Accessibility of Marine Tourism Resources and Community Livelihood in Tanzania: A Case of Bagamoyo and Kilwa Coastal Communities

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Abstract
This article explores the link between the accessibility of marine tourism resources and sustainable livelihoods in Tanzanian communities, guided by the sustainable livelihood's framework. Data was gathered through convenience sampling from Kilwa and Bagamoyo's coastal populations between March and April 2025. Out of 280 distributed questionnaires, 161 (73.9%) were analyzed using SPSS and SEM (AMOS). Results indicated that access to various types of livelihood assets, including financial, human, social, and physical resources, significantly benefits sustainable livelihoods in these coastal areas. Stakeholders should aim to achieve the 2030 Sustainable Development Goals (SDGs), especially SDG 14, which emphasizes the importance of marine tourism resources for coastal communities. Promoting access and sustainable use of these resources can aid conservation efforts and sustainable development. The study offers strategic recommendations for government and private sector investment to ensure equitable access to ocean resources for coastal communities.

Keywords: *Marine tourism resource, coastal communities, financial assets, human assets, social assets, and physical assets.*

INTRODUCTION

The world faces difficulties in eradicating poverty to achieve the 2030 Agenda for Sustainable Development, especially SDG 14. "Life Below Water" is a vital goal aimed at conserving and sustainably using oceans, seas, and marine resources (Henderson, 2019:1). About 2.75 billion

people live near coasts, relying heavily on marine and coastal resources for their livelihoods. A livelihood refers to how people use their skills, abilities, and resources to earn a living and support themselves (Gacutan et al., 2022; Lockerbie et al., 2024). A livelihood is considered sustainable when marine and coastal resources are utilized in a manner that meets current needs without compromising the ability of future generations to meet their own needs (Loureiro et al., 2022). Therefore, the global community must take essential actions to ensure that low-income coastal communities, whose survival depends on healthy oceans and seas, have access to livelihood capital, such as access to finance, social networks, and physical assets, for them to meet their basic needs sustainably (Lockerbie et al., 2024).

Marine tourism resources have been adopted as a key strategy for poverty eradication and ensuring sustainable livelihoods (Henderson, 2019). If managed well and supported, marine tourism resources will continue to provide ecosystem services to humans and other living things (Chen et al., 2020). More than 3 billion people worldwide rely on marine tourism activities, including tourism, recreation, fisheries, coastal protection, biodiversity conservation, boat building, craft making, singing, and tour guiding (Chen et al., 2020).

Marine tourism involves visiting new destinations for activities such as fishing, whale watching, reef walking, provisioning cruise ships, and attending yacht events (Ery, 2022). It also encompasses other coastal tourism activities, including accommodations, restaurants, food services, attractions, and vacation rentals. To support marine tourism, infrastructure such as retail stores, transportation hubs, marinas, and activity providers is essential, which ultimately provides access to livelihood assets for the coastal community (Kimasa, 2013).

Coastal communities offer a range of employment opportunities, including fishing, boat building, tour guiding, craft production, arts, and conservation efforts for coral reefs and mangroves, as well as supporting shipping routes and coastal defenses (Ery, 2022; Lockerbie et al., 2024). However, the growth of marine tourism and coastal investments relies heavily on strong institutional backing within the country (Kimasa, 2013). Despite these economic opportunities, many coastal areas remain impoverished, with residents often living below the poverty line and earning less than $1 per day (Hafidh, 2021; Kimasa, 2013; Torel et al.,

2017). These communities face high vulnerability to natural resource depletion and overexploitation (World Wide Fund for Nature report, 2020).

In these communities, the average life expectancy is only 48 years. About 40% of residents are illiterate and lack access to proper sanitation (Kimasa, 2013). Climate change has caused rising sea levels and increased the frequency of natural disasters, such as floods and droughts, jeopardizing the safety and homes of coastal residents. Consequently, marine tourism has not yet provided substantial benefits to these populations (Sohn et al., 2021; Torell et al., 2017).

A significant challenge involves addressing issues that hinder the industry's ability to support coastal communities in developing sustainable livelihoods. Climate change poses a significant threat to South African coastlines, leading to increased flooding, storms, and land pollution (Dube et al., 2021). In Surabaya, many coastal residents have low educational attainment and belong to lower-income groups (Gai et al., 2017). Similarly, in Pemuteran, Indonesia, communities face high poverty levels, limited English skills among village leaders, and weak management systems (Erapartiwi, 2019). This study examines whether coastal communities in Kilwa and Bagamoyo can achieve sustainable livelihoods through diverse marine tourism activities and provides policy recommendations to enhance their long-term resilience.

Numerous studies have investigated the role of marine tourism in promoting sustainable livelihoods. Some research has focused on how activities related to aquatic tourism can tackle global issues and support the long-term growth of coastal communities. Some have focused on the potential benefits that marine activities could offer to coastal communities (Ery, 2022; Hafidh, 2021; Lockerbie et al., 2024***;*** Sohn et al., 2021; Torell et al., 2017). Kimasa (2013) examined how the growth of marine tourism and coastal investments relies on supportive institutional frameworks within the country. Additionally, studies have shown that marine tourism can play a role in reducing poverty in coastal areas, like in Pemuteran (Erapartiwi, 2019). Research also suggests that access to sustainable livelihood resources is crucial for reducing poverty in coastal regions (Gai et al., 2017).

