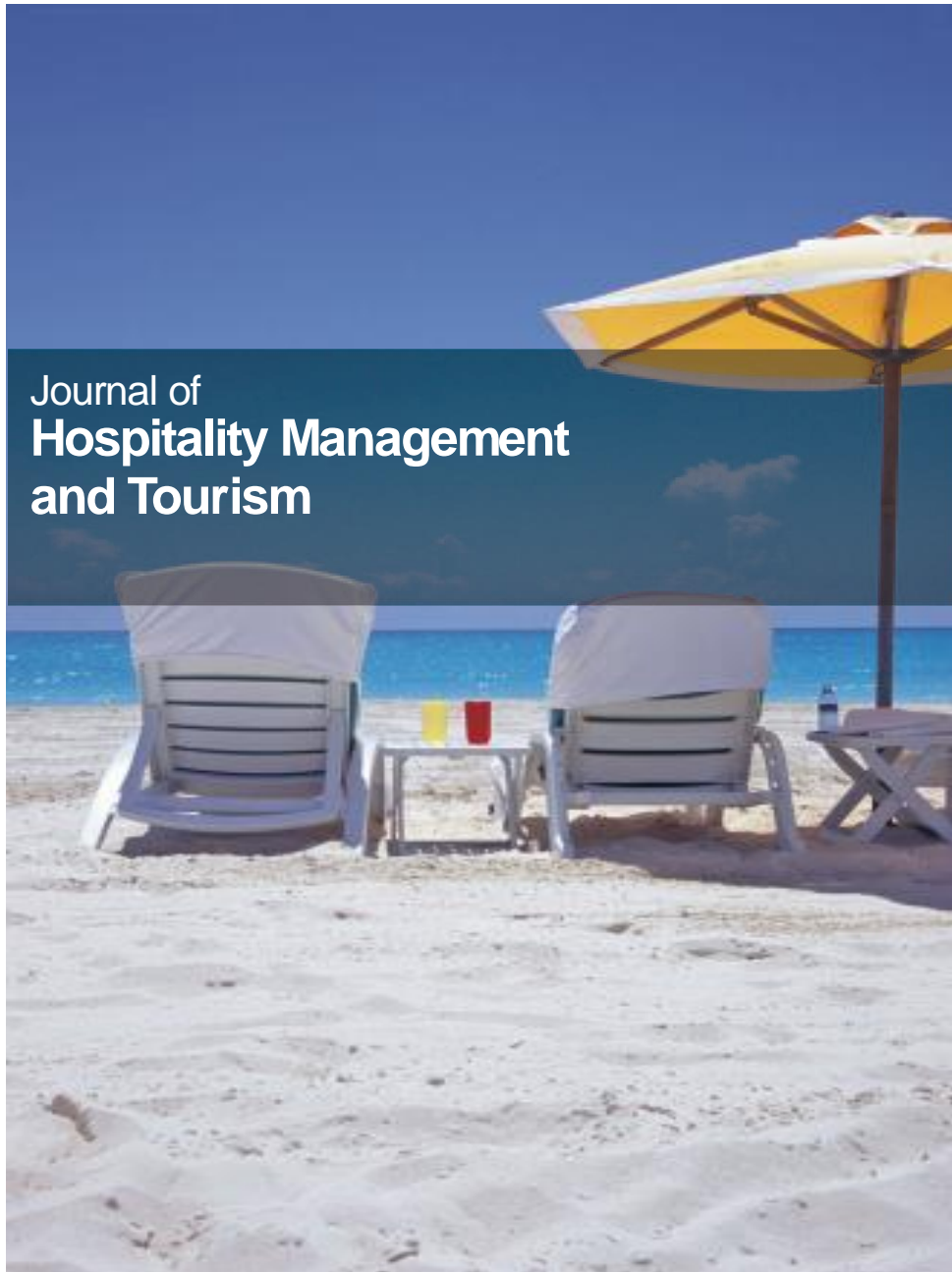


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*Full Length Research Paper*

# **Assessing the impact of ecotourism on livelihood of the local population living around the Campo Ma'an National Park, South Region of Cameroon**

