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Original Article

## Contribution of Ecotourism to the Community's Economy in Coastal Areas of Tanzania

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### Keywords:

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Community's  
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Household Income.

This study assesses the contribution of ecotourism to community economies in Tanzania's coastal areas, with a focus on Kisarawe village, Kunduchi Street, and Kaole village in the Pwani and Dar es Salaam regions. Using a cross-sectional research design that incorporated both qualitative and quantitative approaches, data were collected from 151 households within a 50-kilometer radius of the Pugu-kazimzumbwi Nature Forest Reserve, Mbudya Island, and the Kaole Historical Site through semi-structured surveys. Qualitative data was analyzed using relative frequency analysis, while quantitative data was examined using descriptive statistics, including mean, variance, and standard deviation. The analysis was conducted using MS Excel and IBM SPSS software. Results revealed that ecotourism contributed 41.15% of the total monthly household income, with a median monthly income of TZS 186,920 from ecotourism-related occupations. Six main ecotourism occupations were identified: service provision (25.5%), cleaning services (25.1%), tour guiding (24.7%), first aid nurses (8.5%), curio shops (8.1%), and nursery attendants (8.1%). Community initiatives supporting ecotourism included tree planting (26.4%), food services (21.0%), road maintenance (15.8%), and improvements to water supply (10.5%) and electrical services (10.5%). Local businesses supporting ecotourism provided food and beverage supply (26.3%), motorcycle transportation (5.3%), and other hospitality services (63.1%). While other income sources constitute 58.85% of household income, ecotourism has emerged as a substantial complementary source (41.15%) for coastal communities. The research highlights ecotourism's potential as a tool for economic development in Tanzania's coastal regions, suggesting the need for continued support of sustainable ecotourism to enhance community livelihoods.

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**INTRODUCTION**

Ecotourism is a form of sustainable tourism that involves responsible travel to natural areas while minimizing environmental impacts and supporting local communities (Minciu *et al.*, 2020). Ecotourism highlights the conservation of biodiversity and cultural heritage, as well as the education and empowerment of visitors and the surrounding community (Lim *et al.*, 2023). Ecotourism, as a sustainable form of tourism, has gained significant attention in recent years due to its potential to promote conservation efforts while improving the livelihood of local people (Anup *et al.*, 2021). The concept of ecotourism is the preservation and appreciation of natural and cultural resources, emphasizing their diversity and uniqueness (Roslan *et al.*, 2021).

Tanzania is a country endowed with a vast coastline that has great potential to attract a large number of tourists (Shechambo, 2019). This gives the potential for ecotourism activities which in turn play significant roles in improving livelihood by generating income and providing employment opportunities to local communities in coastal areas. This is through engaging in ecotourism activities such as tour guiding and selling local products, services, and cultural experiences (Shechambo, 2019).

Ecotourism involves implementing strategies to reduce waste production, conserve energy, and preserve biodiversity by seeking a harmonious coexistence between visitors and the natural environment. Ecotourism works under the main principle of sustainability, which entails meeting the needs of present visitors and host communities

without compromising the ability of future generations to meet their own needs (Soaga, 2022). Ecotourism seeks to alleviate poverty and empower residents to actively participate in conserving their natural surroundings by balancing ecological, economic, and sociocultural factors. It creates economic opportunities for communities through tourism-related enterprises such as guided tours, accommodations, and locally produced goods. This situation is relevant for Tanzania's coastal regions, where communities live with ecotourism resources while pursuing economic development.

Coastal area ecosystems are characterized by diverse marine and terrestrial habitats (Francis, 2015). These areas play a crucial role in supporting local livelihoods through traditional activities such as fishing and agriculture while simultaneously harbouring significant potential for sustainable tourism development. Despite their crucial roles, these coastal areas have suffered environmental degradation stemming from factors such as increasing human population, urbanization, high resource demand, and unmanaged ecotourism practices. The degradation of these coastal areas poses a significant threat to both biodiversity and community well-being, particularly in areas proximate to urban centres (Boussougou *et al.*, 2018). Also, ecotourism contributes to the conservation of biodiversity by providing economic incentives for the protection of natural resources (Alaeddinoglu & Can, 2011).