Research on how access to marine tourism resources impacts sustainable livelihoods in Bagamoyo and Kilwa communities is limited. In contrast, Holly et al. (2022) examined how marine tourism resources support coastal communities. Furthermore, Cooper (2022) explored the challenges, responsibilities, and opportunities faced by heritage professionals managing coastal cultural assets. This study aims to examine the relationship between access to marine tourism resources and the sustainable livelihoods of coastal communities.

This study examines the relationship between access to finance, social networks, physical assets, and sustainable livelihoods. The paper is organized as follows: Section 2 lays out the theoretical background, including a conceptual framework and hypothesis development. Section 3 explains the methods used to collect data for this study. Section 4 presents the findings, and the team concludes by summarizing the results and discussing their implications.

THEORETICAL BACKGROUND AND HYPOTHESIS

In 1992, Chambers and Conway advanced the concept of sustainable livelihood, aiming to understand the challenges faced by impoverished communities through the analysis of factors affecting their everyday lives. This idea can inform the development of new projects and assess how existing activities support livelihood sustainability (Scoones, 2000). A livelihood is described as access to resources needed for earning a living, while a sustainable livelihood enables individuals to access resources, cope with stress, and recover from setbacks, ensuring these advantages are passed on to future generations without harming the environment (Scoones, 2000). The core principle of Sustainable Livelihood Theory (SLT) is that empowering people should be at the heart of efforts in rural development, poverty reduction, and environmental preservation. The ability to pursue different livelihood strategies depends on vital assets, including material, social, tangible, and intangible resources.

Chamber & Conway (1992) highlighted that for coastal communities to sustain their livelihoods, they must have access to and control over diverse assets: financial, human, social, physical, and natural. Financial assets include cash, credit, and savings; human assets encompass knowledge, skills, and the workforce; social assets comprise networks, social ties, and memberships; physical assets consist of infrastructure. The

first step in assessing sustainable livelihoods involves identifying barriers to accessing these assets.

Many scholars have applied the sustainable livelihood theory, including Gai et al. (2018), who used it to examine poverty reduction in Surabaya's coastal region. Their successful application showed that access to human resources—such as knowledge and skills—has a 65% significant effect on reducing poverty. Dai et al. (2019) used the theory to identify factors influencing livelihood diversification among different household types in Northwestern China. Their results indicated that access to livelihood assets—like financial, human, and social resources—is unevenly distributed. Additionally, Roy & Basu (2020) investigated the factors driving livelihood diversification strategies among farmers in Bangladesh's coastal areas. Their findings confirmed that access to natural assets, including fishing, rice cultivation, and domestic bird rearing, is vital for diversification. In Tanzania's Kilombero district, a study found that access to financial resources, mainly through cash credit, is significantly linked to livelihood diversification (Akyoo, 2021).

Many previous studies (e.g., Akyoo, 2021; Dai et al., 2019; Gai et al., 2018; Roy & Basu, 2020; Torell et al., 2017) have explored the links between poverty reduction, sustainability, livelihood determinants, or diversification. To the researcher's knowledge, no work has specifically looked into the factors affecting access to marine tourism resources in the context of the sustainable livelihoods of coastal communities. Additionally, no research has focused solely on livelihood resources within Tanzania's coastal populations. This study contributes to the literature by examining how access to marine coastal resources supports sustainable livelihoods in these areas. These aspects are adapted from various studies that also employed Structural Equation Modeling (SEM). Specifically, for financial assets, access to financial institutions for cash credit will be analyzed; for human capital, entrepreneurial skills will be considered; and access to social interaction will be examined under social capital.

Drawing on the Sustainable Livelihood Theory and a review of existing literature, we present a model (see Figure 1) that explores how access to marine tourism resources influences sustainable livelihoods. The decision to analyze the relationships among these variables as determinants of sustainable livelihood stems from the limited evidence on these

constructs, despite their recognized importance (Dai et al., 2019; Gai et al., 2018; Roy & Basu, 2020). Access to financial assets requires support from financial institutions. In contrast, access to human assets is reflected in entrepreneurial skills, representing the efforts of coastal communities to acquire business knowledge and leverage marine tourism resources. Additionally, access to social assets through social interactions encompasses the community's efforts to build networks for marketing their marine tourism products to broader markets, while access to physical assets through.