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**Ecotourism has been reported as a sustainable measure of bridging conservation goals and livelihood sustenance around protected areas, with very little information on the Campo Ma'an National Park (CMNP). This study was initiated to assess the impact of ecotourism activities on the livelihood of the local population living around the CMNP. Data were collected with questionnaires through household surveys and focus group discussions, interviews with key informants and observations in 9 communities. Chi-square test, Spearman's rank correlation and regressions were used for data analysis. The study revealed that 65% of the local population perceived that ecotourism activities do not contribute to livelihood improvement. Chi-square statistics and Spearman rank correlation coefficients showed that the main factors plausibly affecting the impact of ecotourism activities around the CMNP on the local population's livelihood were community, gender, main and secondary occupation, level of education, ethnic group, and number of children. Coefficients of the logistic regression model indicated that the main factors influencing the impact of ecotourism around the CMNP on the local population's livelihood were gender ( $\beta = 1.218$ ;  $p < 0.05$ ); and level of education ( $\beta = 0.442$ ;  $p < 0.05$ ). It is recommended that decision-makers integrate these factors when formulating policies geared towards ensuring livelihood sustenance through ecotourism around the CMNP.**

**Key words:** Ecotourism, livelihood, local population, Campo Ma'an National Park, South Region of Cameroon.

## **INTRODUCTION**

Ecotourism could redress the unending dilemma of conflicting goals between conservation and livelihood sustenance in/around protected areas (PAs) (Lambi et

al., 2012; Ayivor et al., 2013; Fanuel, 2014; Clements et al., 2014; Ajonina et al., 2014; Tchamba et al., 2015; Moshi, 2016; Rainforest Foundation, 2016; Balgah and

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Nfor, 2017; Sama and Molua, 2019). It is spotlighted in academic literature as a strategy for economic development within communities, based on potential economic and social benefits which it can generate, at the same time ensuring natural resource protection (Mulindwa, 2007; Sunita, 2013). Unfortunately, many ecotourism projects viewed as successful reveal insignificant change in existing resource-use practices for the local population, bringing in just modest supplement to local livelihoods (Kiss, 2004).

Ecotourism impart skills of the local population, exposing them to different employment opportunities like receptionists, housekeeping, cooks, gardeners, dancers, watchmen and guides (Ogutu, 2002; Isaac and Conrad-J, 2012; Harilal and Tichaawa, 2018). There is further capital injection into the local economy from ecotourism as visitors spend money on indigenous food and souvenir shopping (Ogutu, 2002; Sunita, 2013). In Kenya, ecotourism is contributing significantly to livelihoods of the Porni's community, with over US\$5300 paid yearly as revenue for community land leased, and between US\$500 and 1200 as entrance fees and bed charges from tourists; and the generated revenue is used for different community livelihood initiatives like school construction, payment of hospital bills and boreholes maintenance (Ogutu, 2002). In Ghana, it has created opportunities for rural communities to earn income, through the creation of poverty alleviation ecotourism related jobs for the conservation of local ecosystem and culture (Ghana Tourism Authority, 2010). Ecotourism projects in and around National Parks (NP) have aided to establish micro credit schemes, granting 'soft loans' for establishment of local retail businesses (Nkengfack, 2011; Isaac and Conrad-J, 2012).

In Cameroon, ecotourism activities around NP generate a little bit of extra income for the rural population as a non-extractive activity, but it is inadequate and not good enough as alternative livelihood, nor a real support for community development projects (Tieguhong, 2008; Nkengfack, 2011; Balgah and Nfor, 2017; Harilal and Tichaawa, 2018; Sama and Molua, 2019). As such, they have to carry on extra activities like farming or entrepreneurship to make ends meet (Nkengfack, 2011; Harilal and Tichaawa, 2018). In some communities around PAs, such as the Douala Edea Wildlife Reserve, ecotourism is not a livelihood option as they are not directly involved in it (Nkengfack, 2011; Harilal and Tichaawa, 2018).

From the aforementioned insights, it was found that most studies carried out on the impacts of ecotourism on livelihood sustenance around PAs in Cameroon and Africa focused mainly on the role played by ecotourism towards livelihood enhancement, while neglecting the factors affecting the impact of ecotourism on the local population's livelihood. Within this context, this study sought to assess the impacts of ecotourism on the livelihood of the local population living adjacent the

Campo Ma'an National Park, South Region of Cameroon, with emphasis laid on the local population's perception of the role played by ecotourism in livelihood sustenance as well as the factors affecting the impact of ecotourism on the local population's livelihood.

