been published in Sustainability (MDPI) and cover the majority of impact by having 530 citations in these four studies, moreover, the journals of Quality and Quantity (Springer Nature), Journal of Cleaner

Production (Elsevier), Ecological Economics (Elsevier), and Journal of Service and Management (Emerald insight) have 252 (from 1 study), 223 (2 studies), 180 (1 study), and 134 (1 study) citations respectively, showing also their important impact that is translated into cumulative citations.

Fig. 4. The relevance of psychological and sociocultural factors and their foundations in environmental science. Source: Created by the authors using litmaps.com.



Note 1: In the upper right corner there are the publications that have influenced the studies that have been included in the present review. Note 2: Customer Sustainable Behaviour (CSB), Employee Sustainable Behaviour (ESB), New Environmental Paradigm (NEP), Pro-environmental behaviour (PEB), Tourism, Theory of planned behaviour (TPB), Value-belief-norm (VBN), Waste (Circular Economy).

4.1.1. The extension of TPB

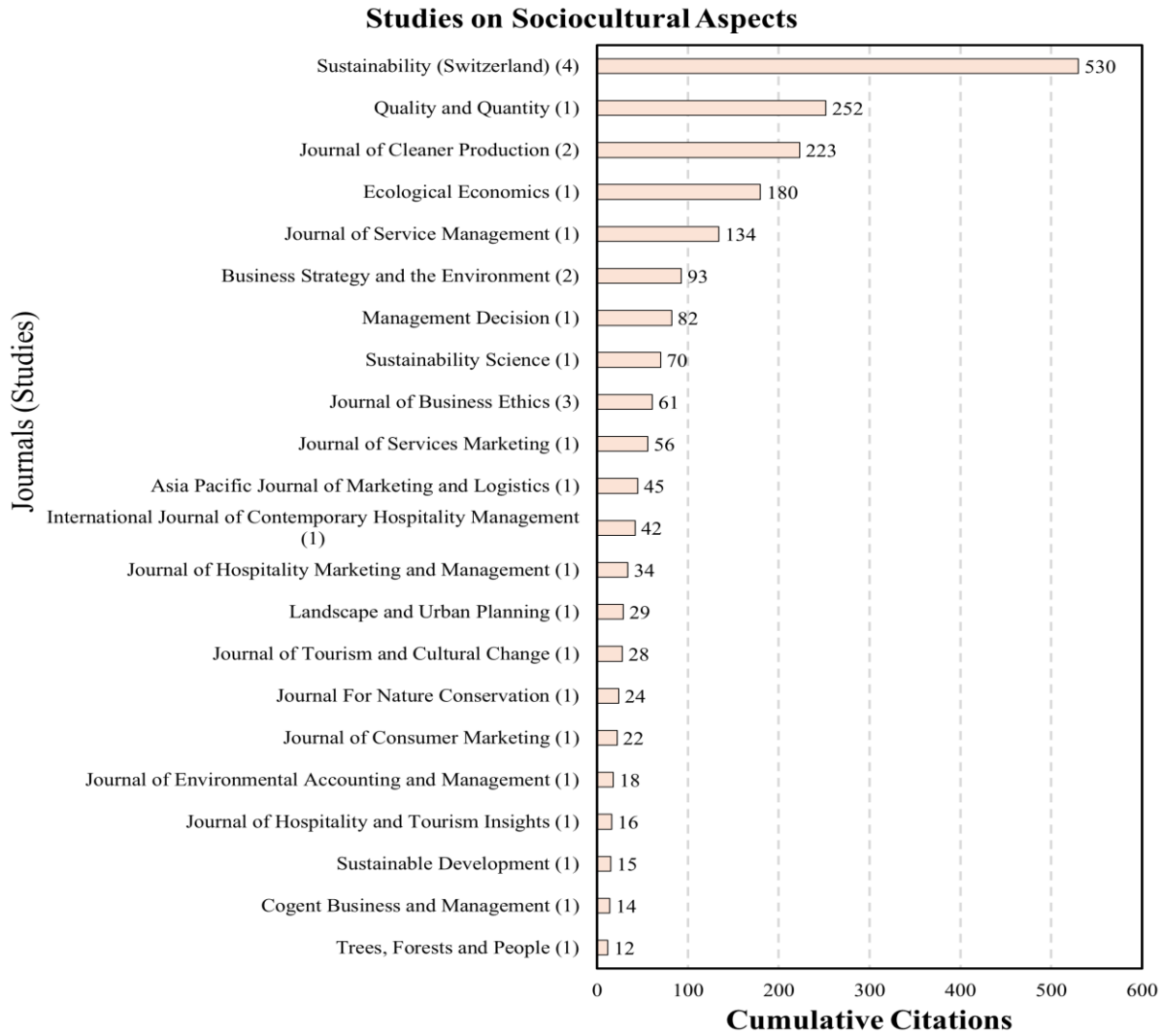
The extension of TPB can examine the purchase intention of green products and services. In the literature there has been an effort to combine TPB with moral intuition[6], considering the pivotal role of inferential intuition on NEP and to all the integral parts of ECCB (Zollo et al., 2018), paving the way for sustainable consumption (Joshi et al., 2021; Maichum et al., 2016).