Ecotourism has the potential to strengthen local communities by providing income opportunities through access to resources and job creation (Ballad *et al.*, 2021). However, to reach the maximum economy, there is a need to balance economic

development with the protection of ecotourism resources. This is achieved through the involvement of local communities in ecotourism activities as the way towards sustainable livelihood and coastal ecosystem protection. It is also challenging to define and measure the beneficial roles of ecotourism destination sites in the economy since they can be subjective and dependent on the assessor's perspective and the communities living in such destination sites. Moreover, such measurements can be time-consuming and resource-intensive (Menbere & Menbere 2002).

Although there is increasing recognition of ecotourism's potential in Tanzania's coastal areas (Pasape *et al.*, 2014), there remains a significant gap in comprehensive studies and documentation concerning the economic contribution to coastal communities in Tanzania. Previous research has largely focused on ecological impacts or general tourism development, leaving the specific economic dimensions of ecotourism at the household level understudied (Shi *et al.*, 2022). This gap is particularly notable in understanding how ecotourism activities compete with traditional livelihood strategies.

Therefore, this study aimed at assessing the contribution of ecotourism to the community's economy in the coastal areas of Tanzania. Specifically, the objectives were to determine the contribution of ecotourism to household income compared to other sources. Households involved in ecotourism activities in coastal areas of Tanzania are expected to have higher average incomes compared to those not involved in ecotourism. The expectation is grounded in the economic benefits associated with ecotourism, such as job creation, economic diversification, and community-based tourism initiatives, which can enhance local livelihoods.

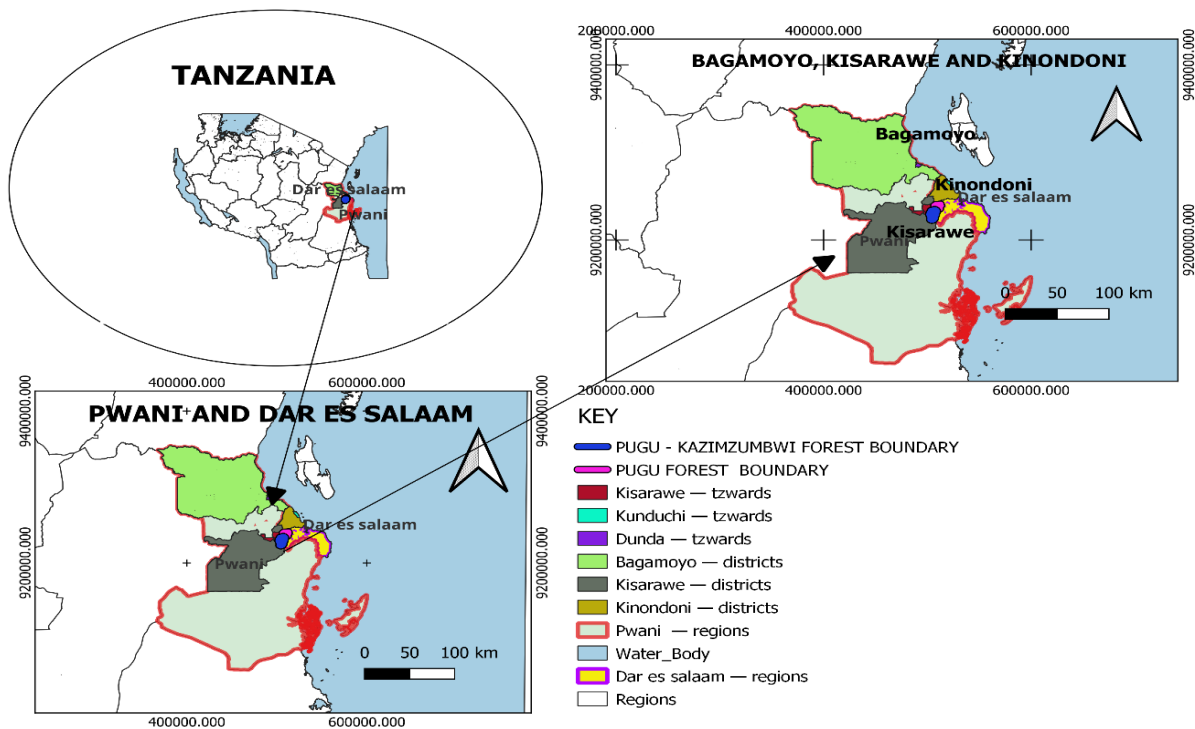
## METHODOLOGY

### Description of the Study Area

The study was conducted in three selected coastal areas of Tanzania: Kisarawe village (in Kisarawe district), Kunduchi street (in Dar es Salaam), and Kaole village (Bagamoyo). Kisarawe village (06°53'S, 39°04'E) lies 25km southwest of Dar es Salaam at 120-350m elevation adjacent to Pugu-kazimzumbwi Nature Forest Reserve (Francis & Bryceson, 2001). Kunduchi Street (06°40'S, 39°13'E) is 25km north of Dar es Salaam at 0-20m elevation, near Mbudya Island Marine Reserve. Kaole village (06°26'S, 38°55'E) is situated 5km southeast of Bagamoyo town at 0-15m elevation.

