






Research Article

Perceived cultural ecosystem services in Zaribar Coastal Park: Implications for tourist well-being

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Abstract

Cultural ecosystem services embedded in urban green spaces play a vital yet often underappreciated role in shaping tourists' well-being. This study investigates the perceived contributions of cultural ecosystem services to tourist well-being in Zaribar Coastal Park, a multifunctional urban green space located in Kurdistan Province, Iran. Drawing on the Millennium Ecosystem Assessment framework, ten cultural ecosystem services dimensions were examined through a structured survey of 300 domestic tourists. The sample was selected via Mitra and Lankford's method, and data were analyzed using partial least squares structural equation modeling. Findings reveal that outdoor recreation, aesthetic appreciation, social relations, cultural heritage, educational values, and sense of place significantly enhance tourists' well-being, while cultural diversity, inspiration, knowledge systems, and spiritual values exerted limited or statistically insignificant effects. This study advances theoretical understanding by refining the cultural ecosystem services–well-being linkage within urban tourism contexts and demonstrating the contextual specificity of cultural ecosystem services impacts. Practically, the findings underscore the need for tourism planners and policymakers to integrate cultural ecosystem services into destination design and management strategies. Prioritizing experiential, aesthetic, and recreational dimensions of cultural ecosystem services can foster more inclusive, sustainable, and human-centered urban tourism models.

Key words: Marivan city, Mitra and Lankford's method, outdoor recreation, structural equation modeling, tourism destination, urban green spaces, Zaribar Lake



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1. Introduction

Tourism is widely acknowledged as a pivotal driver of economic growth and socio-cultural exchange, with significant implications for the well-being of both tourists and host communities (Gaonkar and Sukthankar 2025). Beyond its economic contributions, tourism profoundly influences multiple dimensions of well-being, encompassing physical, mental, socio-cultural, and environmental aspects (Kim and Han 2022). Research has shown that positive tourism experiences, such as engaging with natural landscapes or participating in cultural activities, enhance mental and emotional well-being, offering restorative and enriching benefits to tourists (Hartwell et al. 2018). Furthermore, respectful in-

interactions with local communities and their customs can play an important role in enriching socio-cultural well-being, fostering mutual understanding, cultural appreciation, and a sense of global interconnectedness (Román et al. 2022). This highlights the fundamental role of ecosystem services—defined by the Millennium Ecosystem Assessment (MEA) as “benefits that people obtain from ecosystems”—in enhancing human well-being through meaningful connections between people and their environments (MEA 2003).

These services are often categorized into four distinct groups: provisioning services, regulating services, supporting services, and cultural services. Among them, cultural ecosystem services (CES) are integral to tourists’ overall satisfaction and well-being (Dvornikov et al. 2025). CES provide meaningful and transformative experiences by connecting tourists to the cultural and natural heritage of destinations, thereby enhancing their sense of fulfillment and connection to the environment (Tian et al. 2021). These non-material services allow communities to derive benefits from ecosystems by enhancing their connection with nature (MEA 2003). Parks, in particular, serve as significant sources of CES in urban environments (Adhikary et al. 2025). Community engagement and sustainability efforts in parks play an important role in enhancing the delivery of CES, as they reflect the depth of human–nature interactions and contribute to meaningful, place-based experiences (Wang et al. 2022). Research has shown that active involvement with the natural environment may effectively reduce levels of stress, sadness, anxiety, blood pressure, obesity, and diabetes (Huang et al. 2024). However, CES are often overlooked in planning and management due to their associated challenges, such as limited awareness, lack of quantitative data, conflicting economic priorities, weak policy frameworks, and rapid environmental changes (Ghafari Gilandeh and Vaezi 2022).

Tourist well-being is deeply influenced by outdoor recreation, sense of place, social relations, aesthetic values, and cultural diversity—elements central to CES. Outdoor recreation in natural settings reduces stress and fosters emotional restoration, enhancing mental clarity and connection with nature (Reeder and Brown 2005; Korpela et al. 2014). A sense of place creates emotional bonds with destinations, fostering comfort and familiarity (Jepson and Sharpley 2015; Walker and Moscardo 2016). Social relations enrich travel through meaningful interactions, building camaraderie and lasting memories (Knobloch et al. 2017; Chen and Rahman 2018). Aesthetic values, ranging from scenic landscapes to architectural wonders, promote relaxation, creativity, and intellectual engagement (Gordon 2018; Wang et al. 2020a, 2020b). Finally, cultural diversity broadens perspectives, fostering empathy, tolerance, and personal growth (Sthapit 2017; Lonardi and Unterpertinger 2022).

In recent years, scholarly attention to CES in tourism studies has increased, underscoring the vital role of these services in harmonizing social and economic systems (Zoderer et al. 2016b; Taff et al. 2019; Peng et al. 2024). As the focus on sustainable resource allocation intensifies, understanding the non-monetary value of environmental resources has become increasingly essential (Tajima et al. 2023). However, quantifying CES remains inherently challenging due to their intangible and subjective nature, distinguishing them from provisioning and regulating services that are typically assessed using more established metrics (Smith and Ram 2017).

To address these challenges, researchers have employed diverse methodologies, including questionnaires (Tajima et al. 2023), social media analysis (Grzyb and Kulczyk 2023), interviews (Teff-Seker et al. 2022), and participatory mapping using GIS (Tajima et al. 2023; Cybèle et al. 2024). The study by Smith and Ram (2017) demonstrated that a questionnaire developed in alignment with the CES framework effectively captures the intangible benefits of landscapes for tourists across diverse environments. These approaches aim to reflect the multifaceted dimensions of CES and their contributions to tourists' well-being. Several studies (e.g., Zoderer et al. 2016a; Taff et al. 2019; Tian et al. 2023) emphasize the importance of integrating CES into urban planning and tourism assessments. Taff et al. (2019) highlight CES's role in promoting sustainable tourism and well-being, while Tian et al. (2023) identify historical values as the most impactful in urban parks. Zoderer et al. (2016b) show that natural landscapes, especially traditional ones, are key hotspots for CES, while intensively managed landscapes are primarily valued for their cultural heritage. Collectively, these studies underscore the need to incorporate CES into sustainable management practices and policy decisions.

While much empirical research on CES has examined the perspectives of local residents (Dou et al. 2017; Grzyb 2024), few studies have explored the combined dimensions of CES and tourist well-being (Zoderer et al. 2016a; Tajima et al. 2023), particularly among domestic tourists. Similarly, research on CES and psychological well-being in coastal landscapes is scarce. For instance, Cabana et al. (2024) examined the role of CES in coastal environments in relation to the subjective well-being of adolescents. Furthermore, the impact of CES on tourists' well-being remains a largely underexplored area.

To fill the gap in research, this study examines the perceived CES and their impacts on tourists' well-being in Zaribar Coastal Park in Kurdistan Province, northwest Iran. Green spaces adjacent to water bodies transform landscapes into major urban recreational areas (Durán Vian et al. 2021). The presence of a lake enables physical activity along its shoreline pathways, fostering a sense of place (Kičić et al. 2022). Recreational amenities in these areas can enhance social interactions, and the combination of built environments with water creates valuable aesthetic and cognitive experiences (White et al. 2010). By addressing this research gap, valuable insights can be gained to improve tourist experiences in coastal urban parks. This leads to a critical research question: How does the perception of CES impact tourists' well-being?