Furthermore, cultural and religious concerns regarding the conservation of "*sacred trees*" (e.g., in Zagros Mountains, Iran) or Karma (Chairy and Syahrivar, 2020) show how TPB can positively affect the environmental intentions; however, a study through an *inter-generational comparison* showed that the older generation were more influenced by spirituality than the younger generation (Maleknia et al., 2024).

In essence, the TPB shows academic potential in *community-based ecotourism* by incorporating the various benefits from social psychology and nature uniqueness (as in Yilan County, Taiwan) (Wu and Chen, 2018). Consequently, the extension of TPB with moral, cultural, and religious factors can enhance the current environmental economics literature on the understanding of green purchase intentions and the need for empirical application (e.g., ecotourism).

[6] Moral intuition gives more importance on subjective intentions than rational, for more information please see: (Haidt, 2001). Moreover, inferential intuition is the automation of analytical processes, affective intuition is linked to emotional factors, and holistic intuition that focus mainly on overarching and abstract perspectives (Pretz et al., 2014; Pretz and Totz, 2007)

Fig 5. The cumulative citations of studies that focus on sociocultural and spiritual aspects and the relevant journals



Note: Some studies are not included in the figure as they had fewer than 10 citations. In the parenthesis is the number of publications and cumulative citations: Human Dimensions of Wildlife (1,9); Sustainable Chemistry and Pharmacy (1,7); Journal of Environmental Studies and Sciences (1,5); Environmental Research Letters (1, 3); Journal of Retailing and Consumer Services (1, 3); Current Psychology (1, 2) ; Environment and Social Psychology (1, 2); Human Ecology (1, 2); Journal of Outdoor Recreation and Tourism (1, 1); Discover Sustainability (1, 0); International Journal of Sustainable Development and Planning (1, 0); Journal of Travel and Tourism Marketing (1, 0); Societies (1, 0); Total Quality Management and Business Excellence (1, 0); TQM Journal (1, 0).

4.1.2. The inclusion of VBN and NEP

Regarding the inclusion of VBN, sociocultural and spiritual factors can be highly complex. For instance, *moral self-identity* can be linked to ECCB, but restrained by religious (i.e., spiritual) factors, revealing the significance of *empowerment* and *self-transformation* as mediating roles in VBN (e.g., in Pakistan) (Ishaq et al., 2025), or to EMCB (e.g., in Vietnam) (Le and Kieu, 2019). Moreover, the engagement in conservation (e.g., marine turtles) is a core

sociocultural attribute that can assist different stakeholders on adopting PEBs, especially through *voluntarism* and *communication* (e.g., in Queensland, Australia) (Shum et al., 2023).

The intentions of younger generations have also grasped the attention of researcher, focusing mainly on the psychological, sociocultural and environmental aspects. The VBN can be combined with the social cognitive theory as factors that can alter young consumers' intentions and norms (as in a Malaysian study) (Jahari et al., 2022). In the same manner, young consumers seem to be influenced by environmental responsibility, spirituality, and perceived consumer effectiveness (as in Delhi, India) (Joshi and Rahman, 2019).

The literature on NEP showed that the inclusion of sociocultural and psychological factors can ameliorate the people's understanding on ecosystem valuation (e.g., Setiu Wetland, Malaysia) (Suziana, 2017). Similarly, the PEBs can be deemed as potential predictor of NEP, revealing that spiritual factors can determine the green lifestyle (Genoveva and Syahrivar, 2020). Thus, sociocultural, psychological, and spiritual factors alongside NEP and VBN can underpin environmental valuation by predicting green behaviour.

4.1.3. The effect on PEBs

Apparently, PEBs are influenced by sociocultural norms and spiritual beliefs. Firstly, a crucial factor is *eco-centric leadership* that plays a moderating role on people's PEBs (Biswas et al., 2022; Uddin et al., 2021). For instance, the importance of people's *trust* in public participation can be an interesting factor for building PEBs, especially when climate-related scepticism due to political parties' agenda is more frequent to men compared to women (Duradoni et al., 2025). Another study compared results in two European countries (Lithuania and Austria) and showed that social norms and gender can heavily affect both green-related behavioural aspects, in which, women again exhibit more environmental friendly behaviours (Liobikienė et al., 2017). Further, other factors that can enrich the current sociocultural literature are related to *vividness*, *interactivity*, and *commonweal* on eco-tourism (Wei et al., 2024), or pro-sociality's linkage to environmental responsibility (Chen et al., 2022). In these terms, PEBs are widely interlinked to sociocultural and spiritual factors such as eco-centric leadership, trust in public participation, and elements like vividness and interactivity.