The region experiences a tropical coastal climate with an average temperature of 26°C (ranging from 23°C-25°C and Bimodal rainfall of 800-1200mm annually during March-May and November-December. The area features diverse soil, including well-drained sandy loams in elevated regions, clays formed from lacustrine alluvium, and coastal sand along the beachfront (Francis, 2015; Francis & Bryceson, 2001). This type of soil supports coastal forests with evergreen vegetation and mangrove forests dominated by *Avicennia marina* and *Rhizophora mucronate*, which serve as critical nursery grounds for marine life (Mdemu & Burra, 2016).

Local communities engage in traditional livelihoods such as artisanal fishing, small-scale agriculture, seaweed farming, and ecotourism-related activities. The primary economic activities in the study area include traditional livelihoods such as artisanal fishing, small-scale agriculture, seaweed farming, and coconut cultivation. Each site practices both traditional livelihoods and ecotourism. Each study site represents different conservation categories as follows: Pugu-kazimzumbwi is a protected forest reserve, Mbudya Island is a marine protected area, and Kaole is a protected cultural heritage site as well as an archaeological area (DHI & SAMAKIA Consultants, 2015).

**Figure 1: A Map of the Study Area**

### Study Design

This cross-sectional study employed mixed methods from March to May 2024 across the Pwani and Dar es Salaam regions. Sites were purposively selected based on their tourism significance, categorized into natural (marine parks, coastal forests) and cultural heritage sites three villages within a 50km radius of each attraction site were selected, assuming community members derive benefits from these locations. The sample size was determined using Yamane's (1967) formula;

$$n = \frac{N}{1+Ne^2} \quad (1)$$

whereby n = Sample size,

N = Total population size,

e = Margin of error.

As shown in **Table 2**, the study covered three locations with a total population of, 1246 households (446 from Kisarawe village, 400 from Kinondoni Street, and 400 from Kaole village) Applying Yamane's formula with a 7.5% margin of error:

$$n = 1,246 / [1+(1,246 \times 0.075^2)]$$

$$n = 1,246 / [1+(1,246 \times 0.005625)]$$

$$n = 1,246 / [1+7.01]$$

$$n = 1,246/8.2$$

$$n = 151$$

**Table 1: Sampling Frame and Sample Size Yamane (1967)**

S/N	Location	Sampling frame	Sample size
1	Kisarawe village	446	51
2	Kinondoni street	400	50
3	Kaole village	400	50
	Total	1,246	151

The sample size also considered the central limit theorem that a sample size of  $n \geq 30$  is needed to infer the population under the study (Del, 2019). Semi-structured questionnaires for household heads, covering demographic, income sources, and ecotourism impact perceptions, were utilized.

### Data Collection

This study aims to assess how ecotourism contributes to the income of communities adjacent to coastal areas in Tanzania through various incentives, activities, infrastructure development, and employment opportunities, both direct and indirect. A mixed-method approach was utilized to investigate key community components thoroughly. Ecotourism activities data was collected from the 151 households. This included two sets of data; demographic data such as age, gender, marital status and education level, and household size, and household ecotourism activities such as ecotourism occupations performed by household members, how much income generated from them, ecotourism initiatives present in their society and benefits of the initiatives to the community. A semi-structured questionnaire composed of these was structured and is present in Appendix 1. The filled questionnaires were examined for accuracy and completeness before analysis.

