

Determinants of Local Community Involvement in Ecotourism Development in and around Kakamega Forest Reserve, Kenya

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Abstract

Community involvement is widely recognized as a cornerstone of sustainable ecotourism, yet the structural and socio-economic factors that determine participation in protected areas remain under-researched. This study examines the determinants of local community involvement in ecotourism development in and around Kakamega Forest Reserve, Kenya. Guided by Social Exchange Theory and ecotourism theory, a descriptive survey design was employed with a sample of 207 respondents, including local residents, key informants, and focus group participants. Data was collected through structured questionnaires, interview schedules, and focus group discussions, and analyzed using descriptive statistics and binary logistic regression. Results indicate that the probability of involvement is significantly increased by strong investor–community relationships ($B = 0.82$, $p < .001$, OR = 2.27), access to training ($B = 0.76$, $p < .001$, OR = 2.14), ecotourism awareness ($B = 0.69$, $p < .001$, OR = 1.99), government policy support ($B = 0.58$, $p = .004$, OR = 1.79), NGO support ($B = 0.47$, $p = .006$, OR = 1.60), and availability of social amenities ($B = 0.41$, $p = .023$, OR = 1.51). Conversely, poverty ($B = -0.88$, $p < .001$, OR = 0.42) and inadequate infrastructure ($B = -0.63$, $p = .004$, OR = 0.53) substantially reduce the likelihood of participation. The findings confirm that community involvement is not merely a function of individual willingness but is structurally contingent on institutional support, human capital, and economic capacity. The study recommends integrated policy interventions that combine microfinance, decentralized capacity-building, infrastructure investment, and inclusive governance to democratize ecotourism participation in protected areas.

Keywords: Community participation, ecotourism, protected areas, Kakamega Forest; Kenya

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Introduction

Ecotourism is a key strategy for reconciling biodiversity conservation with rural livelihood improvement across the Global South. Defined as responsible travel to natural areas that conserves the environment and improves the welfare of local people (Ceballos-Lascuráin, 1987; Donohoe & Needham, 2006), ecotourism is premised on the active inclusion of host communities as primary stakeholders rather than peripheral beneficiaries (Weaver, 2008; Stronza et al., 2019). In sub-Saharan Africa, where protected areas overlap with agrarian and pastoral landscapes, community involvement is particularly critical because local residents bear the direct costs of conservation including restricted resource access, crop damage, and limited land-use options while potentially receiving offset benefits through non-consumptive economic activities such as eco-lodges, tour guiding, and cultural tourism (Ileri, 2022; Krüger, 2005; Ouma & Stadel, 2021; Makomere, 2024). National frameworks, such as Participatory Forest Management (PFM) implemented through Community Forest Associations (CFAs), mandate community involvement to foster local stewardship, reduce reliance on illegal extraction, and

ensure sustainable livelihoods (Tadesse & Teketay, 2017).

Despite widespread commitment to community participation, empirical evidence consistently reveals a participation gap, where local communities remain marginalized from decision-making and benefit-sharing mechanisms (Smits, 2013; Stone, 2015). In Kenya while community-based conservation models such as Il Ngwesi and Ngare Ndare have demonstrated that inclusive governance can improve conservation outcomes and household incomes (Ileri, 2022), forest-adjacent communities around Kakamega Forest Reserve Kenya's last remaining patch of the equatorial Guineo-Congolian rainforest report weak institutional linkages, limited technical capacity and opaque benefit-sharing arrangements that constrain meaningful engagement (Kihima & Musila, 2020; Makindi, 2016; Ouma & Stadel, 2021). Consequently, despite hosting significant biodiversity and established ecotourism activities, community involvement around the reserve remains passive, highly fragmented, and unevenly distributed, driving ongoing hostility, illegal resource extraction, and habitat degradation.