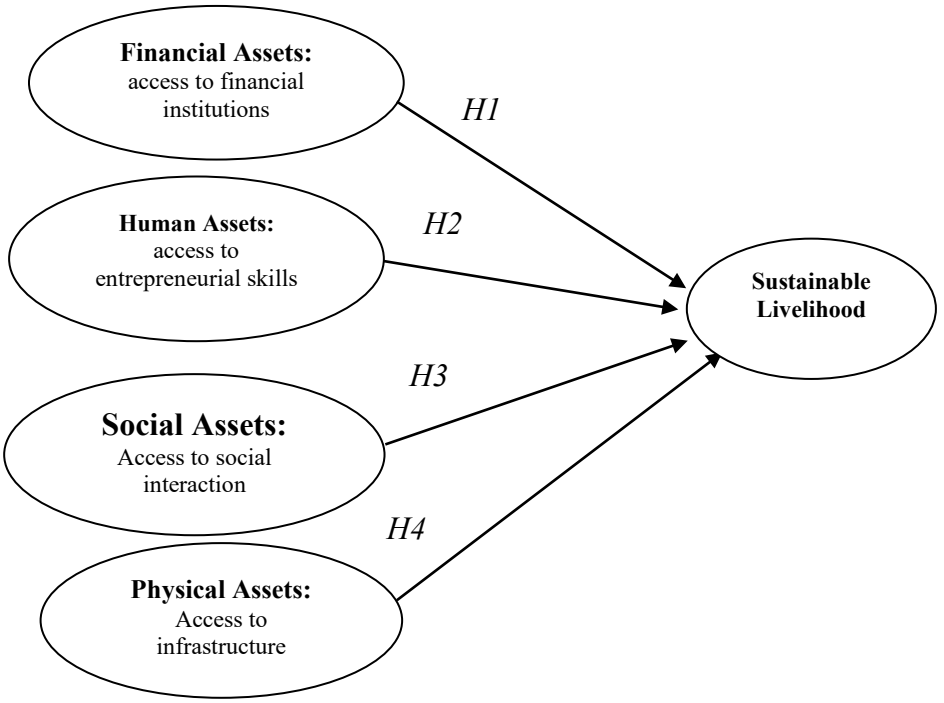

Figure 1: Theoretical model and hypotheses.
Source: Bennett et al. (2018)

The model examines how access to marine tourism resources can enhance sustainable livelihoods, building upon earlier research. We anticipate gaining new insights by examining the factors that affect access within Tanzania's coastal communities. According to Bennett et al. (2018), the model indicates that having access to various livelihood assets—such as

financial, human, social, and physical— is crucial for fostering sustainable development in these areas.

The proposed model includes four theoretical constructs (i.e., access to finance capital through financial institutions, access to human capital through entrepreneurial skills, access to social capital through social interaction, and access to physical capital through tourism infrastructure) from the sustainable livelihood framework, along with their respective sets of indicators, chosen as testable. These were depicted sequentially, reflecting access to livelihood assets and the pursuit of sustainable livelihoods. These insights formed the basis for conceptualizing and proposing a general theoretical framework for Tanzania's coastal communities. In addition, these constructs contributed to the theory by explaining the factors influencing access to marine tourism resources and their impact on the sustainable livelihoods of Tanzania's Coastal communities. The proposed model suggests that a sustainable livelihood depends on access to financial institutions through cash credit, access to human resources through entrepreneurial skills, access to social capital through social interaction, and access to physical assets through tourism infrastructure. Therefore, the study found it necessary to investigate these relationships further for policymakers.

Access to Financial Assets (FA) and Sustainable Livelihood

Access to financial resources has a significant impact on the sustainable livelihoods of coastal communities. Such support can come from savings, credit access, bank loans, as well as inflows like pensions and remittances (Mathenge et al., 2021). Numerous studies have demonstrated that access to financial institutions enhances the performance of small and medium-sized enterprises in coastal areas (Amevenku et al., 2019; Azima et al., 2018; Mathenge et al., 2021; Morara et al., 2018). Gai et al. (2018) explored the concept of poverty reduction in Surabaya's coastal region, focusing on sustainable livelihood through a qualitative research approach using a causal framework.

It was found that financial assets accessed through cash credit were the most significant factor affecting poverty in the coastal area of Surabaya, as fuel expenses could not be compared to the income from fishing. Morara et al. (2018) investigated approaches currently used in Kenya to sustain local livelihoods through coastal fisheries utilizing the capital theory approach. Their findings indicated that individuals or households

with access to financial assets were more likely to be effective in eradicating poverty (Amevenku et al., 2019). Despite the preceding discussion on access to financial assets and sustainable livelihood, the author is unaware of any study examining the relationship between the two constructs in Tanzania's coastal communities. Thus, the following hypothesis is proposed.

Hypothesis 1: There is a positive relationship between access to financial assets through financial institutions' cash credit and sustainable livelihood among Tanzania's coastal communities

Access to Human Assets (HA)and sustainable livelihood

Human assets are flexible resources that underpin sustainable livelihoods (Mathenge et al., 2021). They include factors such as age, gender, education, experience, skills, training, family size, dependency ratio, labor capacity, and the ability to adopt new technologies (Mathenge et al., 2021, Pg 4; Metcalf et al., 2015). These resources are vital for leveraging other types of resources (UNDP, 2015). Smith et al. (2013) examined the feasibility of adaptation strategies in Soc Trang Province, Vietnam, part of the Mekong Delta facing rising pressures on coastal livelihoods. Using participatory workshops and interviews, they identified limited access to human resources as a significant barrier to achieving their primary objectives.

Dai et al. (2019) employed the sustainable livelihood framework to investigate the factors influencing livelihood diversification. They found that labor capacity, a proxy for human assets, significantly supports livelihood diversification among coastal communities in Northwestern China. Similarly, Roy & Basu (2020) examined the factors driving livelihood diversification strategies among farmers in Bangladesh's coastal areas. By applying multiple regression, along with the Simpson index, Herfindahl index, and Priority index, they observed that human assets—measured by age and education—are positively linked to diversification strategies. This suggests that access to human assets can enhance sustainable livelihoods, while limited access may hinder them. These conclusions are based on panel data, as none of the studies employed structural equation modeling to analyze the relationships between these variables. Based on this, the following hypothesis is proposed.