### Data Analysis

A total of 151 observations corresponding to the households in the study area were recorded. Each observation contained quantitative and qualitative variables such as household size and gender, respectively. Qualitative variables were converted in code format from 0 to higher numbers, which represented values of the categories of qualitative variables. For example, instead of male and female, 0 and 1 were used to represent those gender values. Such data preprocessing procedures were conducted in MS Excel before inputting the data into the SPSS program for analysis. This was done to avoid categorization errors as a result of misspelling of categorical class names. Open-ended questions, such as names of ecotourism initiatives, were standardised and categorized, and their values were

coded into numbers (no, yes) = (0,1). For example, the initiatives were standardized and categorized as tree planting, food services provider, water supply, roads maintained, beverage services, motorcycle transportation, water services, and electric services. Therefore, if a member of the household practices any of the initiatives, then it retains a value of 1 unless otherwise it has a value of 0. Since this data was collected for each household member who participated in a given initiative, it was also used to determine household members who were participating in a given initiative.

Quantitative data were analyzed by using the frequency analysis method. For example, there were 5 education level categories, and frequency analysis provided a table to show that out of 151 observations, what is the number or frequency and percentage of the respondent household members fall under each category. For those data that have numeric values such as household size, monthly household ecotourist, and non-ecotourist income, summary descriptive statistics were conducted for a wide range of parameters including range, minimum and maximum range, sum, mean, standard error of the mean, standard deviation, and variance.

To obtain secondary information, such as a portion of household members or income obtained from ecotourism activities, two or more variables were analyzed to generate a single information. For example, to obtain a portion of household income that is generated from ecotourism activities, the variable ecotourism activities and non-ecotourism activities were involved. The sum of income from ecotourism activities practised in a given household was divided by the sum of all ecotourism activities, then multiplied by 100%.

## RESULTS

### Demographic Characteristics

The respondent's population comprised 151 selected heads of households. The demographic profile of respondents showed moderate gender disparity between males and females. Age



distribution revealed a predominantly young to middle-aged population. In the case of marital status, married individuals formed the largest group followed by single individuals in contrast, divorced and widowed each represented a small proportion of

the sample. Educational analysis showed majority attained secondary education while moderate have primary education, college education, and vocational training and are equally represented (**Table 2**).

**Table 2: Demographic Characteristics of the Surveyed Population**

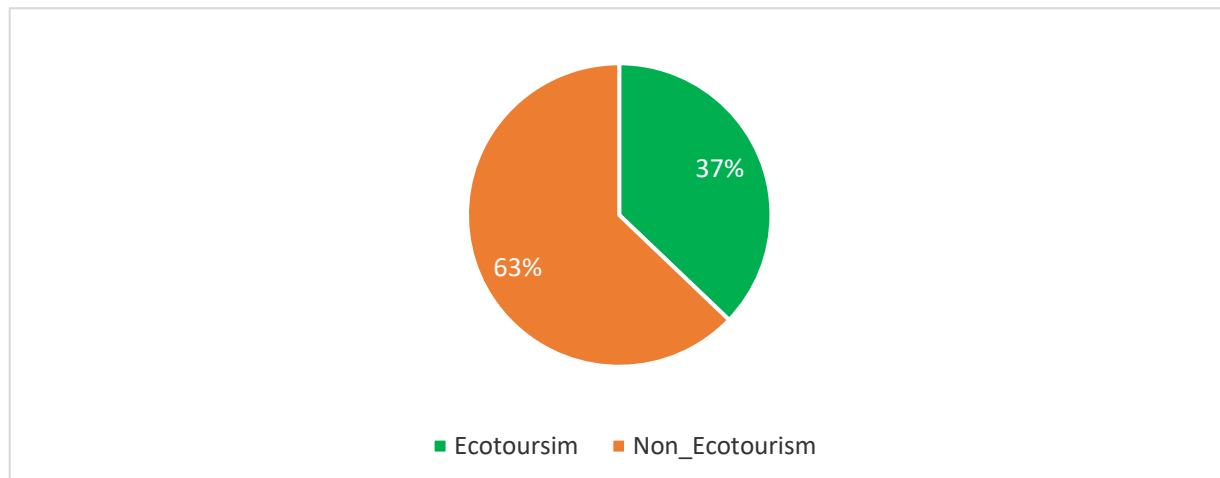
Variable	Category	Frequency	Percentage (%)
Gender	Male	87	57.6
	Female	64	42.4
Age group	18-29	65	43.0
	30-39	64	42.4
	39-60	22	14.6
Marital status	Married	65	43.0
	Single	44	29.1
	Divorced	21	13.9
	Widowed	21	13.9
Education level	Secondary	86	57.0
	Primary	22	14.6
	College	22	14.6
	Vocational training	21	13.9
<b>Total</b>		<b>151</b>	<b>100.0</b>

### Household Participation in Ecotourism Activities

The analysis of household participation in the ecotourism activities revealed that each household had between 1 to 3 members at least engaged in ecotourism activities, with a mean of 1.72 members

per household. **Figure 2** shows the proportion of household members engaged in ecotourism versus non-ecotourism activities. Among the 151 sampled households, a total of 697 household members were identified. Of these members, 259(37%) were involved in ecotourism activities, while 438(63%) were engaged in non-ecotourism activities.