Existing studies on Kakamega has largely focused on general attitudes, perceptions, and broad livelihood impacts (Mbatiany, 2016; Omondi & Kamau, 2010; Ouma & Stadel, 2006), leaving a knowledge gap regarding the empirical determinants that dictate actual participation. Identifying these underlying factors is essential for moving beyond rhetorical calls for community participation toward targeted interventions. Accordingly, this study assessed the factors that significantly influence the probability of local community involvement in ecotourism development in and around Kakamega Forest Reserve.

Empirical Background

Community Involvement in Protected-Area Ecotourism

Community involvement in ecotourism includes a range of engagement ranging from passive information receipt to active decision-making and enterprise ownership (Weaver, 2001, 2008). In protected-area contexts, meaningful involvement requires that local residents participate in planning, implementation, evaluation, and benefit-sharing (Timothy & Tosun, 2003; Stojanović et al., 2021). Empirical research across Africa demonstrates diverse modalities of engagement, including tour guiding, handicraft production, cultural performances, conservation surveillance, and eco-lodge management (Dubale & Esubalew, 2024; Moswete et al., 2023; Tendo, 2023; Xaba et al., 2024). However, the depth of involvement varies significantly. In Uganda's Mabira Forest Reserve, for instance, communities participate in guiding and craft production, yet weak revenue-sharing mechanisms and fragile institutional frameworks limit equitable benefit distribution (Tendo, 2023).

Similarly, in Botswana's Kalahari region, community-driven wildlife excursions and campsite management have boosted household earnings, but external tour agency dominance restricts local command over tourism value chains (Moswete et al., 2023).

In Kenya, research in Arabuko Sokoke Forest identified weak institutional linkages between forest management authorities and community groups as a primary constraint on participation (Kihima & Musila, 2020). In Mount Kenya Forest, community members engage in bird-watching tours and tree nursery operations, yet dependence on external contracts and limited financial independence constrain enterprise sustainability (Kiama, 2024). These studies suggest that participation is shaped by intersecting economic, institutional, and infrastructural conditions rather than by community willingness alone.

Theoretical Framework

Social Exchange Theory

To explain why community members choose to engage or disengage with ecotourism initiatives, this study is guided by Social Exchange Theory (SET). Originally developed by Homans (1958) and subsequently elaborated by Blau (1964) and Emerson (1976), SET conceptualizes social behavior as a rational exchange process in which actors seek to maximize rewards and minimize costs. In tourism studies, SET has been adapted to explain resident attitudes toward and support for tourism development (Jurowski et al., 1997; McGehee & Andereck, 2004; Sharpley, 2014). The theory posits that individuals and communities evaluate tourism initiatives through a subjective cost-benefit calculus encompassing tangible economic gains employment, revenue, infrastructure and intangible social-

psychological rewards such as community pride, cultural affirmation, and place attachment (Han et al., 2023).

Local residents historically bore significant conservation costs, including restricted forest access and wildlife-related crop losses, while receiving benefits through eco-lodge employment, community infrastructure projects, and revenue-sharing arrangements. Their decision to participate in ecotourism is therefore contingent on whether the perceived exchange yields net positive outcomes. Where structural barriers such as poverty, inadequate infrastructure, or weak institutional support inflate the costs of participation, even communities with positive attitudes toward conservation may rationally opt out. Conversely, where training, investor partnerships, and policy incentives reduce entry costs and increase expected benefits, participation becomes more probable.

Drawing on SET and the empirical literature reviewed, this study conceptualizes community involvement as a function of three clusters of variables: (1) relational and human capital factors (investor–community relationships, training, awareness); (2) institutional and policy factors (government support, NGO support); and (3) socio-economic and infrastructural factors (poverty, infrastructure, social amenities).

