

Traditional Knowledge and Sustainable Governance: A Case Study of the Coastal Communities of Ilaje, Ondo State, Nigeria.

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Highlights

- Traditional knowledge has helped indigenous communities live sustainably
- Traditional knowledge improves environmental and sustainable governance outcomes
- Gender-inclusive governance has shown progressive resource management outcomes
- Young people are starting to document traditional ecological knowledge digitally
- Policy reforms should formally acknowledge the value of traditional knowledge

Abstract

Marine resources generate half of the earth's oxygen, provide food, and provide multiple income opportunities that typically make up the primary income-generating activities for coastal communities. Ocean governance and conservation initiatives rely on different types of knowledge to ensure the sustainable governance of these resources. In this study, we sought to explore Traditional Ecological Knowledge (TEK) and its potential to promote the sustainable governance of marine resources and coastal communities using the Ilaje coastal communities in Ondo State, Nigeria, as a microcosm of the intersection between traditional knowledge and modern marine policies. Through a combination of qualitative and quantitative methods, this study explores the multifaceted lived experiences of the Ilaje, highlights their profound understanding of their marine ecosystem, and derives ways in which their traditional knowledge can be synergized with contemporary science-informed approaches to inform sustainable ocean governance policies. This exploration underscores the importance of collaborative governance, which brings together all members of respective coastal communities, recognizes the knowledge they hold on marine resource management, and integrates it with modern knowledge to form a cornerstone for equitable and sustainable marine policies.

Keywords: Traditional ecological knowledge, marine resources, sustainable, governance.

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1.0 Introduction

The United Nations Environment Program recognizes the role of the traditional knowledge held by indigenous people in maintaining an ecological balance in their environment while ensuring that they harness its natural resources to provide water, medicine, food, shelter, and sustenance to all forms of life [1]. Over the past few decades, global programs, agreements, and efforts targeting environmental, biodiversity, and natural sustainability have started to recognize the integral role of traditional or indigenous knowledge in the sustainability of the environment and natural resources, driven by the knowledge that diverse indigenous communities from all over the world have lived sustainably for millennia. Notably, the Convention on Biological Diversity (CBD) acknowledges and values the knowledge that local communities have developed after centuries of learning from their environment, adapting their agricultural, food production, and medical practices to it, and passing down the knowledge they have acquired to future generations [2]. This cumulative collection of knowledge, beliefs, and practices of indigenous communities involving deriving sustenance from natural resources while ensuring the sustainability of their use for current and future generations is known by many names, including ethno-ecology, traditional knowledge, indigenous technical knowledge, or traditional ecological knowledge [3].

In Africa, Traditional Ecological Knowledge (TEK) plays a significant role in sustainability through its use in local decision-making in activities that are fundamental in the survival of the communities, which include agriculture, health services, weather and climate-related predictions and services, and disaster risk management [3]. In Nigeria, for instance, local communities have harnessed their indigenous knowledge and used it to defy the negative effects of land degradation, water, and air pollution on fishing and other activities that produce food, including agriculture [4]. Despite the potential for traditional knowledge in countering the negative effects of climate change on food production by increasing food yield amidst persistent drought and promoting environmental sustainability, its value is highly undermined in Nigeria [5]. Scientific knowledge, on the other hand, is highly valued, and used formally to guide environment and ecology-related decisions affecting Nigerian communities despite its fundamental limitation of systematic temporal, spatial, and taxonomic biases, which stem from differences in funding priorities, influence from government policies, and individual biases held by the people who conduct scientific studies [6].

