

Application of User Preferences in Enhancing the Quality of Coastal Pedestrian Walkways, Case Study: The Coastal City of Bandar Ganaveh*

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ABSTRACT

The expansion of urbanization and, consequently, the horizontal growth of coastal cities along the water's edge have led to adverse social and environmental consequences within coastal urban spaces. In many cases, this process has led to deterioration in the quality of waterfront environments and a decline in user presence and engagement in these areas. In this regard, coastal pedestrian walkways, as the interface between urban spaces and the natural coastal setting, play a significant role in enhancing the quality of the spatial experience, promoting social interactions, and responding to users' needs and preferences. Nevertheless, the qualitative mismatch between these spaces and the factors influencing users' experiential perceptions remains a fundamental challenge for coastal cities. The present study, adopting an evaluative-analytical approach, seeks to identify and prioritize the social and environmental components and indicators that affect the quality of coastal pedestrian walkways, based on users' environmental preferences. This research employs a mixed-methods (qualitative-quantitative) approach and uses a survey methodology. Data collection was carried out through documentary studies and the design and analysis of 120 questionnaires using the Semantic Differential Technique (adjective-pair scales). Data analysis was performed using SPSS software and included the one-sample t-test, the Friedman test, and user response rate analysis. According to the findings, the components of soundscape, surface water control and management, water quality, and spatial fluidity and flexibility ranked among the highest user preferences. Furthermore, users' greater inclination toward collective and group activities underscores the importance of appropriately integrating pause, seating, and movement spaces, along with the quality of urban furniture and cultural-recreational activities, to enhance social interactions. Moreover, the distribution of recreational, tourism-related, and service activities along the pedestrian walkway contributes to diversity and prevents monotony throughout the walking route. The findings of this study can serve as a basis for identifying priorities and developing a design decision-making framework for organizing coastal pedestrian walkways and increasing user presence and vitality within coastal strips.

Keywords: Coastal Landscape, Coastal Pedestrian Walkway, Coastal Walkability, User Preferences, Quality of Public Spaces, Quality of Coastal Zones.

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1. INTRODUCTION

In contemporary cities, public spaces can be regarded as arenas with the highest levels of human contact and interaction, where physical and visual accessibility is available to the majority of the population (Valizadeh and Andalib 2017). Gehl (2011) argues that the primary function of such spaces is to provide a suitable setting for life between buildings; a space that enables unplanned daily activities, pedestrian movement, short pauses, play, and the formation of simple social interactions. In this regard, Jacobs (1961) also maintains that pedestrian walkways, as public spaces within urban areas, create opportunities for unfamiliar individuals to coexist in a shared social setting. Therefore, pedestrian walkways can be considered one of the manifestations of collective spaces within the urban fabric, where the nature and quality of pedestrian movement are of great importance and are recognized as among the most significant and influential factors in enhancing livability, vitality, health, and consequently safety and security in urban spaces (Wood 2010). Pedestrian routes have always provided a setting for social, economic, recreational, and cultural interactions and events, while simultaneously serving as a platform for expressing collective emotions and sentiments within urban spaces (Naderi and Ebrahim 2015). Accordingly, pedestrian walkways are linear spaces within the urban fabric, designed so that their primary control and dominance remain in the hands of pedestrians. At the same time, motorized vehicles are permitted only under specific circumstances and for service-related purposes (Cohen 2011). Thus, pedestrian routes function as inviting environments that encourage users to remain within the urban fabric and, as dynamic urban connectors, foster a sense of place attachment while enhancing the quality of place in the city.

The environment surrounding us encompasses everything; however, the part of the environment that serves as the setting for human activities and maintains relationships with its contextual surroundings is referred to as landscape (Bell 1999). Coastal landscapes can be defined as a collection of landscapes associated with the coast and the sea, including the marine environment, terrestrial habitats adjacent to the water's edge, and the cultural, historical, and anthropological dimensions of communities residing in surrounding areas (Farahi Farimani and Haghighat Bin 2017). In this context, the term urban waterfront refers to a part of the city in direct contact with water (Giovinazzi and Moretti 2010). Furthermore, the design of coastal edges organizes and structures the city's coastal landscape, thereby improving its sensory and visual qualities (Bell 1993). In addition to their significant role in enhancing the visual, environmental, and social qualities of cities, coastal landscapes also create

distinctive places and numerous opportunities to develop memorable collective spaces within urban environments (Hashemi 2015).

In recent decades, increasing attention among waterfront users to the quality of movement along the water's edge has highlighted another dimension of the social and environmental role of coastal pedestrian walkways and, consequently, their contribution to enhancing the vitality and user presence along coastal strips within urban environments. The reciprocal relationship between the natural setting of coastal cities and the urban fabric can facilitate the formation of a dynamic interface in these areas—one capable of adapting (through flexibility and responsiveness) to user behavior and organized in such a way that it addresses users' needs while simultaneously improving environmental and social qualities through the utilization of existing potentials. Failure to address this issue over time leads to a gradual decline in user presence within the fabric of coastal cities. Although numerous studies have recently examined users' environmental preferences, with a primary focus on key indicators, coastal landscapes still do not provide optimal conditions for attracting users to these spaces. Consequently, there remains a need to examine the role of key social factors in this regard. One of the major issues observed along the coastal strip of Bandar Ganaveh is the inability of the existing setting—despite its unique natural capacity to attract visitors—to adequately meet the needs of users across different age groups. Among the most significant problems observed in this area are the lack of appropriate social, cultural, and recreational activities for users; the presence of dark and isolated pathways and insufficient attention to nighttime landscape quality; poor-quality urban furniture and service-related facilities; and inadequate accessibility and definition of pedestrian routes along the shoreline. Neglecting factors that enhance waterfront quality has led to numerous social, environmental, physical, and security-related problems and, to some extent, to the deterioration of environmental and social structures within the coastal city of Bandar Ganaveh. Paying attention to users' needs and environmental preferences in the organization and improvement of spaces within coastal cities not only enhances the quality of user interactions but also strengthens place attachment and increases vitality and user presence within the urban fabric. In this study, the term users' environmental preferences refers to the set of factors and components that indicate users' priorities and preferences within an urban space.

The principal issue addressed in this study is the qualitative mismatch between coastal pedestrian walkways and the social and environmental factors influencing users' experiences along the waterfront. The present research adopts an evaluative–analytical approach and aims to identify, assess, and prioritize users' environmental preferences in

coastal pedestrian walkways. The use of the term application in the title of this study refers to the stage following analysis. It is considered at the level of decision-making implications and design guidance. In other words, by identifying and extracting the components and indicators prioritized by users, this research provides an analytical framework that can serve as an informed basis for guiding organizational processes and decision-making in the design of coastal pedestrian walkways. Therefore, the term application in this article is interpreted as the utilization of the analytical findings of the research in policymaking, management, and design guidance for coastal waterfronts. The structure of the article is organized in such a way that, following the statement of the problem and the explanation of the necessity of the research, the theoretical foundations and literature review section establishes a systematic framework and a proper understanding of previous studies and findings, leading to the extraction of key environmental and social indicators and components. The methodology section explains the research approach and the characteristics of the study area. In the findings section, the data collected through the questionnaire survey are analyzed. Finally, the discussion and conclusion section presents the principal findings of the study, their implications for enhancing the quality of coastal pedestrian walkways, and increasing user presence and vitality. It summarizes the main contributions of the research.

2. LITERATURE REVIEW

In recent years, numerous studies have been conducted on identifying coastal landscape quality indicators based on users' preferences to improve environmental conditions along coastal strips and enhance users' experiences of these environments. Nieman (2008), in a study conducted to examine the priorities and preferences of coastal users along a section of the New York coastline, found that involving waterfront users in the planning of proposed coastal development

projects could improve environmental conditions and visual quality and consequently increase users' willingness to visit and remain in these areas. Subsequently, Semeoshenkova and Williams (2011), in their research aimed at assessing the quality of five beaches in Portugal based on user preferences, found that users across all areas prioritized environmental factors such as beach quality, water quality, and the natural landscape. Similarly, Alves, Benavente, and Ferreira (2014) reported findings consistent with earlier studies. They concluded that environmental and physical characteristics of beaches are among the most important and influential indicators in enhancing the quality of coastal landscapes. However, as the number of users and visitors increases, the quality of these environmental indicators, as well as the quality of service and recreational facilities along coastal areas, tends to decline over time. They also found that users were generally unwilling to accept higher taxes in exchange for improved environmental quality and enhanced service and recreational facilities. One year later, Penn et al. (2016) found that among the identified indicators, environmental and social qualities were the two most significant factors influencing coastal landscape quality. Within these two categories, water quality was considered the most important environmental factor, while preventing excessive crowding and congestion on beaches was identified as the most important social factor. In another study, Mehranian and Marzuki (2018) identified the physical and morphological characteristics of beaches as the most important aspects evaluated by users. At the same time, environmental factors such as natural scenery, beach cleanliness, and water quality ranked second in importance, with levels of importance very close to those of the aforementioned factors, while social activities such as water sports, swimming, and sunbathing ranked third among users' preferences. A summary of selected studies on improving pedestrian walkway quality and evaluating coastal quality indicators is presented in Table 1.