Research Methodology

Study Area

The study was conducted in Kakamega Forest Reserve (KFR) and its adjacent environments in western Kenya. KFR constitutes the southern portion of the greater Kakamega Forest, which includes Buyangu, Kisere, Malava, and Kaimosi blocks (Guthiga & Mburu, 2006). Located between latitudes 0°19' N and longitudes 34°52' E, the reserve lies at an elevation of 1,574–1,623 meters above

sea level, approximately 425 km northwest of Nairobi and 15 km from Kakamega town. The area experiences an equatorial climate with bimodal rainfall (1,500–2,000 mm annually) and temperatures ranging from 11°C to 32°C. The forest is renowned for its high biodiversity, including over 489 butterfly species, primates such as Colobus monkeys, and rare bird species including the Blue-headed Bee-eater and Black-billed Turaco (Althof, 2005; Bradley, 2024; Kanga et al., 2022). The dominant adjacent ethnic communities are the Luhya and, on the southeast, the Nandi. Livelihood activities include mixed farming, small-scale trade, mining, and emerging tourism enterprises.

Sampling and Data Collection

A descriptive survey research design was adopted to systematically characterize community involvement and its determinants (Kim & Park, 2017). The target population comprised local residents living within one kilometer of the forest edge, ecotourism business owners, Kenya Forest Service (KFS) personnel, officials of community-based organizations (CBOs), community forest associations (CFAs), and local administrators. A sample of 207 respondents was determined using Fischer's (1991) formula for proportions, yielding 180 local residents, 7 key informants (chiefs, village elders, KFS officers), and 20 CFA/CBO representatives organized into two focus group discussions (FGDs) of 10 members each. Local residents were selected through systematic and simple random sampling, while key informants were chosen purposively based on expertise and leadership roles (Patton, 2002; Teddlie & Yu, 2007).

Primary data were collected using structured questionnaires, semi-structured interview schedules, focus

group discussion guides, and direct field observations. Secondary data were drawn from published journals, government reports, and organizational documents. To ensure validity, research instruments were reviewed by university supervisors and pre-tested on 30 respondents in Nandi Forest, a site sharing similar ecological and socio-economic characteristics with Kakamega. Reliability was assessed using the test-retest method (Brink, 1991; Kombo & Tromp, 2006). Ethical clearance was obtained from the National Commission for Science, Technology, and Innovation (NACOSTI), and informed consent was secured from all participants.

Measurement and Analytical Strategy

The dependent variable such as community involvement in ecotourism was operationalized as a dichotomous outcome coded 1 = involved and 0 = not involved, based on respondents' self-reported engagement in ecotourism activities or enterprises. Involvement included direct participation in tour guiding, eco-lodge operation, handicraft sales, cultural performances, conservation activities, or decision-making committees. Independent variables were measured using five-point Likert scales and contextual items. Investor–community relationships, training, awareness, government policy support, NGO support, infrastructure adequacy, poverty levels, and social amenities availability were assessed through structured statements. Respondents indicated their level of agreement from 1 (Strongly Disagree) to 5 (Strongly Agree).

Data were analyzed using SPSS Version 25. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized respondent profiles and variable distributions. A binary logistic regression

model was specified to estimate the probability of community involvement:

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \dots \dots \dots \text{Model 1}$$

where p represents the probability of involvement, β_0 is the constant, β_i are regression coefficients, and X_i are the predictor variables. Results were interpreted using regression coefficients (B), standard errors (S.E.), Wald statistics, significance levels (p), and odds ratios ($\text{Exp}(B)$). A 95% confidence level was applied throughout.

Results

Socio-Demographic Characteristics

The socio-demographic profile of respondents (Table 1) reveals a predominantly male sample (87.0%), with the largest age cohort being 40–50 years (37.2%), followed by 29–39 years (26.1%). Educational attainment was varied: 32.4% had secondary education, 25.1% primary, 30.4% no formal education, and 12.1% tertiary. Occupational vulnerability was pronounced, with 43.5% unemployed and 26.1% engaged in farming. Household incomes were generally low, with 56.0% earning Ksh 1,001–5,000 (approximately USD 7–35) per month. Most households (59.4%) had 4–6 members, and 39.6% lived within 50–100 meters of the forest boundary, indicating close physical proximity to ecotourism resources.