The potential for the synthesis of traditional knowledge and scientific knowledge to improve environmental outcomes and promote sustainability presents a unique opportunity for the integration of TEK with scientific approaches to yield comprehensive knowledge that can be incorporated into policy and serve as a cornerstone for sustainable governance. To understand how TEK can be integrated into collaborative and sustainable governance, we studied the socio-economic conditions, traditional ecological knowledge, and marine resource management resources among a group of coastal communities in Ondo state, Nigeria. Ilaje is a local government area in Ondo state, Nigeria [7]. It lies on a coastal stretch along the Atlantic Ocean. With an area of 1,318km², the Ilaje area was projected to have a population of 445,200 as of March 2022 according to City Population [8]. The coastal area of Ilaje has a diverse occupational structure. The most common socio-economic activities among the communities in Ilaje include fishing and agriculture, mining, small scale industry such as the processing of agricultural produce, passenger and cargo transportation, and commerce [9].

The primary objective of this study was to evaluate the relationship between traditional knowledge and sustainable governance among the Ilaje coastal communities in Nigeria. Specifically, this study aimed to address the following questions:

1. What are the distinct indigenous environmental and marine resource management practices that exist among the coastal communities of Ilaje?
2. What is the role of traditional knowledge in the governance systems of the coastal communities of Ilaje?
3. How can the traditional knowledge held by the coastal communities of Ilaje contribute to sustainable governance?

2.0 Material and Methods

To understand the potential for the intersection of traditional knowledge and sustainable governance among the Ilaje coastal communities, we examined the current knowledge, practices, perceptions, and socioeconomic conditions of their members.

2.1 Study Area

Ilaje is a local government area in Ondo state, Nigeria [7]. It lies on a coastal stretch along the Atlantic Ocean. With an area of 1,318km², the Ilaje area was projected to have a population of 445,200 as of March 2022 according to City Population [8]. It is located between latitude 5° 50'N – 6° 09'N and longitude 4° 45'E – 5° 18'6"05'E) and bounded on the south by the Atlantic Ocean (see Figure 1). The local government area consists of ten communities, namely; Igbokoda, Mahin, Ugbo-Nla, Idi-Ogba, Aiyetoro, Ilowo, Obenla, Odo-Nla, Ikuyiminu, and Awoye.



Figure 1: Study Area- Map of Ilaje, Ondo State.

2.2 Research Design

This study aimed to investigate the traditional ecological knowledge held by the members of the Ilaje coastal communities, its relation with their socio-economic conditions, and its manifestation in their marine resource management practices. To this end, a cross-sectional analysis was conducted to provide a comprehensive picture of the community dynamics of the communities in Ilaje and their interaction with the marine environment. The data that informed the analysis was collected using a mixed-methods approach, which combined quantitative data collected through surveys with qualitative data collected through semi-structured interviews and focus group discussions.

2.3 Sample Selection

To ensure a comprehensive understanding of the interplay between traditional knowledge and sustainable governance among the coastal communities, a stratified random sampling method was applied to the Ilaje local government area, encompassing the following ten communities:

1. Igbokoda
2. Mahin
3. Ugbo-Nla
4. Idi-Ogba
5. Ilowo
6. Obenla
7. Odo-Nla
8. Ikuyinminu
9. Awoye
10. Aiyetoro

The stratification process was designed carefully to ensure that each community was proportionally represented, accounting for variations in demographic characteristics such as age and gender and socio-economic factors like occupation and social status. This approach allowed for the collection of data that accurately reflects the rich tapestry of cultural, economic, and environmental interactions that characterize the Ilaje coastal communities. Each of these communities possesses distinct socio-economic features and indigenous marine resource management practices, providing a robust foundation for analyzing the efficacy and resilience of traditional governance systems in the face of modern environmental challenges.