Table 1. Domestic and International Studies Reviewed in relation to the Research Topic

Researcher(s) / Year	Title of Study	Research Approach	Objective	Findings
Barbosa de Araújo and F. Costa (2008)	Environmental Quality Indicators for Recreational Beaches Classification	Quantitative/Qualitative (Assessment of beach quality classification factors)	Assessment and evaluation of natural and socio-economic factors in the classification of recreational beach quality	An experimental investigation was conducted in nine coastal areas representing three levels of development (overdeveloped, developed, and underdeveloped). Based on 60 parameters within the two identified systems, the most suitable indicators were found in less-developed coastal areas with lower levels of human intervention.
Ariza, Jiménez, Sardá, Villares, Pinto, Fraguell, Roca, Martí, Valdemoro, Ballester and Fluvia (2010)	Proposal for an Integral Quality Index for Urban and Urbanized Beaches	Quantitative/Survey-based (Field studies and questionnaire design)	Assessment of Beach Quality Index (BQI) together with Environmental Management Systems for Beaches (EMBs)	The strongest aspects of the evaluated beaches were related to users' short-term demands. In contrast, the weakest aspects were associated with the impacts of human pressure on coastal areas, particularly erosion-related problems.

Researcher(s) / Year	Title of Study	Research Approach	Objective	Findings
Shieh and Alipour Eshliki (2010)	Analysis of Coastal Tourism Environmental Quality Factors Based on Sustainable Tourism Criteria (Case Study: Ramsar Coastal Areas)	Descriptive–Analytical / Survey-based (Field studies and questionnaire design)	Identification of quality indicators and components of coastal landscapes based on users' preferences	Highlighted the importance of social and tourism-related components and their influence on the quality of interaction and communication among users.
Mahmoudi and Alimardani (2015)	The Role of Urban Furniture in Enhancing the Visual and Aesthetic Qualities of Coastal Pedestrian Walkways (Case Study: Bushehr Coastal Walkway)	Descriptive–Analytical / Field studies and questionnaire design	Urban space design and enhancement of environmental quality for citizens	Demonstrated a significant relationship between urban furniture and the enhancement of aesthetic qualities. The quality and attractiveness of urban furniture were identified as influential factors in improving the aesthetic quality of pedestrian walkways.
Didehban, Momeni, and Niknam (2016)	Explaining Pedestrian Walkway Design Principles with a Vitality-Oriented Approach (Case Study: Rana Coastal Park Walkway, Dezful)	Descriptive–Analytical	Creating vibrant and dynamic environments through pedestrian walkways with communicative, functional, and cultural potentials	Recommended the creation of recreational pedestrian walkways, the design of multifunctional routes, attention to natural and historical landscapes, and the development of multifunctional interactive settings.
Semeoshenkova, Newton, Contin, and Greggio (2017)	Development and Application of an Integrated Beach Quality Index (BQI)	Descriptive–Analytical / Survey-based (Field studies, questionnaire design, and quantitative assessment of quality indicators using linear aggregation methods)	Continuous improvement of beach quality, preservation of coastal environmental quality, and enhancement of tourists' experiences	Proposed an Integrated Beach Quality Index (BQI) for evaluating beach quality across urban, semi-urban, and rural contexts, incorporating both human and natural components to assess environmental quality, human well-being, and public health.
Morales, Lizarraga, Salgado, Hernandez, Grano and Rubio (2017)	Evaluation of Beach Quality as Perceived by Users	Descriptive–Analytical / Survey-based (Field studies and questionnaire design)	Improvement of beach quality and evaluation of the environmental quality of three beaches in Guaymas	Existing beach quality varied among the three sites. All beaches require the design and implementation of specific management programs. User-based beach quality assessment was considered essential because it can support management objectives. The identified components were also found to be applicable for evaluating other international beaches.
Huong, Hoe, Lan, Ha and Dac Ve (2017)	Assessment of Beach Quality in the Northeastern Coast of Vietnam by Using the Index Method	Descriptive–analytical / Survey (field studies; quantitative assessment of indicators using the weighted linear aggregation method)	Assessment of beach quality based on beach quality indicators	Assessment of beach quality in three dimensions—recreation, ecology, and conservation—across nine beaches. Sandy beaches exhibited moderate-to-high quality levels, except for Do Son Beach. The strengths and weaknesses of each sandy beach were identified, and appropriate strategies were proposed to improve beach quality.
Lak and Ramezani (2018)	Environmental Preferences of People for Designing Abandoned Spaces beneath Urban Bridges	Qualitative / Survey (interviews) – Documentary studies	Conceptual framework of users' environmental preferences for unmanaged under-bridge spaces based on users' spatial preferences	The most influential qualities affecting users' preferences were pollution (air and noise) and safety/security.
Shaaban (2019)	Assessing Sidewalk and Corridor Walkability in Developing Countries	Qualitative / Assessment of pedestrian walkway evaluation factors	Assessment and evaluation of the walkability of sidewalks and urban corridors	Evaluation of the quality of sidewalks along different streets through measuring various indicators present in urban corridors and streets.
Abedini, Saket Hassanloui, and Azhari (2020)	Development of Nature-Based (Coastal) Tourism through the Approach of Enhancing Natural Landscape Sustainability (Case Study: Hasanlou Dam Area, Naqadeh)	Descriptive–analytical / Survey (field studies and interviews with experts)	Development of coastal tourism at Hasanlou Dam shoreline through improving the sustainability quality of the natural landscape	Strengthening the participation of private and public sector investors was identified as the most important factor, whereas reducing environmental pollution was ranked lowest in improving the sustainability of the natural landscape.

Researcher(s) / Year	Title of Study	Research Approach	Objective	Findings
Rodella and Corbau (2020)	Linking Scenery and Users' Perception: Analysis of Italian Beaches (Case Studies in Veneto, Emilia-Romagna, and Basilicata Regions)	Quantitative / Survey (field studies and questionnaire design)	Assessment of the quality of Italian coastal landscapes from physical and social perspectives	The most important factors affecting coastal landscape quality were beach cleanliness, water quality, high-quality services, recreational activities, and beach width.
Rodella, Albino Madau, and Carboni (2020)	The Willingness to Pay for Beach Scenery and Its Preservation in Italy	Qualitative / Survey (field studies and questionnaire design)	Assessment of coastal landscape quality based on the classification of 40 major Italian beaches into five quality classes (1–5)	Given the high value of coastal scenery and the importance of its preservation in Italy, users showed a greater willingness to pay to improve the quality of Class 4 and 5 coastal landscapes, while Classes 1 to 3 represented beaches with moderate-to-high quality.
Farajzadeh, Valizadeh, Babaei, Panahi, and Azar (2021)	Identification of the Constituent Elements of Urban Pedestrian Walkways Based on Citizens' Sensory Perceptions (Case Study: Tarbiat and Valiasr Pedestrian Walkways, Tabriz)	Quantitative / Field studies and questionnaire design	Perceived quality of urban pedestrian walkways using users' sensory-perceptual components	The importance of visual senses and users' mental perceptions in determining the quality of pedestrian walkways was confirmed.
Saadati, Heidar Nattaj, and Tavallaei (2021)	Application of Users' Environmental Preferences as an Approach to Improving Urban Riverfront Spaces (Babolsar Riverfront, Babolrud)	Qualitative / Survey (questionnaire design and field studies)	Creating an urban space with identity, vitality, and dynamism while maximizing user satisfaction	Identification of factors and components that disturb and influence the enhancement of environmental quality from the users' perspective.

3. THEORETICAL FRAMEWORK

3.1. Coastal Landscapes

According to the European Landscape Convention, a landscape is an area, as perceived by people, whose character results from the interaction of natural and human factors (Council of Europe 2000). The concept of an edge in urban spaces—whether formed by topography, natural elements, buildings, or a combination of these elements—plays a significant role in shaping people's mental image of a place (Lynch 1977). In coastal cities, the waterfront can provide an appropriate setting for leisure activities and play an important role in fostering interaction among people, nature, and urban space. Such environments also contribute significantly to the regeneration of memorable collective places, the enhancement of citizens' quality of life, the promotion of happiness and psychological well-being, and the creation of opportunities for escaping everyday pressures. Moreover, waterfronts strengthen environmental identity and place attachment, thereby contributing to urban vitality and improving ecological quality (Abedini, Saket Hassanlouei, and Azhari 2020). Coastal areas, due to their high levels of biodiversity and scenic beauty, offer a wide range of services to users. Individuals may visit coastal environments for relaxation, entertainment, leisure activities, sports, and social interaction. Over time, these experiences

contribute to place attachment and psychological restoration among users (Heidarzadeh, Haghi, and Zarrin 2021). Coastal users enjoy observing seascapes, running on soft sands, sunbathing, and engaging in coastal activities and sports such as boating, fishing, surfing, and similar pursuits. These natural settings can positively influence users' mental health (Peng, Yamashita, and Kobayashi 2015). Therefore, coastal zones can be regarded as effective environments for promoting users' psychological well-being within coastal cities (Subiza-Perez 2020), as well as areas possessing the highest levels of social and environmental value. This is because coastal environments provide a broad spectrum of facilities, services, and amenities for local communities and economies (Garcia Morales et al. 2018). Consequently, they play a significant role in enhancing the visual, environmental, and social qualities of cities while creating distinctive places and numerous opportunities for the formation of memorable collective spaces in coastal cities (Hashemi 2015).