To address the research question, a conceptual model was developed based on established theoretical frameworks (MEA, 2003; Cheng et al. 2019). This model outlines the relationships between various dimensions of CES and tourist well-being, serving as the methodological foundation for the study. It informs the selection of research variables and guides the overall research design. To evaluate the conceptual framework, the following hypotheses were proposed:

- (1) Cultural diversity improves tourist well-being;
- (2) Spiritual and religious values improve tourist well-being;
- (3) Cultural heritage values improve tourist well-being;
- (4) Aesthetic values improve tourist well-being;
- (5) Social relations improve tourist well-being;
- (6) Sense of place improves tourist well-being;
- (7) Outdoor recreation improves tourist well-being;

- (8) Educational opportunities improve tourist well-being;
- (9) Knowledge systems improve tourist well-being;
- (10) Inspiration improves tourist well-being.

2. Theoretical background and hypotheses

Parks provide various CES that are beneficial to human well-being. Subdividing CES into smaller subcategories facilitates a clearer understanding of visitors' perceptions (Ferguson et al. 2024). MEA (2023) identifies ten types of CES, including spiritual and religious values, aesthetic values, outdoor recreation, cultural diversity, knowledge systems, educational values, inspiration, social relationships, sense of place, and cultural heritage values. Definitions of these concepts are presented in Table 1. The theoretical framework and corresponding hypotheses are illustrated in Fig. 1.

Table 1. Categories of cultural ecosystem services (MEA 2003).

Category	Concept
Cultural diversity	The variety of ecosystems is a determinant of the diversity of cultural groups, defined as communities sharing common languages, traditions, or beliefs that influence their relationship with nature.
Spiritual and religious values	Numerous religious traditions attribute spiritual and theological significance to ecological systems or their constituent elements.
Knowledge systems	Ecosystems have a significant effect on the development of knowledge systems across many civilizations.
Educational values	Ecosystems and their constituents and mechanisms serve as the foundation for both structured and unstructured education in several societies.
Inspiration	Ecosystems provide a diverse range of inspiration for many artistic expressions, including art, folklore, national emblems, architecture, and advertising.
Aesthetic values	A significant number of individuals see beauty or artistic worth in different elements of ecological systems, as shown by their endorsement of parks, "scenic drives", and the choice of residential areas.
Social relations	In certain cultural contexts, ecosystems have a significant impact on the formation and development of social ties.
Sense of place	A significant number of individuals highly appreciate the "sense of place" that is linked to identifiable characteristics of their surroundings, including elements of the ecological system.
Cultural heritage values	Numerous civilizations attach great importance to the preservation of either historically significant landscapes, sometimes referred to as "cultural landscapes", or species that have cultural significance.
Outdoor recreation	Individuals often make decisions on the allocation of their recreational time, taking into consideration the attributes of the natural or developed environments within a certain locality.

2.1. Cultural diversity and well-being of tourists

Cultural diversity enriches tourists' well-being through a myriad of experiences, including traditions, languages, cuisines, and lifestyles. This deepens understanding of the world and fosters enhanced learning opportunities, including

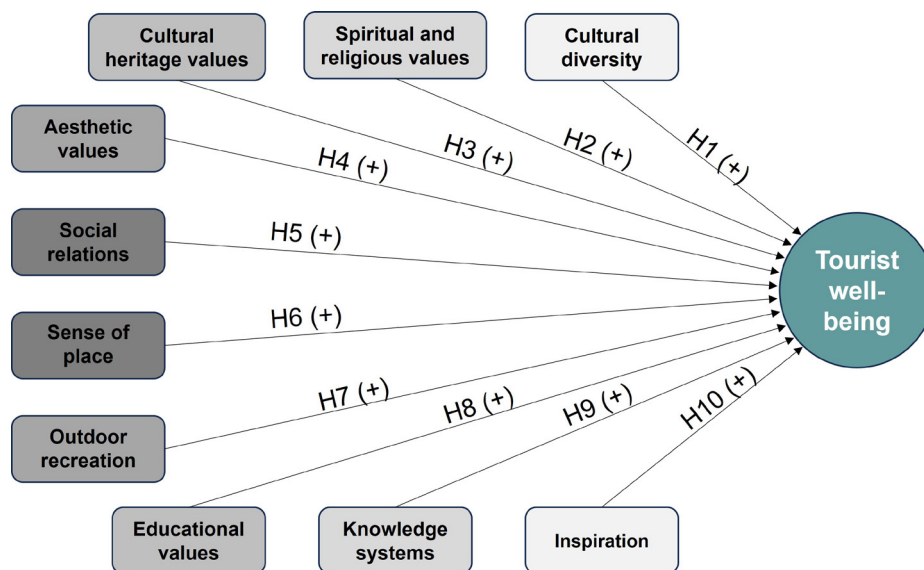


Figure 1. Theoretical framework and hypotheses.

delving into history, art, customs, and societal norms (Staphit 2017). Furthermore, exposure to diverse cultures promotes empathy and tolerance, fostering a more inclusive worldview, contributing to personal growth, and enhancing social harmony. Engaging with diverse cultures also fosters a sense of connection and belonging, nurturing friendships and meaningful interactions that improve overall well-being (Lonardi and Unterperntinger 2022). Based on this premise, the following hypothesis is proposed: Hypothesis 1. Cultural diversity improves the well-being of tourists.

2.2. Spiritual and religious values and well-being of tourists

Spiritual and religious values provide a sense of purpose, significance, and affiliation with a higher entity, which may enhance one’s overall cognitive state, as well as emotional and even physical well-being during travel (Kim and Kim 2019). When tourists engage in spiritual or religious practices, whether through visiting sacred sites, participating in rituals or ceremonies, or seeking spiritual guidance, they often experience a profound sense of peace, inner fulfillment, and spiritual growth. These experiences can lead to a deeper understanding of different cultures and traditions, fostering empathy, tolerance, and respect (Moaven 2020). Based on this premise, the following hypothesis is proposed: Hypothesis 2. Spiritual and religious values improve the well-being of tourists.

2.3. Cultural heritage values and well-being of tourists

Exploring historical sites, monuments, and artefacts offers visitors a deeper understanding of the rich tapestry of human history and cultural diversity. Immersing oneself in cultural heritage fosters a sense of connection to the past (Tengberg et al. 2012). Engaging with cultural heritage often leads to enriching experiences that stimulate curiosity, creativity, and intellectual growth. Tourists gain insights into the values, beliefs, and practices of different communities

(Cheng and Chen 2022). Furthermore, visiting heritage sites can evoke a sense of awe and inspiration in tourists. Many tourists find solace and joy in connecting with their cultural roots and the shared heritage of humanity (Li and Zhong 2022). Thus, the following hypothesis is proposed: Hypothesis 3. Cultural heritage values improve the well-being of tourists.

2.4. Aesthetic values and well-being of tourists

Experiencing beauty in various forms, such as natural landscapes, architectural marvels, artistic creations, and cultural performances, can have a profound impact on emotional and psychological health (Gordon 2018). Scenic vistas, serene beaches, majestic mountains, and lush forests offer tourists opportunities for relaxation, rejuvenation, and inner peace. Connecting with nature's beauty can reduce stress, promote mindfulness, and enhance overall mental well-being (Wang et al. 2020b). Exploring architectural wonders and historical landmarks stimulates creativity, curiosity, and intellectual engagement, enriching the travel experience and leaving lasting impressions (Wang et al. 2020a). Therefore, the following hypothesis is proposed: Hypothesis 4. Aesthetic values improve the well-being of tourists.