**Figure 2: Pie Chart Showing the Proportion of Ecotourism in Household Occupation**



### Distribution of Ecotourism Occupations

The study surveyed 259 people engaged in ecotourism-related occupations and revealed six main ecotourism-related occupations. They

included the service providers, cleaning services, tour guides, first aid nursing, Curio shop operation, and tree nursery attendants (**Table 3**).

**Table 3: Distribution of Ecotourism Occupations in the Surveyed Population**

Ecotourism occupations	Number of Household Members engaged	Percentage (%)
Tour guiding	64	24.7
Service provider	66	25.5
Cleaning services	65	25.1
First aid nurse	22	8.5
Curio shop	21	8.1
Tree nursery attendant	21	8.1
<b>Total</b>	<b>259</b>	<b>100</b>

### Contribution of Ecotourism to Household Income

The study found that ecotourism contributes to household income in coastal communities. The median monthly income from ecotourism-related occupations is TZS 186,920 per month, which is about 41.15%, whereas the median monthly income from non-ecotourism occupations is found to be TZS 243,377, equivalent to 58.85% of the total median monthly household income of TZS 430,398 (**Appendix 2**).

### Initiatives to Support Ecotourism

The survey revealed that the community is engaged in various activities as initiatives to support ecotourism development, including tree planting, food services provision, road maintenance, water supply, water services, beverage services, Motorcycle transportation for visitors and electric services as seen in **Table 4**.

**Table 4: Initiatives to Support Ecotourism**

Initiatives	Count	Proportion (%)
Tree planting	151	26.4%
Food service provision	120	21.0%
Water supply	60	10.5%
Road's maintenance	90	15.8%
Beverage services	30	5.3%
Transport (motorcycle for visitors)	30	5.3%
Water services	60	10.5%
Electric services	30	5.2%
<b>Total</b>	<b>571</b>	<b>100.0%</b>

## DISCUSSION

The study reveals an important pattern in how coastal communities engage with and benefit from ecotourism activities. The demographic composition shows a relatively balanced gender participation, though with a slight male bias (57.6% males and 42.4% females). This reflects broader

societal trends where women's participation in economic activities tends to be lower (Scheyvens & Scheyvens, 2017). While this gender gap is smaller than in traditional economic sectors, it suggests room for improving women's inclusion in ecotourism ventures.

The predominantly young workforce, with 85.4% of respondents under 40 years old, indicates that ecotourism is attracting younger demographics, which aligns with global trends showing a youthful workforce in developing regions (Stanciu *et al.*, 2022). However, the limited representation of older adults (14.6% aged 39-60) indicates barriers to entry and a natural transition away from ecotourism activities with age. Married individuals form the largest group among the population (43%), and singles are the second largest group (29.1%). Divorced and widowed individuals each represent 13.9% of the sample. This distribution suggests a diverse representation of marital statuses, echoing variable marital trends across different cultures and regions (Uy *et al.*, 2021).

The educational profile of participants reveals that secondary education (57.0%) appears advantageous for participation in the sector, while primary, college, and vocational training each represent smaller but significant proportions. This distribution suggests that ecotourism provides opportunities across various educational levels, though there may be room for expanding participation among those with different educational backgrounds.

The study's findings on household participation and income generation demonstrate ecotourism's significant impact. Each household has at least one member engaged in ecotourism activities (mean of 1.72), and 259 out of 697 community members are involved in the sector. The median monthly household income from ecotourism occupation (TZS 186,920) representing 41.15% of total household income) demonstrates its substantial contribution not displacing traditional livelihoods, such as artisanal fishing and small-scale farming, which still account for 58.85% of income (TZS 243,377) contributing to the monthly household income. Out of all ecotourism occupations, service provision is seen to be the best option as out of 259 members engaged in ecotourism, 66 are service providers. These findings align with the research indicating that ecotourism can contribute to local

economies by providing additional income streams (Uy *et al.*, 2021).

