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LOCAL COMMUNITY DISTRIBUTION AND PARTICIPATION IN BIODIVERSITY CONSERVATION IN NATIONAL PARKS: A CASE OF GASHAKA GUMTI NATIONAL PARK SAFETY

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Abstract

In this article, we investigate how the distribution of community participation impacts biodiversity conservation in national parks. This study analyzes factors that influence the distribution of community participation in biodiversity conservation. We hypothesize that employment in tourism increases the likelihood of community participation in biodiversity conservation. Additionally, we hypothesize that financial benefits derived by local people uniquely influence their likelihood of engaging in conservation activities. Furthermore, we hypothesize that infrastructure development affects household likelihood to engage in biodiversity conservation. Data were collected from households using questionnaires. Using logistic regression analysis, we find support for our hypotheses. The results suggest that local community participation in biodiversity conservation is significant. This study contributes to the growing empirical evidence on the effects of local community participation on biodiversity conservation in national parks and its implications for park managers and policymakers. Our study makes significant contributions to the existing literature and has practical implications for park management and policy formulation.

Keywords: Community Distribution, Participation, Biodiversity Conservation, National Parks, Gashaka Gumti

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INTRODUCTION

In this article, we investigate how distribution of community participation impact biodiversity conservation in national parks. We find this to be an important question. Although prior studies have suggested that strict preservation and protection of national parks can stem the tide of loss of biodiversity through total elimination of the communities (Brockington & Igoe, 2006) and all forms of negative human interference such as overutilization of land in and around protected areas for expansion of farming and agricultural activities; illegal logging, mining, overgrazing and other uses (Ritters et al., 2003; Wade and Theobald, 2010; Wilson et al., 2014) leading to ecological disturbances (Machovina et al., 2015; Steffen et al., 2015), there are also clear indications that this approach often degenerates into conflict between local communities and managers because the authorities do not give considerable attention to the people's livelihoods (Ghimire & Pimbert 1997; Redpath et al., 2013; Kansky & Knight, 2014).

As far the local communities are concern the wildlife distribution and their habitat are gift of nature, which still remain their main source of livelihood; therefore, there is no justification for protecting them or prohibiting its use at the peril of their livelihood (Tagowa & Buba, 2012). The most worrying aspect is that most of the protected areas and national parks **distributed** are rightly owned by the indigene, especially in Africa, and they use the natural resources for agriculture, medicinal purposes and will not augur well to "tag" them Protected Areas (PA) (Bhandari & Jianhua, 2017, Brockington & Igoe, 2006).

As a result, the communities demonstrate negative attitudes toward wildlife; they retaliate by killing wild animals that hinder sustainability (Mogomotsi, et al., 2019) and deliberately set ablaze national park as in the case of the Bwindi Impenetrable Forest (BIF) in Uganda (Hamilton et al., 2000) and also practice illegal activities as a form of retaliation to command-and-control conservation policies in Tsitsikamma National Park in South Africa (Watts & Faasen, 2009).

These concerns have led to the growing recognition of local people to be distributed and be closely involved in the park management of natural resources (Brandon & Wells, 1992; Wells & Brandon 1992; Tabuti et al., 2003; Rao et al., 2002b). In that case, the ideal approach that effectively engages the local community in management and decision-making process should give them the opportunity to have a say and greater

control over decisions and activities that affect their lives so as to meet their livelihood needs (Scheyvens, 2007; Bajracharya et al., 2008).

The notion of linking community distribution and involvement with biodiversity conservation that might bring efficient conservation of wildlife and their habitats in the national parks (Souto et al., 2014; Garraway et al., 2017) is premised on the assumption that that if local communities derive some benefits from conservation, they will be more likely to contribute to conservation of biodiversity(Mishra 1982; Sherpa et al. 1986; Lehmkuhl et al. 1988; Wells & Brandon 1992; Andrade & Rhodes, 2012; Heindorf et al., 2021; Salafsky & Wollenberg, 2000). In addition to the feasibility of economic and social benefits from the program (Milner- Gulland et al. 2003), the distribution of community and its involvement in wildlife conservation may be influenced by factors such as age, race or ethnicity, gender, education level and income and others (Carter et al., 2014; Mir et al., 2015).

Given that there is no clear and acceptable definition of community participation in conservation studies (Vimal et al., 2018), 'participation in conservation means active involvement in biodiversity conservation initiatives available in communities' (Mogomotsi et al., (2020). Such initiatives include distribution of volunteers who patrol and protect the wildlife and forest from invaders (Obioha et al., 2012; Ngoufo et al., 2014) and other illegal activities dealing with the problems of deforestation, poaching, illegal logging (Tanvir & Afroze, 2016) as well as overgrazing in highlands of Tigray (Gebremedhin et al., 2011). Moreover, household with strong zeal and zest ensure strict compliance (Kipkeu et al., 2014; Isiugo & Obioha, 2015).

Concerning the outcome of the impact of distribution of local community participation in conservation, Sam et al., (2014) revealed that the community participation significantly improved forest and wildlife conservation. Distributed communities that receive more economic benefits from wildlife have greater desire to participate in conservation than those that do not (Mutanga et al., 2015).

The provision of direct economic benefits that accrue to local people from trophy hunting and implementation of development schemes decrease poaching and grazing through enforcement of rules regulations and also improve conservation through increase in wildlife game scouts as well as of wildlife protection and vigilante (Hutton & Murombedzi, 2005; Lewis & Alpert 1997; Wainwright & Wehrmeyer, 1998; Pender et al.

(2001); Konopo et al., 2016), but more success is where big mammals are present (Hackel, 1998).

However, Milner- Gulland et al. 2003) pointed out that 'participation of the local communities in conservation program was not due to the perceived feasibility of economic and social benefits from the program'; therefore, the success could not be the distribution of socio-economic benefits but by virtue of community increased enforcement levels (Gibson & Marks 1995). Furthermore, evidence suggests that community participation in conservation in some cases has not resulted in decrease in poaching of wildlife because poachers have changed their tactics and prey selection (Gibson and Marks, 1995) through the use of charms to lure wildlife from their hideout. Also, in many conservation initiatives, communities are not actively involved in planning and management (Hutton & Murombedzi, 2005, Wainwright and Wehrmeyer 1998; Songorwa et al. 2000) while others have declined participating in conservation initiatives because of restricted access to the forest (Eshun, 2014). Besides, there have been suggestions that community participation in conservation has scarcely enhanced the livelihood of the local communities (Wainwright & Wehrmeyer 1998) because the socio-economic benefits realised from wildlife conservation have not made a great impact in improving the standard of living (Haiijar et al., 2020). Majority of the local communities, especially those **distributed** outside ACA have limited access to adequate health and educational facilities (Bajracharya et al., 2008).