Hypothesis 2: There is a positive relationship between access to human assets through entrepreneurial skills and sustainable livelihood among Tanzania's coastal communities

Access to Social Assets and Sustainable Livelihood

Social assets are defined as an individual's or household's ability to access benefits through networks, trust, membership, reciprocity, and relationships (Mathenge et al., 2021). These assets are accessible within a community owing to shared norms and values. Amevenku et al. (2019) explored how social assets influence livelihood diversification choices among fishing households in the Volta Basin, Ghana, employing questionnaires and non-hierarchical K-means clustering. Their results showed that social assets positively affect the variety of diversification strategies that households pursue.

Mathenge et al. (2021) discovered that access to social capital in rural households enhances resilience and encourages the adoption of climate change strategies. Likewise, Roy and Basu (2020) examined livelihood diversification in Bangladesh's coastal regions, finding that increased access to social networks is associated with more diversification strategies, suggesting that greater social participation fosters diversification. Regression analysis was used to explore this relationship. Although a link between social assets and sustainable livelihoods has been established, the author should review existing studies on this topic. Based on these findings, the following hypothesis is proposed.

Hypothesis 3: There is a positive relationship between access to social assets through Access to social interaction and sustainable livelihood among Tanzania's coastal communities

Access to physical assets and sustainable livelihood

Physical assets include tools and equipment necessary for households or individuals to sustain their livelihoods, such as affordable transportation, secured shelter, roads, buildings, sufficient water supply, sanitation, clean and affordable energy, access to information and communication, and agricultural implements (Amevenku et al., 2019; Gai et al., 2018; Mathenge et al., 2021). Gai et al. (2017) studied the coastal region of Surabaya using a rationalistic approach and determined that physical assets constitute 60% of the sustainable livelihood framework.

Fishermen in the village still relied on traditional fishing gear and struggled to achieve sustainable livelihoods, as most could only optimize one asset at a time. The community's access to physical support was limited, with many traders continuing to use traditional gear, and some lacking land and title deeds, which prevented them from accessing financial capital from formal sources (Makame et al., 2018). It was also suggested that physical assets could serve as collateral, enabling coastal communities to secure loans and credit from banks and other financial institutions.

Metcalf et al. (2015) examined community adaptation strategies to climate change through a case study of three Australian coastal communities. They found that barriers included heavy dependence on a single employment sector and a lack of physical assets. Similarly, Roy & Basu (2020) identified that limited access to physical assets—such as modern boats, signal systems, and fishing equipment—hindered fishers' adaptation efforts. Multiple studies (Amevenku et al., 2019; Gai et al., 2018; Mathenge et al., 2021) have confirmed a significant positive relationship between access to physical capital and sustainable livelihoods. However, none of these studies focused on Tanzanian communities. We argue that, regardless of their location, Tanzanian coastal communities also need improved access to tourism infrastructure. Therefore, unlike the previous studies, this research emphasizes that coastal communities require better access to tourism infrastructure to utilize marine tourism resources for sustainable livelihoods. Access to livelihood assets, in general, is assumed to enhance sustainability eventually. Based on this, we propose the following hypothesis:

Hypothesis 4: There is a positive relationship between access to physical assets through Access to tourism infrastructure and sustainable livelihood among Tanzania's coastal communities

METHODOLOGY

Sample and Data Collection Techniques. This study analyzes data from research conducted in Tanzania's Kilwa and Bagamoyo districts (see figure 2), chosen for their similar socio-economic conditions and reliance on marine tourism. These towns are among the two most historic sites along the Tanzanian coast of the Indian Ocean, each holding significant historical and cultural importance. Kilwa was selected because it is a UNESCO World Heritage site, renowned for its ancient ruins (Nakamura,

2009; Ichumbaki, 2017). It is also a popular destination for tourist cruises. Bagamoyo is known for its historical role as a major trading port and its well-preserved Stone Town. It hosts one of the region's largest craft markets, where guides bring tourists to buy locally made handcrafted products. Both districts are recognized for their traditional fresh fish markets, which both hotels and communities depend on for daily fish supplies. Their economies are closely tied to marine resources, making them ideal for comparative analysis.

Figure 2: Coastal Community of Tanzania
Source: Nordie Development Fund (2014)

The study used a self-administered questionnaire based on the Sustainable Livelihood Analysis (SLA) framework, as recommended by the Department for International Development (DFID) (1999). The questionnaire was divided into four sections: financial assets, human capital, social capital, and physical capital. To ensure accurate representation, data collection took place during working hours on weekdays in Tanzania, specifically in March and April 2025. The survey targeted individuals from various coastal community groups, including village groups of six people, local tour guides, boat builders, fishermen, cultural singers and dancers, artists, handicraft traders, art groups, and sculptors. Since exact data on the target population size was unavailable, convenience sampling was chosen as the most appropriate method for this research.