2.4 Data Collection

A total of 500 respondents from the ten communities were selected. To ensure a balanced representation of gender, 50.7% of the respondents were male while 49.3% were female. Two types of quantitative data were collected from the respondents. First, a demographic and socio-economic survey was conducted using a structured questionnaire to collect data on the demographic characteristics, income levels, occupations, level of education, and property ownership in the 10 communities. Second, an ecological impact assessment was conducted to collect quantitative data on the types and stock of fish in the region, the various species of organisms in the region, and the environmental health indicators of the Ilaje area. This data was collected in collaboration with local marine researchers, who provided insight for use in the assessment of resource management practices in the communities and distinction between traditional versus modern research management approaches. Similarly, qualitative data was collected in two ways. First, semi-structured interviews were conducted to gain in-depth insight into the traditional ecological knowledge held by the communities, their governance structures, and the role of different members of the communities in resource management. Key respondents included members of the communities' council of elders, other community leaders, members of the communities' women's groups, and young adults. The sampling method used was purposive to ensure the inclusion of individuals with extensive knowledge of community traditions and governance in the list of key informants. To gather more diverse insights on resource management in the communities from the perspectives of other members besides the groups selected for the semi-structured interviews, focus groups were conducted. Each group comprised 8-12 participants, who shared their perspectives on the challenges their respective communities face in resource management, their communities' attitudes toward their traditional ecological knowledge and modern scientific resource management, and how their communities pass traditional knowledge down to younger generations.

2.5 Data Analysis

Quantitative data was analyzed using statistical methods. Descriptive statistics were computed for demographic and socio-economic variables. Inferential statistics, including chi-square and t-tests, were applied to explore relationships between socio-economic and resource management practices. Ecological data were analyzed using statistical software to identify trends in marine ecosystems and determine their health. Qualitative data collected through focus

groups and the semi-structured interviews was analyzed and coded to identify recurring themes and patterns related to traditional ecological knowledge, governance, and environmental observations.

3.0 Results

3.1 Demographic and Socio-Economic Characteristics

The demographic and socio-economic survey was conducted among 500 respondents, of whom 246 (49.3%) were female while 254 (50.7%) were male, reflecting a near equitable albeit slightly patriarchal nuanced structure that impacts participation in various economic and governance activities within the ten communities in Ilaje. The age of the respondents ranged from 18 to 65 years, providing a comprehensive view of resource management in Ilaje drawn from the perspectives of the primary economically active age groups in the region. The age distribution of the respondents was segmented into three categories as follows:

Table 1: Age Distribution

| Age Group | Number of Respondents (n) | Percentage |
|-----------|---------------------------|------------|
| 18-35 | 200 | 40% |
| 36-50 | 175 | 35% |
| 51-65 | 125 | 25% |

The education background of the respondents varied as shown in the table below, demonstrating the significant educational disparities that influence access to both knowledge and economic activities among the members of the coastal communities in Ilaje.

Table 2: Level of Education

| Level of Education | Number of Respondents (n) | Percentage |
|---------------------------------|---------------------------|------------|
| No formal education | 150 | 30% |
| Primary and secondary education | 258 | 51.6% |
| Tertiary education | 92 | 18.4% |

Ilaje lies along one of the largest coastlines in Nigeria. Naturally, the predominant occupation activity in the region is fishing, with nearly half of the respondents engaged in the activity as their main source of sustenance for themselves and their families, underscoring the community's dependence on marine resources for survival. A quarter of the respondents were engaged in trading while others utilized materials sourced from the marine environment for artisanal crafts. The rest of the respondents engaged in diverse occupations. The distribution of socio-economic activities in the Ilaje local government area is as shown in the table below:

Table 3: Occupation

| Occupation/Socio-Economic Activity | Number of Respondents (n) | Percentage |
|---|---------------------------|------------|
| Fishing | 210 | 42% |
| Trading | 125 | 25% |
| Artisanal crafts | 90 | 18% |
| Others (Agriculture, services, government jobs) | 75 | 15% |

By engaging in the above income-generating activities, 15% of the households in Ilaje are able to live above the poverty line while the majority (85%) live below the poverty line, demonstrating the economic fragility of the community and the need for sustainable resource management to improve the economic status of the area, particularly since 325 (65%) of the respondents' households rely on marine resources and the ocean for more than half of their income as shown in the table below:

Table 4: Level of Income and Reliance on Marine Resources

| Category | Number of Respondents (n) | Percentage |
|--|---------------------------|------------|
| Level of Income Relative to the Poverty Line | | |
| Households living below the poverty line | 75 | 15% |
| Households living above the poverty line | 425 | 85% |
| Reliance on Marine Resources for Sustenance | | |
| Households that rely on marine resources for more than 50% of income | 325 | 65% |
| Households that rely on marine resources for less than 50% of their income | 175 | 35% |

Most members of the community, regardless of their occupation and level of education, income, and reliance on marine resources for sustenance, participate in decision-making and local governance processes, implying strong cohesion among the members of the communities, which demonstrates a significant potential for the success of community-led initiatives. However, any initiatives that require authorization from land owners would not be as successful since only a small percentage of landowners in the area have legal ownership of their land as shown in the table below:

Table 5: Community Engagement, Participation in Decision Making, and Property Ownership

| Category | Number of Respondents (n) | Percentage |
|---|---------------------------|------------|
| Community Engagement in Decision Making | | |
| Number of respondents involved in decision making | 403 | 80.6% |
| Number of respondents who are not involved in decision making | 97 | 19.4% |
| Property Ownership | | |
| Respondents who own land | 354 | 70.8% |
| Respondents with legal title deeds | 91 | 18.2% |
| Respondents who do not own land | 55 | 11% |

3.2 Traditional Ecological Knowledge (TEK) and Environmental Observations

The following findings from the interviews and focus groups yielded the following insights and observations on the extent of traditional ecological knowledge held by the Ilaje communities.

Table 6: Traditional Ecological Knowledge and Environmental Observations by Age

| Category of Observation | Age Group | Number of Respondents (n) | Percentage of the Surveyed Population | Nature of Observation |
|---|-----------|---------------------------|---------------------------------------|---|
| Weather prediction and seasonal changes | 51-65 | 125 | 25% | 92% (115) of elders in this age group could predict rainfall patterns accurately using natural indicators such as the behaviour of ocean currents, flora, fish species, sea worms, marine and land animals, amphibians, avian species, human behaviour, and avian species. 87% (109) could predict approaching storms using |

| | | | | |
|---|----------------|-----|------|--|
| | | | | changes in the behaviour of fish. |
| | 18-35 | 200 | 40% | 58% (116) of respondents in this age group were familiar with the above indicators. |
| Fishing practice and marine life cycles | 36-50 | 175 | 35% | 75% (133) of middle-aged fishers had extensive knowledge of tidal cycles and lunar phases and their role in determining the best times to fish. Gender disparities were pervasive in this group's abilities, with 82% (97) of the respondents with these skills being male while 27% (21) were female. |
| Marine habitat and species knowledge | 36-50 | 175 | 35% | 95% (166) of the women in this age group are highly skilled at identifying different seagrass species while 95% (156) are adept at using traditional methods to derive medicinal substances from mangrove barks such as <i>Rhizophora racemosa</i> . The majority of the women in the total surveyed population (approximately 225 women and 45% of the surveyed population) were also found to possess significant knowledge of the invasive species <i>Eichhornia crassipes</i> (water hyacinth), including its applications in phytoremediation, its antioxidant properties, and its uses as a resource for making handcrafts and animal feeds. |
| TEK transmission and educational implications | 51-65 | 125 | 25% | 80% (100) of respondents aged 51 and above are eager to pass on their knowledge to younger generations. |
| | 18-35 | 200 | 40% | While 80% of the older generations were eager to pass down traditional knowledge to younger generations, only 60% (120) of respondents aged between 18 and 35 showed interest in learning these skills, with 70% (140) of younger respondents citing modern education as their primary source ecological knowledge. |
| Observational data on environmental changes | All age groups | 500 | 100% | 68% (340) of respondents across all age groups reported having observed environmental degradation, particularly increased erosion along their coastline and habitat loss. Older respondents were more adept at pinpointing the specific causes of these reported manifestations of environmental degradation in Ilaje. |
| Integration of traditional ecological education in contemporary practices | 18-35 | 200 | 40% | 63% (126) of the younger respondents are starting to document traditional ecological knowledge using digital means to facilitate a novel and modern form of traditional knowledge preservation. |

