The link between community practices and sustainability of beach management units: Evidence from Homabay County, Kenya

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ABSTRACT

Sustainable management of fisheries resources remains a major challenge in community-based governance systems, particularly where socio-cultural dynamics influence resource use and collective decision-making. Beach Management Units (BMUs) were introduced in Kenya as a participatory fisheries co-management approach to enhance compliance with regulations, promote community participation, and improve the sustainability of fisheries resources in Lake Victoria. Despite these efforts, many BMUs continue to face challenges including illegal fishing practices, weak institutional structures, and declining fish stocks. These challenges suggest that existing management frameworks often overlook the role of community practices in resource governance and long-term sustainability. This study examined the influence of Community Practices on the sustainability of Beach Management Units (BMUs) in Homabay County, Kenya. Tragedy of the Commons and Social Network theories anchored the study. Using an explanatory research design with a mixed methods approach, the study integrated quantitative regression analysis with qualitative insights to assess how community norms, shared behaviours, and collective engagement shape long-term project outcomes. The target population was 7,151 individuals comprising registered BMU officials, committee members, and active fishing community participants across the 143 gazetted BMUs. The sample size was 400 respondents and a multi-stage sampling approach was adopted. Structured questionnaires generated quantitative data on community norms, participation, compliance behaviours, and perceptions of sustainability. Key informant interviews, focus group discussions, and document reviews provided qualitative insights and triangulation. A simple linear regression model revealed that Community Practices significantly predicted Project Sustainability. The standardized coefficient indicated a large and statistically significant effect ($\beta = .877$, $p < .001$), confirming that higher levels of community participation, adherence to local norms, and collective responsibility were associated with substantial improvements in project sustainability. These findings were reinforced by qualitative evidence showing that community practices foster social cohesion, enhance compliance with BMU regulations, and strengthen collective action. Participants emphasized that regular meetings, shared decision making, and communal activities promote unity and facilitate implementation of sustainability measures. However, the qualitative results also revealed tensions between traditional fishing practices and modern sustainability requirements, with some community members perceiving new regulations as threats to cultural identity or livelihood security. This resistance aligns with the Tragedy of the Commons and Social Network Theory, which highlight how strong community ties can both support and hinder sustainable resource management. The study concludes that community practices are foundational to the success and longevity of BMU initiatives. The findings underscore the need for culturally sensitive, participatory approaches that integrate traditional knowledge with contemporary sustainability strategies. Recommendations include strengthening community participation, enhancing capacity building, and promoting collaborative governance structures. The study contributes to the growing body of literature on community-based resource management and offers practical insights for policymakers, development practitioners, and resource managers seeking to enhance the sustainability of community-driven project.

Keywords: Beach Management, Community Practices, Governance, Homa Bay County, Sustainability

I. INTRODUCTION

Sustainable fisheries and aquatic resource management is a key issue in the global development agenda. It faces severe threats to ecosystems and the livelihoods of millions of small-scale fishermen worldwide due to overfishing, climate change and environmental degradation. In response, community-based and co-management systems, in which local resource users take on responsibilities in conjunction with government authorities, are widely regarded as key to ecological sustainability and socioeconomic resilience in small-scale fisheries (Odoli *et al.*, 2022). The programs are designed to achieve compliance with legislation and management of rare resources through the use of local ecological knowledge and the use of participatory decision-making. The programs have twin objectives of conservation and community livelihoods.

Co-management frameworks have been promoted in East Africa to facilitate the long-term usage of inland waters. Beach Management Units (BMUs) are community-based and decentralised groups established in the Lake Victoria region to allow fishermen to be directly involved in resource control, compliance with rules and conflict

resolution. The BMUs are the centrepiece of the regional fisheries governance models that strive to balance ecological sustainability of fishing resources with economic advantages to riparian communities. However, BMUs have had mixed success, with some research indicating that capacity gaps, sociocultural challenges and enforcement constraints still impact their effectiveness (Albornoz & Glückler, 2020).