This process ensured the collection of high-quality, relevant data aligned with the research objectives. Out of 280 questionnaires distributed, 161 (73.9%) were suitable for analysis, while 26% were discarded due to incomplete responses. The reasons for dropping some questionnaires are as follows: some were only partially completed, focusing on the respondent's characteristics, while others covered only the access to finance factor, omitting other variables. Due to time constraints and some participants requesting compensation to complete the entire questionnaire, the researcher chose to exclude the remaining questions and focus solely on the data from the completed questionnaires. Despite this, various rules of thumb in the use of Structural Equation Modeling (SEM) suggest that a sample size of 100 or 200 would be sufficient (Boomsma, 1982, 1985).

The data were first entered into SPSS version 24, and an initial normality assessment was conducted using AMOS (Arbuckle, 1995). This involved analyzing the KMO and Bartlett's Tests. Exploratory Factor Analysis (EFA) was then performed to validate the variables and determine which factors to retain, supported by a pattern matrix and Scree plot. Finally, Structural Equation Modeling was employed to examine the relationships among the variables.

The data collection employed measurement scales based on a well-established livelihoods framework. Items were evaluated using five-point Likert scales. All variables—covering financial, human, social, and physical assets—were grounded in prior research and specifically adapted to the marine tourism resources of Kilwa and Bagamoyo (Su *et al.,* 2019;

Ma et al., 2018; Su et al., 2019; Jayaweera, 2010; Sigalla, 2014; Njoel, 2011). Access to social assets was assessed with six items sourced from Njole (2011) and Su et al. (2019); access to human assets was measured by seven items from Kamaruddi & Samsudin (2014) and Su *et al. (*2019); access to financial assets was evaluated with six items adapted from Lindenberg (2002) and Ma et al. (2018); and access to physical assets was evaluated with seven items drawn from Jayaweera (2010) and Sigalla (2014).

RESULTS

Respondents' characteristics

A multiple regression analysis was performed. Table 1 displays the key characteristics of respondents from a cross-sectional sample. As shown, males engage more frequently in marine tourism activities compared to females, and their monthly income reflects the poverty level.

Table 4: Characteristics of Respondents

Characteristics	**Distribution of answers**
Gender	Male:80%; Female: 15.6%
Age	Below 20:6.9%; 20-39: 51.4%; 40-59:35.8%; 60-79:1.2%; 80 & above:0.6%
Education	Primary school:4.0%; High school:62.4%; Certificate/Diploma: 13.9%; Bachelor degree: 17.9%; Master degree:1.7%; I did not go to school. 0%
Marital Status	Single:24.9%; Married:63%; Divorced:5.2%; Widow:2.3%; Widower:0.6%
Job position	Tour guide: 13.3%; Singer: 12.7%; Boat Builder:15%; Fisherman:45.7%; c Others:9.2%
Job Experience	Less than a year; 2.9%; Between 1-5 Years: 17.9%; Between 6-10 years: 39.3%; Between 11-15 years: 16.2%; Between 16-20 years: 19.1%; More than 20 years: 0.6%
Information related to their Marine tourism activities	
Characteristics	Distribution of answers
Place of residence	Kilwa: 55.5%; Bagamoyo:44.6%
Monthly Income	0-50,000: 30.6%; 50,000-100,000: 31.2%;100,000-200,000: 22%; 200,000-300,000: 11.6%; 300,000-above:0.6%
Number of Customers per Month	0-50:4.0%;50-150:82.1%; 12.1%; 1.79%
Range of price per product	0-20,000: 4.0%; 20,000-40,000:55.5%; 40,000-60,000:20.2%; 60,000-80,0005:8%; 80,000-above 14.5%

Source: Researcher, 2025

Results from Multicollinearity Test

In testing the multicollinearity, the Variance Inflated Factor (VIF) and Tolerance values were applied. The cut-off points by Hair *et al.* (2011) were considered. The authors posit that VIF values greater than 5 and Tolerance values less than 0.2 indicate the presence of multicollinearity**.** Table 4.2 shows that there was no multicollinearity issue in the current study, as the tolerance and VIF values did not exceed the threshold values.

Table 2: Multicollinearity Statistics

Model	Correlations			Collinearity Statistics	
	Zero-order	Partial	Part	Tolerance	VIF
(Constant)					
FC2	.282	.153	.127	.870	1.111
SC	.287	.219	.193	.862	1.143
HC	.921	-.176	-.109	.812	1.197
PC	.872	.314	.240	.824	1.421

Source: Researcher, 2025

Exploratory Factor Analysis (EFA)

EFA was used to validate the study's variables before conducting the analysis and measuring the relationship between the variables. Kaiser-Mayer-Olkin's measure of sampling adequacy (KMO) and Bartlett's Test of Sphericity were used to assess the suitability of the variables (see Table 3).

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.880
Bartlett's Test of Sphericity	Approx. Chi-Square	6442.290
	Df	990
	Sig.	.000

Source: Researcher, 2025

To verify the adequacy of each variable and the overall model, ensuring the data is appropriate for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure was used, as it assesses the proportion of variance among variables. While KMO values range from 0 to 1, values between 0.8 and 1 are considered indicative of adequate sampling. In this study, the KMO was 0.880, and Bartlett's Test of Sphericity was significant at $p < 0.000$. These findings are summarized in Table 3. For EFA application, a KMO value of at least 0.6 is recommended (Tabachnick & Fidell, 2007).

