Community Perceptions and Attitudes towards Conservation of Wildlife in Uganda

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Abstract

Community perceptions and attitudes towards the parks and wildlife in Kibale and Queen Elizabeth Conservation Areas, Uganda are explored. We determined local community perceptions and attitudes through a household survey from May 2018 to April 2019 using literature review, focused group discussions, Geographical Information System/remote sensing, and semi-structured interviews from 208 respondents randomly selected from local communities living adjacent to the wildlife-protected areas. Socio-demographic factors mainly gender, age, education level, and distance of household from the park boundary influence (at α=0.05 and 0.001) local community perceptions and attitudes towards wildlife conservation. Local community perceptions of the park and wildlife were influenced (at α=0.05 and 0.001) by community knowledge and awareness of the existence and importance of the park, its attributes, wildlife resources, and benefits. Local community attitudes were influenced (at α=0.05 and 0.001) by the level of conservation education and awareness, resource access and use, handling of victims of illegal entry into the parks, and the costs incurred from invasion by wild animals. We conclude that socio-demographic factors, community knowledge and awareness of the existence of the park, its attributes and resources, community benefits, and costs incurred by the community as a result of invasion by wild animals and vermin, influence community perceptions and attitudes towards conservation of parks and wildlife. The wildlife agency should integrate local community perceptions and attitudes into the park management plans, intensify wildlife conservation education and awareness programs, and provide incentives to local communities to improve community perceptions and attitudes towards the park and wildlife.
Keywords: Biodiversity conservation, local communities, protected areas, socio-demographic variables

Introduction

The term attitudes have been used for positive or negative responses toward an entity or object (Karanth & Nepal, 2012), and is defined as a mental evaluation of a particular entity with some degree of favor or disfavor (Gebregziabher & Soltani, 2019). Attitudes are formed through an individual's experience and perceptions (Infield & Namara, 2001). Attitudes of local people can provide insights into how they will behave, how they comply with wildlife protection regulations, how they respond to economic losses caused by wildlife, nd the degree to which they are willing to coexist with wildlife (Balakrishnan & Belay, 2017). Attitudinal studies have widely been adopted to evaluate the impact and acceptance of conservation involvement on local communities (Bragagnolo et al., 2016). The conservation of wildlife is to a large extent dependent on community acceptance (Kleiven et al., 2004). People's perceptions reflect the beliefs that they derive from their experiences and interactions with a particular phenomenon (Mulrennan et al., 2012; Gebregziabher & Soltani, 2019).

Protected areas (PAs) that exclude local communities or their participation have often caused negative relationships between PAs and local communities, resulting in conflicts and problems such as increased illegal hunting, habitat encroachment and destruction, violence, and poverty among indigenous communities (Nepal, 2002; Choudhry, 2004; Graham et al., 2005; Romañach, 2011). This background continues to influence the communities' perceptions of wildlife conservation (Strickland-Munro et al., 2010). Local people can be a direct threat to PAs when they refuse to cooperate with PA authorities or participate in PA agencies' conservation activities (Holmes, 2007; Holmes, 2013), to the detriment of wildlife conservation (Strickland-Munro & Moore, 2013). The sustainability of biodiversity management programs relies on the nexus of the community's perceptions, knowledge, and awareness of the problems of biodiversity deterioration and mitigation measures (Mengistu & Assefa, 2020). Biodiversity awareness campaigns were reported to raise the knowledge and hence the higher level of community participation in conservation of biodiversity (Montana & Mlambo, 2019).

Snyman (2012) noted that many perception studies have focused on one study area and did not compare community perceptions between different conservation areas. In Uganda, studies have coined a lot on the role of communities in wildlife conservation (Mugisha, 2002). However, little information has been documented on community perceptions and attitudes towards wildlife conservation, and hence, a great need for scientific information on the perceptions and attitudes of local communities adjacent to the PAs towards wildlife conservation, and also generate best practices and recommendations to engage local communities in conservation. We hypothesized

that there is a strong relationship between socio-demographic variables and perceptions and attitudes of local communities towards parks and wildlife. We also tested the hypothesis that there is a strong relationship between community perception and conservation of parks and wildlife. Finally, we tested the hypothesis that there is a strong relationship between community attitudes and the conservation of parks and wildlife. We tested these hypotheses using specific objectives: (i) to determine the demographic factors that influence community perceptions and attitudes towards wildlife conservation, (ii) to determine the local community perceptions of wildlife conservation, and (iii) to assess the attitudes of local communities towards the parks and conservation of wildlife, and (iv) to determine and recommend best practices to improve community perceptions and attitudes towards wildlife conservation. Understanding the findings could contribute towards designing effective conservation programs outside the wildlife protected areas, and reducing resource-based conflicts involving local communities and park management.