Kenya's 2024 Fisheries Management and Development (Beach Management Units) Regulations incorporate BMUs within the national policy framework and provide co-management duties and shared responsibilities for community units, county governments, and the national fisheries authority. The regulatory framework reflects Kenya's commitment to participatory fisheries management that is embedded in broader blue economy efforts aimed at sustainable utilisation of aquatic resources and economic empowerment of coastal and lakeside populations (Odhiambo *et al.*, 2025). The County of Homa Bay is a good example for the use of BMU sustainability at county level due to its long shoreline along Lake Victoria and the different fishing communities. More recent research in Homa Bay has revealed that the interaction between official governance of BMUs and community norms and values is vital for the sustainability of BMU organisation and compliance with fishing legislation. BMU performance outcomes have been positively correlated with local ecological knowledge and communal decision-making (Obiero *et al.*, 2025). But environmental problems, such as illegal fishing and disagreements on breeding zones, also provide important hurdles that hinder the ability of BMU efforts to conserve fish supplies and manage shared resources in a responsible manner (Menza & Mange, 2020).

This study has looked at the effect of community activities such as participatory monitoring, traditional dispute resolution and inclusive governance on operational effectiveness of BMUs. It provides empirical insights on the potential of community-based co-management strategies to enhance sustainable use of natural resources in complex socio-ecological settings. It also provides lessons for policy creation and community governance techniques in Kenya and the broader East African area.

1.1 Statement of the Problem

Kenya developed BMUs to improve fisheries governance and address growing concerns over overfishing, declining fish stocks and deteriorating incomes of fishing communities, especially along the coast and around Lake Victoria. BMUs have been developed as a co-management strategy to elicit community participation in fisheries management, to ensure greater compliance with rules and to extend the sustainability of fisheries resources. Despite these laudable objectives, many BMUs continue to face serious challenges due to mismanagement, illegal fishing, reduced fish catches and lax enforcement of fisheries laws (Kuboja *et al.*, 2024; Pardie & Campion, 2022). These problems raise concerns on the long-term sustainability of fisheries and the usefulness of BMUs as community-based organisations in the management of resources.

In places like Homa Bay County, community practices which arise from native ecological understanding, cultural values and old ways of protecting the environment have influenced fisheries management. On the other hand, modern fisheries management approaches have focused mainly on formal regulatory systems and have ignored these community practices (Azmi, 2022). Community practices are not being properly integrated into BMU government and this has led to disagreements between fishermen and the BMU leadership, loss of trust and less compliance to fisheries management rules. Odhiambo *et al.* (2023) study fishers and find they are more likely to adhere to management rules that are respectful of their cultural values and traditional knowledge systems.

Traditional methods of conservation such as seasonal fishing bans, community controlled fishing zones and customary resource-use regulations are on the decline and this has been associated with criminal fishing and declining fish stocks in some areas of Lake Victoria (Mehta, 2025). These problems are evident in Homa Bay County, where fish landings are declining and fishing supplies are being depleted at a faster rate. Community practices may be highly significant in promoting responsible resource use but there is not much real world evidence on their impact on the long-term viability of BMUs.

Therefore the aim of this study is to understand how community practices contribute to the sustainability of Beach Management Units in Homa Bay County, Kenya. This is so that we can obtain information that can help make fishing co-management more inclusive and sensitive to different cultures.

1.2 Research Objective

To examine how community practices influence sustainability of beach management units in Homabay County, Kenya.

II. LITERATURE REVIEW

2.1. Theoretical Foundation

2.1.1. Hardin's Theory of the Tragedy of the Commons

Hardin (1968) Tragedy of the Commons theory is a simple way to describe why so many people take advantage of shared resources. It says selfish people will always consume shared resources, if there aren't outside

rules or people pressure to make them stop. This theory has been widely applied in fisheries governance to explain phenomena such as illegal fishing, misuse of fishing gear and low compliance in small-scale fisheries (Hofmeyr, 2025). But Hardin's model is not accepted by all, as some people believe that it oversimplifies community behaviour by assuming that everyone is rational and self-interested and does not take into account the roles of social norms, trust and local government structures.