Acceptable Loadings

A pattern matrix and Scree plot were employed to decide the number of factors to retain, based on those meeting the threshold and excluding those with minimal values. The threshold applied was all elements exceeding a value of one. Only variables with acceptable loadings were considered at this stage. The detailed pattern matrix for the retained factor, including its loadings, is shown in Table 4.

Table 4: Pattern Matrix

	Factor				
	1	**2**	**3**	**4**	**5**
CH4	.977				
CH3	.947				
CH5	.932				
CH2	.924				
CH1	.799				
FC2		.940			
FC1		.905			
FC3		.868			
FC4		.540			
FC5		.412			
TC1			.989		
TC2			.855		
TC4			.808		
TC3			.443		
ACC3				.960	
ACC4				.830	
AC5				.799	
LV2					.828
LV1					.800
LV4					.725
LV3					.580

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Source: Researcher, 2025

Results from the Convergent Validity Test

Convergent validity is confirmed when all items in a measurement model are statistically significant. Calculating the Average Variance Extracted (AVE) is also essential to ensure validity. An AVE of at least 0.5 for each factor indicates convergent validity. In this study, all items in the measurement model were statistically significant at $p = 0.000$, specifically, FC=0.70705; SC=0.62098; HC=0.674088; and PC=0.56432.

Given these findings of AVE, it is concluded that the measurement scale has achieved convergent validity.

Results from Reliability Analysis

The present study employs an alternative internal consistency metric, composite reliability (CR), based on CFA results. CR assesses the internal consistency of a latent construct, with a threshold of greater than 0.6 indicating acceptable reliability. It is computed using the formula from Hair et al. (2010), $\mathbf{CR} = (\Sigma\ \lambda)^2 / [(\Sigma\ \lambda)^2 + (\Sigma 1 - \lambda^2)]$, with the outcomes summarized in Table 5.

Where λ = factor loading of every item and n = number of items in a model.

Table 5: Composite Reliability (CR) for the Measurement Model

Financial Assets (FC)	Social Assets (SC)	Human Capital Assets (HC)	Physical Assets (PC)
0.905512	0.73414	0.78345	0.89438

Source: Researcher, 2025

Structural Model Results

When testing the structural model for the entire sample, the analysis began by assessing goodness-of-fit indices. The results indicated that the model satisfied the recommended guidelines for fit, with CMIN/DF = 2.817, GFI = 0.960, TLI = 0.946, CFI = 0.959, and RMSEA = 0.105. A summary of these results is provided in Table 6. These findings suggest an excellent model fit, confirming the appropriateness of testing the study's hypotheses.

Table 6: Standardized and Unstandardized Estimates for the Direct Effect of the Structural Model

			Estimate	S.E.	C.R.	P	Label
LAVA	<---	CH	-.014	.077	-.188	. ***	.011
LVA	<---	FC	-.004	.055	-.066	***	.004
LVA	<---	TC	1.100	.099	11.127	***	.946
FC4	<---	FC	1.000				.947
FC2	<---	FC	1.004	.028	35.671	***	.993
TC4	<---	TC	1.000				.789
TC3	<---	TC	.686	.093	7.380	***	.568
TC2	<---	TC	1.039	.088	11.869	***	.850
CH4	<---	CH	1.000				.931
CH3	<---	CH	.979	.036	27.336	***	.978
CH1	<---	CH	.959	.063	15.318	***	.808
FC5	<---	FC	1.019	.027	38.365	***	1.002
CH5	<---	CH	1.009	.045	22.220	***	.925
LVA1	<---	LVA	1.000				.944
LVA2	<---	LVA	.380	.062	6.180	***	.451
LVA5	<---	LVA	.987	.052	18.807	***	.901

Source: Researcher, 2025

Beginning with H1, which concerns access to financial assets for sustainable livelihoods, a positive and significant relationship was found between financial assets and sustainable livelihood (β = 0.294; P = 0.000; H5b). This hypothesis was supported, as shown in Figure 3.

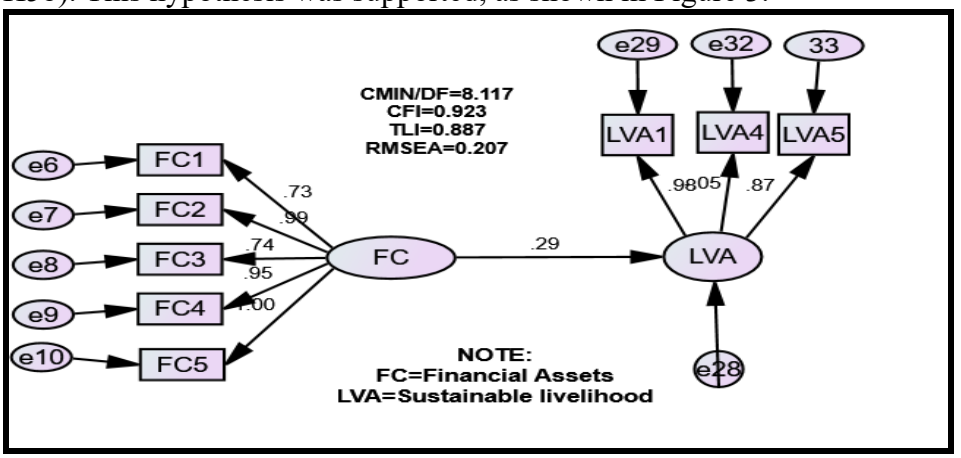

Figure 3: Model Path Coefficients between Access to Finance assets and Sustainable Livelihood

***Source*:** Researcher, 2025

Respectively, H2 Access to social Assets ---Sustainable livelihood, a positive and significant relationship was found between social assets and sustainable livelihood, with β = 1.004; P = 0.000; H5c. Therefore, this hypothesis was supported and is depicted in Figure 4.

