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NATURE CONNECTEDNESS MEASUREMENT IN COASTAL AND MARINE COMMUNITIES

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Abstract

Nature connectedness refers to how people emotionally, mentally, and physically relate to the natural environment. For coastal and marine communities, such connections are important for ecological stewardship and personal well-being. Using a mixed-method approach, this study examines the nature of connectedness levels and dimensions of residents from six coastal and marine regions. A total of 621 participants were obtained through stratified sampling and assessed using the Nature Relatedness Scale (NRS) and the Environmental Identity Inventory. Traditional beliefs, rituals, and everyday practices regarding nature were explored through guided interviews and observational methods for additional qualitative perspectives. Results indicate that marine vicinity, cultural background, and occupational affiliation are strong determinants of nature connectedness. Most notably, higher affective and cognitive scores were noted among participants engaged in fishing and eco-tourism. ANOVA and correlation tests revealed that occupation, gender, and distance from the coast were primary determinants. These findings are relevant for the development of comprehensive conservation policies and community-driven environmental initiatives. This paper stemmed from enhanced policy and practice proposals alongside nature connectedness promotion research in vulnerable coastal ecosystems.

Keywords

Nature connectedness, Marine communities, Coastal ecosystems, Pro-environmental behavior, Environmental psychology, Cultural beliefs, Sustainability

I. INTRODUCTION

Nature connectedness refers to the phenomenon involving how deeply people identify, feel emotionally, and engage with the natural environment. Connected with affection and behavior, these areas and more make up the cognitive dimension of nature connectedness. Connectedness reflects how deeply people internalize their relationship with the environment and their resultant actions, attitudes, and stewardship to the environment (Filfilan&Alattas, 2025).

Nature connectedness is integral to the people of the coastal and marine communities. These communities economically, culturally, and spiritually integrate with natural ecosystems. Coastal areas encompass coral reefs, mangroves, and even estuaries, along with the much broader marine biodiversity (Rao& Tiwari,2023). At the same time, coastal ecosystems serve as hubs for human-nature interaction, making these areas ecological hotspots. These regions, and the people bonded emotionally with the sea and the shore, cultivate a strong environmental identity shaped by experiences and traditions (Daivagna et al., 2025)

Environmental psychologists and conservation scientists are noticing the importance of nature connectedness (Shah& Bansal,2023). It is encouraging that more studies are being done on the nature-culture nexus, though. As evidenced by previous studies, individuals with a strong connection to nature are more likely to engage in conservation activities, support environmental initiatives, and experience enhanced psychological well-being. Most, however, have focused

on urban and terrestrial populations. There is an absence of focused empirical marine and coastal communities, where the nature-human nexus is unique and culturally mediated (Sánchez-Ancajima et al., 2024).

This study aims to fill that gap by measuring nature connectedness in coastal and marine communities across six regions and analyzing the levels and factors that influence nature connectedness.

The study employs mixed methods to blend the primitive metrics of nature connectedness with the narratives of traditional ecological knowledge and community practice. This approach assists in developing policies for sustainable coastal development and conservation by illustrating the role nature connectedness may have in informing such policies.

II. LITERATURE REVIEW

Nature connectedness is recognized as a psychological construct that captures the extent to which a person is emotionally, cognitively, and experientially close to the natural world. It has become one of the central determinants of behavioral sustainability, environmental concerns, and personal well-being (Escobedo et al., 2024). Most foundational works on the concept of connectedness with nature have examined it as a part of one's self-identification with nature, ecological appreciation, and active participation in nature. These aspects contribute to forming the environment and pro-environmental attitude of a person (Pushpavalli et al., 2024).

So far, the majority of empirical research on nature connectedness has studied urban and rural populations, with little attention paid to communities whose livelihoods and cultural identities are intimately related to marine ecosystems (Zafarmand, 2016). In the coastal and marine contexts where life is intertwined with ocean and shoreline activities, the human-nature relationship is particularly distinctive. Inhabitants of these regions often have deep emotional and cultural connections to the ocean and the sea through occupations such as fishing, sea rituals, and intergenerational storytelling. Such relationships create a deeply rooted, practical, and symbolic environmental identity (Ghosh& Chatterjee,2023).