Levels of Community Involvement

Results on the level at which local community members are involved in various phases of ecotourism development in and around the Kakamega Forest Reserve are given in table 2 below. Using a scale of 1 to 5, where 1 indicates "Not at all" and 5 represents "Very large extent," respondents provided their views on community engagement in different aspects of ecotourism.

Table 1: Socio-Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Percent (%)
Gender	Male	180	87.0
	Female	27	13.0
Age	18–28 years	37	17.9
	29–39 years	54	26.1
	40–50 years	77	37.2
	51–61 years	35	16.9
	62+ years	4	1.9
Education	No formal education	63	30.4
	Primary	52	25.1
	Secondary	67	32.4
	Tertiary	25	12.1
Occupation	Unemployed	90	43.5
	Self-employed	30	14.5
	Formally employed	33	15.9
	Farmer	54	26.1
Monthly income (Ksh)	1,001–5,000	116	56.0
	5,001–10,000	49	23.7
	10,001–50,000	34	16.4
	50,001–1,000,000	8	3.9
Distance from forest	1–49 m	61	29.5
	50–100 m	82	39.6
	100–500 m	56	27.1
	1–5 km	8	3.9

Source: Field data, 202

Table 1: Extent of Local Community Involvement in Ecotourism Development

Statement	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)	Mean	Std. Deviation
Design	204 (98.6%)	3 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1.02	0.18
Planning	205 (99.0%)	1 (0.5%)	1 (0.5%)	0 (0.0%)	0 (0.0%)	1.02	0.21
Implementation	0 (0.0%)	7 (3.4%)	198 (95.7%)	2 (1.0%)	0 (0.0%)	2.99	0.25
Evaluation	98 (47.3%)	3 (1.4%)	102 (49.3%)	4 (1.9%)	0 (0.0%)	2.07	1.02
Monitoring	175 (84.5%)	16 (7.7%)	12 (5.8%)	3 (1.4%)	1 (0.5%)	1.26	0.67

Source: Field data, 2025

Descriptive results indicate minimal participation in the design stage (98.6% reported no involvement; $M = 1.02$, $SD = 0.18$) and planning stage (99.0% no involvement; $M = 1.02$, $SD = 0.21$). Engagement was highest during

implementation (95.7% reported some extent of involvement; $M = 2.99$, $SD = 0.25$) and moderate during evaluation ($M = 2.07$, $SD = 1.02$) and monitoring ($M = 1.26$, $SD = 0.67$).

To assess variations in community participation levels across different stages of ecotourism development such as design, planning, implementation, evaluation, and monitoring. Analysis of

Variance (ANOVA) results on whether there were significant differences in participation levels across the above stages are presented in Table 3 below.

Table 3: ANOVA Results for Community Participation Levels Across Stages of Ecotourism Development

		Sum of Squares	df	Mean Square	F	Sig.
Design	Between Groups	.018	1	.018	.541	.463
	Within Groups	6.861	205	.033		
	Total	6.879	206			
Planning	Between Groups	.018	1	.018	.419	.518
	Within Groups	8.861	205	.043		
	Total	8.879	206			
Implementation	Between Groups	.007	1	.007	.103	.748
	Within Groups	12.950	205	.063		
	Total	12.957	206			
Evaluation	Between Groups	9.362	1	9.362	9.331	.003
	Within Groups	205.691	205	1.003		
	Total	215.053	206			
Monitoring	Between Groups	2.139	1	2.139	4.804	.030
	Within Groups	91.291	205	.445		
	Total	93.430	206			

Source: Field data, 2025

Analysis of Variance (ANOVA) confirmed significant differences in participation levels at the evaluation stage ($F(1, 205) = 9.331, p = .003$) and monitoring stage ($F(1, 205) = 4.804, p = .030$), but not at the design, planning, or implementation stages. These findings suggest that community engagement is largely operational rather than strategic, with

residents executing externally designed initiatives rather than shaping them.