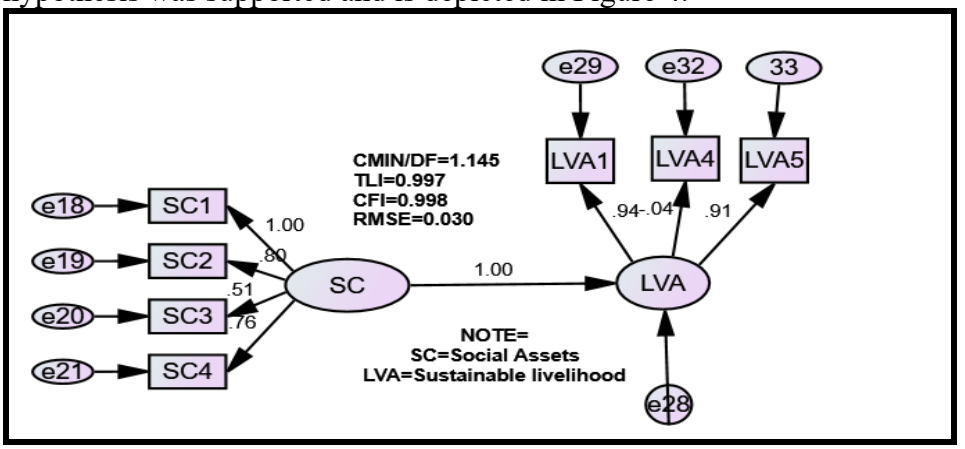

Figure 4: Model Path Coefficients between Access to Social Assets and Sustainable Livelihood
Source: Researcher, 2025

Additionally, H3, which pertains to Access to Human Assets and Sustainable Livelihood, showed a significant relationship between these constructs (human assets and sustainable livelihood) (β = 0.144; P = 0.000; H5a). Therefore, the hypothesis was supported, as illustrated in Figure 5.

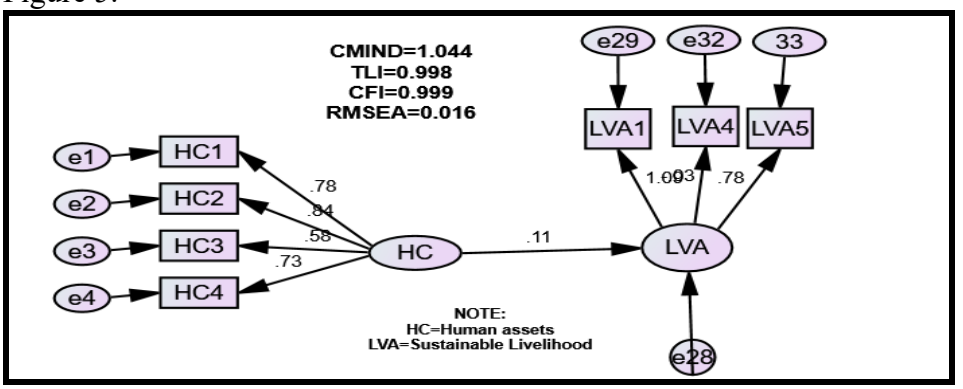

Figure 5: Model Path Coefficients between Access to Human Assets and Sustainable Livelihood
Source: Researcher, 2025

Finally, H4 (Access to Physical Assets --- Sustainable Livelihood) showed that physical assets had a significant and strong impact on

sustainable livelihood (β = 0.326; P = 0.000; H5d), as depicted in Figure 6.

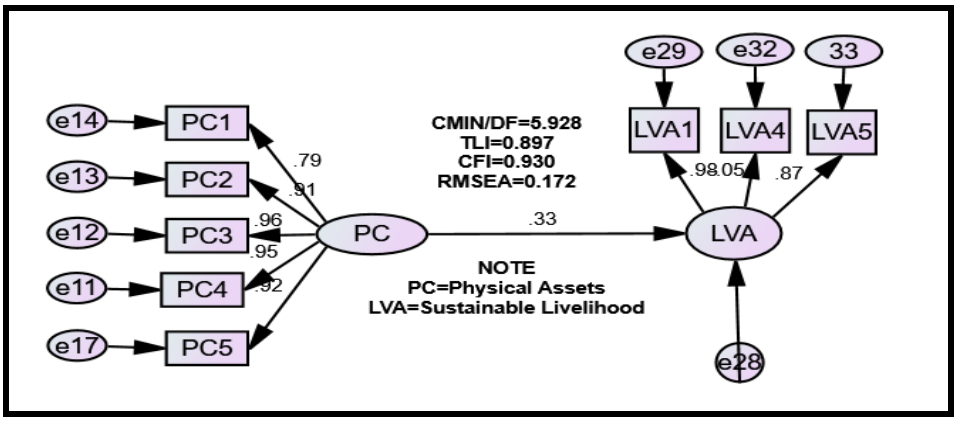

Figure 6: Model Path Coefficients between Access to Physical Assets and Sustainable Livelihood
Source: Researcher, 2025