In terms of the impact of the social attributes of local communities, Sterling et al. (2017) indicate that social group influence people attitude towards participation in conservation and suggest that poor subsistence farmers may not cope as well as wealthier cattle farmers. In addition, Mir et al. (2015) revealed that education level, income and age are important factors that influence local resident to participate in conservation. In this line, Mogomotsi et al., (2020) indicated that education and income positively influence the attitude of locals toward conservation. Thus, people that have lower education level and lower income tend to have lower desire to participate in conservation activities. Meanwhile, Mogomotsi et al., (2020) showed that age negatively influence communities rejecting participation in wildlife conservation.

Although tourism employment is an important factor to encourage local communities to participate in biodiversity conservation, (Bennett, 2015; Bragagnolo et al., 2016; Allendorf et al., 2019), Abukari and Mwalyosi, (2018b) did not find tourism was an

important factor that influenced attitude of local residents near Mole National Park(MNP) and Tanzania National Park(TNP) They reasoned that the number of employment offered local residents might not be considered significant due to the number of villages involved. Nonetheless, Tessema et al., 2010) found tourism employment foster positive attitude of local people to towards biodiversity conservation. Also, local communities closer to catchment areas of wild life that can generate income through tourism accept participation in conservation and wildlife increases (Mariki, 2013).

Despite the success made in protection of certain flagship species and increased attention to the effectiveness of local community participation in conservation in countries such as Kenya and Mexico (Mendez-Lopez et al. (2014) as well as in USA (Berks et al. (2007) also in Spain (Ruiz-Mallén and Corbera (2013), local community participation in conservation is not considered as a predictable model because of community heterogeneity as the factors that influence community involvement in biodiversity conservation vary from case to case(Mir et al. (2015) notwithstanding the local communities still have limited scope to participate in the decision-making process for managing natural resources within Pas" (Castro & Nielsen, 2001; Mendez-Lopez et al., 2014).

The aim of this study was to investigate the impact of the distribution of local community participation in biodiversity conservation in the Gashaka Gumti national Park.The GGNP established purposely for the conservation of biodiversity (Adewumi, 2016) and support of rural development and traditional livelihood (Tagowa & Buba, 2012). Nonetheless, the expected success is far-fetched because of the growing rate of poaching, hunting, land degradation and increased farming and other human activities within and adjacent the park. Although tourism development was important goal for establishing the National Park (Sommer & Ross, 2011), the tourism opportunities have not been fully exploited as promised. The situation has created certain doubt and mixed feeling among the indigene, and some are of the view that the establishment of the park is a way to restrict them to access to the park which they consider as legal and traditional rights and which they make use without any restrictions (Adetoro & Adetola, 2011; Adewumi, 2016).

However, the role of local community participation in conserving biodiversity has been given little attention (Leech & Scoones, 1999). Yet, the intervention of distributed local communities cannot be underestimated as they can fish out residents who engage in illegal poaching if the community realize the promised benefits (McAlindon et al., 2015,

Milner-Gulland et al., 2003; Obioha et al., 2012; Ngoufo et al., 2014). The purpose of this article is to specifically investigate factors that influence local community' participation in biodiversity conservation. We test the influence of employment in the tourism may increase the community likelihood of participating in biodiversity conservation. We also test the influence of financial benefits received on local people likelihood of involvement in conservation. Lastly, we test the effect of provision of infrastructure development on the household likelihood to engage in biodiversity conservation.

Theory and hypothesis

This study utilised the social exchange theory to understand factors that influence the distributed local community participation in biodiversity conservation (Mutanga et al., 2015). Social exchange theory (SET) is defined by Ap, (1992) as "a general sociological theory concerned with understanding the exchange of resources between individuals and groups in an interaction situation" (p. 668). Social exchanges theorist asserts that individual often develop set of attitudes towards other people and things on the premise of expected costs and benefits obtained from participating in activities. By comparison, people view activities that bring benefits to have positive influence while they perceive those with negative outcomes to have negative impact (Bagherian et al., 2009).

Therefore, people may like to participate in activities they can derive the greater benefits and avoid those ones with more expected costs or more costs are incurred. In the social exchange theory (SET), the costs and benefit are subjectively analysed by individuals to decide whether to involve in a particular or the other alternatives (Nunkoo, 2016). In doing so costs are assessed in the terms of suitable alternatives or possible options given up by the participants involved (Cook. et al., 2013). However, when benefits and costs are par, they result in equitable exchange or relationship (Bagherian et al., 2009).

This theory contends that implementation biodiversity conservation initiative should enhance the livelihood of the local people distributed around the park. This is especially important for countries such as Nigeria where Gashaka-Gumi National Park has been adopted to promote series of biodiversity activities in support of the Nigerian Biodiversity programme, to ensure local communities in derive equal social and economic benefits from conservation of wildlife and habitat (Alarape et al., 2018; Adano et al., 2012). Based on basic assumptions of the social exchange theory, we hypothesized that the distribution of local communities that derive positive benefits from biodiversity

conservation and whose loss of livelihood are adequately compensated will have positive attitude. However, those who do not obtain benefits from conservation of biodiversity and those whose lose source of livelihood are not adequately compensated will exhibit negative attitude

In particular, considering the safety and influence social and financial benefits on attitudes of local community participation in conservation, extent studies have suggested mixed results. For instance, Sam et al., (2014) and Mutanga et al., (2015) show that local communities that benefit more financial may have higher desire to support conservation than those that do not. Similar studies have argued the direct economic benefits that accrue to local people has improved conservation (Hutton & Murombedzi, 2005, Wainwright & Wehrmeyer, 1998; Pender et al. (2001); Cooney et al., 2017). On the other hand, Wainwright & Wehrmeyer 1998 asserted that community involvement in conservation has rarely improved the livelihood of the local communities (Wainwright & Wehrmeyer 1998) despite the socio-economic benefits realised from wildlife. Also, Milner-Gulland et al. 2003) argued that local community participate in conservation not because of they perceived the feasibility of economic benefits so success in conservation of biodiversity could be attributed to the accrued benefits but rather the degree of enforcement by local community (Gibson & Marks 1995). This allows us to formulate our first hypothesis:

Hypothesis 1: **Distribution of** socio-economic benefits may negatively influence community desire to participate in biodiversity conservation in Gashaka Gumti National Park

The effect of tourism employment on attitudes of local resident to participate in conservation is mixed. Some studies suggest that tourism employment encourage local communities to participate in biodiversity conservation (Bragagnolo et al., 2016; Allendorf et al., 2019). Tessema et al., (2010) also argue that tourism employment engenders positive attitude of local communities to participate in biodiversity conservation, suggesting economic benefit may be greater that the costs of loss of livelihood may lesser. Nonetheless Abukari and Mwalyosi, (2018b) and George & Oseni (2012) content that does the tourism employment positively influence communities' participation conversation where the number of jobs created may be inadequate due to number of communities

involved. This led us to expect a positive impact of tourism employment on local people willingness to be involved in conservation. Hence:

Hypothesis 2: Distribution of employment to locals in the tourism sector may increase the community likelihood of participating in biodiversity conservation

In term of the impact of infrastructure development and social amenities community attitude towards conservation, Milner- Gulland et al. (2003) suggested that local communities take part in conservation initiates is not due to the perceived of social benefit accrue to them. In addition, Bajracharya et al., (2008) reveal that a most of the communities outside Annapurna Conservation Area (ACA do not have access to adequate health and educational facilities (Bajracharya et al., 2008). However, Bajracharya et al., 2006 and Mehta and Heinen (2001) indicate that most of the ACA villages have adequate sanitation and drinking water facilities, trails, bridges, primary healthcare, primary education both for children and adults, provision of electricity. They concluded the community-based approach to conservation has helped to improve the living standards of local communities within conservation areas. Therefore, this allows us formulate our third hypothesis

Hypothesis 3: we hypothesis infrastructure development may negatively influence the likelihood of the distribution of communities participating in conservation of biodiversity

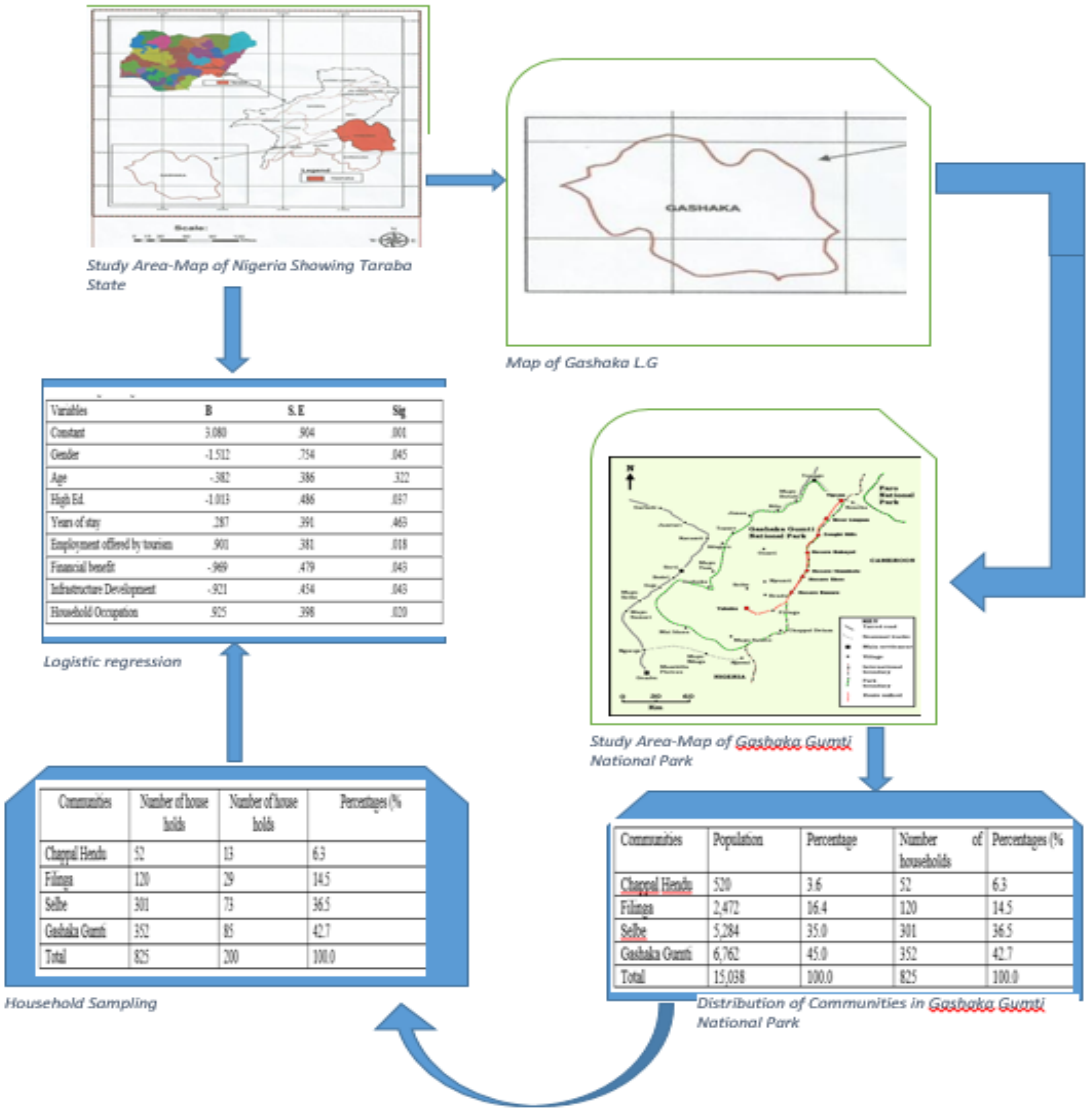

Figure 1. Graphical Abstract

N.B: Graphical abstract showing the study area map of Gashaka Gumti National Park located in Taraba State Nigeria and the distribution of house hold sampling and Distribution of communities in Gashaka Gumti National Park

METHODS

Study Area

The study area is Gashaka-Gumti National Park. It is situated at the foot of the Mambilla Plateau and covers a land area of about 6,411 km2. It lies between latitude 6º55'N and 8º05'N and longitude 11o13' to12º11'E. The Park was originally gazetted as

Gumti, Gashaka and Serti Game sanctuaries by the defunct Northeast Government in the 1970's. The three game sanctuaries were merged and upgraded to a National Park by the Nigeria National Park Decree of 26th August, 1991 which was repealed by Decree 46 of 1999.Gashaka –Gumti National Park is a vast land of spectacular wilderness (6,000 km2) in the southeast corner of Taraba State, adjoining the Mambilla Plateau (Figs. 1 and 2). The Park is an outstanding tourist landmark in Taraba State and the largest of all the eight national parks in the country. It is a home the most diverse in terms of species distributed within the park, such as the colobus monkey and warthogs, including buffalo, roam antelope, chimpanzee, hippopotamus, hyena, giant forest hog, lion and leopard. The park is surrendered by 25 communities; 5 outside, 11 on the periphery and 9 inside, including 6 enclaves (Deshen et al., 2010) belong to different ethnic groups such as Jibu, Dakka,Ndoro, Tigun, Gbaya, Tiv, Mambilla, Kaka and Fulani in the southern part of the park, while in the northern part or Toungo sector are the Chamba, Kutim Potopore, Fulani, Dakka, Nyamnyam and Kona. The main sources occupations are farming, livestock husbandry, vocational jobs, civil service with few hunters and fishermen. The best time to visit the park is during dry season that is between Decembers to March yearly.