## MATERIALS AND METHODS

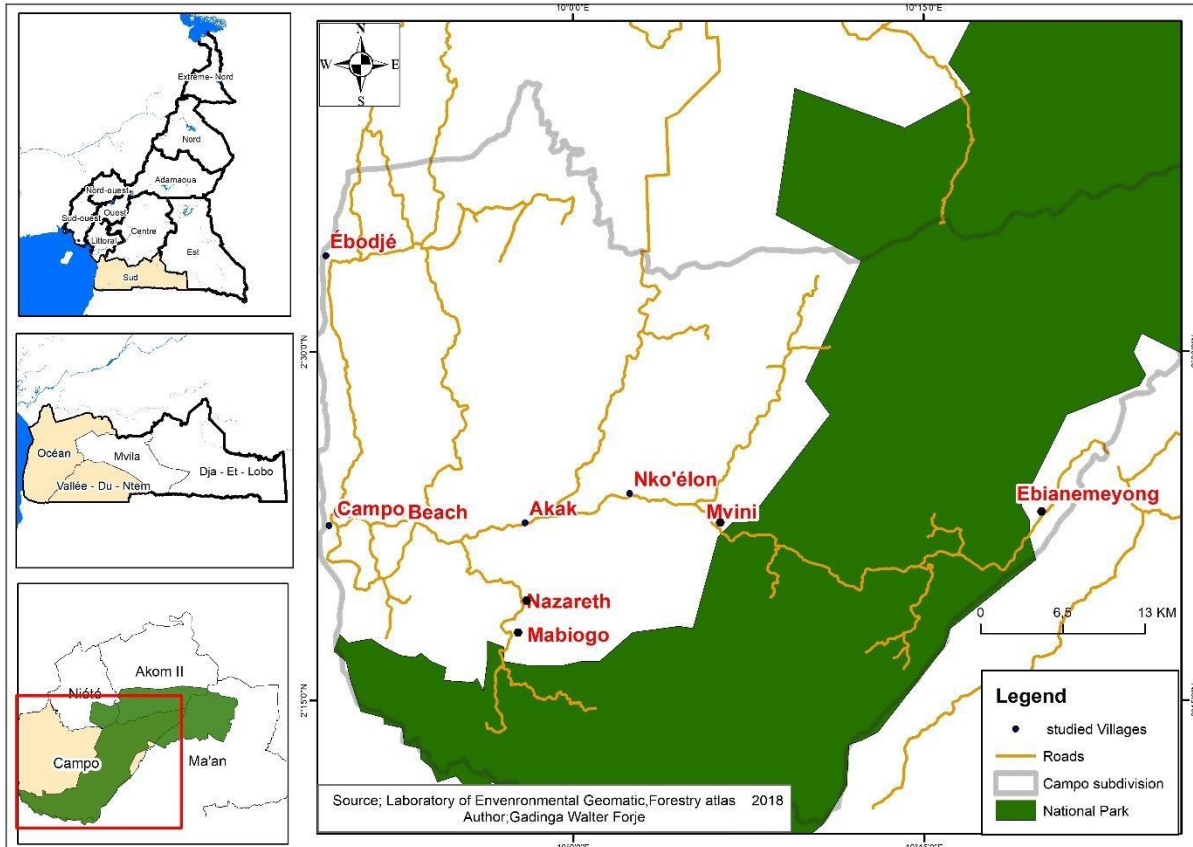
### Study area

This study was carried out in nine communities located in the southern section of the Campo Ma'an National Park, South Region of Cameroon (Figure 1). These communities were selected both at the coast and further inland. Climate parameters that are annual rainfall and temperature averages are respectively 2800 mm and 25°C (Mbenoun et al., 2017). The average annual rainfall reduces as we get further away from the coast to the hinterlands; with an average annual rainfall of about 2800 mm recorded in Campo close to the coast and 1670 mm in Nyabissan in the Ma'an area located further inland (Tchouto, 2006; PNCM, 2014).

Hydromorphic and ferralitic soils are the most dominant types of soil in the study area. Hydromorphic soils are trapped within river valleys and lowlands; and ferralitic soils which are yellowish or reddish in color and developed on very acidic parent rocks. The vegetation of the Campo-Ma'an National Park and its environs consist of the dense Guineo-Congolese evergreen forest. The vegetation generally present is the Biafran type rich in Caesalpinaceae with more than 60 species (Plan Commune de Développement (PCD, 2012). The main existing exploitable species are: Iroko (*Millitia* sp.), Bubinga (*Guibourtia ehie*), Tali (*Erythrophleum ivorense*), Doussie (*Azelia bipindensis*), white Doussie (*Azelia Pachyloba*), Red Eyoum (*Dialium bipindensis*) etc. and certain non-wood forest products used in handicrafts (rattan, raffia and its derivatives, bamboo and certain vines). The rest of the vegetation around the houses is made up of plantations and food fields, fallows and fruit trees. This dense forest is inhabited by different wildlife species like Chimpanzees, gorillas, forest elephants, giant pangolins, marine turtles, forest tortoise, monkeys, duikers and many others. The drainage network of the CMNP and its environs is drained by two Sub-Basins (Ntemand Lobé) or watersheds which are the drainage of the Atlantic Ocean Basin (Ajonina et al., 2010; Anonymous, 2014; PNCM, 2014).