3.2. Coastal Quality Indicators

Enhancing spatial quality in coastal zones can contribute to disaster prevention, tourism development, landscape and environmental improvement, and improvements to residential environments and public accessibility (Chang and Yoon 2017). Therefore, the visual attractiveness of

a landscape and its capacity to attract users can be evaluated through users' levels of satisfaction and interaction with that landscape (De Val, Atauri, and Lucio 2006). Among the environmental challenges affecting the quality of coastal zones are population concentration and growth in coastal areas (Loomis and Paterson 2014), threats to natural resources, declines in biodiversity, and the loss of vulnerable species (Berque and Osamu 2015), and the expansion of environmental pollution in coastal regions (Samsunlu and Akça 1999). These issues are considered among the most significant challenges facing coastal areas. Furthermore, the lack of coordination among interests arising from economic activities due to sectoral approaches in development programs (Rudianto and Gusti 2014), restrictions on public access to beaches, and insufficient attention to the role of citizen and stakeholder participation (Areizaga et al. 2012) have created a considerable gap between the natural capacities of coastal cities and the often incompatible patterns of human activities. Ultimately, this situation pushes coastal cities toward unsustainable exploitation of natural resources and the emergence of critical conditions in many of these areas (Divsalar, Aliakbari, and Bakhshi 2021). On the other hand, recreational activities and land uses located within coastal strips exert both direct and indirect effects on the quality of coastal landscapes. When visitors use coastal areas intensively, the natural structures and elements within these environments may be degraded by continuous human use and exploitation (Barbosa de Araújo and Costa 2006).

3.3. Coastal Pedestrian Walkways

Pedestrian walkways are among the most important public spaces in urban areas. However, uncontrolled horizontal urban expansion, increasing numbers of public and private vehicles, and declining environmental quality have imposed substantial negative impacts on urban structures (Anari, Eghbali, and Moayedfar 2019). Consequently, the physical and mental health of citizens has been exposed to serious risks and threats, and over time, this trend has led to the exclusion of pedestrians from urban spaces (Abbaszadeh and Tamari 2012). Pedestrian routes are not only among the most important elements of urban space but are also essential for the continuation of urban life itself (Woolley 2003). They constitute a fundamental component of mobility within sustainable cities and provide social, environmental, and economic benefits. At the same time, they help limit automobile-oriented mobility in certain parts of urban environments (Banister 2008; Capri et al. 2016). Moreover, because they can generate vitality and strengthen social interaction within the urban fabric, pedestrian environments accommodate a variety of activities, such as leisure, relaxation, play, and entertainment. In the long term, these functions enhance the attractiveness

of urban spaces (Saghafi Asl, Haghlesan, and Abdollahzadeh Taraf 2012). Pedestrian zones are places that, in addition to fulfilling communicative and accessibility functions, provide settings for diverse forms of social interaction. Individuals across age groups and abilities can experience safety, comfort, suitability, and attractiveness as they move through these environments (Abbaszadeh and Tamari 2013). Therefore, pedestrian movement within the urban fabric is closely intertwined with pedestrians' needs and expectations and may be regarded as one of the most fundamental rights of urban space users. Consequently, enhancing the quality of urban environments to increase user satisfaction is of considerable importance from multiple perspectives (Rafieian, Sedighi, and Pourmohammadi 2011; Akbarzadeh Moghadam Langarodi, Ahmadi, and Azadeh 2016).

3.4. User Preferences

Urban spaces constitute an integral part of citizens' daily lives, and their quality and characteristics significantly influence users' perceptions of urban environments (Lynch 1977; Naghibi, Ekhlassi, and Faizi 2022). The biophysical characteristics of an environment, together with users' perceptions and experiences, are among the most important components shaping environmental perception and landscape evaluation. Landscape quality also emerges from the interaction between landscape characteristics and their effects on users and observers (Daniel 2001). Desirable human environments are places where individuals' capabilities can be utilized more effectively and their needs can be better met. User satisfaction with an environment largely depends on the extent to which sufficient information is available to understand and interpret it. Accordingly, environments should be meaningful to users while simultaneously offering novelty, challenge, and mystery that stimulate exploration and provide opportunities for choice (Beer and Higgins 1999). Kaplan (1987) identifies four predictive variables of environmental preference: coherence (immediate understanding), complexity (immediate exploration), legibility (inferred understanding), and mystery (inferred exploration). In other words, key determinants of users' environmental preferences include openness (spatial openness and expansiveness), refuge, enclosure, coherence, legibility, mystery, complexity, age, and typicality (Herzog and Smith 1988).

User preferences are closely related to subjective qualities, with satisfaction, pleasantness, voluntary participation, and similar factors among their principal manifestations. Furthermore, experiences, memories, personal tastes, and cultural and identity-related dimensions shape users' subjective experiences of aesthetic concepts and phenomena. Based on their own internal criteria and meanings, users derive visual

pleasure from landscapes and environmental scenery (Lak and Ramezani 2018). In other words, preferences are linked to individuals' subjective qualities, and participation in an environment can be viewed as an expression of these qualities. Attention to symbolic values and meanings is a key factor in understanding how users relate to and utilize their surrounding environments. Consideration of these factors plays a significant role in organizing and improving environmental settings (Burgess et al. 1988). Over time, neglecting citizens' needs, expectations, and desires regarding their living environments weakens their sense of attachment to urban spaces. This situation can lead to increased urban crime and reduced feelings of safety and security in public spaces (Faizi et al. 2014). Therefore, consideration of user preferences in the planning and design of public spaces—including urban green spaces, pedestrian walkways, linear parks, and similar environments—is of critical importance (Chen, Adimo, and Bao 2009), since citizens have expectations of their urban environments, and any discrepancy between these expectations and reality may result in incompatibility between urban spaces and their users (Daniel 2001).

3.5. Research Questions

Given the importance of users' environmental preferences and the role of pedestrian walkways in enhancing the quality of urban spaces, the principal research question is formulated as follows:

- How can the quality indicators of coastal pedestrian walkways be defined based on users' environmental preferences?
- Based on users' environmental preferences, which environmental and social indicator components play the most significant role in enhancing the desirability of coastal pedestrian walkways?

4. METHOD

The current research strategy, based on the nature of the research, the approach, and the objectives set, is a

combined quantitative-qualitative study conducted as a survey using the semantic differential technique. The semantic differential technique is a scientific method for measuring the meanings, understanding, and recognition of concepts, using a set of bipolar scales located between each pair of opposite adjectives in a seven-point range. In this regard, the respondent's personal experience, knowledge, and vocabulary are very influential on the breadth of the response. According to Osgood, Suci, and Tannenbaum (1967), the general structure of this technique, and based on the basic concepts extracted from previous research on measuring the quality of coastal landscapes, as well as on the identification of the physical characteristics of the area in question and the components extracted from previous studies, a questionnaire was designed, in which for each of the characteristics in the coastal strip, a pair of adjectives was defined that determined the importance of the environmental and social indicators in the coastal strip. In the meantime, users, using their knowledge, life experience, perceptions, and feelings, determine the semantic intensity of each adjective within a specific numerical range from -3 to +3. Before distributing the questionnaire to users, its content validity was tested by five experts and professors from the Faculty of Architecture and Urban Planning at the University of Science and Technology, specializing in urban planning, urban design, and landscape architecture. It has been evaluated and approved. In this study, 120 questionnaires were distributed to residents over 3 months (spring). After collecting the initial data and running the relevant tests in SPSS, all the resulting data were analyzed and evaluated. After this process, the results of this study were extracted.