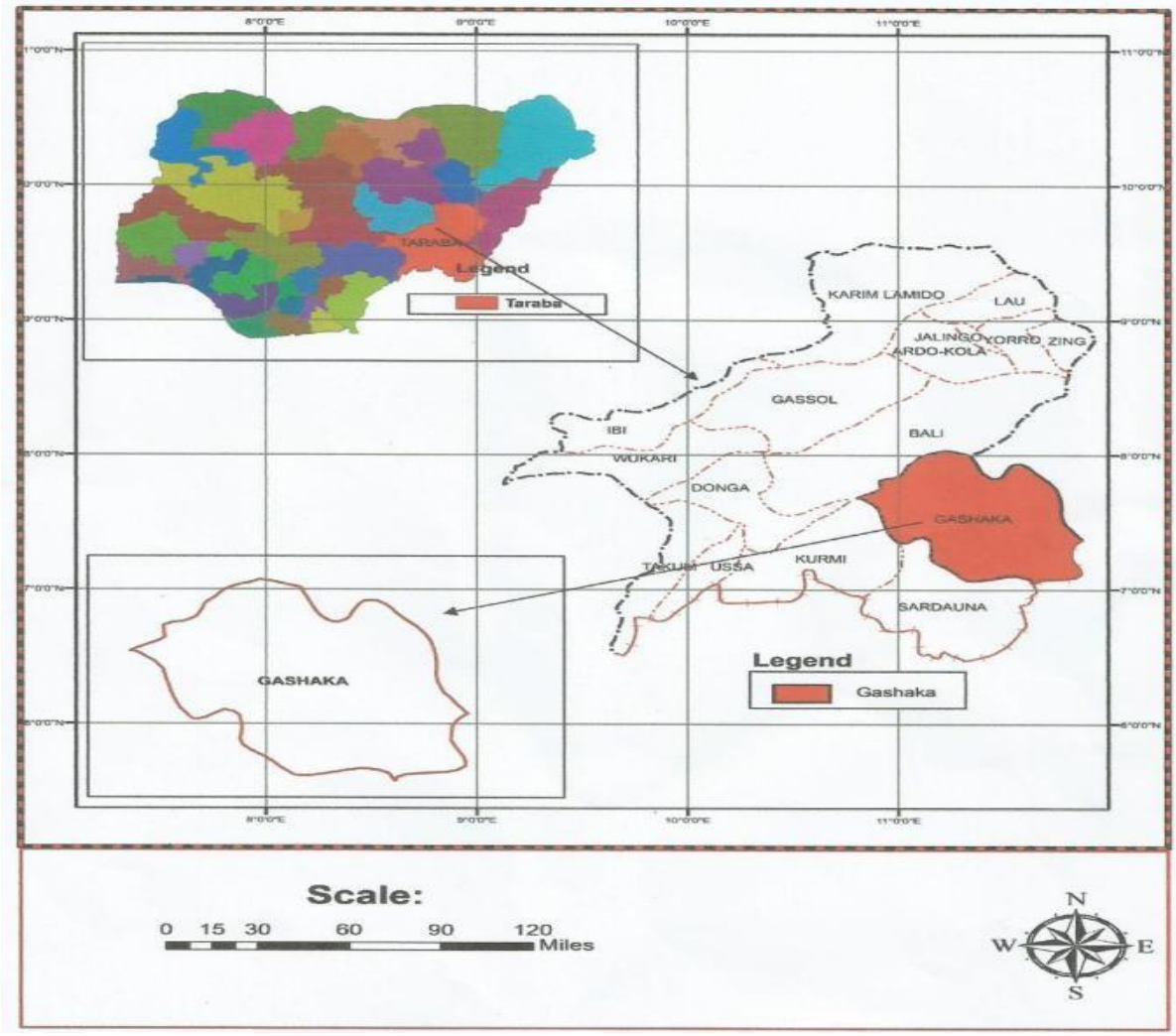

Figure 2. Study Area - Map of Nigeria Showing Taraba State

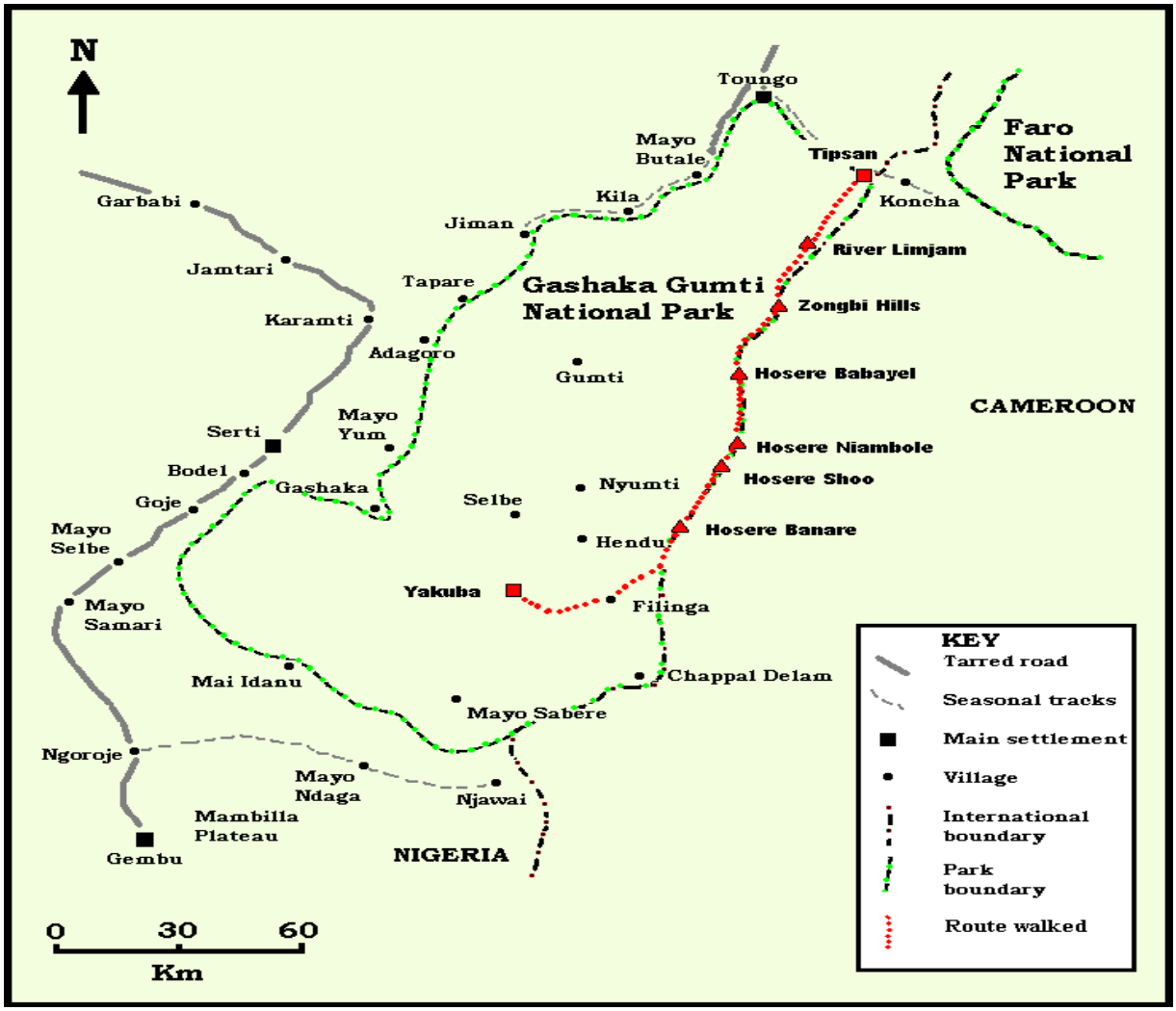

Figure 3. Distribution of Study Area-Map of Gashaka Gumti National Park

Population and Sample

Our study focused on these communities: Gashaka Gumti, Selbe, Filinga and Chappal Hendu communities within the Gashaka Gumti National Park. These communities reside right in the park.

Table 1: Distribution of Communities in Gashaka Gumti National Park

Communities	Population	Percentage	Number of households	Percentages (%
Chappal Hendu	520	3.6	52	6.3
Filinga	2,472	16.4	120	14.5
Selbe	5,284	35.0	301	36.5
Gashaka Gumti	6,762	45.0	352	42.7
Total	15,038	100.0	825	100.0

We selected sample of 200 households from these communities The survey covered 10% of all households in the sampled communities as recommended by Kerlinger (1973) because if it is large enough so long as it allows for reliable data analysis. We applied Nassiuma (2000) model to obtain a sample of 87.9. However, study used a sample size of 200 households for better representation (Table 2) and applied a proportionally allocation to select sample as a representation for each household in the communities to ensure proportionally allocation of sample (Cooper and Schindler, 2011; Wahyuni, , 2012).

Table 2: Distribution of Household Sampling

Communities	Number of house holds	Number of house holds	Percentages (%
Chappal Hendu	52	13	6.3
Filinga	120	29	14.5
Selbe	301	73	36.5
Gashaka Gumti	352	85	42.7
Total	825	200	100.0

This research generated data from household survey which was conducted from June to august 2019. The questionnaires were administered by researcher after a successfully pre-testing on selected members of Filinga community. The pretesting was done purposely to address any issues in the wording, sequencing of questions and to ensure the questions addressed what they were supposed to. The issues raised in the pilot sessions were also incorporated in the questionnaire, which was tested and modified during the pilot survey. Out of two hundred questionnaires distributed to the households, 118 were questionnaires fully completed but 8 of them were rejected due to extreme missing data.

The respondents had to answer questions open ended questions on demographic such as gender (male or female) level of education (Tertiary or Non-Tertiary) age (20 -40 years) and years of stay (1-10 or above 10 years) and closed ended questions on factors that influence community participation in conservation initiatives

Variables and Measures

The measures we used in the study are shown in the Appendix. All scales are adopted from previous literature. Below we discuss the dependent, and independent. The dependent variable for the binary regression model was a dummy variable which is denoted 1 if the respondents were actively participating in biodiversity conservation and 0 otherwise.

The independent variables were the socio-demographic attributes of households such as age, gender, level of education, years of stay, and household occupation. Other independent variables were employment in tourism sector, benefit of infrastructure development in community and financial benefits or compensation for loss of source livelihood.

Statistical analysis

The empirical data collected through a household survey. A logit regression model has been used estimate the association relationship between the independent variables (age, gender, level education, years of stay, employment in tourism sector, infrastructure development, financial benefits) and dependent variable (community desire to participate in conservation) The data were analysed using SPSS version 20.

