

# Determinants of Pastoral Communities' Participation in Community Based Eco-Tourism Enterprises as Livelihood Diversification Strategy

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## Abstract.

Pastoralism has been the main source of livelihood for pastoral communities in Kenya. However pastoral based livelihoods are declining due of vagaries of climate change, reduced rangelands and lack of competitive markets for pastoral products. Livelihood diversification options in pastoral areas depend on alternative resources at the area of habitants. In Laikipia Kenya, enormous Ecotourism activities pose as a potential source of alternative livelihood to pastoralists. Past studies have shown that vagaries of climate change as a major determinant for pastoralist to engage in ecotourism activities, other determinants have not been empirically determined. The study was aimed at identifying other determinants. Data was collected by interviewing 231 households in Laikipia County. Heckman switching regression model was used in analysis. Factors such as engagement in off farm incomes activities, ownership of land and good infrastructure are major determinants of participation in ecotourism enterprises.

**Key words:** Livelihood, diversification, ecotourism, pastoralism, participation

## Introduction

Pastoralism in Laikipia occurs mainly in the Northern and Eastern parts of the county. The climate in this area is mainly arid and semi-arid with low annual mean rainfall of 400mm which occurs in bi-modal pattern. Consequently the area experiences cyclic drought with most recent one recorded in years 2000, 2009 to 2010 and 2014. The altitude ranges from 1300m to 1,500m above sea level. The main vegetation is acacia bush land and scattered open grassland (Galvin *et al.*, 2004).

The extreme climatic events often result in a number of adverse impacts including loss of livestock in the region. The increasing vulnerability of pastoralists' livelihoods to climate change is a pressing problem in Kenya's ASALs and ecosystems resulting from the interaction of ecological, socio-economic and socio-political factors.

Pastoral areas have high levels of poverty that can be attributed to a number of factors including loss of livestock due to droughts, diseases, lack of social facilities, inadequate pastures, poor management of group

ranches, high illiteracy levels, lack of employment opportunities, insecurity arising from banditry and cattle rustling and, generally the inability to exploit available natural resources (Sumba *et al.*, 2007).

There is an increasingly robust case for conservation objectives through pastoralism rather than seeing conservation and pastoralism livelihoods as mutually exclusive pursuits. Positive relations between biodiversity and pastoral livelihoods have existed over the long term, and a picture of a harmonious co-existence has emerged (ILRI, 2006). Pastoralism can survive in ASAL areas through strategies that enhance effective utilization of meager resources, building up security against all types of biotic and abiotic hazard and other catastrophes such as rustling (Oba, 1997). For many groups, these costs are seen as insurmountable, and people are looking for means to diversify their incomes to reduce the risk of pastoral lives.

Pastoralists in Laikipia are among few communities in Kenya that have adopted participatory approach to ecotourism enterprises development and conservation (Mburu, 2004). This endeavour has led to pastoralists embrace community based ecotourism as an innovative strategy for poverty alleviation and livelihood diversification (Mburu, 2004; Honey, 2008). Diversification in pastoral livelihood is a subject of conceptual and policy based researches because incomes from livestock have come under pressure due to climate change shocks (Barrett, 2001).

Laikipia has over 13 community group ranches (Kibicho, 2008) while Il Ngwesi group ranch on the edge of Mukogodo Forest represent the first group ranch to be established in Northern Kenya as a community based conservation enterprise (Barrow, 2000; Kibicho, 2008).

## **Methodology**

### **The Study Area: The Laikipia District**

Laikipia is one of the 47 counties in the Republic of Kenya. It is a high altitude plateau along the equator and lies between latitude 36° 15' East and longitude 37° 20' East, and 0° 17 South and 0° 45' North. Due to equatorial position, Laikipia has a mean annual temperature lies between 16°C and 20°C (Berger, 1989; Ramser, 2007) and wild, diverse and scenic landscapes. There are no state protected areas in Laikipia except for few forests reserves (Woodroffe, Thirgood, & Rabinowitz, 2005). However Laikipia lies between several state protected areas such as Mt. Kenya, Samburu, Shaba, Meru, Aberdare and Maralal national parks. The plateau has immense wildlife population, more endangered species than anywhere else in East Africa.

Laikipia is the only county in Kenya which continues to receive increasingly or stable wildlife populations, in contrast to the declining trend throughout the country. It has been instrumental in demonstrating that wildlife can form the basis to the most economically viable and sustainable land use option in dry lands through ecotourism. This is evidenced by presence of world class community owned tourism projects such as *Il Ngwesi*, *Tassia*, *Koija* star beds, *Ol Gaboli* community *bandas* and *Ole Lentile* sanctuary that markets Laikipia internationally as an ecotourism destination.

## **Results and discussions**

To evaluate households participation in community tourisms and capture the effect of the services on household livelihoods, this study employed Heckmans switching regression method as presented by Heckman (1979), in Madalla (1993); Main and Reilly (1993), and as used by Miranda (2003) to solve the problem of endogeneity of

participation in community tourism on household income. We begin by expressing the general output function with community tourism variable as a dummy as follows:

$$Y = \lambda_i D_i + \beta_i X_i + \varepsilon_i \dots\dots\dots(1)$$

Where Y is the outcome, D is a dummy ( D=1 if participated in community tourism, D=0, otherwise), X<sub>i</sub> is a vector of factors which influence participation such as, market access, fixed land area, fixed capital and household specific factors such as education, age, transfers and others depending on the nature of the problem at hand. In the above function, D is endogenous to Y, and also exogenous to some of the X<sub>i</sub>, implying that D cannot be estimated by Two Stage Least Squares (TSLS) or treatment model. Using any of the two would simply lead to predicting D and including the predicted values into the second stage equation, yet the predicted values of D solves only endogeneity problem and not the second problem where D influences some X<sub>i</sub>. To overcome this problem we employ endogenous switching regime model (akin to switching regression) estimated via heckman sample correction approach (Heckman, 1979; Madalla, 1993). The model involves splitting the sample into participants and non-participants and then estimating the structural equation for each sub-sample. The first stage involves a logit model to predict the probability of participation. The effect of participation in community tourism on household incomes is then estimated in the second equation both using a sub-sample of participants alone, as well as confirmatory estimation of the whole sample. The betas indicate how the variables including participation in community tourism influence household incomes.