### Sampling design

This study made use of three main sampling techniques: purposive sampling technique, random sampling technique and the snowball sampling technique. Purposive sampling was used to select the study area, Campo Ma'an National Park (CMNP). The CMNP was purposively chosen for two main reasons: firstly, it is the pilot site for ecotourism in Cameroon; and secondly, it has been working on a management plan that has projected ecotourism as the main strategic tool for livelihood and conservation around protected areas. After the CMNP was purposively chosen, reconnaissance trips were taken to the area to assess the different stakeholders involved in ecotourism activities in and around the CMNP, and especially to get some general information on the target population (local communities) living around the park. Following the reconnaissance surveys, focus group discussions and key informant interviews were undertaken in the different communities. Snowball sampling was employed to select the participants for focus group discussions and key informant interviews. Focus group discussions and key informant interviews permitted the researcher to know the communities to target during household surveys.



**Figure 1.** Map of the study area. Source: Authors map.

Following focus group discussions and key informant interviews with different stakeholders involved in the management of ecotourism in and around the CMNP, household surveys were carried out in the different chosen communities around the CMNP. Household surveys were done using the simple random sampling technique.

**Data collection procedure**

Primary data were collected through household surveys, key informant interviews, focus group discussions and direct field observations. Household surveys were carried out by administering semi-structured questionnaires. A total of 124 semi-structured questionnaires (open and close-ended questions) were administered to the local population. Respondents targeted for this survey were those involved in one of the following activities around the Park: agriculture, fishing, hunting, harvesting of NTFPs, tourism and trade. Questionnaires were structured to capture socio-economic characteristics of the population; the impact of ecotourism on the livelihood of the local population living adjacent the CMNP. Some socio-economic parameters of the local population vital to this study were: community, age, gender, main occupation, secondary occupation, level of education, ethnic group, marital status, time spent in the community, and number of children. In each sampled community, a local informant helped to translate the questions into the dialect and responses in French.

Key informant interviews and focus group discussions were used to collect general information on the capacity of ecotourism to

improve the livelihood of the local population living adjacent the CMNP. Information collected through key informant interviews, focus group discussions and direct field observations was mainly used to ascertain the truthfulness of responses obtained during household surveys.

**Data analysis**

Information got through household survey was used for descriptive and inferential statistical analyses. Data were encoded into Microsoft Excel and analysed with Statistical Package for Social Sciences (SPSS 19.1). The chi-square test, Spearman rank correlation and binary logistic regression analyses were run. The chi-square test statistic (Equation 1) and Spearman correlation (Equation 2) were used to determine the non-cause-effect relationship existing between socio-economic variables and the impact of ecotourism on the livelihood of the local population.

$$Chi\text{-square test statistic } (X^2) = \frac{(a.d - b.c)^2.N}{(a+c).(b+d).(a+b).(c+d)} \tag{1}$$

Where:

- a: is frequency of males benefiting from ecotourism;
- b: is frequency of males not benefiting from ecotourism;
- c: is frequency of females benefiting from ecotourism;
- d: is frequency of females not benefiting from ecotourism;

N: is the total frequency of all observations.

$$\text{Spearman rho} = 1 - \frac{6\sum(di)^2}{n(n^2-1)} \quad (2)$$

Where:

n: is the numbers of pairs of values of variables X and Y;

di: is the difference obtained from subtracting the rank of Yi from the rank of Xi;

$\sum(di)^2$ : is the sum of the squared values of di.

The binary logistic (BNL) regression model (Equation 3) was used to evaluate the cause-effect relationship existing between socio-economic variables and the impact of ecotourism on the livelihood of the local population.

$$\text{BNL} = \ln \left( \frac{\hat{Y}}{1-\hat{Y}} \right) = \alpha + \beta X \quad (3)$$

Where:

$\hat{Y}$ : is the predicted probability that ecotourism improves livelihood;

$1 - \hat{Y}$ : is the predicted probability that ecotourism does not improve livelihood;

X: are the independent variables like gender, age, occupation, level of education, marital status etc.