Materials and methods

Our study covered an area bounded by altitudes 0° 34' South and 1° 09' North and longitudes 29° 28' West and 30° 56' East in the Albertine Graben, Uganda. The wildlife-protected areas studied were 4 national parks and 4 wildlife reserves. Specifically, they were Kibale National Park (795 km^2), Semuliki National Park (220 km^2), Toro-Semliki Wildlife Reserve (542 km^2) and Katonga Wildlife Reserve (207 km^2) in Kibale Conservation Area; and Queen Elizabeth National Park (1978 km^2), Rwenzori Mountains National Park (995 km$^{2.}$), Kyambura Wildlife Reserve (157 km^2) and Kigezi Wildlife Reserve (330 km^2) in Queen Elizabeth Conservation Area (Fig.1). The landscape experiences a bimodal rainfall pattern occurring during March-May, and August- to November. Annual rainfall ranges from 800 mm to 1600 mm and is greatly influenced by altitude. The landscape lies astride the equator. It experiences small annual variation in air temperature; and the climate is generally hot and humid, with average monthly temperatures varying between 27°C and 31°C, with maximums consistently above 30°C and sometimes reaching 38°C Average minimum temperatures are relatively consistent and vary between 16°C and 18°C. The average monthly humidity is between 60 and 80%. The high air temperatures result in high evaporation rates causing some parts to have a negative hydrological balance. The drainage consists of three main lakes; Lake Albert, Lake Edward, and Lake George, and there are several rivers and streams. A wide variety of vegetation ecosystems and species are known to