3.3 Marine Resource Management and Governance

Semi-structured interviews with members of the traditional decision-making bodies in Ilaje and focus groups of other members of the coastal communities in the area yielded the following information on the intersection of marine resource management and governance within the communities:

Table 7: Perception on the Intersection of Marine Resource Management and Governance

| Category | Age Group | Number of Respondents (n) | Percentage | Perception on the Intricacies of Marine Resource Management and Governance |
|---|----------------|---------------------------|------------|--|
| Influence of the Council of Elders | 51-65 | 125 | 25% | Interviews with nine out of the ten communities in Ilaje showed that 85% (106) of the members of the council of elders are male. They reported active participation in enforcing traditional fishing laws, achieving 90% compliance within the fishing community. However, only 40% (50) of council members acknowledged the need for the integration of modern scientific knowledge with traditional practices. |
| Gender dynamics in decision-making | All age groups | 246 | 49.3% | 30% (21) of the council of elders in the Aiyetoro community are women. 45% of the female respondents from the community indicated a 95% rate of satisfaction with their level of influence over marine resource management decisions. |
| Youth perspectives | 18-35 | 200 | 40% | 30% (60) of respondents aged 18 to 35 felt that traditional governance adequately addressed modern environmental challenges. However, 70% (140) of the younger generation advocated for a more collaborative approach between elders and youth in governance practices. |
| Perceptions of governance effectiveness | All age groups | 500 | 100% | 80% (400) of the respondents from all communities recognized the value of the Elder's Council in resource management. Meanwhile, 65% (325) highlighted the need for governance structures to adapt to environmental pressures and include scientific research in their decision-making processes. |
| Challenges and adaptations | All age groups | 500 | 100% | Although most respondents reported observing a strong presence of traditional governance, 75% (375) of the respondents identified areas of governance that need governance strengthening, including illegal fishing and environmental degradation. Further, 60% (300) believe that a balanced integration of gender perspectives could improve management outcomes. |
| Collaborative | All age | 500 | 100% | Collaborative governance initiatives are |

| | | | | |
|-------------------|--------|--|--|---|
| governance trends | groups | | | gaining support in Ilaje, particularly among female and youth demographics. 80% (160) of the 200 youth respondents expressed readiness to engage in such initiatives. |
|-------------------|--------|--|--|---|

3.4 Collaborative Governance Outcomes

The 10 Ilaje communities have integrated traditional ecological knowledge with scientific management practices. This integration has demonstrated tangible benefits for marine conservation and resource sustainability. According to the respondents, the outcomes of these integrative efforts are as follows:

Table 8: The Outcomes of Collaborative Governance

| Category | Collaborative Governance Efforts | Outcome |
|---------------------------------------|--|---|
| Fish stocks and habitat recovery | Collaborative efforts such as the establishment of no-take zones were observed in seven zones within the coastal communities in Ilaje. | Over a two-year period, fish biomass in the seven protected zones increased by 35%. Additionally, the coverage of mangrove habitats, which are critical for fish breeding, increased by 20% in two zones, improving the health of the marine ecosystem. |
| Women's leadership in Aiyetoro | Aiyetoro has established gender-inclusive governance in the management of its marine resources. | Gender-inclusive governance in Aiyetoro, which is demonstrated by 70% female representation in the council, has shown progressive resource management outcomes in areas such as aquaculture and ecotourism. |
| Climate change and adaptation efforts | Over the past decade, the coastline has retreated 2 meters every year, prompting community effort to address the challenges of climate change. | 50% of the communities are participating in mangrove reforestation, which reduced the rates of erosion by 25% within two years of project implementation. |
| Migration patterns | Communities in Ilaje have established strong collaborative governance to mitigate the impacts of climate change on population movements. | Collaborative governance in communities such as Aiyetoro has slowed the rate of migration due to environmental degradation by 15%. |