Evidence from East Africa shows that resource loss is not only due to people's selfish goals, but also to weak institutions, bad leadership, and economic and social forces (Abdullahi *et al.*, 2024). Hardin's theory, therefore, explains how fisheries can be overfished, but does not go far enough in its analysis of the social factors that influence cooperation in Beach Management Units (BMUs).

2.1.2. Social Network Theory

The Social Network Theory (Barnes, 1954) provides an alternative perspective that emphasizes the importance of relationships, trust, information sharing and social influence as pathways to collective action. In fisheries, it has been shown that high levels of social connectivity improve cooperation, facilitate peer monitoring and help resolve conflicts (Afkhami *et al.*, 2021). Unlike Hardin's model, SNT recognizes communities' capacity to self-organize effectively when there are strong social cohesion and legitimate leadership. However, the literature tends to describe social networks descriptively, without empirically investigating the impact of specific community practices such as norms of communication, role allocation or participatory decision-making on sustainability outcomes.

This difference is particularly clear with respect to Kenyan studies on BMUs, which often focus on governance issues but seldom analyze the social structures that support them. The tension between Hardin's pessimistic prediction of inevitable resource depletion and the social network's optimistic view of collective action is analytically productive. Hardin describes the overexploitation of BMUs, while SNT describes how communities can reduce these overexploited susceptibilities with strong social ties and collective norms. Yet, few empirical studies explicitly integrate these perspectives to better understand BMU performance. This study investigates the impact of community practices and the operational presentation of social networks on sustainability outcomes in Homa Bay County.

2.2 Empirical Review

2.2.1 Beach Management Units

Beach Management Units (BMUs) are community-based organisations working with government in the management of local fisheries resources. They comprise of the actors in the fishing industry; captains, crew members, processors, dealers and traders. A BMU is composed of an executive committee of nine to fifteen elected officials who manage the day-to-day operations and an assembly of all fisheries stakeholders (Odende, 2022). This co-management strategy is aimed at improving sustainability by navigating the intricacies of human-nature interactions in fisheries management through the promotion of shared responsibility and authority (Okusu, 2020).

BMUs were established in East Africa to facilitate more inclusive fisheries governance, enhance compliance and reduce illegal fishing. Global research (Kadagi *et al.*, 2021) shows that community participation in the development and implementation of regulations improves stewardship through co-management. However, institutional weaknesses, elite capture and uneven enforcement constraints are common in Kenya's co-management systems. Co-management in Africa has improved local knowledge and monitoring, but sustainability outcomes have been inconsistent due to economic vulnerability and limited technical capacity (Vugutsa *et al.*, 2025). Lake Victoria has experienced similar challenges with illegal fishing, border conflicts and declining resources affecting BMUs (Oluoch & Obura, 2008).

Studies further show that BMUs with open leadership and collaboration with the Kenya Fisheries Service record higher compliance levels (Odhiambo *et al.*, 2023), while overcapacity, weak enforcement, and livelihood dependence continue to threaten sustainability (Wong & Yong, 2020). Although peer monitoring has reduced illegal gear use on some beaches in Homa Bay County, environmental stresses and social and economic constraints persist. Most of the current research focuses on BMU performance and does not explore the community practices of local norms, communication patterns and traditional governance on the sustainability of the BMU, particularly in Homa Bay. This limits our understanding of the social processes influencing compliance and long-term resource management.

2.2.2 Effect of Community Practices on Sustainability of Beach Management Units

It is well established that a clear distribution of roles for accountability reduces free-riding and improves enforcement. Evidence from Kenya suggests that BMUs with defined patrol and reporting roles are more likely to enforce rules (Etiegni, 2022). However, little research has been undertaken into the role of local norms regarding community members' acceptance or resistance to these roles, a gap that this study aims to fill. The use of local languages and culturally rooted communication also improves legitimacy and participation. BMUs that meet in

Dholuo in Homa Bay are likely to be aware of sustainable practices (Pounds, 2024). Less research has been done on the impact of communication practices on compliance behavior, creating a gap on the social drivers to sustainability.