exist in this landscape; on the mountain and escarpment slopes and in the valleys and flats. The main vegetation ecosystems include montane forests, tropical forests (including riverine and swamp forests), savannah woodlands and grassland mosaics, papyrus, and grassland swamps. (NEMA, 2009)
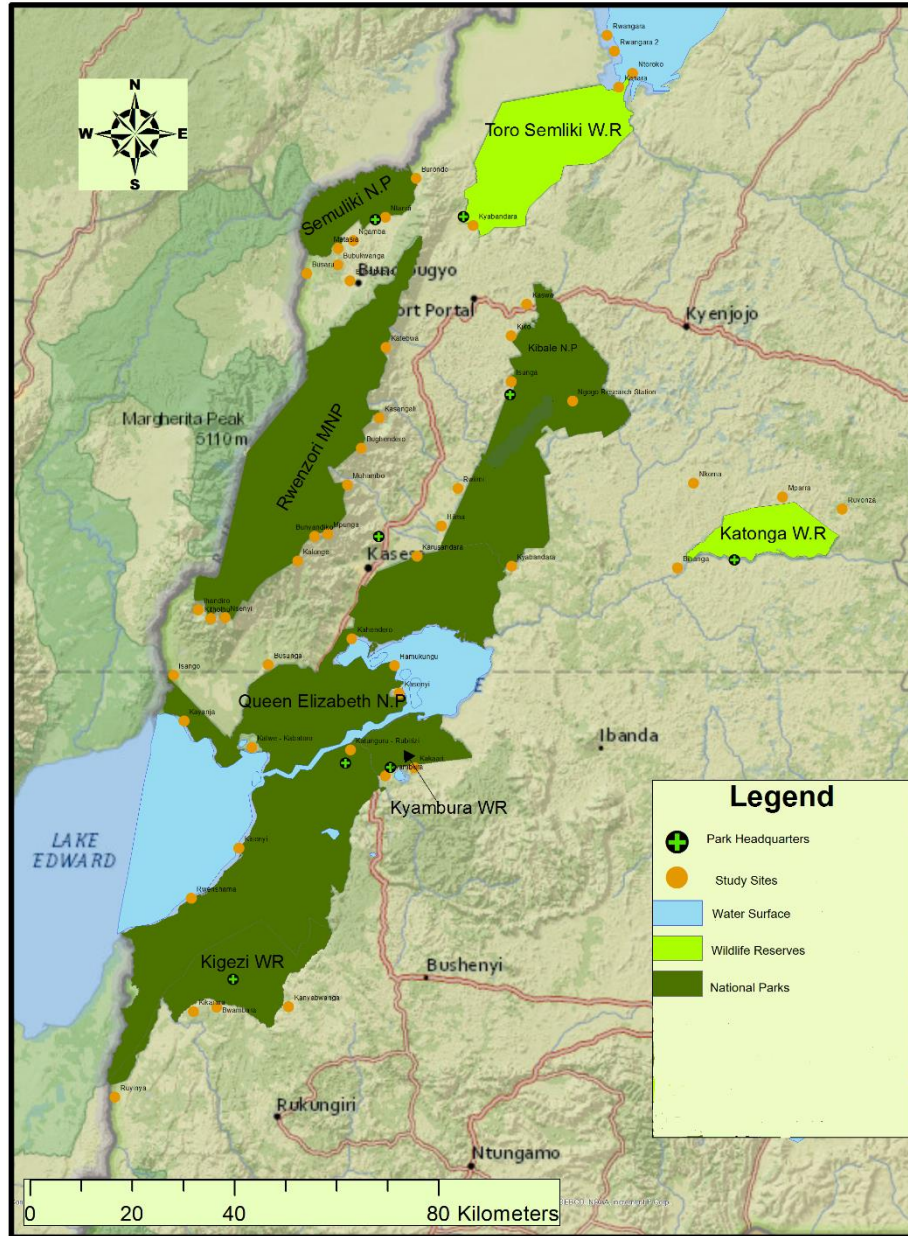
Figure 1. Map of Kibale and Queen Elizabeth Conservation Areas showing Location of Study Sites

We determined the sample size of the respondents using the method adopted by Krejcie and Morgan, 1970. We adopted a stratified and purposive sampling technique to collect focused information from 208 respondents who were segregated as 69 females and 139 males in

households adjacent to the case study wildlife protected areas (national parks and wildlife reserves).

We developed a structured questionnaire by considering the various socio-demographic and cognition variables (e.g knowledge, and experience) (Tadesse & Kotler, 2016) that likely affect the perceptions and attitudes of local people towards the parks and wildlife. Most socio-demographic, knowledge, and experience measuring questions were measured on a nominal scale and rated using 2=yes, and 1=no. Distance between the residential area of the respondents and the edge of the park or wildlife reserve, sex, age, family size, level of education, occupation, land acreage, a distance of household from the park boundary, and length of residence in the area was measured in continuous quantitative values. Information on benefit-sharing (conservation awareness and education, resource access, revenue sharing, community tourism, user rights, and wildlife enterprises/business opportunities), was measured on a nominal scale and rated using 2=yes, and 1=no. Some questions in the questionnaires required the respondents to indicate the extent to which they agreed with the given statements concerning their perceptions and attitudes towards the wildlife protected area on a five-point Likert scale rated using 5=strongly agree, 4=agree, 3= neither agree nor disagree, 2=disagree, and 1=strongly disagree (Likert, 1932). The five-point Likert scale was used to prevent respondents from being too neutral in their responses (Colman et al., 1997). Questions that required the respondents to indicate their level of interest in the conservation of the park and its attributes, were measured on a nominal scale and rated using 5=very interested, 4=interested, 3=neutral, 2=not interested and 1= not very interested. For the supplementary open-ended questions, the respondents narrated their experiences and knowledge about living adjacent to the park or wildlife reserve.