Determinants of Community Involvement

Table 4 presents the binary logistic regression results. The model identified eight significant predictors of community involvement.

Table 4: Logistic Regression Results on Determinants of Community Involvement in Ecotourism

Variable	B	S.E.	Wald	Sig.	Exp(B)
Investor–community relationship	0.82	0.21	15.24	< .001	2.27
Training on ecotourism	0.76	0.19	16.11	< .001	2.14
Ecotourism awareness	0.69	0.18	14.71	< .001	1.99
Government policy support	0.58	0.20	8.41	.004	1.79
NGO support	0.47	0.17	7.68	.006	1.60
Infrastructure adequacy	−0.63	0.22	8.22	.004	0.53
Poverty level	−0.88	0.24	13.44	< .001	0.42
Social amenities availability	0.41	0.18	5.19	.023	1.51
Constant	−1.12	0.35	10.23	.001	0.33

Note. Dependent variable: Community involvement (1 = involved, 0 = not involved).
Source: Field data, 2025

Investor–community relationships exerted the strongest positive effect on involvement ($B = 0.82, p < .001$). The corresponding odds ratio ($\text{Exp}(B) = 2.27$) indicates that a one-unit improvement in the quality of investor–community relations more than doubles the likelihood of a resident participating in ecotourism, holding other factors constant. Training on ecotourism activities and enterprises also demonstrated a powerful positive effect ($B = 0.76, p < .001, \text{OR} = 2.14$), suggesting that capacity-building interventions substantially lower barriers to entry. Similarly, ecotourism awareness significantly increased participation probability ($B = 0.69, p < .001, \text{OR} = 1.99$), underscoring the role of information and knowledge in shaping engagement decisions.

Government policy support was a significant positive predictor ($B = 0.58, p = .004, \text{OR} = 1.79$), indicating that favorable regulatory and fiscal environments enhance community participation. NGO support also increased involvement likelihood ($B = 0.47, p = .006, \text{OR} = 1.60$), reflecting the importance of civil society actors in bridging gaps between state agencies and local communities.

Two variables emerged as significant inhibitors. Poverty had the strongest negative effect among all

predictors ($B = -0.88, p < .001, \text{OR} = 0.42$), meaning that higher poverty levels reduce the odds of participation by 58%. Inadequate infrastructure also significantly suppressed involvement ($B = -0.63, p = .004, \text{OR} = 0.53$), demonstrating that poor transport and communication networks constrain access to ecotourism opportunities. By contrast, the availability of social amenities had a modest but statistically significant positive effect ($B = 0.41, p = .023, \text{OR} = 1.51$).

Discussion

The findings confirm that community involvement in protected-area ecotourism is primarily enabled by relational trust, human capital development, and institutional support—consistent with the reward-maximization premise of Social Exchange Theory (Homans, 1958; Jurowski et al., 1997). The dominance of investor–community relationships as the strongest predictor ($\text{OR} = 2.27$) aligns with empirical evidence from Kenyan conservancies showing that trust-based investor relations improve access to tourism value chains (Ileri, 2022; Makindi, 2016). When investors engage communities transparently—through joint management committees, revenue-sharing agreements, and local employment preferences the perceived

benefits of participation outweigh the costs, prompting higher engagement. Training emerged as the second strongest enabler (OR = 2.14), corroborating studies from Ethiopia and Vietnam that document how skills development in guiding, hospitality, and environmental management integrates communities into tourism enterprises (Dubale & Esubalew, 2024; Le et al., 2025). In Kakamega, where 30.4% of respondents had no formal education, targeted training programs serve as critical equalizers, translating raw willingness into marketable capability. The significant effect of awareness (OR = 1.99) further supports the argument that information asymmetry is a structural barrier to participation (Kala & Bagri, 2018; Tosun & Timothy, 2003). Communities cannot engage with opportunities they do not know exist; therefore, environmental education and tourism information campaigns are not ancillary activities but preconditions for inclusion.