Ecological indicators such as sustainable gear use and protection of breeding grounds continue to be relevant in fisheries management. BMUs with organized patrols exhibit higher compliance levels, but the sustainability risks persist due to high fishing pressure and economic dependence (Dahanayake, 2025). The literature highlights ecological outcomes without addressing the role of community norms in everyday resource-use decisions. Several income sources through aquaculture and value addition initiatives have been proven to reduce pressure on fisheries and enhance compliance (Mwanyoka & Medard, 2026). In Homa Bay, BMUs linked to such livelihood diversification tend to be more stable. However, most studies treat livelihoods purely as economic variables rather than as social practices embedded within community structures, which this study aims to explore.

Participatory decision making is another important dimension. Transparency in assemblies and inclusive governance processes build trust and institutional legitimacy (Sayani, 2025). BMUs with transparent decision-making processes have fewer disputes and are more cohesive. The literature rarely studies the relationship between traditional authority systems and formal BMU governance, thus creating a lacuna in understanding the dynamics of hybrid governance that combines customary and modern systems.

The wider literature on co-management is inconclusive. Asumda (2023) finds improvements in compliance with co-management but de Jong (2025) finds such improvements vary greatly between African fisheries as institutional capacity is low. This suggests co-management effectiveness is highly context dependent especially in areas such as Lake Victoria where enforcement is patchy. In Kenya most BMU studies are heavily reliant on descriptive assessments of compliance and enforcement with few inferential approaches applied to the social mechanisms behind sustainability outcomes. This limits understanding of the role of community practices in shaping compliance behaviour (Cinny Tubman *et al.*, 2021).

III. METHODOLOGY

3.1 Research Design

This study employed an explanatory research design with a mixed-methods approach to examine community practices and the sustainability of Beach Management Units (BMUs) in Homa Bay County. Mixed-methods research integrates both quantitative and qualitative approaches within a single study to provide a more comprehensive understanding of research problems and improve the validity of findings (Sileyew, 2019; Story & Tait, 2019).

The choice of this design was appropriate because issues of community participation and sustainability of BMUs involve complex social, economic, and environmental dynamics that require both statistical measurement and in-depth contextual understanding. Quantitative data were collected using structured questionnaires administered to BMU members to obtain measurable information on community practices and sustainability indicators. Qualitative data were collected through key informant interviews with fisheries officers, BMU leaders, and other stakeholders to capture detailed perspectives and experiences related to fisheries governance and resource management. The integration of quantitative and qualitative data enhanced the credibility and reliability of the findings through triangulation, allowing for a more comprehensive understanding of how community practices influence the sustainability of Beach Management Units (Dawadi *et al.*, 2021; Glastonbury & MacKean, 2020).

3.2 Study Area

The study was conducted in Homa Bay County, located along the shores of Lake Victoria in western Kenya. The county hosts one of the longest and most active freshwater fishing zones in the region, with 143 gazetted Beach Management Units (BMUs) distributed across major landing sites. The area is characterized by vibrant fishing communities whose livelihoods depend heavily on artisanal fisheries, fish trading, and related value-chain activities. The socio-ecological setting of Homa Bay marked by fluctuating fish stocks, high fishing pressure, and strong community networks provides an ideal context for examining how community practices influence the sustainability of BMU governance structures.

3.3 Target Population

The target population comprised all individuals and institutional actors directly involved in the governance and operational activities of BMUs in Homa Bay County. This included registered BMU officials, committee members, fisheries officers, boat owners, fish traders, crew members, and general BMU members operating across the 143 active BMUs. These groups represent the full spectrum of stakeholders whose behaviours, norms, and collective actions shape compliance, governance effectiveness, and long-term sustainability of fisheries resources.

3.4 Sampling and Sample Size

A multistage sampling approach was used to ensure representativeness across the diverse BMUs in the county. In the first stage, BMUs were identified across the five sub-counties bordering Lake Victoria. In the second stage, stratified random sampling was applied to categorize respondents into key groups BMU officials, committee members, boat owners, fish traders, and ordinary fishers ensuring proportional representation of governance actors and resource users. Within each stratum, simple random sampling was used to select individual respondents, minimizing selection bias. The estimated BMU population was 5,212 individuals, comprising officials, fishers, and value-chain actors. Using Yamane (1967) formula at a 95% confidence level and 5% margin of error, a sample size of 371 respondents was calculated. To enrich qualitative insights, purposive sampling was used to select key informants with specialized knowledge of BMU governance. Of the 371 questionnaires distributed, 315 were returned (84.91% response rate), and after data cleaning, 311 questionnaires were retained for analysis, yielding an effective response rate of 83.82%.