To collect data, we carried out a detailed review of relevant literature to gain an understanding of the attitudes and perceptions of local communities around the wildlife-protected areas. Documents reviewed included recently published academic journals and existing relevant park documents. We also held focused group discussions (FGDs) comprised of 9-12 people selected based on their age, knowledge about the area, a distance of household from the park boundary, and duration of residency in the study area. A total of 16 FGDs were held in the selected eight wildlife-protected areas. Two FGDs were conducted for each selected wildlife PA. Each group was made up of youth, women, men, the elderly, religious leaders, representatives of the private sector, and local authorities. Further, we conducted a household survey from May 2018 to April 2019 with permission from Uganda Wildlife Authority. For each sampled household, Global

Positioning System (GPS) points were collected using Garmin eTrex GPS and exported to Geographical Information System (GIS) software ESRI ArcGIS version 10.31 for map production. We used a semi-structured questionnaire to capture the respondents' socio-demographics, their knowledge and awareness, perceptions (how individuals viewed issues), and attitudes (actions taken as a result of how they view issues) towards the wildlife-protected areas. The sampled households were in the range of ≤10km from the PA boundary (Fig. 1) as these were believed to have much interaction with the protected area (Gandiwa et al., 2014).

Then data were analyzed using descriptive statistics, and inferential statistics as in the Statistical Package for the Social Sciences (SPSS) Version 22. The statistical tests used in the analysis were the Independent Samples t-test to compare community responses, Kruskal-Wallis Analysis of Variance (ANOVA) to test whether there were significant differences in community attitudes and perceptions of wildlife conservation, Pearson Chi-square test to compare the differences between frequencies, Spearman's rho correlation coefficient (r) was used to establish demographic factors that influence community perceptions of wildlife conservation, and Cronbach's alpha coefficient (α) to determine the scale's internal consistency and reliability. The Cronbach's alpha coefficient (α) results in the scale's internal consistency and the scales' reliability ranged from 0.62 to 0.89 in all the communities. These reliability results were all acceptable as the recommended value for α was 0.784 for all the measures.

Results

Demographic factors that influence community perceptions and attitudes toward wildlife conservation

The sample largely mirrors the population and the respondents well represented the communities adjacent to the national parks and wildlife reserves in the study area. The study considered various demographic factors (gender, age, education level, occupation, length of residence, and distance of household from the park boundary (Table 1).

Table 1. Demographic Characteristics of the Survey Respondents

Variable	Categories	Frequency	Percentage (%)	χ^2	df	P-value	Cramer's Value
Sex of the respondent	Male	139	66.8	23.558	1	0.000	0.231
	Female	69	33.2				
Age of the respondent	18-31 years	56	27.3	137.263	3	0.000	0.350
	32-45 years	118	57.6				
	46-60 years	15	7.3				
	61+ years	16	7.8				
Marital status	Married	154	77	58.32	1	0.000	
	Not Married	46	23				
Level of education of the respondent	Primary	82	42.1	88.051	4	0.000	0.159
	Secondary	57	29.2				
	Certificate	21	10.8				
	Diploma	20	10.3				
	Degree	15	7.7				
Type of housing	Permanent	60	31.6	41.523	3	0.000	0.291
	Semi-permanent	90	47.4				
	Mud and wattle	36	18.9				
	Other	4	2.1				
Acreage (if owns the land)	<1 hectare	11	5.7	162.091	2	0.000	0.249
	1-5 hectares	142	73.2				
	>6 hectares	41	21.1				
Length of residence near the PA	1-3 years	8	4.2	174.884	3	0.000	0.617

	4-6 years	13	6.8				
	7-9 years	9	4.7				
	10 years and above	160	84.2				
Occupation	Formally employed	15	10.2	69.023	4	0.000	0.598
	Business	23	15.5				
	Religious leaders	2	1.4				
	Peasant farmers	85	57.4				
	Fisherfolk	23	15.5				
Distance of household from the park boundary	<5km	145	75.1	190.465	1	0.001	0.201
	6-10km	48	24.9				

Analysis by Spearman's rho (ρ) correlation coefficient revealed varied correlations between demographic factors and community perceptions and attitudes (Table 2) There was a significant positive association between age and community perceptions and attitudes toward the importance of the park to protect plants and trees, ($r_s(208)=.708$, $p<.01$), wild animal species, ($r_s(208)=.712$, $p<.01$), and parkland, ($r_s(208)=.531$, $p<.05$). There was a significant positive association between level of education and community perceptions and attitudes toward the importance of the park to protect plants and trees, ($r_s(208)=.763$, $p<.01$), and wild animal species, ($r_s(208)=.733$, $p<.05$). Further, there was a negligible correlation between gender, and community perceptions and attitudes toward the importance of the park in protecting animal species, ($r_s(208)=.049$, $p<.05$); and between the distance of households from the park boundary and community perceptions and attitudes of punishing people who poach, ($r_s(208)=.024$, $p<.05$) (Table 2).