PEBs in the form of environmental *engagement* can be strengthened, either personally through "self-assessed spirituality" or collectively through the participation to religious events (Briguglio et al., 2020); and further strenghtened by environmental awareness factors in order to underpin sustainable development (Ly, 2024). Similarly, the voluntary participation of people (e.g., trekkers in a biosphere reserve in Spain, or general public in Japan) on ecotourism management can strengthen their PEBs through practical engagement such as tree planting and provision of spiritual co-benefits (Basu et al., 2020; Chao and Zhang, 2024). Therefore, the provision of green rewards can boost consumers' *green loyalty* (Prayoga et al., 2025), and combine sociocultural, psychological, and economics frameworks.

Additionally, a bitter example is how people feel a stronger *connection* (emotional and behavioural) to nature, when live closer to ecological disturbances (e.g., tree loss in City of Ann Arbor, USA). This proximity to ecological degradation showed greater willingness to engage in stewardship (Hunter, 2011). The summary of these notions can lead to the conclusion that PEBs can be reinforced by personal spirituality, collective religious participation, and emotional connections formed through proximity to nature.

4.1.4. Examples in Eco-tourism and Circular Economy

In corporate social responsibility literature, green knowledge sharing is a potential tool to boost green competitive advantage (Lin and Chen, 2017). However, as noted before, it is the qualitative elements that can significantly influence people's PEBs related to eco-tourism, inter alia, ethics, spirituality, aesthetics, altruism and rest factors (Ahmad et al., 2024; Gallarza et al., 2017, 2016; Hasni et al., 2024; Meng et al., 2022). Moreover, the Ability-Motivation-Opportunity (AMO) can reveal how PEBs are linked to environmental passion (Perano et al., 2024).

On the other hand, consumers' behaviours are heavily linked to site-specific PEBs, especially when there are environmental degradation or pollution (Ekonomou and Halkos, 2023; Halkos and Ekonomou, 2023; Manoj et al., 2020). Interestingly, another study showed that behavioural intention can be affected significantly by factors such as *brand trust* and *brand attachment* (Xu et al., 2022) or even with *social bonding* and mental wellbeing (Önder and Topsakal, 2024). These aspects can be also linked to biocultural characteristics and protection of natural landscape as the Mount Hermon (Lebanon) (Baydoun et al., 2024).

Undoubtedly, sociocultural and religious differences have the most crucial impacts on PEBs. Again in the tourism sector, sociocultural factors such as "*commitment to sustainability*" can act as driving forces on environmental attitudes and intentions, especially in younger consumers (e.g., Generation Z) with different cultural backgrounds (Liu et al., 2024; Lopes et al., 2024). In Assisi (Italy), spirituality indeed is a catalyst for PEBs, but it can be further strengthened when combined with other sociocultural factors (Rivetti et al., 2025). Similarly, in Singapore, consumers' cultural and religious sentiments can affect their wellbeing (Minton et al., 2022). Studies have revealed how peoples' (e.g., pilgrims) sensitivity towards natural environment or cultural values seems to affect both sustainable development initiatives and human development in Guadalupe, Spain (Ramírez and Fernández, 2018) or in Bangalore, India (Vighnesh et al., 2023).

Recently, the anthropogenic impacts on environmental pollution have been monitored under the scope of *circular economy*, especially regardung sustainable waste management (Halkos and Aslanidis, 2024a, 2024b). For example, two studies in China show how the sociocultural aspects can affect the ethical perspectives of circular strategies. The first study shows how stimulus-organism response paradigm can affect the decision-making process based on consumers' intentions, through social pressure, on plastic waste recycling (Mehmood et al., 2024). Additionally, the second study revealed that the PEB adoption regarding renovation waste can be affected by two factors, i.e., *public supervision* and *environmental regulation*. Leading to the conclusion that sociocultural parameters play a key role on PEB in circular economy practices mainly through social pressure to lower waste generation and boost ethical decision-making.

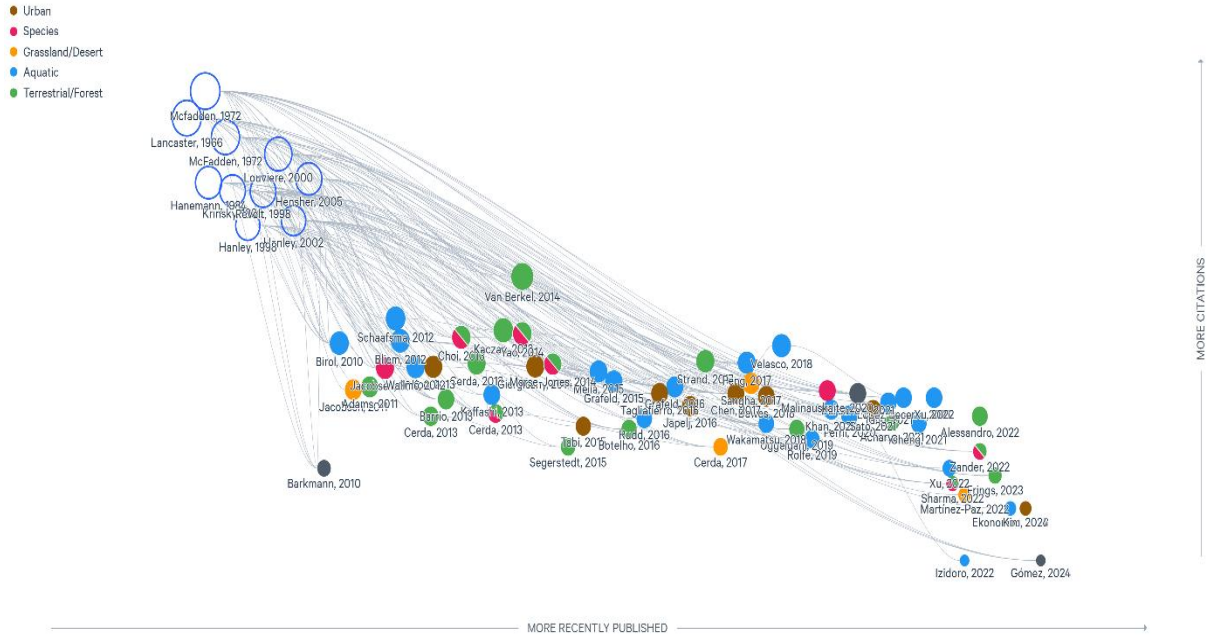
4.2. Results on environmental valuation methods for sociocultural and spiritual aspects