Overall support for collaborative governance among the communities is high, with 85% of the surveyed members approving integrated collaborative governance approaches. This rate of approval is higher in youth and women, who reported 90% and 95% approval rates, respectively. Despite these high rates of approval of the integrative approach, challenges to collaborative governance exist, particularly in aligning traditional practices with scientific recommendations and managing fishing pressures. 75% of the community members are interested in enhancing collaborative governance with ecological monitoring.

3.5 Challenges in the Integration of Traditional Ecological Knowledge (TEK) and Contemporary Governance

The respondents, and data, suggested that traditional ecological knowledge can significantly contribute to sustainable practices. However, several obstacles inhibit its full potential. The survey, focus groups, interviews, and the ecological impact assessment identified the following challenges.

3.5.1 Underrepresentation in Policy-Making

Scientific studies have often marginalized TEK due to differing epistemologies. A review of policy documents showed that only 20% (n=55) of coastal management plans in West Africa explicitly referenced TEK. Additionally, a survey conducted among policy-makers (n=120) revealed that 70% acknowledged the importance of TEK but only 30% actively engaged with local knowledge holders during the planning process.

3.5.2 Lack of Legal Recognition

Legal frameworks often prioritize quantitative, scientifically obtained data. Interviews with legal experts indicated that TEK is recognized in only 10% (n=42) of environmental legislation across the region. Additionally, a comparative study demonstrated that countries with legal provisions for TEK have a 50% higher rate of successful conservation outcomes.

3.5.3 Declining Interest in TEK among Youth

Quantitative data points to a generational shift, with only 35% (n=200) of the youth (ages 18-25) in the Ilaje communities expressing a strong interest in traditional practices. A sociological study on knowledge transmission indicated that modern education systems often undervalue TEK, leading to a reduced transmission rate of 40% compared to historical figures.

3.5.4 Modernization and External Influences

Economic pressures force a shift towards more immediate income-generating activities. Data shows a 25% increase in migration to urban areas for non-traditional employment among the community members (n=500) in the last ten years. The influx of technology and globalized media has also shifted cultural practices, with 60% (n=200) of the youth prioritizing digital literacy over traditional knowledge.

3.5.5 Cultural Erosion and Knowledge Loss

Ethnobotanical knowledge, which is crucial for maintaining local biodiversity, has declined by 40% as per botanical surveys and interviews with local herbalists (n=20).

3.5.6 Data Integration Challenges

Finally, bridging the gap between qualitative TEK and the quantitative demands of scientific research presents a significant challenge, with a reported 60% (n=15 projects) of collaborative projects facing data compatibility issues. Further, an assessment of joint TEK-scientific initiatives found that only 50% (n=12) of the projects succeeded in creating a mutually understood language for knowledge exchange.

4.0 Discussion

The ten communities in the Ilaje local government area are diverse with regard to age distribution, gender, level of education, income levels, and their level of reliance on marine resources for sustenance. This diversity is reflected in their contributions, insights, and beliefs on the contributions of traditional ecological knowledge of marine resource management. For instance, the age of the respondents ranged from 18 to 65 years. Older respondents possess relatively more traditional knowledge, as demonstrated by their adeptness at predicting changes in weather by observing the behavior of the ocean, animals, and plants. Older members of the ten communities are also more willing to share this knowledge than the younger generations are willing to receive it, implying a risk of the loss of this knowledge, particularly since the majority of the young members of the communities reported being more likely to

acquire ecological knowledge from modern means. Fortunately, a significant percentage of young people in the communities are starting to document traditional ecological knowledge digitally, preserving it for use by future generations and paving the way for its formal use in governance since some young people feel that traditional knowledge can address modern environmental challenges adequately while the majority of the communities' young people advocate for and welcome more collaboration in governance between them and elders.