Table 2. Relationship between Demographic Factors and Community Perceptions and Attitudes of Wildlife Conservation. (Values are Spearman's rho (ρ) correlation coefficient)

Demographic factors	Conservation perception					
	It is important to protect plants and trees in the park	It is important to protect wild animal species in the park	People who poach should be punished	It is good parkland is protected	I think the park was created for the betterment of the community	I am happy that my village borders or is in the park
Gender	r_s=.009, p<.01	r_s=.049, p<.05	r_s=.992, p>.01	r_s=.147, p>.01	r_s=.978 p>.01	r_s=.591 p>.01
Age	r_s=.708, p<.01	r_s=.712 p<.01	r_s=.093 p>.01	r_s=.531 p<.05	r_s=.034 p<.05	r_s=.005 p<.01
Level of education	r_s=.763, p<.01	r_s=.733, p<.05	r_s=.318, p>.01	r_s=.309, p>.01	r_s=.878, p>.01	r_s=.284, p>.01
Distance of household from PA	r_s=.533, p>.01	r_s=.751, p<.01	r_s=.024, p<.05	r_s=.533, p>.01	r_s=.518, p>.01	r_s=.982, p>.01
Length of residence	r_s=.822, p>.01	r_s=.946, p>.01	r_s=.479, p>.01	r_s=.349, p>.01	r_s=.609, p>.01	r_s=.031, p>.01
Household size	r_s=.916 p>.01	r_s=.202, p>.01	r_s=.560, p>.01	r_s=.451 p>.01	r_s=.735, p>.01	r_s=.569, p>.01
Acreage (if owns land)	r_s=.371, p>.01	r_s=.649, p>.01	r_s=.774, p>.01	r_s=.042, p<.05	r_s=.196, p>.01	r_s=.600, p>.01

Local Community Perceptions of the Park

Purpose of the park—Regarding the purpose of the parks, analysis of the community responses indicated no statistically significant difference in responses ($F_{(3, 205)} = 1.239$, p = 0.298, α = .05). Eighty-two percent (82%) of the respondents indicated conservation of wildlife, 16% tourism development, and the rest indicated fulfillment of local social needs and conservation of bio-cultural diversity.

Visit the parks—Twenty-two percent (22%) of the respondents had visited the park (χ^2 (1, N=208)=6.523, p=0.089, Cramer's Value=.204), and their reasons for visitation varied: with resource uptake scoring 97%, tourism (2%), and 1% for study purposes. Those who did not visit the park cited various reasons: high park entry fees (56%), viewed the park as a liability to them due to human-wildlife conflicts (12%), and the rest "had no reason to visit".

Community benefits—Communities derive benefits from the parks through the collaborative resource management program (where protected area management shares benefits, decision-making, authority, and responsibility in the management of protected areas or their resources with the local people). The benefits include resource access and use (21%), employment (19%), environmental services (18%), community tourism enterprises (17%), appreciating wildlife and beauty (8%), revenue sharing (5%), culture-related benefits (5%), scholarships (5%), and wildlife use rights trailed with (2%) and these benefits contribute to poverty reduction, as revealed by the statistically significant result of χ^2 (8, N=208) = 38.479, p=.001, Cramer's Value= .283.

Local Community Perceptions of the Park's Attributes

Park boundaries—Local communities were aware of the park boundaries, as revealed by the statistically significant results from the one-way ANOVA ($F_{(3, 205)}$ = 4.717, p = 0.001, α = .001). However, there were still human-wildlife conflicts (a situation that arises when wildlife's requirements overlap with those of the human population creating costs to the affected people and wildlife) along the park boundary arising from crop-raiding, loss of livestock to predators, human injuries, and death resulting from animal attacks, and shifting of park boundaries as a result of crop cultivation, and river channel migration specifically in the Semuliki National Park.