Visual representation of the overall structure of the research (influencing the structure of the questionnaire design and quantitative evaluation of the indicators)

Overall goal: Improving the quality of coastal walkways

Indicators: Environmental-social

Components influencing the indicators:

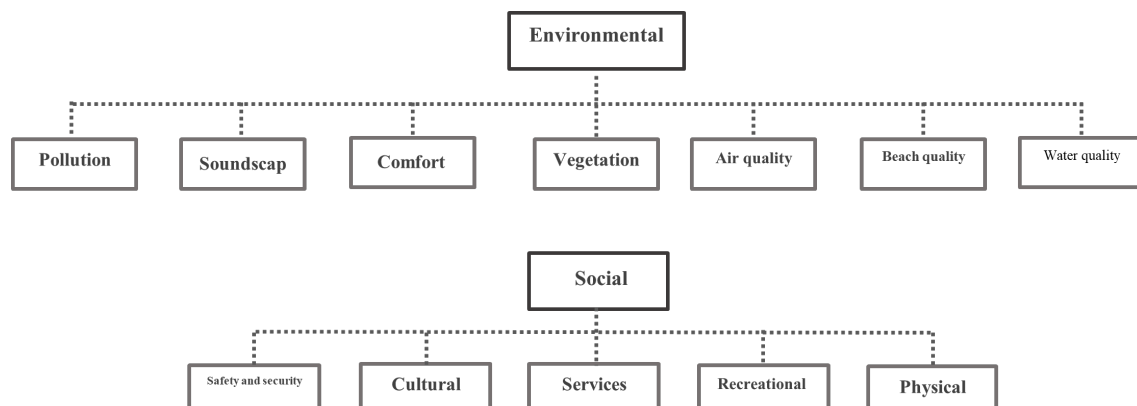


Fig. 1. Conceptual Framework of the Research

4.1. Identification of the Study Area

Bandar Ganaveh County, located in Bushehr Province, is adjacent to the Persian Gulf, between Bushehr and Bandar Dilem, and 18 kilometers east of Bandar Imam Hassan. The study area is located directly adjacent to the Persian Gulf and on the northwest side of Bandar

Ganaveh Creek. This area begins at the intersection of Janbazan Street and extends to the Fishing Ports Administration. In the vicinity of this area, there are facilities such as service, welfare, recreational, and residential spaces, covering a two-kilometer-long area and about 30 hectares.

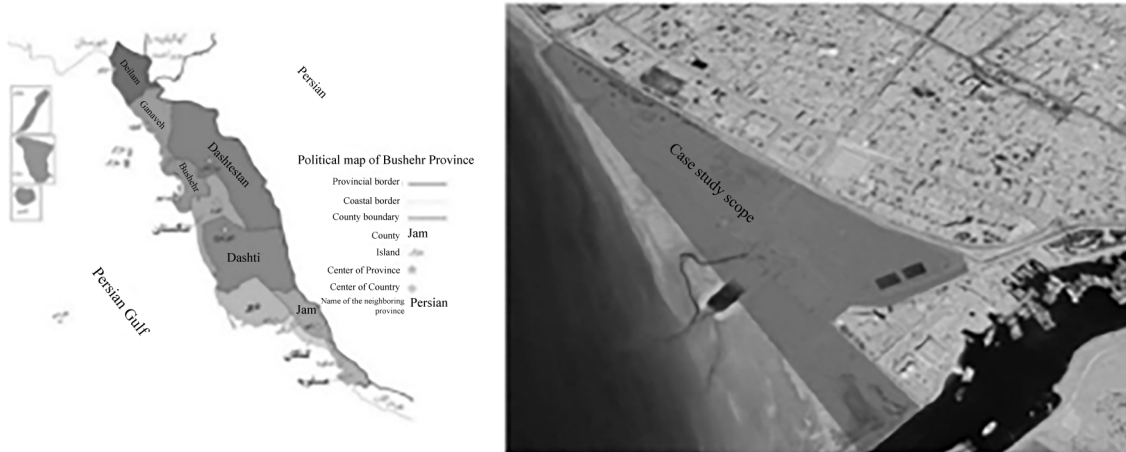


Fig. 2. Study Area

(<https://wikimedia.org/Bandar-e/Ganaveh> 2024; Google Earth)



Fig. 3. Assessment of Factors Influencing the Physical Characteristics of the Study Area

	-3	-2	-1	0	+1	+2	+3	
Uniformity Attribute								
Extremely Uniform								
Highly Uniform								
Relatively Uniform								
Neutral								
Relatively Diverse								
Highly Diverse								
Extremely Diverse								
Diversity Attribute								

Fig. 4. Sample Questionnaire Design

5. ANALYSIS OF RESEARCH FINDINGS

In this study, 120 questionnaires were distributed to users, of which 20 users left some questions unanswered or answered fewer than the total number of questions, resulting in these questionnaires being

excluded from the overall review and evaluation. Also, among the 100 completed questionnaires, 57 users were male, and 43 were female. Among the respondents, 10 had a sub-diploma, 19 a diploma, 42 a university degree, and 29 a postgraduate degree.

According to the data, it can be stated that a high percentage of respondents had a university education, and to be precise, about 71% of these people had a university education, and 29% had a diploma and sub-diploma education. Based on the results, 86% of the respondents were identified as citizens and permanent residents of Bandar Ganaveh County,

8% as citizens and temporary residents, and 6% as tourists. The average age in this study was determined to be 35-36 years old with a standard deviation of 11.346 years old, and the youngest respondent in this study was reported to be 15 years old, and the oldest was reported to be 65 years old.

Table 2. Demographic Variables

Demographic Variables												
Frequency	Gender		Age			Educational Level				User Status within the Statistical Population		
	Female	Male	15-30 Years	30-60 Years	Above 60 Years	Below Diploma	Diploma	Bachelor's Degree	Postgraduate Studies	Permanent Resident	Temporary Resident	Tourist
Frequency (%)	43	57	38	58	4	10	19	42	29	86	8	6
Total (%)	100		100			100				100		

To assess the normality of the data, the Kolmogorov-Smirnov test was used, which, according to its general structure, tests the null hypothesis of normality and the alternative hypothesis of non-normality. Also, if the sig significance level is less than 0.05, the assumption of normality of the question data is rejected. Based on the results of this test, all questions designed in this questionnaire have a significant level of less than 0.05; therefore, some questions do not have a normal distribution, which was previously consistent with the results of the skewness and elongation of the questions, because most of the variables in this questionnaire were skewed and elongated, and somehow out of normality. This is while some other questions have a significance level of more than 0.05. When data are not normal, parametric tests cannot be used to analyze the data, and nonparametric tests such as Friedman's should be used to maintain the validity of the results. However, based on the central limit theorem and given that the sample size is greater than 30 and some variables are normally distributed, the one-sample t-test can be used to analyze the data. Therefore, the data from these two tests have been ranked. Since the effects of negative and positive variables are considered in both tests, to increase the validity of the results, the percentage of

effective responses from individuals to each variable has also been evaluated to measure users' inclinations and preferences for each pair of attributes. After conducting relevant tests and measuring and evaluating the average of the desired data, and also by using the percentage of effective response of users to each of the components mentioned for each indicator, the desired data has been evaluated in three main groups, which includes positive user opinions in the range of +2 to +3 and negative opinions in the range of -2 and -3 and includes the spectrum of "very" and "very" in the main questionnaire, and also the second group, which includes neutral user opinions, includes the range of -1, zero and +1 and includes the spectrum of "same" to "relatively". Expressing the spectrum of user responses is important because it indicates the tendency and inclination of each individual toward the stated pair of attributes within the study area. On the other hand, the validity of the Friedman test based on the percentage of user responses remains. It expresses the priority of each component with greater accuracy. In this assessment, the percentage of effective user responses, including the "very" and "extremely" options, has been used to prioritize the components.

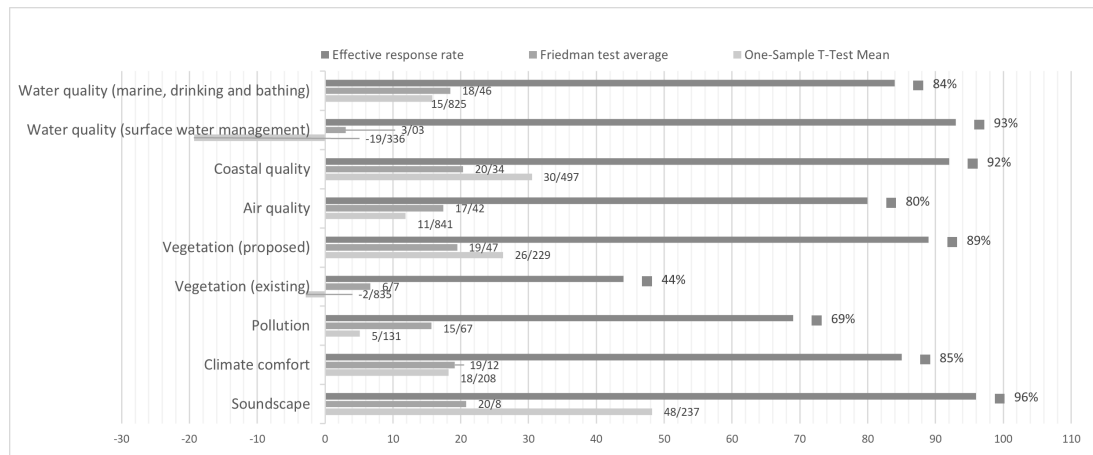


Fig. 5. Weighting of Environmental Indicator Components based on the Mean Values of the Selected Statistical Tests and the Percentage of User Responses

In measuring and evaluating the components of the environmental index, attention to the soundscape, water quality, and beach quality is a very important factor; as a result, it has received the highest level of user attention, with an effective response rate of over 90%. According to user preferences, controlling and managing surface waters and preventing sewage, effluent, and graywater from entering the sea are considered very important factors in improving the environmental quality of the beach. This attitude, along with other water quality factors, including the cleanliness of seawater, access to drinking water, and bathing, has been given secondary importance, with a percentage of over 80%. Components such

as vegetation suitable to the climate and substrate, climatic comfort, and air quality are ranked second, with an effective response rate of over 80%; pollution control in the target area is ranked third, with a percentage of over 60%. Users' dissatisfaction with the limited and unsuitable existing vegetation, as well as the lack of density and extent of suitable green space in this substrate, has caused the existing vegetation on the site to be ranked lowest, with a percentage of less than 50%, and the desire to restore and create diverse planting substrates suitable for the climate and ecosystem of the target area is ranked higher.