Comparatively, gender representation among the respondents was almost equal although there were more male than female respondents, implying a patriarchal structure. This patriarchal structure is reflected in participation in leadership, with men dominating the membership of the Elder's council, making up 85% of all members while women make up 15% in nine out of the ten communities. The only exception to this observation is the Aiyetoro community, in which women constitute 70% of the Elder's Council, and demonstrate higher levels of satisfaction in their influence over marine resource management decisions. Women in this community are more involved in decisions on marine resource management, which enriches governance in the community since they have and contribute more knowledge of marine vegetation and are adept at deriving value such as food, medicine, and raw materials from it. In addition to leadership, gender differences are also evident in specific socio-economic activities. Notably, more men in the ten communities engage in fishing and, therefore, hold more traditional knowledge of the environmental changes that determine the optimum times for fishing. Comparatively, women are more knowledgeable in marine habitats and species and are adept at deriving food, medicine, and other useful material from sea grass, mangrove, and other species. Together, men and women hold knowledge that can be combined to supplement scientific findings in informing governance decisions on the sustainable management of marine resources.

The communities in Ilaje have faced several challenges associated with climate change, including the degradation of their environment, unsustainable fishing practices caused by illegal fishing, increased erosion along the extensive coastline in the area, and the loss of habitats for crucial plant and animal species in the region. The communities have adopted a wide range of strategies to address and mitigate these challenges. Through mangrove reforestation, for instance, the Aiyetoro community has managed to reduce erosion by 25% in just two years, demonstrating the effectiveness of mangrove reforestation in addressing coastal erosion, which impairs coastal stability, leads to habitat loss, affects economic activities such as fishing, and raises flooding risk in coastal regions [10,11,12]. Similarly, the restoration of the forests has, together with the establishment of no-take zones, increased fish biomass since mangroves are critical for fish breeding. These approaches are strengthened by the communities' integrative and collaborative governance approaches, which receive overwhelming support from all members of community, including near-universal support from women and the youth.

Ultimately, the robust community engagement in Ilaje has had a positive impact on their ability to address and mitigate the negative impacts of climate change on their environment. However, the communities continue to struggle with the integration of traditional knowledge with scientific knowledge, the youth's preference for digital literacy and modern knowledge over traditional knowledge, and underrepresentation in national and regional coastal management plans. These challenges identify a critical need for policy reforms to formally acknowledge the value of traditional knowledge through the creation of legal frameworks that protect and promote traditional knowledge, educational programs that encourage the transfer of knowledge between generations, and the adoption of interdisciplinary environmental and resource management approaches that incorporate traditional knowledge and incorporate its complexities.

5.0 Conclusion

Climate change manifestations in coastal areas, which include coastal erosion and changes in fish biomass, threaten the sustenance of the majority of the individuals and households in Ilaje who rely on marine resources for sustenance. The coastal communities in Ilaje have accumulated and continue to acquire traditional knowledge that has proven to be instrumental in restoring habitats and protecting crucial marine resources and people's livelihoods. Universal community participation improves these outcomes as demonstrated by the positive impact of community engagement in the communities in the region of study. Ultimately, the integration of traditional knowledge with modern and scientific knowledge can improve the outcomes of natural resource management, promoting sustainable governance.

6.0 Ethical Considerations

Prior to data collection, ethical approval was obtained from the appropriate review board. Informed consent was ensured for all participants, with confidentiality and the right to withdraw from the study maintained throughout the research process.

7.0 Limitations

The research acknowledged potential biases in self-reported data and the challenge of capturing the full complexity of TEK through a structured survey. Additionally, the cross-sectional nature of the study limits the ability to make causal inferences.

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Data availability statement

Data will be made available on request.

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Conflict of Interest

There is no Conflict of Interest.