DISCUSSION

Findings showed that when access was considered a mediating variable between livelihood assets and sustainable livelihood, the results were insignificant, aligning with the previous study that confirmed access to livelihood assets impacts achieving sustainable livelihood (H1-H4). However, removing the mediation construct from the model rendered the results significant, consistent with prior research demonstrating that livelihood assets have a positive and meaningful relationship with sustainable livelihood (H5a-H5d) (Gai et al., 2020; Li et al., 2020; Massoud et al., 2016; Walelign, 2015). Specifically, H5a confirmed that financial assets have a positive and significant relationship with sustainable livelihood. This aligns with Liu et al. (2018), who found that financial assets have a notable influence on various livelihood strategies aimed at sustainability. Similarly, Liu et al. (2018) observed that financial assets have a significant impact on farm households' choice of livelihood strategy.

Physical assets (PC) showed a significant positive correlation with Sustainable livelihood (5b). The results indicated that physical assets are established to support the community's livelihood. These findings align with those of Ding et al. (2018) and Walelign (2015), who noted that physical assets are crucial to household participation in pastoral activities and living standards. Conversely, Geiser et al. (2011) observed that

physical assets located near markets in Vietnam did not significantly or positively influence citizens' welfare. Additionally, Su et al. (2019) discovered that physical assets related to agricultural involvement had a worse, negative effect on material well-being.

The results indicated that social assets have a positive and significant impact on the sustainable livelihoods of coastal communities. This aligns with previous research, which shows that social assets contribute to better living standards and lower resource access costs while protecting the environment (Gunasekara et al., 2017). Mulema (2008) found that social assets are crucial for joint decision-making, enabling men to make choices about land, manage money, visit markets, decide what to sell, and utilize financial resources. Conversely, these findings contrast with Su et al. (2019), who reported that social assets do not influence sustainable livelihoods for agricultural workers, as many in this group have weak social networks. Similarly, Ding et al. (2018) found no link between social assets and improved living strategies.

The study revealed that human assets are positively and significantly associated with sustainable livelihoods. These results align with Amevenku (2019), who states that human assets are a key driver of livelihood strategies. Pour et al. (2018) discovered that human assets support both commercial and mixed livelihood approaches. Coglan & Pascoe (2007) found that human assets have a notable impact on the stocks within fisheries communities. Additionally, Morara et al. (2018) observed that human assets contribute to the sustainability of fisheries communities and their local livelihoods in Kenya.

Managerial Implications

Given the strong positive link between livelihood assets—such as financial, social, physical, and human assets—and the sustainable livelihood of coastal communities, the government and private agencies need to prioritize financial aid and entrepreneurial training. Strengthening financial assets can help these communities access necessary financial support. Additionally, support measures like capacity-building workshops, moral encouragement, and professional training on effectively utilizing marine cultural heritage resources can contribute to poverty reduction, thereby advancing sustainable development goals.

Currently, financial institutions are working to relax certain loan requirements for communities committed to sustainable livelihoods. There is a clear positive relationship between human assets and sustainable living. Proper investment in human assets is crucial for addressing challenges faced by coastal communities. The main difficulty is investing in social assets to develop effective institutions capable of sustainably managing both physical and human resources. Additionally, when physical assets benefit entire coastal communities rather than individuals, social assets become vital for maintaining networks and regulating their use. The study's findings will assist policymakers in directing their resources and efforts to ensure Tanzania's coastal communities have access to livelihood assets. For example, access to financial assets should be prioritized for communities in Bagamoyo and Kilwa, whose livelihoods rely on marine resources. These communities should receive low-interest loans, training to expand small businesses, and opportunities to join social groups. This approach would enable them to form different groups and secure support from banks through group loans rather than individual ones.

Study Limitations and Areas for Future Research

The current study suggests several avenues for future research. It examined the relationship between the accessibility of marine tourism resources and community livelihood, specifically in Kilwa and Bagamoyo, Tanzania. However, other researchers could explore how these factors relate in different tourism contexts, such as national parks, travel agencies, tour operators, and other stakeholders who directly benefit from tourism resources.

CONCLUSION

Given the rapid global depletion of marine resources and the prevalence of hunger, malnutrition, and poverty in coastal communities, conservation and sustainable use of marine resources are essential for efforts to eradicate extreme poverty and hunger. This study examined two coastal communities whose livelihoods depend on the sea, providing insights into the relationship between access to livelihood assets and achieving sustainable livelihoods. Employing the sustainable livelihood theory, the research explored how financial, human, social, and physical access to marine cultural heritage resources supports the sustainability of communities in Kilwa and Bagamoyo. The main finding indicated that access to livelihood assets significantly and positively impacts sustainable

livelihood, offering useful guidance for effective governance of marine resources. The key challenge remains in how to further invest appropriately in these assets to help society adapt to the changing and uncertain nature of maritime cultural heritage resources.

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