## RESULTS AND DISCUSSION

### Socio-economic characteristics of respondents

Analysis of socio-economic data revealed that the main socio-economic attributes were: communities, age, gender, main occupation, secondary occupation, level of education, ethnic group, time spent in the community, marital status, and number of children (Table 1). With respect to communities, it was found that most of the respondents lived in the communities of Ebianemeyong (19%) and the least in Mvini (4%). With respect to age, most of the respondents were between the ages of 31 to 45 years (42%). There were equally a relatively high proportion of respondents with ages above 46 years (35.5%). Respondents less than or equal to 30 years were the least represented in the study population (23%).

Pertaining to gender, most of the respondents were male (66%). Only 34% of the respondents were female. With regard to the main occupation of the respondents, it was found that they were mostly farmers (43.5%), and the least were drivers (1%). With respect to secondary occupation, it was found that most respondents had no secondary occupation (28%). However, 72% were into secondary occupations. As for level of education, it was found that most of the respondents had either primary (38%) or no formal education (24%), with few in secondary education.

In the case of ethnic group, most of the respondents were from the ethnic groups Mvae (35%) and the least represented ethnic group was the Beti (7%). With regard to time spent in the community, it was found that most respondents (58%) had spent over 10 years in the community. Pertaining to marital status, most of the

respondents (67%) were married, with 3% divorced cases. In terms of the number of children, it was found that most of the respondents (13%) of the respondents had 3 to 5 children.

### Local population's perception of the impact of ecotourism around the CMNP on livelihood

For 65% of the riparian populations of the CMNP, ecotourism activities in and around the CMNP did not contribute towards improving their livelihood and only 35% perceived the contrary.

### Non-cause-effect and cause-effect relationship between independent variables and impact of ecotourism on local population's livelihood around the CMNP

Chi-square test statistics indicated the existence of a non-cause-effect relationship between the different independent variables and the impact of ecotourism on the livelihood of the local population (Table 2).

According to the independent variable considered, a statistically significant non-cause-effect relationship showed that it existed between perceived impacts of ecotourism on livelihood and independent variables like community ( $X^2 = 22.54$ ;  $p < 0.05$ ); gender ( $X^2 = 11.66$ ;  $p < 0.05$ ); main occupation ( $X^2 = 25.50$ ;  $p < 0.05$ ); secondary occupation ( $X^2 = 13.68$ ;  $p < 0.10$ ); level of education ( $X^2 = 27.34$ ;  $p < 0.05$ ); and ethnic group ( $X^2 = 28.33$ ;  $p < 0.05$ ). Meanwhile independent variables like age ( $X^2 = 1.34$ ;  $p > 0.10$ ); time spent in the community ( $X^2 = 1.64$ ;  $p > 0.10$ ); marital status ( $X^2 = 0.17$ ;  $p > 0.05$ ); and number of children ( $X^2 = 5.96$ ;  $p > 0.10$ ) had no statistically significant non-cause-effect relationship with perceived impact of ecotourism on local population's livelihood.

Coefficients of the Spearman rank correlation indicated the existence of a direct and indirect non-cause-effect relationship between independent variables and perceived impact of ecotourism on the local population's livelihood (Table 3). However, there is a statistically significant direct non-cause-effect relationship between perceived impacts of ecotourism on livelihood and independent variables like community ( $\rho = 0.200$ ;  $p < 0.05$ ); gender ( $\rho = 0.307$ ;  $p < 0.05$ ); main occupation ( $\rho = 0.218$ ;  $p < 0.05$ ); level of education ( $\rho = 0.287$ ;  $p < 0.05$ ); and ethnic group ( $\rho = 0.263$ ;  $p < 0.05$ ). Meanwhile a statistically significant indirect non-cause-effect relationship was found to exist between perceived impacts of ecotourism on livelihood and independent variables like secondary occupation ( $\rho = -0.204$ ;  $p < 0.05$ ); and number of children ( $\rho = -0.200$ ;  $p < 0.05$ ). Independent variables like age, time spent in the community and marital status had a statistically non-significant direct and indirect relationship with perceived impacts of ecotourism on livelihood.