Moreover, the study identified a diverse range of ecotourism-related employment opportunities with service provisions such as transport, beverage and food services), cleaning around ecotourism attractions, and tour guiding collectively account for 75.3% of ecotourism. This concentration suggests these roles are crucial entry points for community participation in the sector, similar to patterns observed in other studies focusing on tourism-related jobs (Shi *et al.*, 2022). The smaller proportions in specialized roles such as first aid nursing (8.5%), curio shop operation (8.1%), and tree nursery attendance (8.1%) indicate potential areas for skill development and occupational diversification.

The study identified several community-led initiatives supporting ecotourism development. Tree planting emerged as the leading initiative accounting for (26.4%), reflecting community awareness of environmental conservation's importance to sustainable ecotourism. Food service provision (21%) and road maintenance (15.8%) demonstrate community recognition of the need for basic tourism infrastructure. The presence of diverse support services, including water supply (10.5%) and transport services (5.3%) indicates the development of a comprehensive ecotourism support system and reflects community awareness of the importance of environmental conservation to sustainable ecotourism and is consistent with other findings such as Kanwal *et al.*, 2020 where local community initiatives play a vital role in supporting tourism infrastructure.

Households typically have at least one member engaged in ecotourism activities (mean 1.7152), representing approximately 19.06% of household members. This moderate level of household participation suggests that families are diversifying their income sources rather than becoming overly dependent on ecotourism. A trend was also noted in a study by Ávila-Foucat *et al.* (2021), which



examined household strategies in ecotourism-dependent countries.

The findings demonstrate that ecotourism has established itself as a significant contributor to coastal communities' income. The sector's ability to generate substantial household income while promoting environmental conservation aligns with multiple sustainable development goals. Particularly SDG 1 (no poverty) and SDG 8 (Decent work). SDG 14 and 15 (Life below water and life on land, respectively). However, the observed patterns also highlight areas requiring attention, including the need for increased participation of older adults and women in ecotourism activities and opportunities for developing more specialized roles and services. The importance of maintaining a balance between traditional and economic-based livelihoods. The potential for expanding community-led environmental initiatives. These insights suggest that while ecotourism has successfully contributed to community economies, there remains scope for enhancing its inclusivity and sustainability impact.

## CONCLUSION AND RECOMMENDATION

### Conclusion

This study examined the contribution of ecotourism to community economies in coastal areas of Tanzania, focusing on the distinct locations: Kisarawe Village, Kunduchi Street, and Kaole Village. Each area demonstrated unique ecotourism activities and economic impacts. Kisarawe's primary ecotourism activities include forest walks in Pugu Kazimzumbwi, cultural tourism experiences, and local handicrafts. At Kunduchi Street, marine-based ecotourism dominates, featuring activities such as recreation at Mbudya island, beach eco tours, watersports and boat tours, and local seafood restaurants. In Kaole village, primary ecotourism activities include heritage site tours, cultural tourism experiences, traditional worship, traditional crafts, and archaeological site visits. The study reveals that ecotourism activities contribute positively to household income across all

three communities, representing a substantial proportion of local economic activity.

Ecotourism has also contributed to occupational diversification, with numerous household members engaged in ecotourism-related activities. The results reveal that ecotourism particularly benefits younger community members while contributing to infrastructure development and environmental conservation efforts. Therefore, this study demonstrates that ecotourism has become an integral component of the coastal community economic structure in Tanzania. While not replacing traditional income sources, it provides significant supplement income and has catalyzed various community development initiatives. Since the study was conducted in only a smaller part of the coastal areas, there is a need for further research to cover a larger portion of Tanzania's coastal regions to obtain a more comprehensive picture of ecotourism's contribution to community economies.

### Recommendation

Based on the research findings, the recommendations for ecotourism development in the coastal community encompass comprehensive policy development that supports the current 19.06% household participation in ecotourism activities while balancing economic and environmental considerations. Capacity building should focus on the young to middle-aged population targeting key occupations like tour guiding, service provision, and cleaning services through targeted training programs. Infrastructure development should prioritize existing community initiatives such as road maintenance, water supply, and electric services, while simultaneously supporting the ecotourism ecosystem. Environmental conservation efforts should build upon the successful community-led tree planting initiatives, developing robust monitoring mechanisms. Economic diversification can leverage the existing diverse ecotourism occupations, creating skill development pathways in niche roles

like first aid nursing, curio shop operation, and tree nursery attendance.