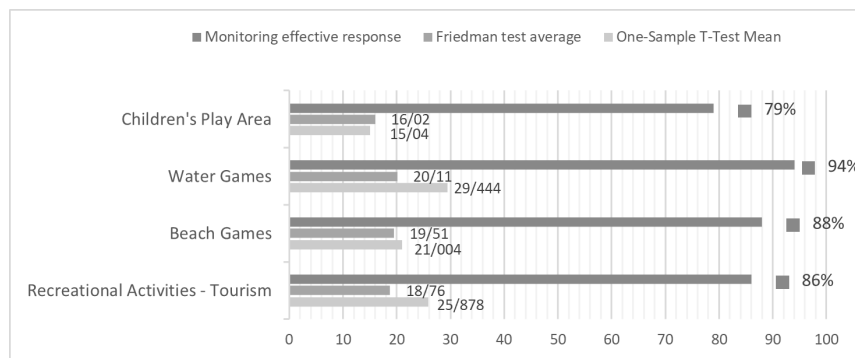


Fig. 6. Weighting of Recreational Components within the Social Indicator based on the Mean Values of the Selected Statistical Tests and Effective User Response Percentages

In evaluating the recreational component of the social index, the desire for group and collective entertainment and games has received the most attention from users of both genders. Based on the average of the Friedman and Tickenmunhay tests, creating platforms for playing water games is the first priority for users, with a percentage of over 90%. Beach activities and games, as well as recreational and tourism activities with a percentage of over 80, are in second place, and creating a children's play space with a percentage of over 70 is in third place

among user preferences. Among user responses, the desire to create a platform for playing and water-based entertainment is seen in roughly equal proportions across both gender groups. This is important, while in the beach games component, the desire of men to create football and beach volleyball playgrounds is much higher than that of women. On the other hand, the desire of women to create play spaces for children, along with spaces for pauses and movement, is allocated a higher percentage.

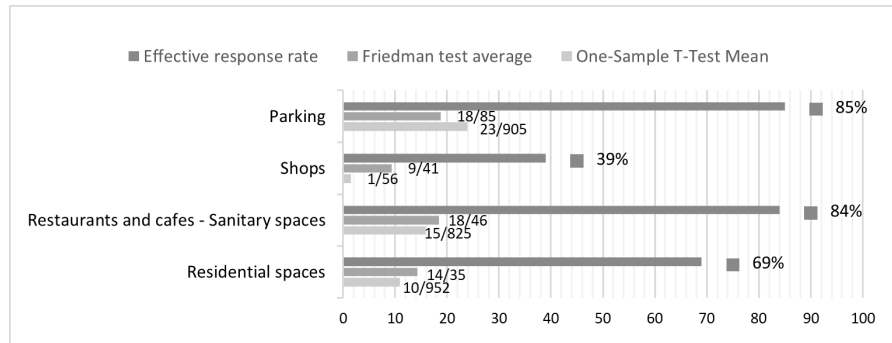


Fig. 7. Weighting of Service Components within the Social Indicator Based on the Mean Values of the Selected Statistical Tests and Effective Response Percentage

The results of the service component assessment and evaluation show that one important factor in improving the quality of coastal walkways is providing space for parking for users. In expressing users' preferences and priorities, attention is paid to the presence of parking, the creation of restaurants and

cafes, and access to sanitary spaces, with a response rate of over 80%; in second place, the presence of temporary accommodation camps and spaces for rest and meeting. The creation of stores that also meet users' basic needs ranks third in this assessment, with a percentage of 39%.

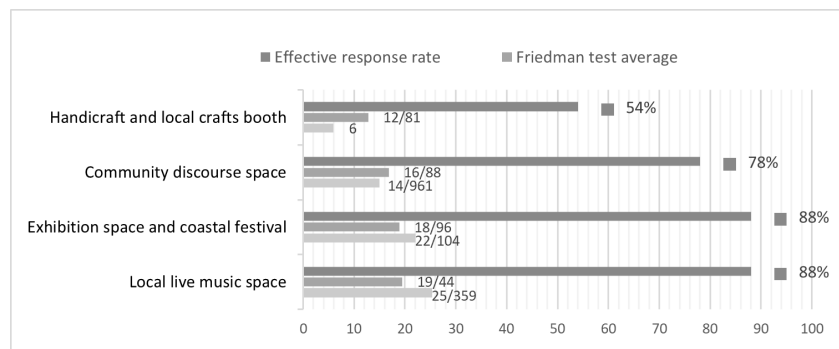


Fig. 8. Weighting of Cultural Components within the Social Indicator based on the Mean Values of the Selected Statistical Tests and Effective Response Percentage

In the cultural component of the social index, the space for playing local live music and the platform for hosting exhibition spaces and coastal festivals rank first among users' preferences, with percentages over 80%. The importance of these components to users is to revive the history and ethnic and regional beliefs of Bandar Ganavah, and, on the other hand, to promote and improve conditions for collective interaction

between people. In addition, paying attention to spaces for collective discourse is ranked second with a percentage of over 70, which is an indication of the users' greater desire to establish group interactions compared to individual spaces and activities. After that, the presence of handicraft stalls in Bandar Ganavah ranks third, with a percentage of over 50.

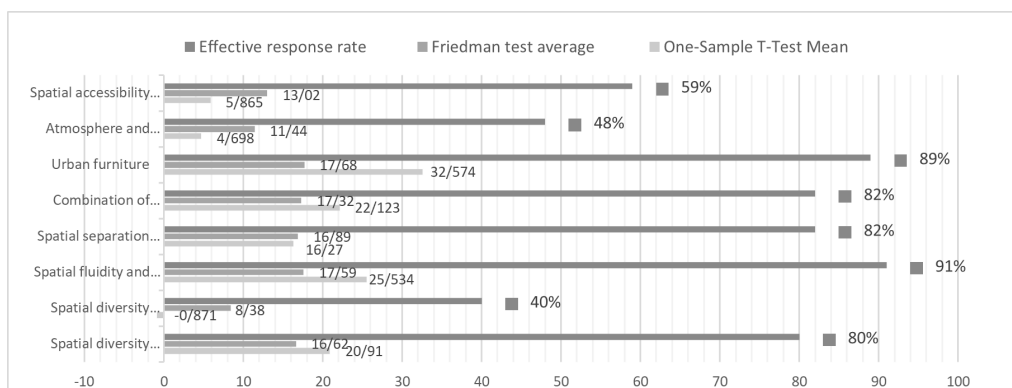


Fig. 9. Weighting of Physical Components within the Social Indicator based on the Mean Values of the Selected Statistical Tests and Effective Response Percentage

Based on the evaluation of the physical component of the social index, spatial fluidity and flexibility are the most important and receive the highest level of attention, with a percentage over 90%. After that, attention to the design, materials, and quality of urban furniture, with an effective response of 89%, an appropriate combination of spaces (sitting, pausing, and moving), separation of space and functions, as well as spatial diversity (physical) with a percentage of over 80% are in second place among the preferences of users. The importance and attention to the accessibility and connection between spaces and different functions, with a percentage of over

50, is in third place, followed by the atmosphere and sense of space, and visual diversity of spaces, with percentages of over 40 in fourth place. According to users' environmental preferences, what makes the waterfront space a suitable place for users to be present is the use of forms, furniture, and elements that are most in harmony with the beach bed and do not cause the destruction or loss of the shoreline's ecological structure. It is also better to use forms, planting beds, furniture, and elements that, while not limiting users' visual and physical connection to the beach and sea, also meet users' needs and provide appropriate organization of the water's edge.