There is growing understanding that the connection between humans and the sea is not mediated solely through geographical distance, but also through professional engagement, cultural heritage, and qualitative modalities of human perception.

The bond coastal residents have with their marine environment is often warmer and more spiritually deep than that of tourists and inland residents (Abdullah,2025). Still, adaptations to context-specific psychometric methods that measure nature connectedness have, mid-scope, been overlooked, resulting in potential under- or over-estimation of connectedness in marine regions (Ziwei& Han, 2023).

Equally important, demographic factors like gender, age, education level, and even occupation shape people’s relationship with nature. Fishing communities, for example, tend to have more direct, ongoing, emotional, and experiential attachment to nature due to their occupation, while eco-tourism communities often display heightened cognitive and behavioral congruence with eco-sustainable practices (Ziwei et al., 2023). This deep understanding highlights the need for more culturally-informed and deeper approaches to measure nature connectedness in coastal regions (Herrera et al., 2023)

While some researchers have attempted to study emotional attachment to marine environments, comprehensive work using standardized measures specific to coastal communities is lacking. This absence of holistic work is critical in understanding the field of environmental psychology and conservation planning (Karthika, 2025). Capturing how coastal communities view and relate to their nature is vital for developing targeted ecosystem education, sustainable livelihood frameworks, and participatory models for conservation.

To address these gaps, the present study integrates qualitative and quantitative methods to measure nature connectedness in six coastal regions.

It uses quantitative measures as well as qualitative factors to form an integrated understanding of the extent to which the marine environment is interfaced with by an individual, considering demographic, occupational, and geographic elements. This approach aids in illustrating the gap between the environment and the social realities of coastal populations, justifying culturally appropriate solutions to sustain their environment.

III. METHODS

In coastal and marine communities, this study integrated quantitative surveys with qualitative fieldwork to examine nature connectedness using a mixed-methods approach. The study design aimed to gather both quantitative and qualitative cultural data through participant engagement, psychometric evaluations, and fieldwork.

3.1 Participant Selection

The study's participants came from six coastal and marine communities, which were culturally and geographically distinct. These sites were selected based on ecological diversity, distance to coastal ecosystems, related occupations, and cultural practices. To address differences across gender, age groups, and multiple occupational sectors, including fishing, eco-tourism, agriculture, and other coastal industries, stratified sampling was applied. There were 621 participants in total. Community contacts and local institutions were used for recruitment to foster trust, relevance, and reliability in participant engagement. Participants were informed of the purpose of the study, anonymity, and the voluntary nature of their involvement, and ethical approval was secured before data collection.

3.2 Measurement Tools

The Nature Relatedness Scale (NRS) was the primary tool used to assess nature connectedness. It was designed to capture someone's relationship with nature affectively, cognitively, and experientially. The NRS encompasses three principal subscales:

• NR-Self, the assessment of the emotional identification of individuals with nature;

• NR-Perspective, the measurement of the awareness and understanding of the human–nature relationship and its interdependence;

• NR-Experience, the measurement of the occurrence and quality of nature contact, which includes being in and using the senses in natural settings.

To capture this evaluation, the Environmental Identity Inventory was administered to gauge the perception of responsibility towards the environment. Both instruments were contextually pre-tested for relevance and internal reliability. Psychometric evaluation of these instruments in the administered population indicated the presence of high internal consistency. Cronbach's alpha coefficients were above 0.82 for all subscales.

3.3 Data Collection Procedures

To enhance cultural relevance, sensitivity, and methodological rigor, data collection was done in three distinct phases. In the first phase, structured surveys were conducted face-to-face with the help of trained local enumerators who spoke the local dialects and understood the cultural context. This ensured accurate translation of the questions into regional dialects, which promoted participant willingness to respond openly and in detail.

Community elders, local fishermen, tourism operators, and environmental leaders were interviewed in the second phase during semi-structured interviews.