3.5 Data Collection Instruments and Procedures

The study employed multiple data collection instruments consistent with the mixed-methods design. Structured questionnaires were administered to BMU members and fishers to collect quantitative data on community norms, participation levels, compliance behaviours, and sustainability perceptions, using Likert-scale items to measure constructs such as collective action and communication practices. Key informant interview guides were used to obtain qualitative insights from BMU officials, fisheries officers, and community leaders on governance dynamics and socio-cultural influences on resource use. Focus group discussion guides facilitated exploration of shared behaviours, traditional practices, and collective responses to regulatory enforcement among fishers. Additionally, document review checklists were used to examine BMU constitutions, meeting minutes, enforcement records, and fisheries management reports for triangulation.

Data collection procedures involved researcher-administered questionnaires supported by trained bilingual assistants fluent in Dholuo and English. Access to landing sites was facilitated through collaboration with BMU officials, and data collection was scheduled around landing periods and market hours to maximize respondent availability. Informed consent was obtained from all participants, confidentiality was assured, and completed questionnaires were checked daily for accuracy and completeness before undergoing final data cleaning.

3.6. Measurement of study Variables

To measure the research variable, the study established the indicators of each variable and then employed the Likert scale to measure the variables. The scale will comprise of an interval scale of 1-5; where 1= Strongly Disagree, 2= Disagree, 3=Undecided, 4=Agree and 5= Strongly Agree. The respondents were requested to answer the questionnaire using the five-point scale.

3.7. Model specification

To test the research question, the study adopted a linear regression model for the purpose of analysis. The following sets of equation were used. Testing the effect of the predictor variable community practices on sustainability of beach management projects.

$$Y = \beta_0 + \beta_1 CP_{it} + \varepsilon_{it} \quad \text{..... (1)}$$

Where:

Y = Sustainability of beach management Unit
β_0 = Constant
β_1 = Regression coefficients
CP = Community Practices
i = BMU
t = time
ε = error term

IV. FINDINGS & DISCUSSION

4.1 Demographic Information

The demographic characteristics of respondents provide essential context for interpreting the study's findings on community practices and the sustainability of Beach Management Units (BMUs) in Homa Bay County. Table 1 presents a consolidated summary of gender, age, education level, and respondent category. The education profile of the respondents shows a clear concentration at the lower levels of formal schooling, with 130 individuals (41.8%)

having completed primary education and 122 (39.2%) having reached secondary level. A smaller proportion of respondents reported post-secondary qualifications. Diploma holders accounted for 39 respondents (12.5%), representing the segment of the BMU community with technical or vocational training. Degree holders numbered 13 (4.2%), while postgraduate-educated respondents were only 7 (2.3%).

The gender distribution shows that 176 respondents (56.6%) were male, while 135 (43.4%) were female. This pattern reflects the gendered structure of fisheries along Lake Victoria, where men dominate fishing and boat-related activities, whereas women participate more in processing, trading, and value-chain support roles. The relatively strong female representation in the sample ensures that the study captures perspectives from both production and post-harvest segments of the fishery. This balance is important because gendered social networks influence communication, trust, and participation in BMU governance factors central to understanding community practices and sustainability outcomes.

The age profile indicates a broad distribution across the adult population. Younger respondents aged 18 22 years accounted for 24 individuals (7.7%), while those aged 23 27 years represented 36 respondents (11.6%). The middle-aged group's 28 32 years (50 respondents, 16.1%), 33 36 years (58 respondents, 18.6%), and 37 41 years (58 respondents, 18.6%) formed the majority of the sample. The largest single group comprised respondents aged 42 years and above, totalling 85 individuals (27.3%). This distribution suggests that BMU activities are driven largely by mature adults with substantial experience in fishing and community governance. Older respondents bring institutional memory and traditional ecological knowledge, while younger members reflect emerging livelihood pressures and evolving compliance behaviours. This age diversity strengthens the study's insights into how community practices are shaped across generations.