2.5. Social relations and well-being of tourists

When people travel, they often seek connections with others, whether with locals or fellow travelers (Chen and Rahman 2018). Sharing experiences with others creates lasting memories and interpersonal bonds. Whether exploring a new destination, sampling local cuisine, or participating in group activities, these shared moments enhance enjoyment and create a sense of camaraderie (Coelho et al. 2018). Laughing, exchanging stories, and forming relationships with others can contribute to overall feelings of joy and fulfillment during travel (Knobloch et al. 2017). Research has shown that tourists who engage in meaningful social interactions report higher levels of satisfaction with their travel experiences. These interactions enrich the journey, offering deeper fulfillment beyond merely visiting attractions (Chen and Rahman 2018). Based on this, the following hypothesis is proposed: Hypothesis 5. Social relations improve the well-being of tourists.

2.6. Sense of place and well-being of tourists

Developing a sense of place enables tourists to form emotional connections with the destinations they visit. This connection fosters feelings of attachment, comfort, and familiarity, which contribute to overall well-being (Jepson and Sharpley 2015). A strong sense of place often arises from authentic experiences that reflect a destination's unique culture, history, and identity. Participating in activities and interactions that highlight local character can deepen tourists' appreciation and satisfaction with their travel experiences (Walker and Moscardo 2016). Furthermore, a sense of place can promote comfort and security, helping to reduce stress and anxiety often associated with travel. For some tourists, it also plays a role in shaping personal identity (Peng et al. 2020). The

research hypothesis is proposed accordingly: Hypothesis 6. Sense of place improves the well-being of tourists.

2.7. Outdoor recreation and well-being of tourists

Outdoor recreation in natural environments plays a pivotal role in enhancing tourist well-being by providing opportunities to engage with nature and disconnect from everyday stressors (Reeder and Brown 2005). Empirical studies have consistently shown that time spent in natural settings significantly improves mental health, reducing stress, anxiety, and fatigue, while promoting emotional restoration and cognitive rejuvenation (Korpela et al. 2014; Rastkhadiv and Rahimi 2024). Nature-based recreational activities such as hiking, birdwatching, or simply immersing oneself in scenic landscapes offer a therapeutic escape that fosters relaxation and mental clarity. These experiences not only contribute to immediate psychological well-being but also cultivate a deeper connection with nature. This underscores the importance of integrating outdoor recreational opportunities into tourism planning to support the holistic well-being of tourists (Korpela et al. 2014). Based on this, the following hypothesis is proposed: Hypothesis 7. Outdoor recreation improves the well-being of tourists.

2.8. Educational values and well-being of tourists

Educational tourism experiences can significantly enhance tourists' well-being by fostering cultural understanding, personal growth, and a sense of purpose (Joseph Sirgy 2019). Exploring different cultures, customs, and lifestyles through travel promotes empathy, tolerance, and respect for diversity. These experiences also build resilience and self-confidence, leading to a sense of achievement and satisfaction (Edelheim 2020). Moreover, such experiences can facilitate meaningful connections with locals, tour guides, and fellow travelers, thereby promoting emotional well-being (Pope 2018). Thus, the following hypothesis is proposed: Hypothesis 8. Educational values improve the well-being of tourists.

2.9. Knowledge systems and well-being of tourists

Knowledge systems provide tourists with easy access to relevant information about destinations, accommodations, attractions, activities, and local customs. This enables them to make well-informed decisions, ensuring safety, satisfaction, and enjoyment during their travels (Tribe and Liburd 2016). Through these systems, tourists can access essential information regarding safety measures, potential risks, and emergency contacts. This helps them navigate unfamiliar environments more confidently, reducing anxiety and enhancing their overall well-being (Tavakoli and Wijesinghe 2019). Knowledge systems often include cultural insights and tips, helping tourists understand and respect local customs, traditions, and etiquette. This cultural awareness fosters positive interactions with locals and promotes cross-cultural understanding (Magni 2017). Therefore, the following hypothesis is proposed: Hypothesis 9. Knowledge systems improve the well-being of tourists.

2.10. Inspiration and well-being of tourists

Visiting inspiring landmarks, natural wonders, or culturally rich sites can evoke powerful emotions such as awe, wonder, and joy. These emotional experiences contribute to overall well-being by providing moments of personal fulfillment and enrichment (Knobloch et al. 2017). Tourists may gain insights, develop new skills, or challenge their existing beliefs, leading to enhanced self-esteem and a sense of accomplishment (Gordon 2018). Immersing oneself in awe-inspiring natural environments promotes feelings of peace, tranquility, and connectedness with nature, an association strongly linked to improved mental health and overall well-being (Buckley 2020). Traveling to culturally vibrant destinations or attending artistic events can also stimulate creativity and inspiration. Exposure to new art forms, architecture, music, or cuisine can ignite creative thinking and provide fresh perspectives, enhancing well-being (Gordon 2018). Therefore, the following hypothesis is proposed: Hypothesis 10. Inspiration improves the well-being of tourists.

3. Research method

3.1. Case study

The city of Marivan is located at 31°35'N and 46°10'E in the west of Kurdistan Province, Iran (Rezaei et al. 2022). Due to its moderate and favorable climate as well as natural, commercial and cultural attractions, this city has become one of the popular tourist destinations (Tayebnia 2020). Zaribar Coastal Park in Marivan with an area of 4.6 ha, stands as an appealing destination known for its diverse and captivating physical and natural features. Situated along the shores of Zaribar Lake, the park boasts a beautiful environment with panoramic views of the lake and the surrounding forest landscapes.

Zaribar Coastal Park is home to rich biodiversity, supporting a variety of native plant and animal species (Farshad et al. 2021). The lake's clear and unspoiled waters offer ample opportunities for recreational activities such as swimming, boating, and fishing. Well-designed walking paths and hiking trails meander through the park, allowing visitors to immerse themselves in its natural beauty. These trails lead to secluded spots, each offering its own unique charm. In addition to its physical appeal, Zaribar Coastal Park holds considerable cultural and ecological significance, making it an ideal case study for exploring CES.

Zaribar Coastal Park exemplifies a unique integration of recreational services (e.g., swimming, boating, and fishing), aesthetic services (e.g., panoramic views and natural beauty), spiritual and inspirational services (e.g., a serene environment for reflection), and cultural heritage services (e.g., traditional pavilions, local games, and street theater). This comprehensive range of CES makes the Park a microcosm for studying the interplay between cultural values and natural ecosystems, providing valuable insights into how cultural services enhance human well-being and community identity. The Park features architectural elements, including traditional pavilions and viewing platforms, enhancing the cultural atmosphere and providing spaces for relaxation and enjoyment of the environment for visitors (Taghilo et al. 2018). It also serves as a venue for

cultural events, such as street theater and local games, creating a vibrant and lively space that connects visitors with the cultural identity of the region. Zaribar Coastal Park, as a case study, exemplifies the harmonious integration of physical beauty and cultural richness. The unique blend of natural wonders and cultural elements in this park has created a diverse destination that satisfies both the aesthetic and cultural preferences of visitors, offering an immersive and enriching experience (Rastkhadiv et al. 2024). The map and the study area photos are illustrated in Fig. 2.