This section is centred on the 59 studies on environmental valuation that include also sociocultural and spiritual elements (see Fig 6). The majority of the papers refer to aquatic ecosystems covering the 25.42% (15 papers) of the studies, followed by terrestrial and forest ecosystems with 23.73% (14 papers), urban ecosystems with 15.25% (9 papers), species' protection with 13.56% (8 papers), and grassland or desert ecosystems with 6.78% (4 papers). It should be also mentioned that 6 studies are mainly methodological applications, and 3 studies

are not included to one of the previous categories due to their irrelevance. Furthermore, it is interesting to mention the source of the studies based on the journal in which they have been published as well as the cumulative citations from these studies.

The cumulative citations of studies that focus on sociocultural and spiritual aspects and the relevant journals in environmental valuation are presented at Fig 7. By far the majority of the relevant studies have been published in Ecological Economics (19 papers) reaching 916 citations. Next in order, the journals with more than 100 citations are Ecological Indicators (Elsevier), Journal of Environmental Management (Elsevier), and Journal of Nature Conservation (Elsevier) with 358 (from 2 studies), 192 (5 studies), and 127 (2 studies) citations respectively, revealing their relevance based on the cumulative citations.

Fig. 6. The interconnection between environmental valuation studies. Source: Created by the authors using litmaps.com.



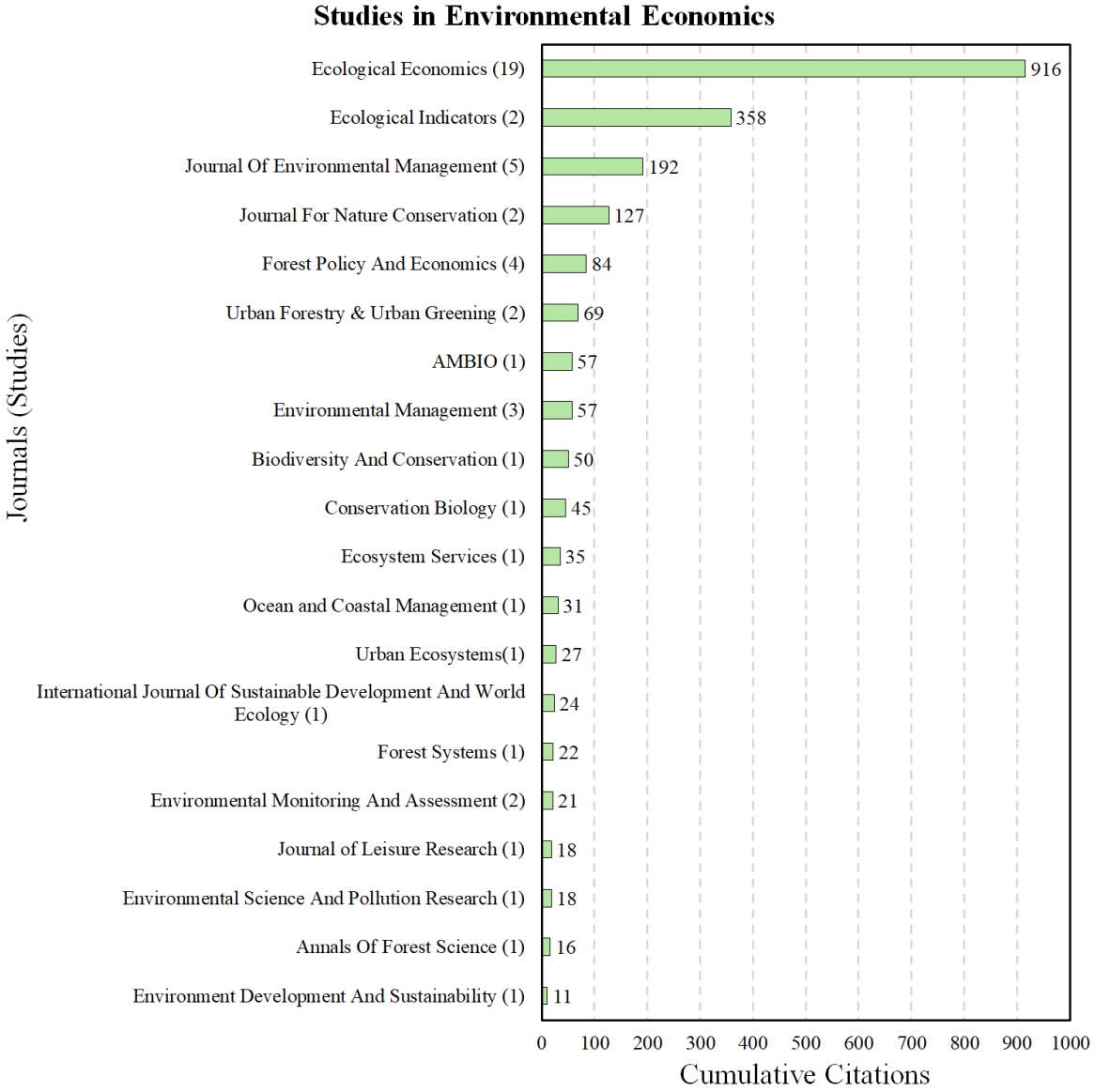
Note 1: In the upper right corner there are the publications that have influenced the studies that have been included in the present review. Note 2: The categories of the graph: Urban Ecosystem (e.g., urban forests/ or anthropogenic characteristics); Aquatic (freshwater and saltwater) and Coastal Ecosystems; Grassland/Desert Ecosystem; Species Protection; Terrestrial/Forest Ecosystem.