The sample included a diverse mix of BMU stakeholders. Fishermen accounted for 79 respondents (25.4%), representing the core resource users whose daily practices directly affect fish stocks and compliance with regulations. Boat owners and committee members, each comprising 36 respondents (11.6%), contribute managerial and governance perspectives, while fisheries officials (38 respondents, 12.2%) provide regulatory oversight. Fishmongers (33 respondents, 10.6%) and business persons (89 respondents, 28.6%) highlight the economic and market-driven dimensions of the fishery. This diversity ensures that the study captures viewpoints from across the entire fisheries value chain, enabling a more comprehensive understanding of how community practices, leadership structures, and economic incentives influence BMU sustainability.

Table1

Demographic Variables

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	176	56.6
	Female	135	43.4
	Total	**311**	**100.0**
Age	18 22 years	24	7.7
	23 27 years	36	11.6
	28 32 years	50	16.1
	33 36 years	58	18.6
	37 41 years	58	18.6
	42 years and above	85	27.3
	Total	**311**	**100.0**
Education Level	Primary	130	41.8
	Secondary	122	39.2
	Diploma	39	12.5
	Degree	13	4.2
	Postgraduate	7	2.3
	Total	**311**	**100.0**
Category of Respondent	Fisherman	79	25.4
	Boat owner	36	11.6
	Committee member	36	11.6
	Fisheries official	38	12.2
	Fishmonger	33	10.6
	Business person	89	28.6
	Total	**311**	**100.0**

4.2 Validity and Reliability of the Research Instrument

The study employed several statistical procedures to establish the reliability and validity of the measurement scales used to assess community practices, committee composition, and sustainability outcomes within Beach Management Units (BMUs). Internal consistency reliability was examined using Cronbach's alpha. The scale

measuring community practices, comprising eight items, achieved a Cronbach's alpha of 0.729, indicating satisfactory reliability. Similarly, the sustainability practices scale, consisting of five items, recorded a Cronbach's alpha of 0.788, demonstrating good internal consistency. Both coefficients exceed the recommended minimum threshold of 0.70, confirming that the items within each construct were sufficiently correlated and measured their respective concepts consistently.

Table 2
Reliability

	Cronbach's Alpha	N of Items
Community Practices	.729	8
Sustainability Practice	.788	5

Construct validity was assessed through Exploratory Factor Analysis (EFA) using Principal Component Analysis with Varimax rotation. The Kaiser Meyer Olkin (KMO) measure of sampling adequacy was 0.831, which falls within the "excellent" range and indicates that the dataset was suitable for factor extraction. Bartlett's Test of Sphericity was highly significant ($\chi^2 = 4754.044$, df = 703, $p < 0.001$), confirming that the correlation matrix was not an identity matrix and that the variables shared enough common variance to justify factor analysis.

Table 3
KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.831
Bartlett's Test of Sphericity	Approx. Chi-Square	4754.044
	df	703
	Sig.	.000

The factor extraction process yielded a ten-component solution, with all components having eigenvalues greater than 1.0. The components collectively explained 64.52% of the total variance after rotation, surpassing the commonly accepted 60% threshold for social science research. The rotated component matrix showed clear and interpretable loadings, with all retained items loading above 0.50 on their respective components. Items related to committee composition loaded strongly on the first component, sustainability practice items loaded on the second, and additional components captured coherent dimensions of community participation, community behaviour, and community values. These patterns confirm that the constructs were empirically distinct and aligned with the theoretical structure underpinning the study.

Table 4
Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.248	19.074	19.074	3.677	9.677	9.677
2	3.698	9.731	28.805	3.631	9.554	19.231
3	2.848	7.495	36.300	3.231	8.501	27.732
4	2.219	5.839	42.139	2.887	7.597	35.329
5	1.991	5.239	47.377	2.858	7.521	42.850
6	1.579	4.156	51.533	1.859	4.893	47.743
7	1.428	3.759	55.292	1.834	4.828	52.570
8	1.308	3.441	58.733	1.720	4.527	57.098
9	1.147	3.018	61.751	1.497	3.941	61.038
10	1.052	2.767	64.519	1.322	3.480	64.519

Extraction Method: Principal Component Analysis.