Management of the park and park resources—Analysis using the Pearson Chi-Square revealed statistically significant results on who manages the park and park resources (χ^2 (1, N=208) = 13.288,

p= 0.000, Cramer's Value=.289). Specifically, 95% of the respondents indicated that the wildlife agency (Uganda Wildlife Authority) manages the parks, while the rest didn't know.

Community conservation/Involvement of local communities in park management activities—The focused group discussions with the communities and park staff indicated that park authorities involve the local communities in the benefit-sharing schemes mainly conservation awareness and education, collaborative resource management, resource access, revenue sharing, community tourism, and wildlife enterprises/business opportunities. However, the communities were not aware of the wildlife user rights policy.

Institutional arrangements—The focused group discussions with the communities and park staff, revealed that there were no established community conservation institutions that would participate in managing the wildlife in-situ and ex-situ.

Legal and illegal activities—Some residents in the communities were involved in illegal activities mainly armed poaching for game meat, illegal entry into the park, and resource uptake (trees for timber and building poles, charcoal burning, domestic animal grazing, medicinal plants, fish, wild honey, ivory from elephants, and harvesting of *Prunus africana* bark especially in KNP and RMNP). As a result, the victims when arrested were punished. Communities knew victims punished for participating in illegal activities in the park, and 54% of the respondents viewed the punishments as too harsh and stringent (χ^2 (3, $N = 208$) = 1.702, $p = .001$, Cramer's Value=.636). The punishments included imprisonment, fines, and community service.

Wildlife population—With regards to the response to the question "In your view, has the park contributed to the increase in wildlife numbers?" the results were not statistically significant ($F_{(3, 205)}$ = 1.132, p = 0.338, $\alpha = .001$).

Research and monitoring—From the FGDs, local communities were not involved in wildlife research and monitoring across the wildlife PAs which involvement would not only present an opportunity for indigenous knowledge but also create an attitudinal change in communities towards the parks and wildlife.

Tourism development—From the FGDs, the local communities indicated that they were aware that the parks are areas of both foreign and domestic tourism. They present an opportunity for local communities to participate in community-based tourism.

Local Community Perceptions of Conservation of the Park and Park Resources

Knowledge and awareness of the importance of the park and park resources—Regarding the level of knowledge and awareness of the importance of the park and park resources, 61.5% of the local communities expressed that they were aware while the rest were not aware (χ^2 (1, $N = 208$) = 43.511, $p = .000$, Cramer's Value=.468).

Conservation of the park and park resources—Analysis of the community perceptions towards the conservation of park and park resources using the Kruskal-Wallis One Way ANOVA test indicated significant differences in their perceptions towards the protection of parkland, the plants, and wild animals therein. (Table 3).

Challenges from the park and its resources—We generated a list of challenges, which affect community perceptions about wildlife PAs by asking people why they liked or disliked neighboring the park and the challenges they face from the park. Fifty-nine percent (59%) of the respondents (N=208) indicated that they disliked living adjacent to the PAs because of the challenges they pose to them. The key challenges identified by this percentage (59%) of the respondents were crop raids (51.3%), injury or death to humans (13.9%), zoonotic diseases attacking livestock (12.2%), unfriendly park policies 11.3%, and beating by the park patrol team when illegally found in the park (11.3%). The remaining 51% of the respondents (N=208) indicated that they liked living adjacent to the wildlife PAs.