**Table 1.** Socio-economic attributes of the local population around the CMNP.

Socio-economic attribute	Description	Frequency	Percent (%)	N
Communities	Ebianemeyong	23	18.5	124
	Ebodje	20	16.1	
	Mabiogo	14	11.3	
	Nazareth	11	8.9	
	Mvini	5	4	
	Nkoelon	15	12.1	
	Campo Beach	10	8.1	
	Akak	10	8.1	
	Campo	16	12.9	
Age	≤ 30 years	28	22.6	124
	31 – 45 years	52	41.9	
	> 46 years	44	35.5	
Gender	Female	42	33.9	124
	Male	82	66.1	
Main occupation	Hunting	9	7.3	124
	Fishing	22	17.7	
	Farming	54	43.5	
	Petty trade	11	8.9	
	Building	4	3.2	
	Driving	1	0.8	
	Gorilla tracking	3	2.4	
	Working with NGO	9	7.3	
	Eco-guard	7	5.6	
	Others	4	3.2	
	Secondary occupation	None	35	
Hunting		12	9.7	
Fishing		11	8.9	
Farming		33	26.6	
Petty trade		15	12.1	
Dress making		1	0.8	
Gorilla tracking		4	3.2	
Working with NGO		9	7.3	
Others		4	3.2	
Level of education		No formal education	30	24.2
	Primary	48	38.7	
	Secondary	20	16.1	
	High school	11	8.9	
	Tertiary	15	12.1	
Ethnic group	Iyassa	29	23.4	124
	Mvae	43	34.7	
	Bagyeli	13	10.5	
	Mabi	14	11.3	
	Beti	8	6.5	
	Others	17	13.7	

Table 1. Contd.

Time spent in the community	≤ 5 years	24	19.4	124
	6 – 10 years	28	22.6	
	> 10 years	72	58.1	
Marital status	Not married	37	29.8	124
	Married	83	66.9	
	Divorced	4	3.2	
Number of children	0	15	12.1	124
	1	9	7.3	
	2	20	16.1	
	3	16	12.9	
	4	16	12.9	
	5	16	12.9	
	6	13	10.5	
	7	10	8.1	
	8	5	4	
	9	3	2.4	
	12	2	0.8	

### Cause-effect relationship between independent variables and impact of ecotourism on livelihood of the local population living around the CMNP

Coefficients of the binary logistic regression model indicated the existence of a cause-effect relationship between independent variables and the perceived impact of ecotourism on livelihood (Table 4). From the coefficients of the logistic regression model, two independent variables had a statistically significant direct cause-effect relationship with perceived impact of ecotourism on livelihood. These two independent variables were gender ( $\beta = 1.218$ ;  $p < 0.05$ ); and level of education ( $\beta = 0.442$ ;  $p < 0.05$ ).

The classification table of the logistic regression model indicated the observed and predicted statistics for the perceived impacts of ecotourism on the livelihood of the local population (Table 5). From the percentage of the perceived impacts correctly classified, it was found that upwards of 74.2% of the perceived impacts of ecotourism on the livelihood of the local population was correctly classified. This goes to show that the predictions of the model are powerful enough to be taken seriously.

## DISCUSSION

### Local perception of ecotourism impact on livelihood

The local population living around the CMNP perceived that ecotourism activities contribute very little to their livelihood. This is explained by the fact that, income from

ecotourism has been paid to conservation management. All revenue goes in to the coffers of the government; in turn, the communities benefit no basic social amenities like water, schools etc. This result corroborates those of Harilal and Tichaawa (2018) who have also found the same similar result for the rural population around the Douala-Edea Wildlife Reserve. This is also supported by Das and Chatterjee (2015)'s finding, which portrays that the local communities involved in ecotourism activities benefit little or nothing. These findings could also be attributed to the fact that, ecotourism activities around national parks prohibit the local population from carrying out any activity within the park limits. Activities around the park such as farming, hunting, and collection of NTFPs are also regulated. These protection and regulation in and around the park respectively have probably resulted in an increase or stabilization in fauna species like buffaloes, elephants, chimpanzees and gorillas (Tchamba et al., 2015). Such growth in fauna population propels human-wildlife conflicts resulting from the destruction of many farmlands in the communities by wildlife. This makes the local population to see ecotourism activities as a threat to their livelihood rather than an asset. This could also be attributed to the fact that the management of the parks for ecotourism is based on the top-down approach. This approach relegates the local population to the background, reducing their ability to participate in ecotourism activities. The lack of participation in the ecotourism sector makes the local population to lose the benefits coming from ecotourism and to lose interest in the activity.

On the contrary, the findings of Isaac and Conrad-J

**Table 2.** Chi-square test statistic showing non-cause-effect relationship between independent variables and impact of ecotourism on the local population around CMNP.