RESULT

Distribution of Demographic and Socio-Economic factors of Respondents

Table 2 show that results of social and Economic factors. The result shows that about (71.8%) of the respondents were males 135 (71.8%) and while (28.2%) of females. The youngest respondent was 18 years while the oldest was 70. Moreover, almost 68.1% of the respondents had no tertiary education. Further, this finding shows that majority (63.8%) of the households were farmers. Also, almost (68.1%) of respondents had stayed in the Gashaka Gumti between 1-15 years. Besides, the results suggest more people (66%) acknowledged had employment in the tourism sector while 81.4% had benefitted

financially. Finally, about 62.8% of the respondents had acknowledged benefiting from infrastructure development in the community.

Table 3. Results from Distribution of Social and Economic factors

Variable (%)	**Frequency**	**Percentage**
Gender		
Male	135	71.80
Female	53	28.20
Age		
18-40	104	55.3
40 and 70	84	44.7
Education level		
Tertiary	60	31.9
Non-Tertiary	128	68.1
Occupation		
Farming Household	68	36.2
Non-farming household	120	63.8
Years of Stay		
1-15 years	128	68.1
16 -25 years	60	31.9
Employment offered by tourism		
Yes	124	66.00
No	64	34.00
Financial benefits		
Yes	153	81.4
No	38	18.6
Infrastructure Development		
Yes	118	62.8
No	70	37.2

Table 4. Distribution of Logistic Regression

Variables	**B**	**S. E**	**Sig**
Constant	3.080	.904	.001
Gender	-1.512	.754	.045
Age	-.382	.386	.322
High Ed.	-1.013	.486	.037
Years of stay	.287	.391	.463
Employment offered by tourism .018	.901	.381	
Financial benefit	-.969	.479	.043
Infrastructure Development	-.921	.454	.043
Household Occupation .020	.925	.398	

N.B: Mean Beta (**B**), Mean Standard Error (**S.E**), Mean Significant (**Sig**)

DISCUSSION

In this article, we have addressed the relationship between local community participation and biodiversity conservation. The incentive for conducting this study is that existing studies suggest that relationship between the two concepts have resulted in mixed outcomes. Further recent development suggests that local communities still have limited scope to participate in the decision-making process for managing natural resources within the park (Castro & Nielsen, 2001; Mendez-Lopez et al., 2014).

It is generally assumed that local communities are more likely to support conservation initiatives if they receive direct benefits from them (Bruner et al., 2001,, Dudley et al. 1999). In this study, we found that direct financial benefit had negatively influenced local people towards conservation. The lower the financial benefits; the lower the willingness among the respondents to take part in biodiversity conservation. This outcome is not surprising because the local communities see the wildlife as sources of income. While the government continue to educate the local communities on the

significance on biodiversity conservation, they should also fulfil the promised benefits. Hence, this result adds to the growing body of research of conservation (e.g., Dahal, 2021; Sherpa et al. 1986; Lehmkuhl et al. 1988; Brandon and Agrawal & Gibson, 1999; Dudley et al. 1999; Salafsky & Wollenberg 2000). Mogomotsi et al., 2020), which adds further to its validity and importance in research practice.