Figure 2. Case study area. **A** Zaribar Coastal Park (Google Earth 2025) **B** Zaribar Coastal Park and related CES (Karnaval 2019): 1—Boating, 2—Scenic landscape, 3—Bird watching, 4—Street theatre, 5—Natural landscape, 6—Fishing, 7—Local dance, 8—Local food, 9—Scenic landscape, 10—Paragliding site, 11—traditional pavilions, 12—Tomb.

3.2. Procedure of data collection

In this study, tourist well-being was measured using the hedonic approach (Cooke et al. 2016; Spanou et al. 2020), focusing on the positive experiences perceived by tourists during their interactions with CES in Zaribar Coastal Park. Based on the internationally accepted definition provided by the United Nations World Tourism Organization (UNWTO 2010), which defines a tourist as “an individual who travels to a place outside their usual environment and stays at least one night for purposes such as leisure or recreation”, we included only domestic tourists who were not residents of Marivan and had visited the park for at least two days. This criterion was clearly communicated in the description of the questionnaire and accompanying announcements for online participants. For field respondents, we verified their eligibility prior to survey administration.

Data collection was conducted using a structured questionnaire comprising closed-ended questions measured on a 5-point Likert scale (very high = 5, high = 4, medium = 3, low = 2, very low = 1). The questionnaire was meticulously designed based on a thorough review of relevant literature and aligned with the theoretical framework of the study. It was organized into multiple sections to comprehensively address the research objectives and included a total of 42 questions. Among these, 30 questions were dedicated to assessing ten variables related to CES, with three questions per variable to ensure detailed and nuanced responses (independent variables).

Additionally, eight questions were designed to measure dependent variables, capturing participants' past experiences and perceptions of the cultural services offered by urban parks. A demographic section, comprising four questions, gathered information on gender, age, marital status, and education level. The study focused on domestic tourists, with data collection conducted during the spring and summer of 2023, periods when Zaribar Coastal Park experiences peak visitation. The variables and factors measured in the questionnaire are summarized in Table 2.

To ensure the validity and reliability of the questionnaire, a rigorous multi-step procedure was implemented: (i) Content validation: The questionnaire was developed through a systematic synthesis of constructs and indicators derived from existing literature on CES and urban parks. Each item was carefully aligned with its corresponding theoretical construct to ensure conceptual coherence. The preliminary version underwent an expert review process involving specialists in landscape, urban planning, and tourism. Their feedback on relevance, clarity, and appropriateness led to iterative refinements to the questionnaire. (ii) Pilot testing: A pilot study involving 30 participants representative of the target population was conducted to identify and address potential issues related to question wording, structure, and overall design. Participant feedback was systematically analyzed and used to enhance the questionnaire's clarity, coherence, and usability. (iii) Reliability assessment: The internal consistency of the questionnaire was evaluated using Cronbach's alpha coefficient during the pilot phase. All constructs demonstrated satisfactory reliability ($\alpha > 0.7$), confirming the instrument's robustness for data collection and analysis.

The questionnaire was distributed using both in-person and online methods. The online questionnaires were shared via tourism-related public pages

Table 2. Classification of factors related to cultural ecosystem service variables in the questionnaire structure.

Variables of CES	Factors of CES	Labels
Inspiration	Inspire creativity and imagination through natural landscape	IN1
	Inspiration from natural landscape	IN2
	Inspiration from culture and spiritual values in tourism destination	IN3
Educational values	Environmental education through bird watching	EV1
	Cultural and historical education	EV2
	Health and well-being education through recreational activities such as walking, fishing, and boating	EV3
Sense of place	Sense of identity and belonging	SP1
	The sensed landscape	SP2
	Sense of community	SP3
Cultural heritage values	History and antiquity of the region	CH1
	Local culture and traditions	CH2
	Local cuisine and traditional cooking	CH3
Aesthetic values	Biodiversity; diversity of plants and animals	AV1
	Provide aesthetic pleasure landscape	AV2
	Harmony between nature and human presence	AV3
Social relations	Recreational activities and social interaction	SR1
	Cultural exchange between locals and tourists	SR2
	Various forms of urban furniture to promote social interactions	SR3
Spiritual and religious values	Connecting local tourists with natural contexts spiritually	SRV1
	Connection to Kurdish identity	SRV2
	Myths and legends	SRV3
Outdoor recreation	Recreational space for relax and enjoy outdoors	RE1
	Nature-based outdoor recreation	RE2
	Recreational activities such as walking, fishing, Paragliding, and boating	RE3
Knowledge systems	Artisanal and craft knowledge	KS1
	Medicinal and herbal knowledge	KS2
	Environmental stewardship	KS3
Cultural diversity	Ethnic and linguistic diversity	CD1
	Traditional music and dance	CD2
	Festivals and celebrations	CD3
Well-being benefits of cultural ecosystem service	The experience of connecting to nature	CES1
	The feeling of belonging and attachment to a place	CES2
	The experience of inspiration from nature	CES3
	Experience the cultural and historical background of the city in the landscape	CES4
	Providing the necessary infrastructure to gain educational experiences in urban green spaces	CES5
	The experience of strengthening bonds with others	CES6
	Experience and acquire topics related to spirituality and religion	CES7
	The improvement of physical and/ or mental health	CES8

on Instagram and public groups on Telegram with followers from various regions across Iran, resulting in 178 completed responses. The remaining 122 responses were collected on-site from domestic tourists. Although a random sampling approach was initially intended for the on-site survey, true random sampling is practically unfeasible in such open settings where the target population is undefined and fluctuating. Therefore, a combination of convenience sampling (based on tourist availability) and informal quota sampling (to ensure basic diversity in age and gender) was applied to obtain a reasonably diverse sample. Online distribution was prioritized for its cost-effectiveness and efficiency in gathering large datasets, as supported by previous studies (Luo et al. 2022; Xia et al. 2023). The online platform ensured mandatory responses to all questions and utilized warm colors to enhance respondent engagement. QR codes were employed for distribution. Given the uncertainty regarding the population size, the Mitra and Lankford method (Eq. 1) was applied to determine the sample size, an approach particularly suited to landscape studies with undefined or unknown populations (Mitra and Lankford 1998). With a margin of error (e) set at 2.88%, the method yielded a sample size of 300 participants, deemed appropriate for the study.

$$e = \sqrt{\frac{P \times (1 - P)}{n}}, \quad 2.88 = \sqrt{\frac{0.5 \times (1 - 0.5)}{n}} \quad (1)$$

Where: P is the estimated population proportion (or percentage), and $P = 50\%$ (or 0.5) is used to maximize the margin of error, e is the margin of error (or sampling error), $e = 2.88$, n is the sample size, and $n = 300$.

3.3. Data analysis

Multivariate analysis is a very effective way for analyzing data in behavioral and social sciences research (Rastkhadiv and Veisi Nabikandi 2024). Structural Equation Modeling (SEM) based on the variance approach and Covariance-based Structural Equation Modeling (CB-SEM) are among the primary methods for analyzing complex and multivariate data. This approach encompasses statistical methods such as factor analysis, regression, and path analysis. It enables the researcher to establish multiple relationships simultaneously. SEM pursues the following objectives: 1) Modeling relationships between independent and dependent variables in the structural model, 2) Modeling latent variables in the measurement model, 3) Modeling measurement errors of observable and dependent variables, and 4) Testing hypotheses derived from the literature using data or path analysis (Kirschkamp 2008).