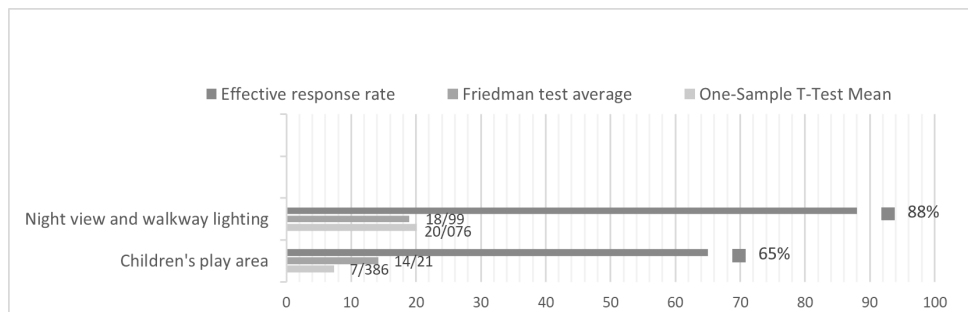


Fig. 10. Weighting of Safety and Security Components within the Social Indicator based on the Mean Values of the Selected Statistical Tests and Effective Response Percentage

The results of the safety and security component of the social index indicate its importance to users, especially women. In urban spaces, one of the important factors in users' presence is safety and security, whereas in open spaces, it is not. According to users, paying attention to night views and appropriate lighting on the sidewalk, as well as the various sections of access, functions, and activities, will improve the safety and personal security of users along the coastal sidewalk. Therefore, this component has a percentage of more than 80 and is a user priority; this is important, while safety and security in children's play areas, despite its high importance to users, is ranked second with a percentage of more than 60.

5.1. Summary and Discussion

Coastal landscapes are among the most valuable natural environments within coastal urban fabrics. Due to the coexistence of natural elements and urban structures, these areas remain attractive to both residents and tourists in coastal cities. Walking is considered one of the most fundamental manifestations of user presence and movement in urban spaces. Coastal pedestrian walkways, by providing opportunities to observe scenic landscapes, experience nature-based visual pleasure, and move along the linear structure of the shoreline, play a significant role not only in social dimensions but also in the environmental quality of coastal landscapes and are therefore of ongoing importance to users. Based on prior studies in the field of coastal pedestrian walkways and the identification

of influential indicators of coastal quality, the importance of both social and environmental indicators in the design and organization of coastal strips can be highlighted. Considering the components of these two indicators significantly improves the quality of coastal pedestrian walkways and, in turn, increases user presence in coastal areas.

The findings of this study, based on questionnaire data and statistical analysis, in addition to supporting previous research ([Semeoshenkova and Williams 2011](#)) regarding the importance of environmental indicators in improving coastal landscape quality based on user preferences, also highlight the importance of social indicators in enhancing collective interaction and increasing user presence in coastal strips. Moreover, unlike the findings of Alves, Benavente, and Ferreira (2014), which suggest that increased user presence may reduce environmental quality over time, the results of the present study in Bandar Ganaveh indicate that user participation in coastal planning and management can enhance environmental quality while simultaneously increasing willingness to use these spaces. This participation fosters a stronger sense of responsibility and commitment among users toward the coastal landscape. Consistent with Penn et al. (2016), factors such as water quality, beach quality, and air quality play a significant role in improving coastal landscape quality. However, the present study additionally identifies soundscape factors, climate-responsive vegetation, climatic comfort, and environmental pollution control as

influential components. Based on statistical analysis of the collected data, the components influencing environmental and social indicators can be categorized into six priority groups based on the mean values from the one-sample t-test and the Friedman test, and the

effective response percentages. This ranking system provides designers and landscape architects with an accessible framework for identifying key factors in coastal design and supports decision-making toward sustainable coastal development.

Table 3. Ranking of Effective Components in Coastal Landscape Design based on Environmental and Social Indicators

Rank	Effective Response Percentage	Components
1	Above 90%	Soundscape (96%); Recreational (Water Sports) (94%); Water Quality (Surface Runoff Management) (93%); Physical Structure (Spatial Fluidity and Flexibility) (91%)
2	Above 80%	Vegetation (Native Planting, etc.) (89%); Urban Furniture Quality (89%); Beach Games (88%); Cultural Spaces (Music and Exhibition Areas) (88%); Safety and Security (Night Lighting and Pedestrian Paths) (88%); Recreational-Tourism Activities (86%); Services (Parking) (85%); Climatic Comfort (85%); Water Quality (Clean Water for Drinking and Bathing) (84%); Restaurants and Cafés – Sanitary Facilities (84%); Spatial Separation of Functions (82%); Coexistence of Pause/Rest/Movement Spaces (82%); Spatial Diversity (80%); Air Quality (80%)
3	Above 70%	Children's Play Area (79%); Cultural Public Gathering Spaces (78%)
4	Above 60%	Pollution (69%); Accommodation Facilities (69%); Children's Play Safety (65%)
5	Above 50%	Spatial Accessibility (59%); Handicraft Booths (54%)
6	Below 50%	Spatial Atmosphere (48%); Existing Vegetation (44%); Visual Diversity (40%); Shops (39%)

6. CONCLUSION

Based on the results of the evaluation and study of users' environmental preferences for environmental and social components, it can be stated that users of coastal landscapes rank social components as more effective than environmental components in attracting users to this area. One important factor in improving the quality of coastal walkways is the quality of each component within the desired context. The environmental indicator components with the highest level of importance in both genders, men and women, in a way express the desire of users and citizens to preserve the existing natural environment and the city's coastline, and express the importance of the social indicator dependent on environmental qualities, because many activities that improve the quality of the social indicator in coastal landscapes; Such as coastal and water activities and sports, the soundscape, which specifically refers to hearing the sounds of seabirds and the sound of waves, as well as activities such as exhibition spaces, coastal festivals, and spaces for playing local music, are also dependent on the improvement and promotion of environmental components such as water quality, beach quality, and air quality.

Studies in the field of social indicators show that, since 38% of the participants in this questionnaire are users aged 15 to 30, paying attention to group and collective activities, as well as the diversity of functions in this area, increases users' willingness to use coastal walkways. Also, paying attention to this issue can attract tourists to the area, because one of the challenges in the coastal strip of Bandarganavah

is the lack of high-quality recreational and cultural activities. On the other hand, paying attention to physical factors such as spatial and functional diversity, appropriate quality of urban furniture, and appropriate access to restaurants, cafés, and sanitary spaces scattered along the sidewalk can, in a sense, better meet users' needs for service spaces.

Among the findings of this study, we can mention the users' desire to create diverse planting beds and improve the quality of urban furniture with similar percentages (89%). Therefore, by combining these two qualities, it is possible to have a significant impact on the coexistence of sitting, pausing, and moving spaces. On the other hand, paying attention to night views and appropriate lighting, especially on the coastal walkway, will improve security and increase the time users (especially women) spend there. Also, to improve safety and security in children's play areas, it is better to place them near family play and seating areas, because one of the preferences of users, especially women, is physical and visual access for parents to the area. These preferences have been expressed, while many of these components currently exist in the study area. However, the way the components are combined, the lack of spatial integration in different parts of the site, and the lack of appropriate quality of these elements on the one hand, and the lack of appropriate physical qualities, such as appropriate flooring, access to service components such as sanitary spaces, pause and semi-pause spaces along the walkway, on the other hand. The lack of appropriate lighting, safety, and security at night, on the other hand, is the cause

of dissatisfaction among users of this area. According to users, the components and factors that affect the quality of coastal landscapes - especially coastal walkways - should make users more willing to be in this area, and rather than the presence or absence of each component affecting this issue, it is the quality of each component that provides this ideal. In other words, what improves the quality of the social index in coastal walkways is the effectiveness of each of these components on the quality of people's interactions with each other; also, the quality of each of the environmental and social index components in coastal landscape design can be discussed when, in addition to efforts to improve and promote the desired context, attention is also paid to the quality of user presence in this area. Considering the preferences of users in the coastal city of Bandar Ganavah, paying attention to the social index and its components can increase users' direct participation in planning and managing coastal landscapes based on their needs and priorities in the long term. Also, in addition to the aforementioned, it is worth mentioning that in the final section of the questionnaire, users were asked to state the factors affecting the improvement of the

quality of the coastal walkway and the characteristics of a suitable coastal walkway from their perspective; Some of them expressed attention to the quality of the movement routes and limiting the possibility of motor vehicles, while others expressed the desire for the presence of diverse planting beds, while not limiting the visual connection to the sea and beach landscape, and the existence of diverse activities as factors affecting this. The results of this study indicate the level of users' desire and interest in activities that improve their social interactions while paying attention to the components and factors affecting the quality of the environmental index. Also, the quality of the social index has a two-way relationship with the quality and importance of environmental indicators, because the design of coastal landscapes is to some extent dependent on the quality of the environmental index in this area. Therefore, there is a need for complementary research to compare and more rigorously evaluate the impact of physical and recreational tourism components on the emergence of environmental quality in coastal landscapes, as well as their impact on attracting tourists to coastal cities.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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The authors state that they have directly participated in the stages of conducting research and writing the article.