The result also suggests that infrastructure development had a negative relationship with local peoples' willingness to engage in biodiversity conservation. By implication, a decrease in infrastructure development may lower the people desire to involve in conservation. There is a need for government to improve and expand basic infrastructure and social amenities. This will help the local people to be more committed to conservation initiatives.

Additionally, the study found a negative relationship between age and participation in biodiversity conservation (Ayodele, & Abubakkar, 2001). This shows that as people grow older their desire grows weaker to participate in conservation initiatives. It is important for government to give proper orientation in order to sustain people's interest in biodiversity conservation.

Similarly, the study reports a negative relationship between education and participation in biodiversity conservation. This finding suggests that the lower education the lower the desire to participate in wildlife conservation. This might be the case as the local people viewed wildlife as source of livelihood. Thus, it necessary to build the capacity of rural villagers on the importance of biodiversity conservation in general and wildlife in particular (Mogomotsi et al., 2020).

Our result further suggest that employment delivery by tourism had a positively relationship with people attitude towards conservation. The more formal jobs provided to local through tourism development, the greater the willingness of the people to participate in biodiversity conservation. Furthermore, we find household occupation negatively impact on locals' desire local to engage in conservation. It is not surprising that local cultivate on the park as they claim ownership of the land. It is critical to educate locals on the importance of conservation.

CONCLUSION

The aim of this study was to explore factors influencing local community distribution and participation in biodiversity conservation. The results of this study suggest that the of gender, age, level of education as well as employment offered by tourism; and financial benefit, infrastructure development and household occupation, were significant factors that could influence local community participation in biodiversity conservation in Gashaka Gumti National Park.

More specifically, the results of the study suggest that the gender may discourage respondent to involve in conservation activities. In particular, females allocation ought to be educated more to support conservation initiatives. The study also reveals that there is need for government to employ local people in the tourism sector. This opportunity may encourage the people to play active role in conservation activities. In addition, the results indicate that although the age of local people in general is important factor that can contribute to conservation in the park. However, the older ones might not be willing to play any key role in conservation initiative. Additionally, although the findings show education was important factor influencing participation in conservation in general, less educated people might not be actively involved in conservation of biodiversity in the park. Also, the study suggests employment opportunity in the tourism may enhance local peoples' participation in conservation. Further, lack of direct financial benefit from conservation, and decreased in infrastructure development might reduce the desire of the locals to participate in biodiversity conservation. Finally, the result indicates that household with farming occupation may not be willing to engage in conservation.

Our study makes significant contributions to extant literature and has implications for the distribution of Park managers and policy makers. The study contributes by adding to the growing empirical evidence that exist on effect of distribution of local community participation and biodiversity conservation in national park.

In terms of policy implication, the result of increased employment in tourism sectors would increase the distribution local community as well as participation in biodiversity. Also, the finding of decreased or failure to fulfil financial benefit from conservation would discourage participation in conservation. Moreover, to encourage local communities to be active in conservation, Community distribution should be encouraged and measures to ensure and improve financial benefits from the conservation are critical

taken in to consideration, lastly, to motivate local communities to be actively involved in conservation, measures that to expand and improve basic infrastructure and social amenities are imperative.

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Competing Interest

There is no report of competing interest among the authors.

REFERENCES

Abukari, H., & Mwalyosi, R. B. (2018). Comparing conservation attitudes of Park-adjacent communities: The case of Mole National park in Ghana and Tarangire National Park in Tanzania. *Tropical Conservation Science*, *11*(3), 66-79.

Abukari, H., & Mwalyosi, R.B. (2020). Local communities' perceptions about the impact of protected areas on livelihoods and community development. *Global Ecology and Conservation*, 22 (2), 34-55

Abukari, H., Mwalyosi, R.B., 2018b. Comparing pressures on national parks in Ghana and Tanzania: the case of Mole and Tarangire national parks. *Global Ecology and Conservation*. 15(13), 124-137.

Adams, W. M., Aveling, R., Brockington, D., Dickson, B., Elliott, J., Hutton, J., & Wolmer, W. (2004). Biodiversity conservation and the eradication of poverty. *Science*, *306*(5699), 1146-1149.

Adano, W. R., Dietz, T., Witsenburg, K., & Zaal, F. (2012). Climate change, violent conflict and local institutions in Kenya's drylands. *Journal of Peace Research*, 49(1), 65-80.

Adetola, B. O., & Adetoro, A. O. (2014). Threats to biodiversity conservation in Cross River National Park, *Nigeria. International Journal of Conservation Science*, 5(4), 547-552.

Adetoro, A. O., Lawal, M. S., & Jenyo-Oni, A. (2011). Biodiversity conservation and community participation in Kainji Lake National Park, Nigeria. *Advances in Applied Science Research*, 2(2), 218-226.

Adewumi, I. B., Usui, R., & Funck, C. (2019). Perceptions of multiple stakeholders about environmental issues at a nature-based tourism destination: The case of Yakushima Island, Japan. *Environments*, 6(8), 93.

Agrawal, A., & Gibson, C. C. (1999). Enchantment and disenchantment: the role of community in natural resource conservation. World development, 27(4), 629-649.

Allendorf, T. D., Swe, K. K., Oo, T., Htut, Y., Aung, M., Allendorf, K., ALLENDORF, K., HAYEK, L.-A., LEIMGRUBER, P., & Wemmer, C. (2006).Community attitudes towards three protected areas in Upper Myanmar, Burma. *Environmental Conservation*, 33(4), 344–352.

Andrade, G. S., & Rhodes, J. R. (2012). Protected areas and local communities: an inevitable partnership toward successful conservation strategies?. *Ecology and Society,* 17(4).

Ap, J. (1992). Residents' perceptions on tourism impacts. *Annals of Tourism Research*, 19(3), 665–690.

Ayodele, J. T., & Abubakkar, M. B. (2001). Trace metal levels in Tiga Lake, Kano, Nigeria. *Tropical Environmental Resources*, 3(2), 230-237.

Bagherian, R., Samah, B., Samah, A. A., & Ahmad, S. (2009). A social exchange approach to people's participation in watershed management programs in Iran. *European Journal of Scientific Research*, 34(3), 428-441.

Bagherian, R., Samah, B., Samah, A., & Ahmad, S. (2009). Factors influencing local people's participation in watershed management programs in Iran. *American-Eurasian Journal of Agricultural & Environmental Science*, 6(5), 532–538.

Bajracharya, S. B., Furley, P. A., & Newton, A. C. (2006). Impacts of community-based conservation on local communities in the Annapurna Conservation Area, Nepal. *Biodiversity & Conservation*, *15*(8), 2765-2786.

Bennett, A. F. (2016). Eucalypts, wildlife and nature conservation: from individual trees to landscape patterns. *Proceedings of the Royal Society of Victoria*, 128(1), 71-86.

Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., & Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological conservation*, *205*, 93-108.