4.3. Correlation Analysis

The correlation analysis examined the association between community practices and the sustainability of Beach Management Units (BMUs). The results show a strong and statistically significant positive correlation between the two variables ($r = 0.877$, $p < 0.01$). This indicates that higher levels of community practices such as effective communication, participatory decision-making, clear role allocation, and adherence to community norms are strongly associated with improved sustainability outcomes in BMU-managed projects. The magnitude of the correlation (0.877) suggests that community practices account for a substantial proportion of the variation in project

sustainability, highlighting their central role in shaping governance effectiveness and long-term resource management. The significance at the 0.01 level confirms that this relationship is unlikely to be due to chance, providing robust empirical support for the theoretical expectation that strong social networks and cohesive community structures enhance collective action and sustainability.

Table 5

Correlation Analysis

	PS	CP
Project Sustainability	1	
Community Practices	.877**	1

**. Correlation is significant at the 0.01 level (2-tailed).

4.4 Regression Analysis

A simple linear regression was conducted to examine whether Community Practices significantly predict Project Sustainability. The model summary indicated a strong overall fit, with the predictor explaining a substantial proportion of variance in the dependent variable. The results showed that the model produced R = .877 and R^2 = .770, indicating that Community Practices accounted for 77% of the variance in Project Sustainability. The ANOVA results confirmed that the model was statistically significant, F (1, N 2) = 33.410, p < .001, indicating that the regression model provided a significantly better fit than a model without the predictor. Examination of the standardized coefficients showed that Community Practices had a strong and statistically significant effect on Project Sustainability. The standardized beta coefficient was β = .877, p < .001, demonstrating that higher levels of Community Practices were associated with substantial increases in Project Sustainability.

Table 6

Regression Analysis

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	-1.057	.233		-4.539	.000
	Community Practices	1.194	.037	.877	32.147	.000
	Model Summary					
	R	0.877				
	R2 Change	0.770				
	Std. Error of the Estimate	1.95558				
	Model Fit					
	F change	033.410				
	Sig.	0.000				

a. Dependent Variable: Project Sustainability

4.5 Discussion

These findings align with a substantial body of empirical literature emphasizing the importance of community participation, shared norms, and local ownership in sustaining development initiatives. For example, Luomba (2016) found that coastal communities with strong participatory traditions and shared ecological knowledge demonstrated higher compliance with fisheries regulations and more sustainable resource use. Similarly, Tegenie (2026) argue that community cohesion and collective action are critical for long-term environmental stewardship, as they enhance trust, reduce conflict, and promote shared responsibility. The strong positive effect observed in the current study reinforces these arguments, suggesting that community practices are not merely supportive factors but foundational drivers of sustainability. Other studies in East Africa have also documented the centrality of community practices in the success of Beach Management Units (BMUs). Cichecka (2025) reported that BMUs with strong community engagement, regular meetings, and shared enforcement norms exhibited better fisheries outcomes and higher compliance with conservation rules. This is consistent with qualitative insights from the present study, where participants noted that community practices foster unity, collaboration, and adherence to BMU regulations.

One participant stated:

> *"Regular meetings and communal activities encourage collaboration, making it easier to implement and adhere to BMU regulations"* (Male Participant, 33 years).

Such findings underscore the role of community practices in strengthening social cohesion and enabling collective action which are key ingredients for sustainable resource management. However, the findings also contrast with studies that highlight the limitations of community-based approaches when cultural practices conflict with

sustainability objectives. For instance, Cinner *et al.* (2012) observed that in some Kenyan coastal communities, deeply rooted fishing traditions hindered the adoption of modern conservation practices, leading to continued resource depletion. This aligns with the qualitative evidence in the present study, which revealed that traditional fishing practices may be perceived as integral to cultural identity, making community members resistant to change. From the perspective of Hardin's *Tragedy of the Commons*, such resistance can perpetuate unsustainable exploitation when customary practices are not aligned with ecological realities.