These interviews illuminate the intricate components of the community rituals, oral traditions, and seasonal practices that demonstrate ecological wisdom and the emotional bond to the sea in marine stewardship.

Researchers in the third phase conducted non-intrusive field observations, documenting interactions with the environment and behaviors in more natural contexts. These included fishing, attending religious or conservation rituals, coastal farming, and various family nature-oriented activities. The notes collected from the field were used alongside the survey and interview data to enhance the study's triangulation, thereby increasing its validity and rigor.

Through all of the data collected, the methods provide the resulting dataset with a rich environment for examining the level and extent of the connection to the environment in coastal and maritime populations. Quantitative data were later subjected to descriptive and inferential statistical analyses, and qualitative data were thematically coded to reveal the culturally embedded constructs.

3.4 Methodological Flowchart

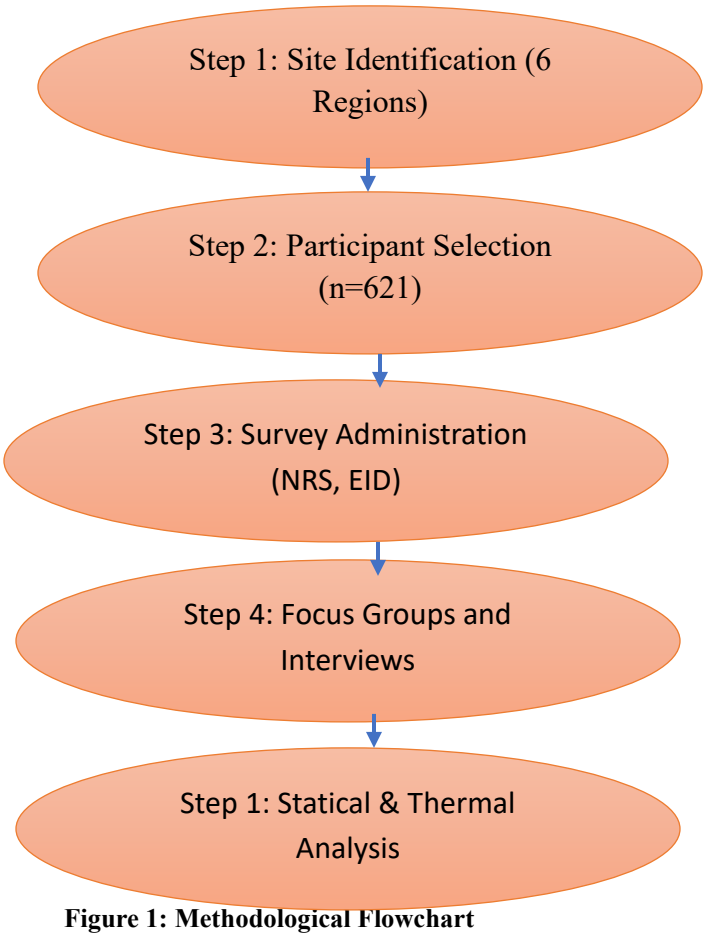

Figure 1: Methodological Flowchart

In Figure 1, Step 1 shows the identification of six coastal regions, which is followed by stratified participant recruitment (n = 621). Surveys were conducted using validated instruments, and qualitative information was gathered through interviews and observations. The last steps of the process were statistical and thematic analysis to guarantee depth and accuracy.

III. RESULTS

The following results summarize both descriptive and inferential analyses of nature connectedness among participants.

3.1 Demographic Characteristics

Table 1. Participant Demographics (N=621)

Variable	Category	Frequency	Percentage (%)
Gender	Male	300	48.3
	Female	321	51.7
Age Group	18–30	184	29.6
	31–45	213	34.3
	46–60	143	23
	61+	81	13
Primary Work	Fishing	218	35.1

	Tourism	145	23.3
	Agriculture	72	11.6
	Others	186	30

The demographic profile of 621 participants is in Table 1. It exhibits almost equal gender ratios alongside a wide range of ages. Economically, most participants worked in fishing (35.1%), followed by tourism (23.3%) and agriculture (11.6%). This range of participants enriches the representation of the study, thereby increasing its value and scope across different types of communities.