Bhandari, D., & Jianhua, Z. (2017). Household dependency on buffer zone community forest and its implication for management of Chitwan National Park, Nepal. *International Journal of Sciences,* 3(3), 68-80.

Bolch, T., Buchroithner, M. F., Peters, J., Baessler, M., & Bajracharya, S. (2008). Identification of glacier motion and potentially dangerous glacial lakes in the Mt. Everest region/Nepal using spaceborne imagery. *Natural Hazards and Earth System Sciences*, 8(6), 1329-1340.

Bragagnolo, C., Malhado, A. C., Jepson, P., & Ladle, R. J. (2016). Modelling local attitudes to protected areas in developing countries. *Conservation and Society*, 14(3), 163-182.

Brandon, K. E., & Wells, M. (1992). Planning for people and parks: Design dilemmas. *World Development*, 20(4), 557-570.

Brockington, D., & Igoe, J. (2006). Eviction for conservation: a global overview. Conservation and society, 424-470.

Bruner, A. G., Gullison, R. E., Rice, R. E., & Da Fonseca, G. A. (2001). Effectiveness of parks in protecting tropical biodiversity. *Science*, 291(5501), 125-128.

Carter, N., Jasny, M., Gurung, B., & Liu, J. (2015). Impacts of people and tigers on leopard spatiotemporal activity patterns in a global biodiversity hotspot. *Global Ecology and Conservation*, 3, 149-162.

Castro, A. P., & Nielsen, E. (2001). Indigenous people and co-management: Implications for conflict management. *Environmental Science & Policy*, 4(4-5), 229-239.

Cooney, R., Roe, D., Dublin, H., Phelps, J., Wilkie, D., Keane, A., & Biggs, D. (2017). From poachers to protectors: engaging local communities in solutions to illegal wildlife trade. *Conservation Letters*, 10(3), 367-374.

Cooper, D. R., & Schindler, P. S. (2011). Qualitative research. *Business Research Methods*, 4(1), 160-182.

Dahal, R. (2021). Nepal's Network of Protected Areas and Nature-Based Tourism. In *Nature-Based Tourism in Asia's Mountainous Protected Areas* (pp. 245-268). Springer, Cham.

Dudley, A. M., Rougeulle, C., & Winston, F. (1999). The Spt components of SAGA facilitate TBP binding to a promoter at a post-activator-binding step in vivo. *Genes & Development*, 13(22), 2940-2945.

Eshun, G. (2014). Towards the dual mandate of ecotourism in Africa-comparative evidence from Ghana. *Africa Insight*, 44(3), 164-184.

Everett, R. L., & Lehmkuhl, J. F. (1999). Restoring biodiversity on public forest lands through disturbance and patch management irrespective of land-use allocation. Practical approaches to the conservation of biodiversity. Island Press, *Washington, DC, USA*, 87-105.

Garraway, E., Parnell, J., & Lewis, D. S. (2017). Successful community-based conservation: The story of Millbank and Pterourus (Papilio) homerus. *Insects*, 8(3), 69.

George, E. O., & Oseni, J. E. (2012). The relationship between electricity power and unemployment rates in Nigeria. *Australian Journal of Business and Management Research*, 2(2), 10-17

Gibson C.C. and Marks S.A. 1995. Transferring rural hunters into conservationists: an assessment of community-based wildlife management in Africa. *World Develop*. 23: 941–957.

Hackel, J. D. (1999). Community conservation and the future of Africa's wildlife. *Conservation biology*, *13*(4), 726-734..

Hajjar, L., Cook, B. S., Domlyn, A., Ray, K. A., Laird, D., & Wandersman, A. (2020). Readiness and relationships are crucial for coalitions and collaboratives: Concepts and evaluation tools. *New Directions for Evaluation*, 2020(165), 103-122.

Hamilton, A., Cunningham, A., Byarugaba, D., & Kayanja. (2000). Conservation in a region of political instability: Bwindi impenetrable forest, Uganda. *Conservation Biology,* 14(6), 1722-1725.

Heindorf, C., Reyes-Agüero, J. A., Fortanelli-Martínez, J., & van't Hooft, A. (2021). More than Maize, Bananas, and Coffee: The Inter–and Intraspecific Diversity of Edible Plants of the Huastec Mayan Landscape Mosaics in Mexico1. *Economic Botany*, 75(2), 158-174.

Hutton, J., Adams, W. M., & Murombedzi, J. C. (2005, December). Back to the barriers? Changing narratives in biodiversity conservation. In Forum for development studies (Vol. 32, No. 2, pp. 341-370). Taylor & Francis Group.

Isiugo, P. N., & Obioha, E. E. (2015). Understanding theoretical underpinning of wildlife resource-based conflict in Oban Hills, Nigeria. *Journal of Human Ecology*, 49(1-2), 153-161.

Kahler, J. S., & Gore, M. L. (2012). Beyond the cooking pot and pocket book: Factors influencing noncompliance with wildlife poaching rules. *International Journal of Comparative and Applied Criminal Justice*, 36(2), 103-120.

Kansky, R., & Knight, A. T. (2014). Key factors driving attitudes towards large mammals in conflict with humans. *Biological Conservation*, 179, 93-105.

Kipkeu, M. L., Mwangi, S. W., & Njogu, J. (2014). Community participation in wildlife conservation in Amboseli Ecosystem, Kenya. *Journal of Environmental Science, Toxicology and Food Technology,* 8(4), 68-75

Leach, M., Mearns, R., & Scoones, I. (1999). Environmental entitlements: dynamics and institutions in community-based natural resource management. *World development*, 27(2), 225-247.

Machovina, B., Feeley, K. J., & Ripple, W. J. (2015). Biodiversity conservation: The key is reducing meat consumption. *Science of the Total Environment*, 536(5), 419-431.

Mariki, S. B. (2013). Conservation with a human face? Comparing local participation and benefit sharing from a national park and a state forest plantation in Tanzania. *Sage Open*, 3(4), 21-38.

McAlindon, T. E., Driban, J. B., Henrotin, Y., Hunter, D. J., Jiang, G. L., Skou, S. T., ... & Schnitzer, T. (2015). OARSI clinical trials recommendations: design, conduct, and reporting of clinical trials for knee osteoarthritis. *Osteoarthritis and cartilage*, 23(5), 747-760.

Méndez-López, M. E., García-Frapolli, E., Pritchard, D. J., González, M. C. S., Ruiz-Mallén, I., Porter-Bolland, L., & Reyes-Garcia, V. (2014). Local participation in biodiversity conservation initiatives: A comparative analysis of different models in Southeast Mexico. *Journal of Environmental Management*, 145, 321-329

Milner-Gulland, E. J., Bukreeva, O. M., Coulson, T. N., et al. (2003). Reproductive collapse in saiga Antelope harems. *Nature*, 422(6928), 135.