Independent variable	Description	Improves livelihood (freq.)	Does not improve livelihood (freq.)	Chi-square ( $\chi^2$ )	p-level
Community	Ebianemeyong	6	17	22.54**	0.004
	Ebodje	7	13		
	Mabiogo	2	12		
	Nazareth	4	7		
	Mvini	2	3		
	Nkoelon	6	9		
	Campo Beach	2	8		
	Akak	1	9		
	Campo	13	3		
Age	≤ 30 years	9	19	1.34 <sup>ns</sup>	0.512
	31 – 45 years	21	21		
	> 46 years	13	31		
Gender	Female	6	36	11.66**	0.000
	Male	37	45		
Main occupation	Hunting	4	5	26.50**	0.002
	Fishing	6	16		
	Farming	12	42		
	Petty trade	3	8		
	Building	0	4		
	Driving	1	0		
	Gorilla tracking	2	1		
	Working with NGO	8	1		
	Eco-guard	5	2		
	Others	2	2		
Secondary occupation	None	15	20	13.68*	0.091
	Hunting	6	6		
	Fishing	3	8		
	Farming	15	18		
	Petty trade	0	15		
	Dress making	0	1		
	Gorilla tracking	1	3		
	Working with NGO	2	7		
	Others	1	3		
Level of education	No formal education	9	21	27.34**	0.000
	Primary	10	38		
	Secondary	6	14		
	High school	4	7		
	Tertiary	14	1		
Ethnic group	Iyassa	8	21	28.33**	0.000
	Mvae	9	34		
	Bagyeli	8	5		
	Mabi	2	12		
	Beti	2	6		
	Others	14	3		

Table 2. Contd.

Time spent in the community	≤ 5 years	11	13	1.64 <sup>ns</sup>	0.441
	6 – 10 years	9	19		
	> 10 years	23	49		
Marital status	Not married	13	24	0.17 <sup>ns</sup>	0.918
	Married	29	54		
	Divorced	1	3		
Number of children	0	7	8	5.96 <sup>ns</sup>	0.818
	1	4	5		
	2	9	11		
	3	5	11		
	4	5	11		
	5	6	10		
	6	3	10		
	7	3	7		
	8	1	4		
	9	0	3		
	12	0	1		

\*\* , \*Significant at 5 and 10% probability levels respectively; ns = not significant.

**Table 3.** Spearman correlation showing direct and indirect non-cause-effect relationship between independent variables and impact of ecotourism on the local population around CMNP.

Independent variable	Spearman rho coefficient	p-level
Community	0.200*	0.031
Age	-0.041 <sup>ns</sup>	0.654
Gender	0.307*	0.001
Main occupation	0.218*	0.015
Secondary occupation	-0.204*	0.023
Level of education	0.287*	0.001
Ethnic group	0.263*	0.003
Time spent in the community	-0.090 <sup>ns</sup>	0.322
Marital status	-0.016 <sup>ns</sup>	0.864
Number of children	-0.200*	0.043

\* Significant at 5% probability level; ns = not significant.

(2012) found that the local population sees ecotourism as significantly contributing to livelihood improvement in their different communities. In the same vein, Ogutu (2002) indicated that huge financial benefits from ecotourism are used to develop social facilities like schools and hospitals in the local community of Porini. These positive findings could be attributed to the fact that the local population is directly involved in the management of the protected area. Thus, there is a bottom-top approach to management which makes the local population to participate actively in management, thereby reaping enormous benefits from ecotourism activities

### Determinants of local population's perception of the impact of ecotourism on livelihood

Although different studies carried out in Cameroon and Africa have generally reported that ecotourism activities around protected areas impact the local population either favorably or unfavorably (Ndenecho, 2009; Kimbu, 2010; Nkengfack, 2011; Isaac and Conrad, 2012; Conrad-J et al., 2013; Sunita, 2013; Kimengsi, 2014; Cheung, 2015; Harilal and Tichaawa, 2018), little has been done to examine in an in-depth and holistic manner, the factors influencing the impacts of ecotourism on the local

**Table 4.** Logistic regression showing cause-effect relationship between independent variables and impact of ecotourism on the local population around CMNP.

Independent variable	B	p-level	df	Exp (B)
Constant	-2.855*	0.023	1	0.058
Community	-0.059	0.546	1	0.943
Age	0.127	0.721	1	1.136
Gender	1.218*	0.024	1	3.380
Main occupation	0.084	0.441	1	1.087
Secondary occupation	-0.060	0.475	1	0.942
Level of education	0.442*	0.048	1	1.556
Ethnic group	0.097	0.602	1	1.102
Time spent in the community	0.143	0.658	1	1.154
Marital status	0.212	0.664	1	1.236
Number of children	-0.084	0.489	1	0.919
Number of observations	124			
-2 Log Likelihood	131.628			
Nagelkerke $R^2$	0.283			

\*Significant at 5% probability level.