REFERENCES

- Abbaszadeh, Shahab, and Sevdam Tamri. 2013. "Investigation and Analysis of the Components Affecting the Improvement of Spatial Qualities of Pedestrians in Order to Increase Social Interactions: Case Study of Tabriz Education and Valiasr Axes." *Quarterly Journal of Urban Studies* 1(4): 1. https://urbstudies.uok.ac.ir/mobile/article_3668.html. [in Persian]
- Abedini, Asghar, Meysam Saket Hassanloui, and Ali Azhari. 2020. "Development of Natural (Coastal) Tourism with Emphasis on Sustainability: Case Study of Hassanlou Naghdeh Dam Area." *Tourism Planning and Development* 9(32): 107-122. https://tourismpd.journals.umz.ac.ir/article_2754.html. [in Persian]
- Akbarzadeh Moghadam Langarodi, Amir, Hasan Ahmadi, and Seyed Reza Azadeh. 2016. "Evaluation of Urban Sidewalk Quality: Case Study of Alam al-Hoda Sidewalk, Rasht." *Journal of Urban Research and Planning* 7(25): 125-140. <https://ensani.ir/fa/article/download/360012>. [in Persian]
- Alves, Bruna, Javier Benavente, and Óscar Ferreira. 2014. "Beach Users' Profile, Perceptions and Willingness to Pay in Cadiz (SW Spain)." In *Proceedings of the 13th International Coastal Symposium*, 521-526. <https://www.researchgate.net/publication/278115190>
- Anari, Farzad, Naser Eghbali, and Reza Moayedfar. 2019. "Evaluation of Communication Network Structure and Urban Resilience in Eastern Tehran." *Journal of New Attitudes in Human Geography* 12(1): 595-617. https://www.jgeoqeshm.ir/article_92799_db432a7b6489655715cc2be28787f08c. [in Persian]
- Areizaga, Jurgi, Sanò, M, Medina, Raul and Juanes, Jose 2012. "Improving Public Engagement in ICZM: A practical approach." *Journal of Environmental Management* 109: 123-135. <https://www.researchgate.net/publication/227172128>.
- Ariza, Eduard, Jose A. Jimenez, Rafael Sada, Miriam Villares, Josep Pinto, Rosa Maria Sansbello, Fraguell Maria, Elisabet Roca, Carolina Marti Llambrich, Herminia Veldemoro, Ramon Ballester, and Modest Fluvia. 2010. "Proposal for an Integral Quality Index for Urban and Urbanized Beaches." *Environmental Management* 45(5): 998-1013. <https://www.researchgate.net/publication/43100589>.
- Baništer, David. 2008. "The Sustainable Mobility Paradigm." *Transport Policy* 15(2): 73-80. <https://www.researchgate.net/publication/223541451>.
- Barbosa de Araujo, Maria Christina, and Monica F. Costa. 2006. "The Significance of Land-Based Waste Sources for Tourist Beaches." *Pan-American Journal of Aquatic Sciences* 1(1): 28-34. <https://www.researchgate.net/publication/255588378>.
- Barbosa de Araujo, Maria Christina, and Monica F. Costa. 2008. "Environmental Quality Indicators for Recreational Beaches Classification." *Journal of Coastal Research* 24(6): 1439-1449. <https://www.researchgate.net/publication/250083852>.
- Bell, Simon. 1993. *Elements of Visual Design in the Landscape*. London: E & FN Spon. <https://www.researchgate.net/publication/237174536>.
- Bell, Simon. 1999. *Landscape: Pattern, Perception and Process*. Washington, DC: Island Press. <https://www.researchgate.net/publication/237175056>.
- Berque, Joannes, and Matsuda, Osamu. 2015. "Coastal Biodiversity Management in Japanese Satoumi." *Marine Policy* 39: 191-200. <https://www.researchgate.net/publication/257163193>.
- Burgess, Jean, Melanie Limb, and Chris Harrison. 1988. "Exploring Environmental Values through the Medium of small groups: 2. Illustrations of a group at work." *Environment and Planning A* 20. <https://www.sciencedirect.com/science/article/pii/S0959378096000234>.
- Beer, A., and C. Higgins. 1999. *Environmental Planning for Site Development*. 2nd ed. London: Taylor & Francis. <http://ndl.ethernet.edu.et/bitstream/123456789/44484/1/48.pdf>.
- Capri, Salvatore, Matteo Ignaccolo, Giuseppe Inturri, and Michela Le Pira. 2016. "Green Walking Networks for Climate Adaptation." *Transportation Research Part D* 45: 84-95. <https://www.researchgate.net/publication/267727131>.
- Chang, Jeong-In, and Sungsoo Yoon. 2017. "Assessing the Economic Value of Beach Restoration: case of songdo Beach, Korea". *Journal of Coastal Research* 79(10079): 6-10. <https://jcr.kglmeridian.com/downloadpdf/view/journals/coas/79/SI/article-p6.pdf>.
- Chen, Bo, A. Adimo Ochieng, and Bao Zhiyi. 2009. "Assessment of Aesthetic Quality and Multiple Function of Urban Green Space from the users' perspective: The case of Hangzhou Flower Garden, China." *Landscape and Urban Planning* 93: 76-82. <https://www.sciencedirect.com/science/article/abs/pii/S0169204609001145>.
- Cohen, Nevin. 2011. *Green Cities: An A-to-Z Guide* (The SAGE Reference Series on Green Society: (Toward a Sustainable Future-series Editor: Paul Robbins Book 4). Sage. <https://www.amazon.com/Green-Cities-Reference-Sustainable-Future-ebook/dp/B00YFRCTI0>.
- Council of Europe. 2000. European Landscape Convention (Treaty No. 176). <https://hrlibrary.umn.edu/euro/ets176.html>.

- Daniel, Terry C. 2001. "whither Scenic Beauty? Visual Landscape Quality Assessment in the 21st Century." *Landscape and Urban Planning* 54(1): 267-281. <https://www.researchgate.net/publication/223248778>.
- Didehban, Mohammad, Kourosh Momeni, and Sara Niknam. 2016. "Sidewalk Design with Vitality Approach." *Isfahan Conference Proceedings*. <https://civilica.com/doc/606880/>. [in Persian]
- Divsalar, Asadollah, Esmail Aliakbari, and Amir Bakhshi. 2018. "Smart Growth and Coastal Cities: Babolsar Case." *Geographical Planning Journal* 8(29): 181-200. https://gps.gu.ac.ir/article_80361.html. [in Persian]
- Faizi, Mohsen, Farhang Mozaffar, Mehraneh Raiti-Damavandi, and Maryam Azimi. 2014. "The Comparison of Public Perception and preference between regular-geometrical and natural-organic urban parks(case study: Laleh park and Daneshjoo park." *Quarterly Journal of Urban Studies* 4(13): 5-16. https://urbstudies.uok.ac.ir/mobile/article_11720.html. [in Persian]
- Farahi Farimani, Maryam, and Mehdi Haghighat Bin. 2017. "Marine Landscape Ecology." *Humans and Environment Quarterly Journal* 43. <https://civilica.com/doc/1872871/>. [in Persian]
- Farajzadeh, Mehdi, et al. 2021. "Urban Pavements and Citizen Perception." *New Attitudes in Human Geography* 13(2). <https://civilica.com/doc/1165012/>. [in Persian]
- Fuente de Val, Gonzalo de la, Jose A. Atauri, and Jose Vicente de Lucio. 2006. "Relationship between Landscape Visual Attributes and Spatial Patterns indices: A test Study in Mediterranean-Climate Landscapes." *Landscape and Urban Planning* 77(4): 393-407. <https://www.researchgate.net/publication/223491638>.
- Garcia Morales, G., Jose Arreola-Lizarraga, Renato Mendoza-Salgado, Jaqueline Garcia-Hernandez, Pedro Rosales-Granod, and Alfredo Ortega-Rubio. 2018. "Evaluation of Beach Quality as Perceived by Users." *Journal of Environmental Planning and Management* 61(1): 1-15. <https://www.researchgate.net/publication/315594832>.
- Gehl, Jan. 2011. *Life Between Buildings: Using Public Space*. Washington, DC: Island Press. <https://www.amazon.com/Life-Between-Buildings-Using-Public/dp/1597268275>.
- Giovinnazzi, Oriana, and Marta Moretti. 2010. "Port Cities and Urban Waterfront: Transformations and Opportunities" *Journal of Land Use, Mobility and Environment* 2. <https://www.researchgate.net/publication/279500940>.
- Hashemi, Negar Al-Sadat. 2015. "Safe Edge Landscape Design." Master's thesis, Tarbiat Modares University. <https://elmnnet.ir/doc/10917191-43522>. [in Persian]
- Heidarzadeh, Ehsan, Mohammad Reza Haghi, and Niusa Zarrin. 2021. "Coastal Strip Satisfaction in Bushehr." *Geographical Urban Planning Research* 9(1): 211-229. <https://www.sid.ir/paper/1062787/fa>. [in Persian]
- Herzog, Thomas, and Gregory A. Smith. 1988. "Danger, Mystery, and Environmental Preference." *Environment and Behavior* 20(3): 320-344. <https://www.researchgate.net/publication/249623914>.
- Huong, Thi Thu Do, Nguyen Dinh Hoe, Lan Tran Dinh, Nguyen Thi Thu Ha, and Nguyen Dac Ve. 2017. "Assessment of Beach Quality in the Northeastern coast of Vietnam by using index method." *Journal of Marine Science and Technology* 17(3): 292-300. <https://www.researchgate.net/publication/321131890>.
- Jacobs, Jane. 1961. *The Death and Life of Great American Cities*. New York: Vintage. <https://www.amazon.com/Death-Life-Great-American-Cities/dp/067974195X>.
- Kaplan, Stephen. 1987. "Aesthetics, Affect, and Cognition Environmental preference from an Evolutionary perspective." *Environment and Behavior* 19(1): 3-32. <https://journals.sagepub.com/doi/10.1177/0013916587191001>.
- Lak, Azadeh, and Mina Ramezani. 2018. "Users' Preferences For Designing Spaces Under Urban Bridges As Vital Urban Spaces." *Armanshahr Architecture & Urban Development* 11(23): 225-235. https://www.armanshahrjournal.com/article_69692.html. [in Persian]
- Loomis, David K., and Shona Paterson. 2014. "The Human dimensions indicators of coastal ecosystem services: Managing for social values." *Ecological Indicators* 44: 63-68. <https://www.researchgate.net/publication/258208894>.
- Lynch, Kevin. 1977. *The Image of the City*. Cambridge, MA: MIT Press. <https://www.amazon.com/Image-City-Kevin-Lynch/dp/0262620014>.
- Mahmoudi, Hamid, and Masoud Alimardani. 2015. "Urban Furniture in Coastal Walkways." *Sustainable Architecture and Urban Planning* 3(1): 31-46. <https://civilica.com/doc/607117/>. [in Persian]
- Mehranian, Hamed, and Azizan Marzuki. 2018. "Beach Users' Perceptions Toward Beach Quality and Crowding: A Case of Cenang Beach, Langkawi Island, Malaysia." *Sea Level Rise and Coastal Infrastructure*. <https://www.researchgate.net/publication/327494748>.
- Morales Gisela Garcia, Lizarraga, Salgado Jose Alfredo Arreola, Hernandez Renato Mendoza, Pedro Rosales Grano, and Alfredo Ortega Rubio. 2017. "Evaluation of Beach Quality as Perceived by Users." *Journal of Environmental Planning and Management* 61(3): 1-15. <https://www.researchgate.net/publication/315594832>.
- Naghibi, Maryam, Ahmad Ekhlassi, and Mohsen Faizi. 2022. "Provision of Intervention Strategies to Convert Leftover Spaces to Pocket Parks, with an Emphasis on User Preferences." *Armanshahr Architecture & Urban Development Journal* 14(37): 261-273. http://www.armanshahrjournal.com/article_147104.html. [in Persian]