4.2.1. Aquatic and Coastal Ecosystems

Geographic proximity, cultural attitudes toward nature, leisure preferences, and public awareness can be heavily affected by individuals' sociocultural background, regarding their WTP for ecosystem restoration and sustainable tourism. Initially, the interlinkages between spatial distance to a river basin is important on influencing citizens' WTP for ecosystem services restoration can become a crucial policy tool (Cheng et al., 2021). Similar actions have been taken in Mar Menor (Spain) regarding the implementation of the water framework directive in order to protect aquatic ecosystems (Perni et al., 2020). In Oahu beaches (Hawaii, USA) several factors affect individuals' WTP through a DCE for the protection of fish species (ranging from 8.48 to 11.42 EUR), improvement of coral reef coverage (18.21 to 24.02 EUR), bacterial exceedance reduction (13.58 to 50.07 EUR), and for the improvement of water clarity (42.42 to 60.01 EUR) (Peng and Oleson, 2017). Interestingly, wellness tourism has heavily

underpinned the regional development in rural destinations (e.g., Kamena Vourla, Fthiotida, Greece), for instance, individuals' WTP might be on relatively high average WTP values (e.g., 56.32 EUR/visit) based on a conjoint analysis (Ekonomou et al., 2023). However, there are also alternative sustainable tourism policies that aim to reduce tourists in key environmental points, without affecting total revenues in Ecuador (Galapagos National Park) (Viteri Mejía and Brandt, 2015).

Fig. 7. The cumulative citations of studies that focus on sociocultural and spiritual aspects in environmental valuation and the relevant journals



Note: Some studies are not included in the figure as they had fewer than 10 citations. In the parenthesis is the number of publications and cumulative citations: Journal of Behavioral and Experimental Economics (1, 0); International Journal of Tourism Research (1, 1); Frontiers in Marine Science (1, 2); Sustainability (Switzerland) (1, 3); Land Degradation and Development (1, 4); Wetlands (1, 4); International Journal of Services, Technology and Management (1, 5); Environmental Conservation (1, 7).

Sociocultural factors can interpret how individuals' WTP for wetland and coastal conservation is shaped by cultural values, local community perspectives, recreational use, and

stakeholder identities and can become important tools in shaping sustainable environmental conservation policies. The aesthetic and recreational values of coastal wetland park can allow for a balanced policy agenda between sustainable tourism and environmental conservation (Xu and He, 2022). For example, in an urban wetland park an empirical discrete CE study showed that people were influenced by information-related (ranging from 1.80 to 3.69 EUR), cultural (2.01 to 2.24 EUR), or by biodiversity improvement (4.73 to 5.21 EUR) factors in Xixi National Wetland Park, China (Yang, 2021). The perspective of local communities is also critical in policymaking, for example, local citizens were willing to conserve the Shadegan wetland in Iran by reaching a WTP 2.96 EUR per household (for the CVM method) or 10.86 EUR (for the CE method)(Kaffashi et al., 2013). Similarly, the perception of stakeholders (e.g., fishermen) in Mar Menor, Spain was to sacrifice 41.75 EUR/person (CVM) regarding the lagoon conservation for its social and economic wellbeing benefits (Velasco et al., 2018). Furthermore, except of the local communities, another important stakeholders are the users of an environmental good or service, to exemplify the divers' preferences for coral reef conditions reached a WTP from 4.65 to 42.36 EUR (for the CE), or 12.06 EUR (for the CVM) (Grafeld et al., 2016).