Institutional support from both government and NGOs significantly increased involvement probability. This finding resonates with research in Namibia and Rwanda, where revenue-sharing policies and external technical assistance strengthened community conservancies (Bizimana & Uwimpuhwe, 2025; Nghipondoka, 2023). However, the relatively modest odds ratios for government policy (1.79) and NGO support (1.60) compared to investor relations and training suggest that top-down institutional support is necessary but insufficient without direct market linkages and skills transfer. Social amenities, while significant, showed the weakest positive effect (OR = 1.51), indicating that community facilities such as water, electricity, and health services create an enabling environment but do not independently drive tourism engagement.

The analysis reveals that poverty and infrastructural inadequacy are the most formidable barriers, together confirming the cost-minimization dimension of Social Exchange Theory. Poverty's strong negative coefficient ($B = -0.88$) indicates that for the poorest households—those earning less than Ksh 5,000 monthly—the immediate demands of subsistence override the uncertain, long-term returns from ecotourism. This finding is consistent with the observation that communities prioritize livelihood security over conservation-linked enterprises when liquidity constraints are severe (Ouma & Stadel, 2021). The 43.5% unemployment rate and 56.0% low-income concentration in the sample underscore the depth of this trade-off.

Inadequate infrastructure (OR = 0.53) compounds poverty by raising the transaction costs of participation. Poor road networks limit tourist access to remote villages, reducing demand for local services, while weak communication systems constrain marketing and booking capabilities. Comparative studies in South Africa and Indonesia confirm that remote communities with deficient transport networks participate less in high-value tourism activities despite high willingness (Xaba et al., 2024; Saufi et al., 2014). In Kakamega, the collapse of the Kakamega Environmental Education Program (KEEP) eco-lodges and snake park attributed in part to infrastructural and governance failures provides tangible evidence of how structural deficits undermine community-based enterprises.

Particularly, the neutral attitudes reported in the descriptive analysis suggest that community members do not inherently oppose ecotourism; rather, structural constraints render participation irrational from a cost-benefit perspective. This decoupling of attitude from behavior is a critical insight: interventions targeting awareness alone will fail if they are not

accompanied by poverty alleviation and infrastructure investment.

Conclusion and Policy Recommendations

This study set out to identify the determinants of local community involvement in ecotourism development in Kakamega Forest Reserve, Kenya. The analysis revealed that participation is significantly shaped by eight factors: investor–community relationships, training, awareness, government policy support, NGO support, social amenities, poverty, and infrastructure.

Theoretically, it advances the application of Social Exchange Theory in protected-area ecotourism by demonstrating that the exchange is not merely psychological but deeply material. The decision to participate is structured by access to capital, infrastructure, and institutional mediation. This moves SET beyond its traditional focus on attitudinal support toward a structural political economy of participation.

The findings suggest that ecotourism development in Kakamega requires an integrated enabling environment approach. First, microfinance and revolving loan facilities should be channeled through existing CBOs and SHGs to address capital constraints. Second, county and national governments must prioritize rural road networks and digital connectivity around the forest periphery. Third, Kenya Forest Service should institutionalize joint planning forums that move communities from implementation-only roles to co-design and co-evaluation. Fourth, investor partnerships should be regulated to include mandatory local employment quotas and capacity-building clauses, ensuring that relational benefits are codified rather than discretionary.

Future research should adopt longitudinal designs to track how these

determinants evolve as ecotourism matures and employ structural equation modeling to test mediated pathways particularly whether infrastructure improvements reduce poverty's negative effect on participation. Comparative studies across Kenya's forest ecosystems would also clarify whether the Kakamega findings are generalizable or context-specific.

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