The model is expressed as

$$\left. \begin{matrix} y_1 = \beta_{1i} X_{1i} + \varepsilon_{1i} \\ D = \gamma_i Z_i + \varepsilon_i \end{matrix} \right\} \text{iff } D > 0 \quad \text{For the participants sub-sample} \dots\dots\dots(2)$$

$$\left. \begin{matrix} y_2 = \beta_{2i} X_{2i} + \varepsilon_{2i} \\ D = \gamma_i Z_i + \varepsilon_i \end{matrix} \right\} \text{iff } D \leq 0 \quad \text{for the non-participants sub-sample} \dots\dots\dots(3)$$

Where; y<sub>1</sub> and y<sub>2</sub> are the outcomes for participants and non-participants sub-samples respectively. X<sub>1i</sub> and X<sub>2i</sub> are the conventional factors that influence outcome functions for participants including participation. D is a dummy (D=1, if participants and D=0, otherwise), Z<sub>i</sub> is a vector of conditional covariates that influence the probability of participating in community tourism programme.  $\gamma_i$  are the corresponding vectors of parameters and  $\varepsilon_{1i,2i}$  are random disturbances. The (y) variables are observed conditional on the unknown criterion determined by the D function, which is estimated via a logit model to yield  $\gamma_i$  estimates. Under the model assumptions, the estimated coefficients are efficient and asymptotically normal. Essentially this model allows for the full set of interaction terms between participants and factors that influence household returns/income. Besides, it allows evaluation of the contribution of community tourism among other factors on household income.

Results on participation in community tourism (Table 24), shows first stage logistic estimates of the Hickman's switching regression. The estimates show that engagement in off-farm activity by a household member

significantly increases the probability of such households diversifying into community tourism. This could probably be due to the benefits that such households accrue from employment income such as ability to take their children to school. Results also show that households who have titles to their land were also more likely to participate in community tourism, pointing at the ease in decision making to provide services such as camping sites, lodges among other products without consulting other community members.

**Table 24: Determinants of Participation in Community Tourism by Agro-Pastoralists in Laikipia County-Kenya**

Chi-square	128.86***		Cox & Snell R		Nagelkerke R	
-2 Log likelihood=191.362	B	S.E.	Wald	Sig.	Exp(B)	Square 0.569
Gender (if female=1)	-0.167	0.425	0.153	0.695	0.847	
Age of head	-0.023	0.015	2.317	0.128	0.977	
Education of head	-0.002	0.123	0.000	0.986	0.998	
<b>if any hhd member is employed</b>	<b>3.315</b>	<b>0.668</b>	<b>24.588</b>	<b>0.000</b>	<b>27.515</b>	
If any member belong to community group	-0.257	0.420	0.374	0.541	0.774	
School going children	0.001	0.071	0.000	0.990	1.001	
<b>if own title to land being used</b>	<b>-1.397</b>	<b>0.511</b>	<b>7.468</b>	<b>0.006</b>	<b>0.247</b>	
if received any benefits from tourism last year	0.739	0.468	2.494	0.114	2.094	
Household size	0.080	0.056	2.007	0.157	1.083	
<b>if had improved communication system-roads/telephone/power</b>	<b>1.941</b>	<b>0.439</b>	<b>19.502</b>	<b>0.000</b>	<b>6.964</b>	
<b>if security has improved from last season (1=yes)</b>	<b>0.861</b>	<b>0.469</b>	<b>3.366</b>	<b>0.067</b>	<b>2.365</b>	
Constant	-3.493	1.020	11.719	0.001	0.030	

Better road infrastructure and general communication system as well as security system were also significant in determining the propensity of households to participate in community tourism. This indicate the need for the government to enhance road and telephone infrastructure within the communities as well as providing security both for the wildlife as well as residents against cattle rustlers who frequent such environments and dishabile the community systems.

### Conclusions

Off-farm employment, ownership to titles of land being used, communication infrastructure and security are key factors that influence the likelihood of the agro-pastoral households participating in community tourism. Further analysis point at the importance of education, membership to community groups, security, communication infrastructure and involvement in pastoral activities as important factors in enhancing tourism incomes for the participants in the community tourism. These results have significant policy implications on the importance of road/other communication infrastructure and collective action in enhancing participation and raising household returns from community tourism. Investment in security through by county government would attract more tourists also contribute to the peace and stability of residents, often required as they carry out community tourism activities. Diversifying into community tourism among the agro-pastoralists have significant contributed to changes in total income hence programs that encourage them to participate in tourism and add value to their products is essential towards addressing poverty in the region.

## Recommendations

Inclusion of community based ecotourism enterprises as a livelihood activity is gaining momentum among pastoralists. State led policies to enhance determinants of participation such as enhanced security; infrastructure development and education need proper planning and funding from state agencies.

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