However, specific actions are needed on the valuation of sociocultural factors by demonstrating how people's emotional connection, cultural values, educational awareness, and national context influence their WTP for marine conservation, under the scope of marine species protection and ecosystems preservation. Marine animal tourism (e.g., manatee watching) may not only generate significant revenue for local communities, but also offer psychological advantages, attachment, enjoyment, and education that reached a WTP of 3.74 EUR per month in a CVM case in Brazil (Izidoro and Schiavetti, 2022). Similarly, the results from CE comparison between Japan and Australia showed that individuals were willing to pay 6.74 EUR to protect threatened whales in Japan, whereas in Australia the people had a price range between 9.95 to 80.03 EUR (Wakamatsu et al., 2018). The results regarding the non-use economic values for little-known aquatic species at risk of biodiversity from a study in Ontario (Canada) revealed a moderate average WTP from 8.26 to 18.71 EUR based on three CE (Rudd et al., 2016). A CE publication focused on threatened, endangered, and rare species under the scope of a marine-oriented policy framework in USA, showing a WTP of 52.45 EUR/household for recovering Puget Sound Chinook salmon to 95.72 EUR/household for recovering the North Pacific right whale (Wallmo and Lew, 2012).

4.2.2. Grassland and Desert Ecosystems

Sociocultural factors can impact WTP in grassland, desert, and badland ecosystems by highlighting the importance of cultural heritage, indigenous community wellbeing, and the perceived lack or presence of meaningful cultural and ecological values for these factors that shape how people relate to and value these landscapes. A CE study in Store Åmose, Denmark examined the impact of embedding effects, where the proposed environmental and cultural heritage restoration project was evaluated under a CE context by changing the status quo level (Jacobsen et al., 2011). Furthermore, in the Atacama Desert, Chile, individuals were willing pay between 4.83 and 31.41 EUR per month in order to protect charismatic species in a biodiversity hotspot (Cerda et al., 2018), showing the significance of biological diversity even in deserts.

What is important in valuation of cultural heritage is apparently the inclusion of indigenous people, for example, another case study that applied a conventional basic value transfer technique in Fish River Station, Australia observed the socio-cultural benefits of ecosystem services and their linkage to Indigenous people's wellbeing (Sangha et al., 2017). In

parallel, except for the protection of grasslands or desert ecosystems, there are also the badlands that are places with low ecosystem services due to environmental degradation. A relevant publication showed how badlands seem to lack the necessary cultural and regulating ecosystem services through a contingent ranking method (Martínez-Paz et al., 2023).

4.2.3. Terrestrial and Forest Ecosystems

Effective payments for ecosystem services (PES) programs design must align with farmers' preferences, as participation is voluntary and influenced by sociocultural values. Consequently, differences in WTP between tax-based and donation-based schemes highlight the role of social norms and cultural attitudes in shaping PES in forest ecosystems. A study in France monitored the WTP for PES in forest ecosystems by focusing on the altruistic characteristics through a CE application and demonstrated that the WTP for supporting PES projects in the tax-based subset ranged from 25.54 to 83.47 EUR per household (Frings et al., 2023). A similar study in Tanzania (East Usambara Mountains), through a CE and a LCM model, displayed that a PES initiative should be adapted to socio-economic or cultural context of the environmental challenge and people were willing to be compensated with a WTA from 36.71 to 103.58 EUR per acre per year (Kaczan et al., 2013). These results are relatively higher when compared with the previous ecosystem categories, leading to the conclusion that forest ecosystems provide not only necessary use values, but also significant non-use values.

Policymakers should also aim on ways to raise awareness and ultimately mobilise funds for the protection environmental goods and services (Strand et al., 2017). Initially, a study in Nepal (Siwalik landscape), through a generalised linear mixed model, examined how forest ecosystem services that can be linked also to WTP for bequest values with an overall mean WTP ranging from 3.91 to 8.94 EUR per household per year for all scenarios (Acharya et al., 2021). Additionally, the observation of positive and negative externalities of forest biomass on neighbouring communities wellbeing in Portugal indicated that, based on CVM and a discrete CE models, on average respondents are willing to pay about 17.16 EUR/month to avoid the effects on fauna/flora and 15.64 EUR to avoid the odour impact, while their WTP to avoid effects on landscape is much smaller 7.85 EUR/month, approximately (Botelho et al., 2016). Interestingly, the interlinkages between forests and indigenous people were monitored, aiming to find how cultural aspects (e.g., superstition) can affect people’s preferences for environmental sustainability by employing a CE method in Ghana, the results marked that the mixed logit model revealed a WTP that reached 79.24 EUR, while the generalized multinomial logit reached even till 92.65 EUR GHS per annum per household (Arthur et al., 2024). Lastly, the societal co-benefits of riparian buffer strips, such as recreation and aesthetics, by applying a CE method, exhibited a WTP from 72.80 to 207.92 EUR/household/year in Denmark (Uggeldahl and Olsen, 2019). Overall, key sociocultural factors include cultural beliefs, community well-being, and public awareness, all influencing WTP levels for environmental goods and services in forest and terrestrial ecosystems across diverse regions.