3.2 Nature Connectedness Scores

Table 2. Nature Relatedness Scale Scores (Mean ± SD)

Subscale	Mean ± SD	Interpretation
NR-Self (Emotional)	4.32 ± 0.71	Strong connection
NR-Perspective (Cognitive)	4.18 ± 0.66	High awareness
NR-Experience (Physical)	3.94 ± 0.74	Moderate to High

Table 2 shows the average scores along with their interpretations for each subscale of the Nature Relatedness Scale. Participants had the highest mean scores in NR-Self (4.32 ± 0.71), which reflects a strong emotional connection to nature. This is along with the high-scoring pro-environmental intention subscale, which shows that a majority of participants not only feel connected to nature but also intend to take action to protect it. Although NR-Experience is moderate to high, it has comparatively lower scores, which may suggest that participants had limited physical access to nature or opportunities to engage with nature because of their jobs or other environmental-related constraints.

3.3 Occupational Influence

Table 3. ANOVA: Connectedness by Occupation

Occupation	Mean NCS Score	F-value	p-value
Fishing	4.41		
Tourism	4.27	6.32	0.002 **
Agriculture	4.18		
Others	3.96		

In Table 3, the average nature connectedness scores for different occupations are compared across four groups. Participants from fishing communities scored the highest (4.41), followed by those from tourism. ANOVA results also indicated meaningful differences ($F = 6.32$, $p = 0.002$), which implies the presence of a primary occupation impacts connectedness to nature. People involved in nature-based marine occupations have closer ties to nature, which supports the hypothesis that connectedness is enhanced through direct participation.

3.4 Geographic Proximity to Nature

Table 4. Correlation: Distance from Coast vs NCS Dimensions

Dimension	r-value	p-value
NR-Self (Emotional)	-0.41	< 0.01
NR-Experience	-0.37	< 0.01
Pro-environmental Intent	-0.29	< 0.05

Table 4 illustrates the negative relationship between distance to the coast and nature connectedness subscales. For example, NR-Self demonstrates a strong negative correlation ($r = –0.41$, $p < 0.01$), suggesting that individuals living closer to the sea tend to have a stronger emotional connection. This highlights how affection in nature-human relationship systems is influenced by distance.

Emotional and behavioral connectedness decreases as residents relocate further from natural coastlines.

IV. DISCUSSION

This research reconfirms the nature of connectedness in coastal and marine peoples. The high emotional and cognitive scores captured indicate that residents consider nature as a part of their lives. Cultural and spiritual practices and occupations, particularly in fishing communities, strongly appear to foster this bond.

The results indicate that nature connectedness is not only an individuality but a socio-cultural trait, as it is influenced by the history, culture, economic activities, and location of a place. Such information is crucial in formulating strategies for conservation. The marine conservation programs are more likely to succeed when the residents' traditional ecological knowledge, their culture, and co-management practices of the coastal ecosystem are respected.

Strengthening the ecological commitment of the younger generation, especially in the face of rising tourism and modernization, is vital to safeguarding these areas. We propose that place-based environmental education, such as school-based coastal immersion, will foster intergenerational connections to the coast.

Regardless, the research has some shortcomings. Although the sample was diverse, it was limited to six regions. The instruments, while validated, were initially designed for the general population and need to be tailored to the coastal population.

Future studies could examine changes over time in nature connectedness and its relationship with specific actions such as participation in marine conservation activities or sustainable fishing.

V. CONCLUSION

This study offers a thorough assessment of nature connectedness in coastal and marine communities and reveals strong affective, cognitive, and experiential bonds with those environments. Cultural and occupational traditions, as well as proximity to the sea, play a significant role in shaping these connections.

Cultivating nature connectedness in these communities is vital for individual well-being and the health of coastal ecosystems. Policies for marine conservation and climate adaptation need to consider residents' deep psychological and cultural bonds with their surroundings.

Adapting measurement tools for specific local contexts as well as designing interventions that strengthen human-nature relationships, particularly in ecologically vulnerable regions, should be the focus of further research.

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