In this context, one of the most widely used tools is Smart PLS software. Structural Equation Modeling (SEM) with a Partial Least Squares (PLS) approach in Smart PLS is particularly well-suited for small sample sizes and non-normal data, demonstrating robustness against collinearity (Hair et al. 2021). The primary reasons for selecting PLS include its strong predictive power, ability to address complex models, and its effectiveness in exploratory research aimed at advancing theoretical frameworks or developing new models (Henseler et al. 2009). Furthermore, PLS excels in analyzing latent variables with fewer indicators, making it a preferred choice for studies with limited data

(Hair et al. 2010). Given these advantages, the data collected in this study were analyzed using Smart PLS software.

The standardized betas in linear regression denote the coefficients of the route. The examination of path coefficients necessitates an analysis of their size, sign, and importance. Positive route coefficients show direct links between latent variables, both endogenous and exogenous. Conversely, negative path coefficients signify an inverse relationship between latent variables. The magnitude of these coefficients reflects the strength of the relationship, typically ranging between -1 and 1. Values in close proximity to -1 are indicative of robust negative associations, while values closer to 1 signify robust positive associations (Hair et al. 2021). The amount and value of the beta coefficient in the model determine the relevance of route coefficients. The link or hypothesis is deemed verified if the resulting value above the minimum needed statistic at the selected confidence level. The value is compared to minimal *t*-statistics of 1.64, 1.96, and 2.58, respectively, at significance levels of 90%, 95%, and 99% (Henseler et al. 2009; Hair et al. 2021).

3.4. Descriptive statistics

SPSS was used to obtain descriptive statistics for the respondents' demographic characteristics. The total number of participants in the survey was 300. Of these, 47.3% were female and 52.7% were male. Regarding marital status, 43% of respondents were single, while approximately 57% were married. This study was conducted among individuals aged 18 years and older. The largest proportion of participants fell within the 18–29 age group, while the smallest proportion belonged to the 40–50 age group. In terms of education level, individuals holding a bachelor's degree comprised 41% of the sample, whereas those with a diploma made up only 12.7% (Table 3).

Table 3. Respondents' demographic characteristics (n = 300).

Variable	Category	Number	Percentage (%)	Total percentage (%)
Gender	Male	158	52.7	100
	Female	142	47.3	100
Marital status	Single	129	43	100
	Married	171	57	
Age	18–29	94	31.3	100
	30–39	71	23.7	
	40–50	66	22	
	>50 years old	69	23	
Education level	Under diploma	45	15	100
	Diploma	38	12.7	
	Bachelor	123	41	
	Master and higher	94	31.3	

3.5. Reliability and validity

To assess the reliability and validity of the research variables, PLS Algorithm reports generated by SmartPLS software were used. Composite Reliability (CR) and Cronbach's Alpha (α) tests were applied to evaluate internal consistency and the reliability of the constructs. The values of α and CR are considered acceptable when they exceed 0.7 (Aburumman et al. 2023). As shown in Table 4, all variables in this study demonstrated CR values greater than 0.7, confirming their acceptability. Additionally, the α values for all variables, except for the outdoor recreation variable, were greater than 0.7. However, Fornell and Larcker (1981) suggested that the CR score is superior and more acceptable than the α criterion for internal consistency, as it utilizes the loadings of items obtained in the theoretical model. Given that the CR reliability test for the outdoor recreation variable yielded a value greater than 0.7, the α value remains acceptable. Equations 2, 3 illustrate how to calculate CR and α , respectively.

$$CR = \frac{\sum_{i=1}^n \lambda_i^2}{\sum_{i=1}^n \lambda_i^2 + \sum_{i=1}^n Var(e_i)} \quad (2)$$

Where: CR is composite reliability, λ is standardized factor loading, n is the number of observed variables (items), e is error term.

$$\alpha = \frac{n\bar{r}}{1 + \bar{r}(n - 1)} \quad (3)$$

Where: α is Cronbach's alpha, n is the number of items, \bar{r} is an average inter-item correlation.

The Average Variance Extracted (AVE) measures the validity of constructs, with values greater than 0.5 indicating an acceptable level of validity (Hair et al. 2011). In this study, all research variables recorded AVE values above the 0.5 threshold, suggesting that the constructs demonstrate strong validity. The calculation method for AVE is presented in Eq. 4.

$$AVE = \frac{\sum_{i=1}^n \lambda_i^2}{n} \quad (4)$$

Where: AVE is average variance extracted, λ is standardized factor loading, n is the number of observed variables (items).

3.6. Predictive relevance (Q²) of the structural model

The predictive relevance of the Stone-Geisser (Q²) is a key indicator used to evaluate the quality of a structural model. It assesses the model's predictive accuracy through the blindfolding technique. As a widely recognized criterion for predictive relevance, the Q² value indicates how well the model can predict endogenous latent variables. According to Henseler et al. (2009), Q² values of 0.02, 0.15, and 0.35 correspond to weak, moderate, and strong predictive relevance, respectively. In this study, the Q² value obtained for the structural model is 0.484 (Table 5), signifying a strong level of predictive power and confirming the model's robustness.

Table 4. Construct reliability and validity.

Variables	Items	Factor loading	α	Rho_A	CR	AVE
Aesthetic values	AV1	34.564	0.855	0.864	0.912	0.775
	AV2	49.258				
	AV3	46.467				
Cultural heritage values	CHV1	63.505	0.789	0.851	0.859	0.694
	CHV2	11.166				
	CHV3	54.805				
Knowledge system	KS1	39.940	0.773	0.814	0.870	0.771
	KS2	42.446				
	KS3	60.904				
Cultural diversity	CD1	4.926	0.803	0.801	0.884	0.678
	CD2	4.061				
	CD3	2.203				
Educational values	EV1	30.396	0.712	0.708	0.796	0.718
	EV2	33.870				
	EV3	43.360				
Inspiration	IN1	14.016	0.852	0.853	0.91	0.568
	IN2	30.169				
	IN3	10.366				
Outdoor recreation	RE1	121.949	0.65	0.804	0.757	0.506
	RE2	14.905				
	RE3	0.459				
Sense of place	SP1	28.713	0.767	0.777	0.818	0.601
	SP2	13.313				
	SP3	23.278				
Social relations	SR1	49.329	0.729	0.72	0.759	0.549
	SR2	29.232				
	SR3	2.175				
Spiritual and religious values	SRV1	47.878	0.743	0.765	0.854	0.662
	SRV2	15.366				
	SRV3	24.862				
Well-being of tourists	CES1	32.160	0.894	0.905	0.917	0.583
	CES2	13.906				
	CES3	27.699				
	CES4	45.185				
	CES5	28.914				
	CES6	33.590				
	CES7	12.443				
	CES8	8.142				

Table 5. Construct cross-validated redundancy.