The valuation of ecosystem services, expect of the use (monetary) values, incorporates also non-use (non-monetary) values such as recreation, aesthetic beauty, cultural heritage, spirituality and inspiration. The interconnectedness of protected areas (e.g., climate regulation, cultural experiences etc.) are underfinanced and lack management effectiveness, this was ratified by a study CE study in Germany, where citizens were willing to pay from 5.25 EUR to 14.87 EUR for water protection in an old, protected area (Segerstedt and Grote, 2015). In Chile, based on a CE method, the WTP for the environmental protection of fauna and flora, as well as water quality (drinkable water) is monitored, as a way to reveal potential stewardship

preferences from the public, resulting on a marginal mean WTP/visitor from about 2.20 EUR/visitor/visit for securing the existence of five species of endemic orchids to about 11.51 EUR for guaranteeing the availability of drinkable water for 50 years (Cerda et al., 2013). Similarly, the impact of aesthetic value for biodiversity, existence value of endemic species, and conservation values showed that can be estimated between 6.75 and 17.49 EUR/person/visit (Cerda, 2013). A CE study in Spain observed the impacts of natural (forest and river) and cultural capitals (patrimony) on WTP for the management of a reserve, where the empirical results for the CLM and RPL modes were 38.04 EUR/ year and 40.51 EUR/ year respectively (Barrio and Loureiro, 2013). In a conjoint analysis (CE and time travel cost) study in Netherlands regarding the cultural services of agricultural landscape, the use (monetary) value is estimated to 31.28 EUR per tourist/year (travel cost), while the non-use (non-monetary) cultural services value is placed on 116.96 EUR (CE) (Van Berkel and Verburg, 2014). In a CE study in USA, the influence of invasive plants was observed as a factor that impacts on recreational choices, where individuals exhibited different choices, for example, regarding the reduction of invasive plants coverage the WTP was 7.33 EUR per visit, but people were also asked to state their opinion regarding the increase of plant and animal biodiversity, showing a WTP of 5.05 EUR and 9.09 EUR respectively (Adams et al., 2011). Similarly, in a travel cost study in Italy, the consumer surplus for the recreational impacts of forests proximity to urban areas was estimated between 9.53 and 22.58 EUR per visit (Alessandro et al., 2023). To conclude, the studies also identified the influence of sociocultural and spiritual elements on environmental conservation, inter alia public environmental stewardship, cultural and aesthetic appreciation, and perceived value of natural and heritage assets can significantly shape individuals' preferences.

4.2.4. Urban Ecosystem (e.g., urban forests/ or anthropogenic characteristics)

Tree planting and reforestation initiatives in urban ecosystems are influenced not only by ecological and socioeconomic perceptions, but also by cultural values and potential barriers to community engagement (Dawes et al., 2018), in this sense, the complexity of landscapes is further intertwined with biophysical characteristics and socio-cultural dimensions, such as identity, heritage, and local land-use traditions (Tagliafierro et al., 2016), highlighting the need for culturally informed ecological planning.

The WTP is an important parameter in urban sustainability policymaking (Halkos et al., 2022, 2024a). Four studies in Europe focus on the impact of green projects impact on citizens' sociocultural and spiritual aspects, such as urban forests or street trees as well as blue projects such as river restoration actions or the creation of a port. In a CE study in Slovenia residents' preferences were assessed based on urban forest benefits such as information boards that accents the cultural and historical features, resulting in a WTP of 0.16 EUR per year for each additional 1% of outstanding trees, while the WTP ranged between 1.40 and 1.87 EUR per year for forest openings (Japelj et al., 2016). In a CE study in Poland, the aim was to find out how the residents value street trees in a city, in which the empirical results the WTP was between 0.72 and 2.01 EUR/month/km (Giergiczny and Kronenberg, 2014) In a discrete choice model study in Belgium, socio-cultural factors play an important role on river restoration actions with the WTP to be 39.64 EUR/household/ year for water improvements, and 73.23 EUR/household/year for recreational activities (Chen et al., 2017). Additionally, a study in Spain investigated the negative environmental externalities of a port can and its impact on local people, where off-site non-users, on-site non-users, and beach users wanted to be compensated with a WTA of 57.82, 146.75, and 193.17 EUR respectively (Tabi and del Saz-Salazar, 2015).

Moreover, two studies on South Korea monitored how spirituality is linked to either urban forests or to pilgrimage eco-tourism, the former study showed that citizens' preferences for urban forests attributes, emphasizing on recreation, reached a WTP from 0.76 to 4.26 EUR (Koo et al., 2013); moreover, the latter study on pilgrimage tourism, people were affected by psychological and spiritual dimensions, showing an average WTP of 114.58 EUR per year per household (Kim et al., 2024).