Mir, Z. R., Noor, A., Habib, B., & Veeraswami, G. G. (2015). Attitudes of local people toward wildlife conservation: A case study from the Kashmir Valley. *Mountain Research and Development*, 34(4), 392–400.

Mogomotsi, G. E. J., Mogomotsi, P. K., & Mosepele, K. (2019). Legal aspects of Trans-boundary water management: An analysis of the intergovernmental institutional arrangements in the Okavango River Basin. *Leiden Journal of International Law*, 1–18.

Mogomotsi, P. K., Stone, L. S., Mogomotsi, G. E. J., & Dube, N. (2020). Factors influencing community participation in wildlife conservation. *Human Dimensions of Wildlife*, 25(4), 372-386.

Mutanga, C. N., Vengesayi, S., Muboko, N., & Gandiwa, E. (2015). Towards harmonious conservation relationships: A framework for understanding protected area staff-local community relationships in developing countries. *Journal of Nature Conservation*, 25, 8–16.

Nassiuma, D. K. (2000). Survey sampling. Theory and methods, 10(1), 59-63. .

Ngoufo, R., Yongyeh, N. K., Obioha, E. E., Bobo, K. S., Jimoh, S. O., & Waltert, M. (2014). Social norms and cultural services-community belief system and use of wildlife products in the Northern periphery of the Korup National Park, South-West Cameroon. *Change and Adaptation in Socio-Ecological Systems,* 1(1), 26-34.

Okonkwo, O. N., Hassan, A. O., Alarape, T., Akanbi, T., Oderinlo, O., Akinye, A., & Oyekunle, I. (2018). Removal of adult subconjunctival Loa loa amongst urban dwellers in Nigeria. PLoS *Neglected Tropical Diseases*, 12(11), 69-80.

Patricia Kefilwe Mogomotsi, Lesego S Stone, Goemeone E. J Mogomotsi & Nqobizitha Dube (2020) Factors influencing community participation in wildlife conservation, *Human Dimensions of Wildlife*, 25:4, 372-386,

Pender, J., Gebremedhin, B., Benin, S., & Ehui, S. (2001). Strategies for sustainable agricultural development in the Ethiopian highlands. *American Journal of Agricultural Economics*, 83(5), 1231-1240.

Ritter, C. D., McCrate, G., Nilsson, R. H., Fearnside, P. M., Palme, U., & Antonelli, A. (2017). Environmental impact assessment in Brazilian Amazonia: Challenges and prospects to assess biodiversity. *Biological Conservation*, 206, 161-168.

Roe, D. (2001). Community-based wildlife management: Improved livelihoods and wildlife conservation? *Bio-Briefs*, 2001(1), 1-4.

Roe, D., Booker, F., Day, M., Zhou, W., Allebone Webb, S., Hill, N. A. O., Kumpel, N., Petrokofsky, G., Redford, K., Russell, D., Shepherd, G., Wright, J., and Sunderland, T. C. H. (2015). Are alternative livelihood projects effective at reducing local threats to specified elements of biodiversity and/or improving or maintaining the conservation status of those elements? *Environmental Evidence*, 4(22), 1-22.

Ruiz-Mallén, I., & Corbera, E. (2013). Community-based conservation and traditional ecological knowledge: implications for social-ecological resilience. *Ecology and Society*, 18(4), 12-19.

Salafsky, N., & Wollenberg, E. (2000). Linking livelihoods and conservation: a conceptual framework and scale for assessing the integration of human needs and biodiversity. *World development*, *28*(8), 1421-1438.

Saunders et al., (2007) Fahrig, L., Arroyo-Rodríguez, V., Bennett, J. R., Boucher-Lalonde, V., Cazetta, E., Currie, D. J., & Watling, J. I. (2019). Is habitat fragmentation bad for biodiversity? *Biological Conservation*, 230, 179-186.

Scheyvens, R. (2007). Exploring the tourism-poverty nexus. *Current Issues in Tourism*, 10(2-3), 231-254.

Sommer, V., & Ross, C. (2011). Exploring and protecting West Africa's primates: The Gashaka primate project in context. *In Primates of Gashaka* (pp. 1-37). Springer.

Songorwa, A. N., Bührs, T., & Hughey, K. F. (2000). Community-based wildlife management in Africa: A critical assessment of the literature. *Natural Resources Journal*, 40(3/5), 603-643

Souto, T., Deichmann, J. L., Núñez, C., & Alonso, A. (2014). Classifying conservation targets based on the origin of motivation: implications over the success of community-based conservation projects. *Biodiversity and Conservation*, 23(5), 1331-1337.

Steffen et al., 2015 Allan, E., Manning, P., Alt, F., Binkenstein, J., Blaser, S., Blüthgen, N., & Fischer, M. (2015). Land use intensification alters ecosystem multifunctionality via loss of biodiversity and changes to functional composition. *Ecology letters*, 18(8), 834-843.

Sterling, E. J., Betley, E., Sigouin, A., Gomez, A., Toomey, A., Cullman, G., ... & Porzecanski, A. L. (2017). Assessing the evidence for stakeholder engagement in biodiversity conservation. *Biological conservation*, 209, 159-171.

Tabuti, J. R., Lye, K. A., & Dhillion, S. S. (2003). Traditional herbal drugs of Bulamogi, Uganda: plants, use and administration. *Journal of Ethnopharmacology*, 88(1), 19-44.

Tagowa, W. N., & Buba, U. N. (2012). Emergent strategies for sustainable rural tourism development of Gashaka-Gumti National Park, Nigeria. *WIT Transactions on Ecology and the Environment*, 161, 27-41.21. UNEP-WCMC 2014

Tanvir, O. F., & Afroze, Z. A. (2016). Role of community youths in conservation of forests and protected areas of Bangladesh. *International Journal of Biological and Ecological Engineering*, 10(1), 230-233.

Tessema, M. E., Liliehohm, R. J., & Asshenafi, Z. T.-W. (2010). Community attitudes management toward wildlife and protected areas in Ethiopia. *Society and Natural Resources,* 23(6), 489–506

Vimal, R., Khalil-Lortie, M., & Gatiso, T. (2018). What does community participation in nature protection mean? The case of tropical national parks in Africa. *Environmental Conservation*, 45(4), 333-341.

Wade, A. A., & Theobald, D. M. (2010). Residential development encroachment on US protected areas. *Conservation Biology*, 24(1), 151-161.

Wahyuni, D. (2012). The research design maze: Understanding paradigms, cases, methods and methodologies. *Journal of applied management accounting research*, 10(1), 69-80.

Watts, S., & Faasen, H. (2009). Community-based conflict resolution strategies for sustainable management of the Tsitsikamma National Park, South Africa. *South African Geographical Journal,* 91(1), 25-37

Wilson, T. S., Sleeter, B. M., Sleeter, R. R., & Soulard, C. E. (2014). Land-use threats and protected areas: A scenario-based, landscape level approach. *Land,* 3(2), 362-389.