Dependent variable	Q ² (=1-SSE/SSO)
Well-being of tourists	0.484

3.7. Assessing Goodness-of-Fit (GoF)

It is important to note that, in structural equation modeling using the PLS technique, there is no universally accepted single index for evaluating the overall model fit, as is common in covariance-based SEM. To address this gap, Tenenhaus et al. (2005) introduced the Goodness-of-Fit (GoF) index, which incorporates both the measurement model and the structural model. The GoF index serves as a global criterion for assessing the overall quality, explanatory power, and credibility of a PLS-SEM model. The GoF value can be calculated using Eq. 5:

$$GoF = \sqrt{R^2 \times AVE} \quad (5)$$

$$\mu_{AVE} = \frac{1}{n} \cdot \sum_{i=1}^n x_i$$

$$= \frac{\mu_{AVE}}{0.775 + 0.694 + 0.771 + 0.678 + 0.718 + 0.568 + 0.506 + 0.601 + 0.549 + 0.662 + 0.583} = \frac{\mu_{AVE}}{11}$$

$$\mu_{AVE} = 0.645$$

$$\mu_{R^2} = \frac{1}{n} \cdot \sum_{i=1}^n x_i$$

$$\mu_{R^2} = 0.906$$

$$GoF = \sqrt{0.906^2 \times 0.645}$$

$$GoF = 0.72$$

The value of the Goodness-of-Fit (GoF) index ranges between 0 and 1. According to Wetzels et al. (2009), threshold values of 0.01, 0.25, and 0.36 represent weak, moderate, and strong model fit, respectively. Based on these benchmarks, the GoF value (0.72) obtained for the current research model indicates a strong and acceptable overall model quality.

3.8. Coefficient of determination (R²)

In the analysis of structural models using the PLS approach, the R² value is a fundamental measure for evaluating latent variables. This indicator quantifies the percentage of the latent variable's variability that the exogenous variable can explain. The latent variables (dependent) in the structural model are characterized as weak, moderate, and considerable, with respective values of 0.19, 0.33, and 0.67 (Henseler et al. 2009). However, Hair et al. (2011) defined values of 0.025, 0.5, and 0.75 as weak, moderate, and substantial, respectively. In the structural model of this study, as depicted in Fig. 4 and Table 6, the R² value for the dependent variable "Well-being of tourists" is 0.906. This signifies that the independent variables in the study have been able to elucidate 90.6% of the variations in the dependent variable. This considerable value indicates the high quality of the research structural model.

Table 6. R² assessment.

Dependent variable	R ²	R ² adjusted
Well-being of tourists	0.906	0.902

4. Results

4.1. Path coefficients and structural analysis of research hypotheses

The results indicate that several independent variables significantly influence tourist well-being at Zaribar Coastal Park, supporting the proposed hypotheses. Among these factors, outdoor recreation, aesthetic values, and social relations were identified as the most influential on tourist well-being, with *t*-statistics of 4.461, 3.438, and 3.201, and path coefficients of 0.301, 0.208, and 0.141, respectively. Since their *t*-statistics exceeded 2.58, outdoor recreation, aesthetic values, and social relations were confirmed at the 99% confidence level, with all relationships showing significant positive effects. Additionally, several other CES variables also positively influenced tourist well-being at approximately the 95% confidence level. Specifically, cultural heritage values, sense of place, and educational values had *t*-statistics of 2.186, 2.542, and 2.162, with corresponding path coefficients of 0.182, 0.167, and 0.103, respectively. Since the *t*-statistics for these variables exceeded the threshold of 1.96, they were confirmed

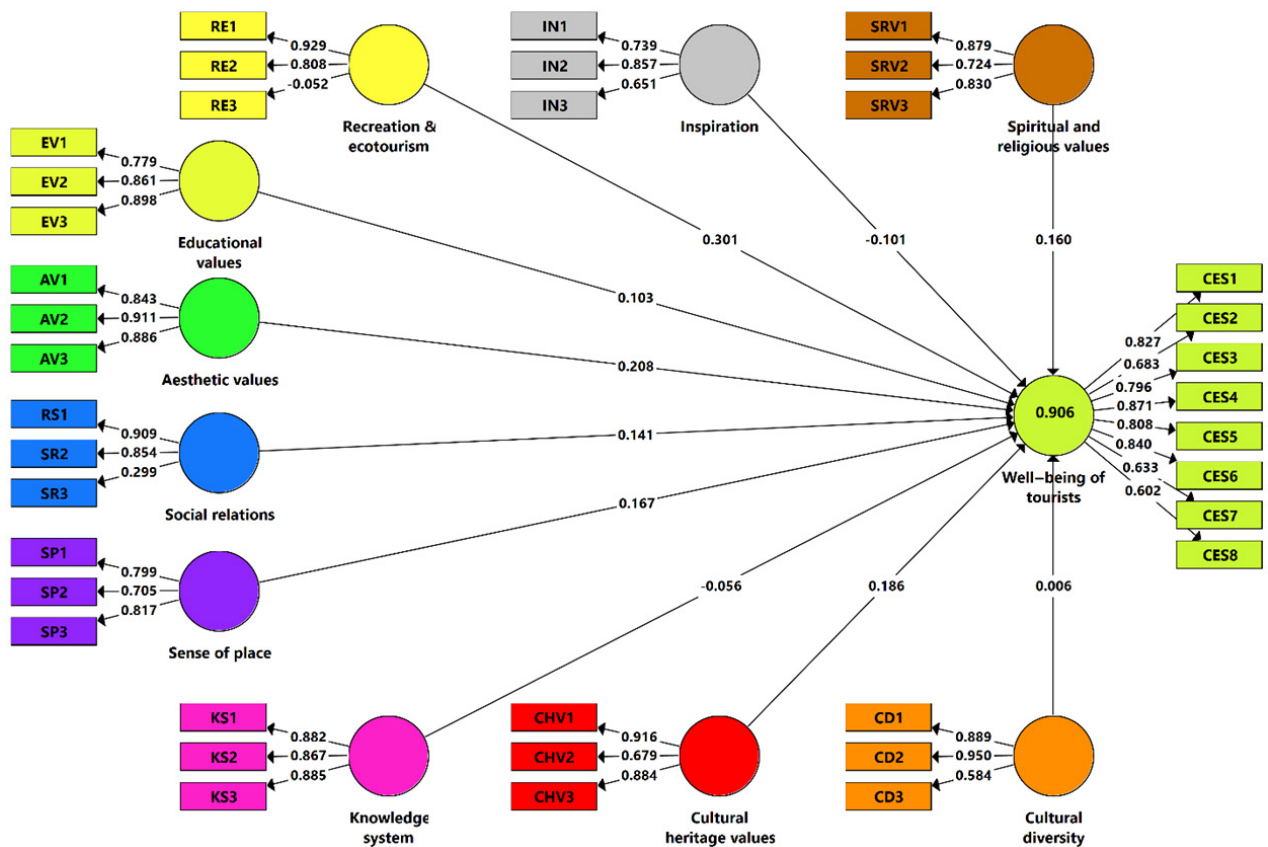


Figure 3. Path coefficients.

at a 95% confidence level. These findings indicate that these factors positively influence tourist well-being, suggesting that tourists perceived a positive experience of nature in relation to these CESs. Furthermore, other variables in the study—namely, cultural diversity, inspiration, knowledge systems, and spiritual and religious values—did not obtain acceptable *t*-statistics and path coefficients. Path coefficients, *t*-statistics, and *p* values for the research hypotheses are presented in Figs 3, 4 as well as Table 7.