Similarly, Dushkova and Ivlieva (2024) found that strong community networks can sometimes reinforce unsustainable norms, particularly when external interventions are viewed as threats to autonomy. This contradicts the assumption that community cohesion always leads to sustainability. The qualitative findings in the current study echo this tension, showing that while community practices can promote unity and cooperation, they can also amplify resistance to new practices perceived as externally imposed. The generational differences observed in the qualitative data further complicate the relationship between community practices and sustainability. Older community members tended to adhere more strongly to traditional methods, while younger members were more open to innovation. This mirrors findings by Arlinghaus *et al.* (2021), who reported that age and cultural attachment significantly influence attitudes toward fisheries management reforms. Such contradictions highlight that community practices are not uniformly beneficial; their impact depends on how well they align with sustainability goals.

The methods by which community practices influence the sustainability of Beach Management Units (BMUs) were further clarified by the qualitative investigation. The efficiency of BMU governance systems is largely determined by community practices, which are characterized by shared norms, values, rituals, and collective actions. The adoption of contemporary sustainability measures, such as controlled landing sites or regulated gear use, is frequently seen as a danger to autonomy, heritage, or livelihood stability in communities where fishing methods are deeply ingrained in cultural identity. Participants portrayed opposition to new practices as a preservation of cultural continuity rather than a rejection of sustainable principles, demonstrating this conflict in multiple talks. This opposition is consistent with Hardin's Tragedy of the Commons, which contends that if customs are allowed to continue unchecked, they may lead to the overuse of common resources. Strong community links and shared belief systems, however, might intensify opposition to externally introduced measures, especially when those interventions are seen as imposed rather than cooperatively produced. This phenomenon is explained by Social Network Theory.

The significance of culturally aware approaches to BMU governance was underlined by the participants. "Our community practices foster a strong sense of unity," said one participant. Collaboration is fostered by regular gatherings and group activities, which facilitates the implementation and observance of BMU laws (Male Participant, 33 years). This opinion is consistent with the more general conclusion that community practices improve social cohesiveness, encourage group activity, and bolster adherence to BMU rules. The qualitative data also showed that attitudes toward sustainable activities varied by generation. While younger members of the community were more receptive to new ideas, older members tended to stick more firmly to conventional fishing techniques. This age gap occasionally caused conflict, making it more difficult to implement new sustainable practices. The necessity for participatory and culturally based approaches is further highlighted by the fact that some communities saw sustainability programs as external impositions rather than locally beneficial reforms. These results support Luomba (2016) who found that local communities have important ecological knowledge and that their participation in decision-making improves adherence to sustainable practices. Therefore, including community traditions into BMU governance is a cooperative and culturally aware method of managing coastal resources. BMUs can encourage sustainable behaviors that support ecological health and community livelihoods by empowering local people and integrating their knowledge systems.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study set out to determine the influence of Community Practices on Sustainability of beach management units, and the findings provide strong empirical support for the centrality of community-level norms, behaviours, decision making and collective actions in sustaining development initiatives. These results underscore the central role of community norms, shared behaviours, and collective engagement in shaping the long-term viability of development initiatives. Projects that embed community participation, strengthen local ownership, and align interventions with community values are more likely to achieve sustained outcomes, whereas those that overlook community dynamics risk resistance, weak compliance, and eventual decline.

5.2 Recommendations

Based on these findings, several recommendations emerge. First, development practitioners and Beach Management Units should prioritize participatory approaches that actively involve community members in decision-making processes. Strengthening community participation enhances ownership and fosters a sense of shared

responsibility for project outcomes. Second, interventions should integrate traditional ecological knowledge with modern sustainability practices, recognizing that cultural identity and customary practices shape community attitudes towards change. Third, capacity-building initiatives should be expanded to equip community members with the skills and knowledge necessary for effective resource management. Fourth, efforts to promote social cohesion through regular meetings, communal activities, and collaborative enforcement can reinforce compliance with sustainability measures. Finally, culturally sensitive approaches and or practices should be adopted to ensure that interventions respect local customs and values, thereby reducing resistance and enhancing acceptance.

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