**Table 5.** Classification table for the logistic regression model.

Observed	Predicted		
	Improves livelihood	Does not improve livelihood	Percentage correct
Improves livelihood	73	8	90.1
Does not improve livelihood	24	19	44.2
Over all percentage classified			74.2

population living around protected areas in general and national parks in particular. This study through the use of appropriate inferential statistics is one of the first to unearth the factors influencing the impacts of ecotourism on the local population living around the CMNP, south region of Cameroon.

From the coefficients of the logistic regression model, only two independent variables (gender and level of education) show a statistically significant relationship with the impacts of ecotourism on the livelihood of the local population. These two variables had a statistically significant direct cause-effect relationship with the impact of ecotourism on the local population's livelihood.

For gender, the finding indicates that males benefit more from ecotourism activities than females. This result is similar to that of Kimengsi et al. (2019), where they acknowledge that, men participate more in ecotourism activities than women within the Western Highland region of Cameroon. This is in contrast with the findings of Tran and Walter (2014), where it was noticed that, there was almost parity in the level of involvement in ecotourism activities based on gender. The latter explains that, there was a more equitable division of labor, resulting in self-

confidence and new leadership roles performed by women. Irandu and Shah (2014) have found out that it is necessary for ecotourism packages to be more inclusive for both women and men. This is due to the high positive impacts of women's involvement like formal and informal employment, economic independence, and decision-making. In the CMNP, the main ecotourism activities for the local population were; tour guides, porter, clearing of tracks to touristic attractions in the forest, and gorilla tracking. These are mainly activities which are tedious, requiring energy and courage to engage in them especially in forest communities. This most likely explains the low rate of women's participation in ecotourism activities in the area. In coastal communities like Campo beach and Ebodje where the main site visited is the beach, the females are more involved in ecotourism activities than the other communities. In Ebodje, some women gain extra income when a tourist visits their community as they are used as cleaners and receptionists in the eco-lodges and in some rare cases as cooks. These ladies are often paid less than men as their activities are considered less strenuous and less risky.

For level of education, the finding indicates that as



level of education increases, the benefits obtained from ecotourism activities equally increase and vice versa. This could be attributed to the fact that more educated persons have the possibility of serving as interpreters as well as tour guides, making them to have more benefits from ecotourism activities than their less educated counterparts. The result is in line with the findings of Kimengsi et al. (2019), who have demonstrated that, high level of education provides multiple choices to community members to participate in high valued and high income ecotourism activities, enhancing livelihood survival practices of the person with such human capital. Liu et al. (2020) acknowledge that, those with low level of education, lack the technical skills to improve on their livelihood strategies in rural areas of Mongolia. Tran et al. (2018) report that, education plays a pivotal role in households' livelihoods choices, with income inequality reflected in level of educational attainment in the North west region of Vietnam. In Central Nepal, educational level of different households' head significantly impacted rural households positively in implementing diverse subsistence strategies with ecotourism inclusive (Khatiwada et al., 2017). In the CMNP, 63% of the population has ended up in the primary school. Implicitly, the benefit of the local population for livelihood sustenance is minimal. This also depicts the inability of the community to actually develop and manage ecotourism projects successfully. For these communities to actually benefit from ecotourism, there is the need for partnership with public and private enterprises, capable of developing veritable ecotourism ventures, that can provide employment to many persons in the communities based on their levels of educational attainment. Thus, the impact of ecotourism on the livelihood of the local population living around the CMNP is influenced by a plethora of factors with the two most important being gender and level of education.

## Conclusion

To conclude, the local population living around the Campo Ma'an National Park, South Region of Cameroon perceived that ecotourism contributes little to their livelihood. Several factors affect the impact of ecotourism on the livelihood of the local population. The factors plausibly affecting the impact of ecotourism on the local population's livelihood were community, gender, main and secondary occupations, level of education, ethnic group, and number of children. The factors having a direct causal effect on the impact of ecotourism on the local population's livelihood were gender and level of education. There is the need for policy makers therefore, to factor in these variables when formulating policies geared towards enhancing the benefits of ecotourism on the livelihood of the local population living around the CMNP. For ecotourism to work as a livelihood option in the CMNP, policies should take into consideration gender

sensitive activities that can reduce the disequilibrium in ecotourism employment, as well as encourage real public private partnership

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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