Table 7. Path loadings.

Paths/hypotheses	Original sample	Sample mean	Standard deviation	<i>t</i> -statistics	<i>p</i> values
Aesthetic values -> Well-being of tourists	0.208	0.215	0.061	3.438	0.001
Cultural diversity -> Well-being of tourists	0.006	0.005	0.019	0.316	0.752
Cultural heritage values -> Well-being of tourists	0.186	0.182	0.066	2.816	0.005
Educational values -> Well-being of tourists	0.103	0.097	0.048	2.162	0.031
Inspiration -> Well-being of tourists	-0.101	-0.092	0.085	1.191	0.234
Knowledge system -> Well-being of tourists	-0.056	-0.055	0.046	1.215	0.225
Outdoor recreation -> Well-being of tourists	0.301	0.301	0.067	4.461	0.001
Sense of place -> Well-being of tourists	0.167	0.161	0.066	2.542	0.011
Social relations -> Well-being of tourists	0.141	0.142	0.044	3.201	0.001
Spiritual and religious values -> Well-being of tourists	0.16	0.158	0.083	1.93	0.054

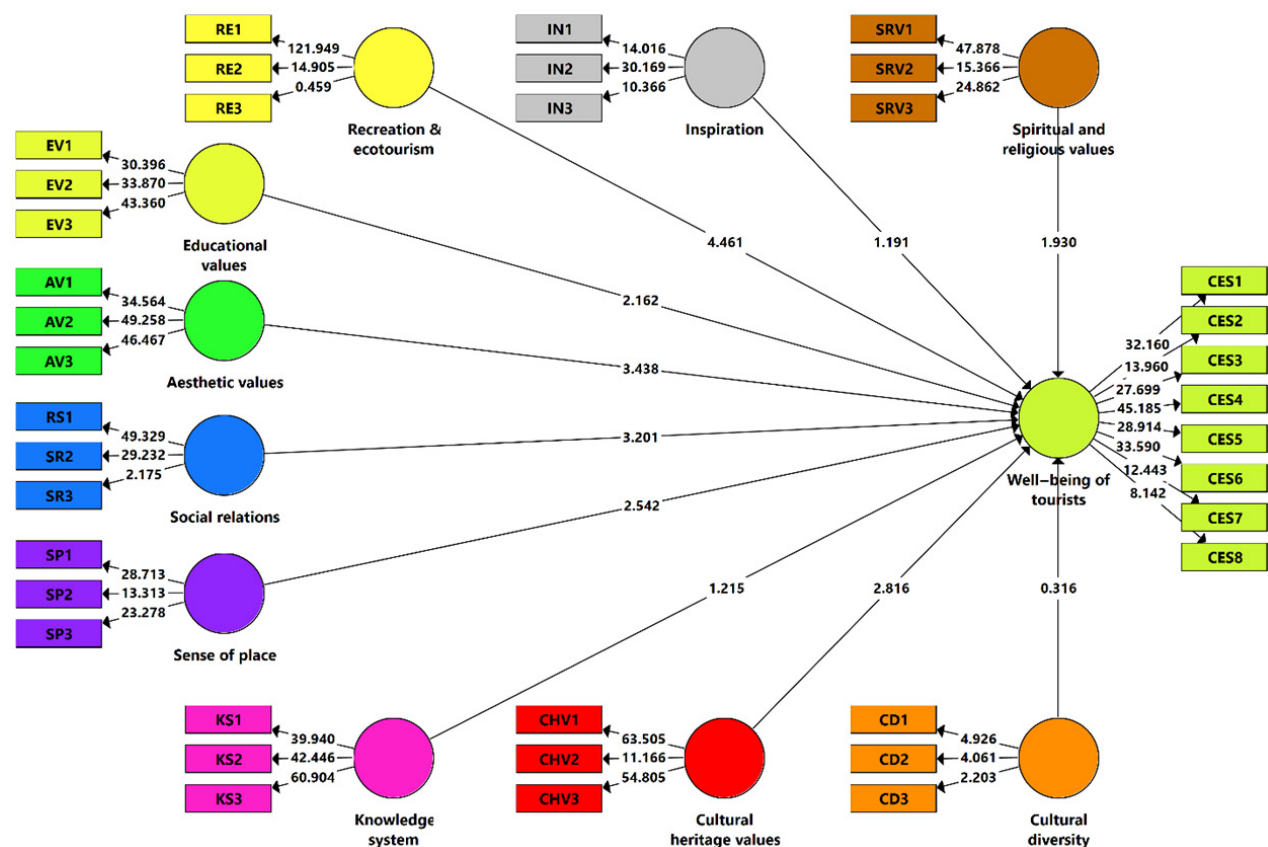


Figure 4. *t*-statistics.

5. Discussion and conclusions

The findings support most of the proposed hypotheses and indicate that CES has positive effects on tourists' well-being from various perspectives. The results of the hypothesis testing are shown in Table 8.

The results reveal that recreational spaces exhibit a highly robust association with tourists' well-being. Consistent with the present research, Mao et al. (2023) demonstrated that enhancing recreational and entertainment opportunities available to the public constitutes an effective and direct approach to augmenting CES provision. In Zaribar Coastal Park, tourists engage in recreational activities, including fishing, boating, paragliding, and swimming. Furthermore, the expansive shoreline, framed by rolling hills and dense vegetation, creates a scenic backdrop conducive to unwinding and enjoying the outdoors. Tourists often choose to picnic along the banks, set up temporary camps, and engage in casual strolls along the water's edge.

Table 8. Summary of hypothesis testing.

Hypothesis	Test
Hypothesis 1: Cultural diversity improves the well-being of tourists.	Rejected
Hypothesis 2: Spiritual and religious values improve the well-being of tourists.	Rejected
Hypothesis 3: Cultural heritage value improves the well-being of tourists.	Accepted
Hypothesis 4: Aesthetic value improves the well-being of tourists.	Accepted
Hypothesis 5: Social relation improves the well-being of tourists.	Accepted
Hypothesis 6: Sense of place improves the well-being of tourists	Accepted
Hypothesis 7: Outdoor recreation improves the well-being of tourists	Accepted
Hypothesis 8: Educational value improves the well-being of tourists.	Accepted
Hypothesis 9: Knowledge systems improve the well-being of tourists.	Rejected
Hypothesis 10: Inspiration improves the well-being of tourists.	Rejected

The analysis conducted in this study has identified aesthetic values as a significant variable influencing the well-being of tourists visiting Zaribar Coastal Park. The aesthetic values of Zaribar Lake significantly shape tourists' experiences by offering diverse visual and sensory stimuli. The lake's biodiversity—with its rich variety of plant species and animal life—creates a dynamic and captivating landscape, reinforcing tourists' connection with nature. Moreover, the lake provides a pleasing visual environment, where the interplay of natural elements, such as water, sky, and landforms, inspires aesthetic appreciation. This scenic quality encourages leisure activities like photography, contributing to mental restoration. Crucially, the lake's setting demonstrates a unique harmony between humans and nature, where traditional local practices coexist with natural features. These findings align with prior research, such as the study by Gai et al. (2022). This emphasizes the interplay between ecological features and human perception in shaping tourist experiences, and prioritizing biodiversity, designing visually engaging environments, and facilitating settings that promote a sense of harmony between people and nature. These strategies

not only enrich the quality of visitor experiences but also reinforce the goals of environmental sustainability and long-term ecosystem stewardship.