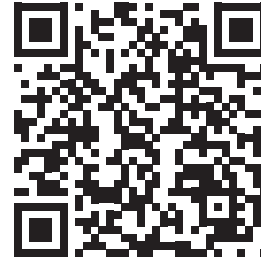
- Naderi, Maryam, and Omid Ebrahim. 2015. Activating walkways and urban streets with emphasis on the application of environmental graphics. *Journal of Urban management* (41): 49-66. <https://sid.ir/paper/92125/fa>. [in Persian]
- Nieman, Thomas J. 2008. "The Visual Environment of the New York Coastal Zone: User Preferences and Perceptions." Department of Horticulture and Landscape Architecture, University of Kentucky, Lexington, KY, USA. <https://www.tandfonline.com/doi/abs/10.1080/08920758009361867>.
- Osgood, Charles E., and George J. Suci, and Percy Tannenbaum. 1967. *The Measurement of Meaning*. Urbana: University of Illinois Press. <https://www.amazon.com/Measurement-Meaning-Charles-Osgood/dp/0252745396>.
- Peng, Chenchen, and Kazuo Yamashita. 2015. "An Empirical Study on the Effects of the Beach on Mood and Mental Health in Japan." *Journal of Coastal Zone Management* 18(4): 1-6. <https://www.researchgate.net/publication/307792483>.
- Penn, Jerrod M., Wuyang Hu, Linda Cox, and Lara Kozloff. 2016. "Values for Recreational Beach Quality in Oahu, Hawaii." *Marine Resource Economics* 31(1): 2-17. https://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1020&context=agecon_facpub.
- Rafieian, Mojtaba, Esfandiar Sedighi, and Marziyeh Pourmohammadi. 2011. "Feasibility Study of Quality Improvement by Pedestrianization of Urban Roads Case Study: Aram Street of Ghom CBD." *Urban and Regional Studies and Research* 3(11): 41-56. https://urs.ui.ac.ir/article_20001_00.html. [in Persian]
- Rudianto, Tantu, and Gušti Andi. 2014. "An Analysis of Coastal Land conflict in the North of Jakarta coastal area: (A general algebraic modeling system approach)". *Journal of coastal conservation* 18(1): 69-74. <https://link.springer.com/article/10.1007/s11852-013-0298-4>.
- Rodella, Ilaria, and Corinne Corbau. 2020. "Linking Scenery and Users' Perception analysis of Italian beaches (case studies in Veneto, Emilia-Romagna and Basilicata regions)." *Ocean & Coastal Management* 183(3). <https://www.researchgate.net/publication/335991512>.
- Rodella, Ilaria, Fabio Albino Madau, and Donatella Carboni. 2020. "The Willingness to Pay for Beach Scenery and its Preservation in Italy." *Sustainability* 12(4): 1-26. <https://www.researchgate.net/publication/339389642>.
- Saadati, AmirSam, Vahid Heidar Nattaj, and Novin Tavallaei. 2021. "Utilization of the Environmental Preferences of the Users as an Approach to Improving Urban Riverside Spaces; Case Study: Babolrood Riverside, Babolsar." *Armanshahr Architecture & Urban Development* 15(40): 101-116. http://www.armanshahrjournal.com/article_89057.html. [in Persian]
- Saghafi Asl, A., M. Haghlesan, and A. Abdollahzadeh Taraf. 2012. "The Role of Pedestrian Streets in Sustainability of Urban Spaces: Case study: Tabriz Tarbiyat Street, Iran." *Advances in Natural and Applied Sciences* 6(6): 1014-1021. <https://www.researchgate.net/publication/261222494>. [in Persian]
- Samsunlu, A., and L. Akça. 1998. "Coastal Pollution and Mitigation Measures in Turkey." *Water Science and Technology* 39(8): 13-20. <https://www.sciencedirect.com/science/article/pii/S0273122399001821>.
- Semeoshenkova, Vera, and Allan Williams. 2011. "Beach Quality Assessment and Management in the Sotayento (Eastern) Algarve, Portugal." *Journal of Coastal Research* SI 64: 1282-1286. <https://www.researchgate.net/publication/265519638>.
- Semeoshenkova, V., A. Newton, A. Contin, and N. Greggio. 2017. "Development and Application of an Integrated Beach Quality Index (BQI)." *Ocean & Coastal Management* 143: 74-86. <https://www.sciencedirect.com/science/article/pii/S0964569116301661>.
- Shaaban, K. 2019. "Assessing Sidewalk and Corridor Walkability in Developing Countries." *Sustainability* 11: 3865. <https://www.researchgate.net/publication/334513904>.
- Shieh, Esmail, and Sajad Alipour Eshliki. 2010. "Investigates the Contributory Factors of Coastal Tourism Improvement with Regard to Sustainable Tourism Criteria; Case Study: Ramsar Coast." *Armanshahr Architecture & Urban Development* 3(5): 155-168. [in Persian]
- Subiza-Pérez, M., L. Vozmediano, and C. San Juan. 2020. "Green and Blue Settings as Providers of Mental Health Ecosystem Services, Comparing Urban Beaches and Parks and Building a Predictive Model of Psychological Restoration." *Landscape and Urban Planning* 204: 1-8. <https://www.sciencedirect.com/science/article/abs/pii/S0169204620303418>.
- Valizadeh, Negar, and Alireza Andalib. 2017. "Designing the public realm considering the relationships between activity patterns and design features (case study: Persian Gulf Martyrs Lake Area, District 22, Tehran)." Paper presented at the *International Conference on Civil Engineering, Architecture and Contemporary Urbanism of Iran*, Tehran. <https://elmnnet.ir/d/20758107-11601/source>. [in Persian]
- Wood, Lisa Jane, Lawrence D. Frank, and Billie Giles-Corti. 2010. "Sense of community and its relationship with walking and neighborhood design". *Social Science & Medicine* 70(9): 1381-90. <https://www.researchgate.net/publication/41622280>.
- Woolley, Helen. 2003. *"Urban Open Spaces"*. New York: Spon Press. <https://www.researchgate.net/publication/286470807>.

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