4.2.5. Species Protection

An important category of non-marketed valuation is the existence value that refers to the worth people assign to simply knowing that a natural resource or ecosystem exists, even if they never directly use it as in the case of the protection of special species protection. An interesting CE study in North and South Korea, based on NEP, focused on four parameters: (i) risk of overuse, (ii) biocentric aspects (species' rights, availability of resources, (iii) anthropocentric (e.g., ecological crisis), and (iv) technocentric optimist (e.g., human ingenuity, showing a mean WTP estimates for endangered species that was calculated for the 'weaker' and 'stronger' segments, and the segment-specific mean WTP estimates are 3.14 and 4.67 EUR, respectively (Choi and Fielding, 2013).

In Europe, several studies focus on threatened species protection. For example, in the UK the species conservation characteristics and uniqueness (e.g., charisma and endemism) can reach a WTO even till 30.08 EUR per household per year (Morse-Jones et al., 2012). Similarly, in a study in Iceland, through CVM and logistic regression, the evaluation of sociocultural (e.g., recreation, spiritual, and cultural) aspects reached an average WTP of 46.94 EUR for the protection of whales (Malinauskaite et al., 2020). In a CE study in Denmark, the existence WTP value ranged from 8.18 to 248.28 EUR/household/year regarding the valuation of biodiversity importance for endangered and rare wildlife(Jacobsen et al., 2012).

Additionally, other pivotal sociocultural links were identified with the conservation of wildlife. In USA the application of a CE study led to the conclusion that the WTP for bird conservation was 12.28 EUR annually, the preferences include mainly the non-use and cultural values of habitat conservation programs (Sharma and Kreye, 2022). Moreover, in a CE and CVM study in Australia, the preferences from different socio-economic stakeholders (e.g., indigenous people) showed a mean WTP of 41.34 EUR/ year on average regarding the conservation of threatened species (Zander et al., 2022). Accordingly, public preferences in New Zealand ranged from 10.83 to 40.98 EUR/year for the creation of planted forests can provide safe habitats for threatened with extinction species (Yao et al., 2014).

To recapitulate, several important sociocultural factors have been identified that can influence environmental valuation, inter alia, the cultural identity of indigenous people, spiritual and recreational connections with rare animal species, as well as the concern for species' uniqueness based on their existence values. Overall, policymakers should be highly alerted regarding public preferences, as they often reflect deep-rooted biocentric, anthropocentric, and non-use values, but they may vary across regions and stakeholder groups.

5. Conclusions and Policy Implications

This review offers a multidisciplinary framework for valuing culturally and spiritually significant natural landscapes, emphasizing how value pluralism can enhance inclusive environmental decision-making. A sum of 103 studies were extracted, 44 on sociocultural and

spiritual aspects, and 59 from environmental economics. These include integrating psychological and sociocultural factors into sustainable development, recognizing spiritual capital as a S2E, and highlights the ethical influences on PEBs. The following sub-sections provide theoretical and practical implications, future research directions, and a conceptual synthesis for a holistic environmental valuation approache.

5.1. Theoretical Implications

This review highlights that values, ethics, and norms significantly influence individuals' WTP for environmental goods or services. At the micro level, personal values such as environmental concern, spirituality (religious or secular), and emotional attachment to nature shape PEBs. Additionally, cultural beliefs like reverence for sacred trees or the concept of Karma can strengthen the connection to nature and increase WTP, linked to the aesthetic appreciation.

At the macro level, ethical beliefs and social norms (altruism and pro-sociality) motivate individuals to act for the collective environmental good. Demographic factors, including age, gender, and participation in spiritual or community activities, also affect environmental commitment. Younger generations, though less traditionally spiritual, show strong activism and a sense of ecological responsibility. Ultimately, integrating sociocultural and spiritual dimensions into environmental economics can enrich behavioral models like TPB and VBN, promoting deeper emotional and moral engagement with nature and informing more inclusive valuation approaches.

5.2. Practical Implications, Limitations, and Future Work

Regarding the practical implications, researchers should consider the importance of qualitative methods (ethnographies) or quantitative analysis (econometrics) in capturing people's preferences heterogeneity based on spiritual and cultural capitals. Secondly, advanced econometric methods include the MiLM (or RPL) and flexible MiMLM models; however, these may not cover all qualitative aspects. As a result, using LCM may shed light on smaller groups of respondents (for example, based on age).

Other limitations in econometrics are, inter alia, respondents' non-attendance, learning fatigue effects, and the influence of personal behaviors, as stated in the CE literature. In a similar way, different forms of biases, such as social desirability bias, can become very difficult to overcome, for this reason the inferred valuation approach provides an alternative way to deal with social desirability bias in CE studies.

To conclude, having in mind the commitment to sustainability, the services to ecosystems, and the Nature's contribution to people, the present review aims to incorporate non-monetary values (e.g., identity and spiritual meaning) into inclusive decision-making policy agendas that are based on psychological, social, and economic interlinkages. This effort would allow for tailored environmental policy by respecting heritage and patrimony in environmental valuation. Ultimately, what the present paper aims to create a research pathway that goes beyond traditional valuation methods and call for culturally-based economic instruments (e.g., WTP) that do not include only economic capacity, but also respect qualitative spiritual characteristics.

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