The findings underscore a direct association between social relations within urban green spaces and the well-being of tourists, affirming the significance of these factors in enhancing visitor experiences and overall well-being. Orban et al. (2017) conducted a study that found a positive association between the amount of green space inside urban areas and the frequency of social contact among people. Gehl (2011) emphasizes the importance of public spaces, particularly well-utilized seating areas within open spaces, in facilitating social interactions. In Zaribar Coastal Park, opportunities for recreational activities and social interaction, cultural exchange between locals and tourists, and the presence of various forms of urban furniture (e.g., benches, gathering spaces) play a pivotal role in promoting social relations. These include interacting with local people who display and offer various types of handicrafts, communicating with local tourist guides, and participating in local activities, such as wearing traditional clothes and engaging in local games.

The findings suggest that educational tourism experiences play a crucial role in enhancing tourists' well-being. Numerous studies recognize ecosystems as valuable resources for environmental education (Tian et al. 2021). These study findings, consistent with prior research (e.g., Zhou et al. 2020), suggest that educational values significantly impact the perceived well-being of visitors to Zaribar Coastal Park. Tourists have an appropriate educational opportunity in this ecosystem through activities like bird watching, and the introduction of fauna and flora in Zaribar Coastal Park by tourist guides and environmental specialists.

Specifically, the findings reveal that the presence of intangible cultural elements within Zaribar Coastal Park—such as local cuisine and traditional performances—enhances tourists' emotional and social well-being by fostering a sense of cultural connection and authenticity. This outcome is consistent with the findings of Dai et al. (2019), who emphasized the role of cultural heritage in strengthening emotional bonds through active engagement with local traditions. Conversely, our findings diverge from those of Zhang et al. (2022), who contended that the influence of cultural heritage is often diminished by the dominance of modern urban development. In Zaribar Coastal Park, intangible heritage is experienced through activities such as tasting regional dishes like Ash Dough and Kalane, and observing or participating in traditional Kurdish dance, Halparkeh. These culturally immersive interactions not only provide tourists with unique and memorable experiences but also play a key role in enhancing their subjective well-being. Therefore, cultural heritage, as perceived by visitors, serves as a meaningful contributor to positive tourist experiences within natural urban settings.

The study's findings indicate a statistically significant correlation between the sense of place in Zaribar Coastal Park and the well-being of tourists. The results are consistent with previous studies (e.g., Vada et al. 2019). Zaribar Coastal Park offers a wide range of experiences, fostering a sense of identity and commitment to the area, which in turn improves visitors' sense of place and general well-being. The sensed landscape, with its interplay of the lake, sky, and surrounding mountains, evokes emotional attachment. This is further deepened by cultural elements, where tourists witness Kurdish clothing, hear the Kurdish language, and enjoy traditional Kurdish music and dance (Farshad et al. 2021).

Furthermore, this study revealed that variables including inspiration, spiritual and religious values, knowledge systems, and cultural diversity have weak and negligible effects on tourists' well-being. Moreover, their significance was not substantiated, failing to meet the requisite thresholds as demonstrated in Table 7. The findings align with certain extant research. For example, Layke (2009) found no discernible criteria for the benefits of spiritual and religious values in nature during the evaluation of ecosystem services' indicators. Similarly, Coscieme (2015) contended that assigning the source of inspiration to a specific ecosystem or component is challenging due to the multifaceted influences of culture, history, education, and personal background. This perspective resonates with our findings regarding the ambiguous impact of inspiration on tourist well-being within the context of Zaribar Coastal Park. Conversely, our results diverge from those of Riechers et al. (2016), whose investigation suggested inspiration to be a significant CES in urban green landscapes. Such disparities highlight the contextual nuances inherent in the assessment of CES components and underscore the importance of considering the specific socio-cultural and environmental characteristics of the case study. Moreover, our analysis revealed that knowledge systems and cultural diversity did not exhibit a significant relationship with the well-being of tourists. The results align with the conclusions drawn by Rall et al. (2017), indicating a recurring trend across studies regarding the limited influence of these variables on tourist well-being.

The findings of this study build on the previous research (Rastkhadiv et al. 2024) by demonstrating the distinct ways CES influence well-being among different user groups. While prior work emphasized the role of parks as everyday restorative environments for local residents—providing stress relief, social interaction, and a sense of place—our results reveal that tourists engage with these spaces in a more temporary and goal-oriented manner, seeking outdoor recreation, aesthetic enjoyment, and cultural experiences. This underscores the importance of designing and managing green spaces to balance the long-term psychological benefits for residents with the immediate, experiential needs of visitors, supporting sustainable tourism development in culturally and ecologically sensitive regions.

5.1. Contribution to theory

This study advances the theoretical understanding of CES by empirically examining their impact on tourist well-being in a coastal urban park context. It extends the CES framework by identifying specific dimensions—outdoor recreation, aesthetic values, social relations, cultural heritage, sense of place, and educational values—that significantly influence well-being, while highlighting the limited impact of inspiration, spiritual values, knowledge systems, and cultural diversity. These findings refine existing models (e.g., MEA 2003) by demonstrating the context-specific nature of CES effects in coastal settings, addressing a gap in prior research focused predominantly on resident perspectives or terrestrial landscapes. The study also contributes to tourism literature by integrating well-being as a measurable outcome of CES, providing a foundation for future theoretical explorations of human–nature interactions in urban tourism settings.

5.2. Contribution to practice

The findings offer actionable insights for managing Zaribar Coastal Park and similar urban green spaces. Prioritizing nature-based recreational activities (e.g., boating, fishing), enhancing aesthetic elements like biodiversity and landscape harmony, and fostering social interactions through cultural programs and urban furniture can improve tourist well-being. These strategies support sustainable tourism by aligning park management with visitor needs while promoting environmental stewardship. The study also informs policy by highlighting the need to integrate CES into urban planning to address challenges like biodiversity loss and habitat degradation, ensuring long-term benefits for tourists and local communities.

5.3. Limitation and future research

The sample of 300 domestic tourists, while adequate for PLS-SEM, may limit the generalizability of findings. Data collected during spring and summer 2023 may not reflect seasonal variations in tourist perceptions. Additionally, unexamined variables, such as visit frequency, site familiarity, and travel type (e.g., guided tours or solo travel), may influence the relationship between CES and well-being. Future research should employ larger, more diverse samples, including international tourists, to enhance result robustness and their applicability. Multi-seasonal studies could clarify temporal variations in CES perceptions. Examining factors such as visit frequency, site familiarity, and travel modalities would provide deeper insights into their impact on well-being. Comparative analyses across other coastal or urban parks would further validate findings, informing evidence-based strategies for sustainable tourism management and enhanced visitor experiences.

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Additional information

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No conflict of interest was declared.

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Conceptualization: JB, AR, AF. Data curation: AR. Formal analysis: AR. Investigation: AR, JB. Methodology: AR. Project administration: JB. Resources: AF. Software: AR. Supervision: JB. Validation: AR. Visualization: AR. Writing - original draft: AF, AR. Writing - review and editing: JB.

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Data availability

All of the data that support the findings of this study are available in the main text or Supplementary Information.