Community participation strategies should be designed to ensure inclusive engagement across gender and educational levels, ultimately supporting the sustainable growth of ecotourism that contributes 41.15% to household income while preserving the local environmental and cultural landscape.

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## Appendices

### Appendix 1: Data Collection Sheet-Household Questionnaire

#### Section 1: Demographic information

##### 1.1 Household identification

Household number.....

Date of the interview.....

Contact.....Ward..... Village.....

##### 1.2 Respondent's information

1.2.1 Name of interviewee (Optional).....

1.2.2 Gender (Tick)

Male
Female
Other

## 1.2.3 Age

Age group	Tick
Between 18 -29	
Between 30 - 39	
Between 40-49	
Between 50-59	
60 and above	

## 1.2.4 Marital status (Tick one option)

Single
Married
Divorced
Widowed
Separated

## 1.2.5 Education level

Primary
Secondary
Technical
University
Informal education

## 1.2.6 Household composition

Age	Gender		Occupation
	Male	Female	
1-17			
18-35			
36 -60			
Above 60			
Total members			

**Section 2: Contribution of Ecotourism on Adjacent Community's Income in Coastal Areas of Tanzania****2.1 Household Employment Opportunities**

a) How many jobs do you think are created directly or indirectly by ecotourism in your household? Mention and describe.

- i.....
- ii.....
- iii.....
- iv.....

b) Are any members of the household engaging in ecotourism activities? Yes/No

c) If the answer is yes in (b) above, please specify the type of involvement and the number of people employed in your household for each type of activity.

Activity	Number of people engaged

**2.2 Household Income Generation**

d) What is your primary source of income?

Primary sources of income	Tick
Wages and salaries	
Government benefits	
Business	
Other sources(specify)	

e) How much income do you generate from it per month?

Income level	Tick
1. Less than 50,000	
2. 50,000 to 199,000	
3. 200,000 to 599,000	
4. 600,000 to 1,990,000	

f) Do you derive income from ecotourism activities (Yes/No) If yes, specify the nature of ecotourism-related income

Income level	Tick
1. Less than 50,000	
2. 50,000 to 199,000	
3. 200,000 to 599,000	
4. 600,000 to 1,990,000	

g) Are there any specific initiatives or programs aimed at involving local communities in ecotourism activities? Yes/No

h) If the answer is yes in (g) above, please name them.

.....

.....

.....

i) Can you describe any infrastructure development or business development in your community attributed to ecotourism?

.....

.....

.....



**Appendix 2: Summary Descriptive Statistics for Quantitative Data for Household Members with Respect to Ecotourism**

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Occupation Age 1 to 17	151.0	3.0	0.0	3.0	261.0	1.7	0.1	0.9	0.8
Occupation Age 18 to 35	151.0	5.0	0.0	5.0	219.0	1.5	0.1	1.6	2.6
Occupation Age 36 to 60	151.0	2.0	0.0	2.0	195.0	1.3	0.1	0.7	0.5
Occupation Age above 60	151.0	1.0	0.0	1.0	22.0	0.1	0.0	0.4	0.1
Number of ecotourism household members	151.0	2.0	1.0	3.0	259.0	1.7	0.1	0.9	0.8
% Ecotourism HH members	151.0	22.2	11.1	33.3	2877.8	19.1	0.8	9.8	96.1
Median monthly income from non-ecotourism occupations	151.0	275000.0	125000.0	400000.0	36750000.0	243377.5	11117.7	136616.9	18664183223.0
Median monthly income from Ecotourism occupations	151.0	375000.0	25000.0	400000.0	28225000.0	186920.5	11152.7	137047.3	18781953642.4
Total monthly income	151.0	650000.0	150000.0	800000.0	64975000.0	430298.0	17043.7	209435.9	43863410596.0
Percentage income from non-ecotourism occupations	151.0	59.5	23.8	83.3	8885.7	58.8	1.6	19.5	381.4
Percentage income from ecotourism occupations	151.0	59.5	16.7	76.2	6214.3	41.2	1.6	19.5	381.4
Initiatives for Ecotourism	151.0	4.0	1.0	5.0	571.0	3.8	0.1	0.8	0.6