Table 3. Community Perceptions of Conservation of the Park and Park Resources

| Conservation perception	Rating of protected areas using the Likert scale (Values are the mode)								Kruskal-Wallis One Way ANOVA (α = .001)					
	Kibale NP	Semuliki NP	Toro-Semliki WR	Katonga WR	Queen Elizabeth NP	Rwenzori Mountains NP	Kigezi WR	Kyambura WR	Responses (N)	Sum of Squares	df	Mean Square	F value	P-value
It is important to protect plants and trees in the park	5	5	5	5	5	5	5	5	208	20.822	3	6.941	3.676	0.000
It is important to protect wild animal species in the park	5	5	5	5	5	5	5	5	208	27.847	3	9.282	5.756	0.001
People who poach should be punished	4	4	4	4	4	4	4	4	208	21.481	3	7.16	0.609	0.610
It is good to parkland is protected	5	5	5	5	5	5	5	5	208	48.659	3	16.22	7.457	0.000
I think the park was created for the betterment of the community	2	2	5	5	1	2	2	2	208	35.482	3	11.827	3.339	0.021
I am happy that my village	2	5	5	5	1	5	1	1	208	135.019	3	45.006	2.298	0.080

borders or is in
the park

NP= National Park; WR= Wildlife reserve

**Local community attitudes towards the park and wildlife conservation**

Community-park relations—Regarding the attitudes of the local communities towards the park authorities, 44% of the respondents indicated a friendly attitude, 33% indicated that it depends on the situation, 18% reported an unfriendly attitude, and 5% were non-committal. Analysis using the Pearson Chi-Square revealed statistically significant results that the attitudes of park authorities towards communities affect community participation in the conservation and management of protected areas (χ^2 (3, N=208) =24.815, p=.000, Cramer's Value= .229) and the high Cramer's value indicates a very strong effect of the attitudes of local communities towards the wildlife PAs. Further analysis using Kruskal-Wallis One Way ANOVA revealed a statistically significant difference in community responses on community-park relations with $F_{(3, 205)} = 4.526$, p = 0.001, α = .05. And this interaction contributes towards conservation of wildlife ($F_{(3, 205)} = 10.549$, p = 0.000, α = .05). Given this attitudinal rating, the response to the question "what do you recommend about the future of wildlife protected areas? the majority of the respondents (74.8%) recommended co-existence with the wildlife protected areas and a paltry 8.6% recommended closure, and degazettement, and the rest were not decided (χ^2 (2, N = 208) = 21.699, p = .001, Cramer's Value=.282) and the high Cramer's value indicates a very strong effect that conservation areas have on the community

Community interest in knowing about conservation of the park and park resources—The responses of the park adjacent communities on the level of community interest in knowing about conservation of the park and park resources revealed that 41.3% of the respondents were "interested" and 39.1% were "very interested." When combined, the overall community interest in knowing about the conservation of the park and park resources totals 80.4%. (Fig. 2) Further analysis using Kruskal-Wallis One Way ANOVA revealed a statistically significant difference in community responses on the level of community interest in knowing about the conservation of the park and park resources with $F_{(3, 205)} = 5.231$, p = 0.001, α = .05.
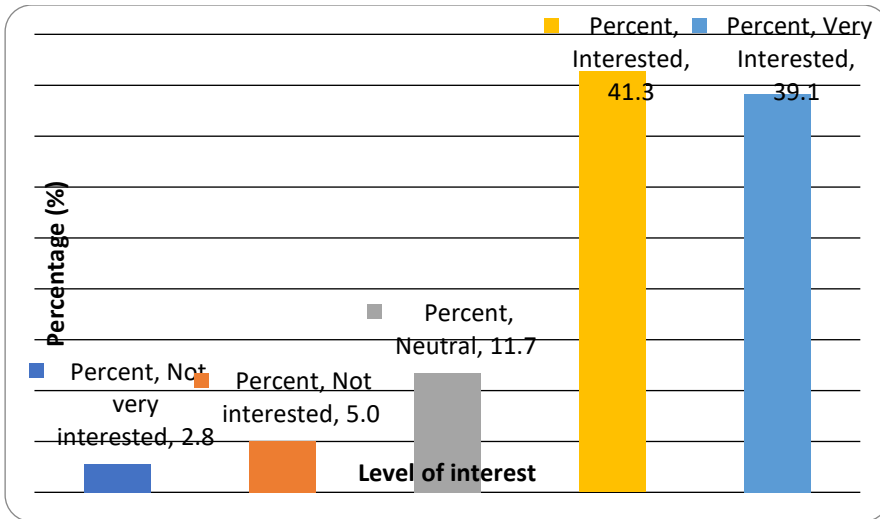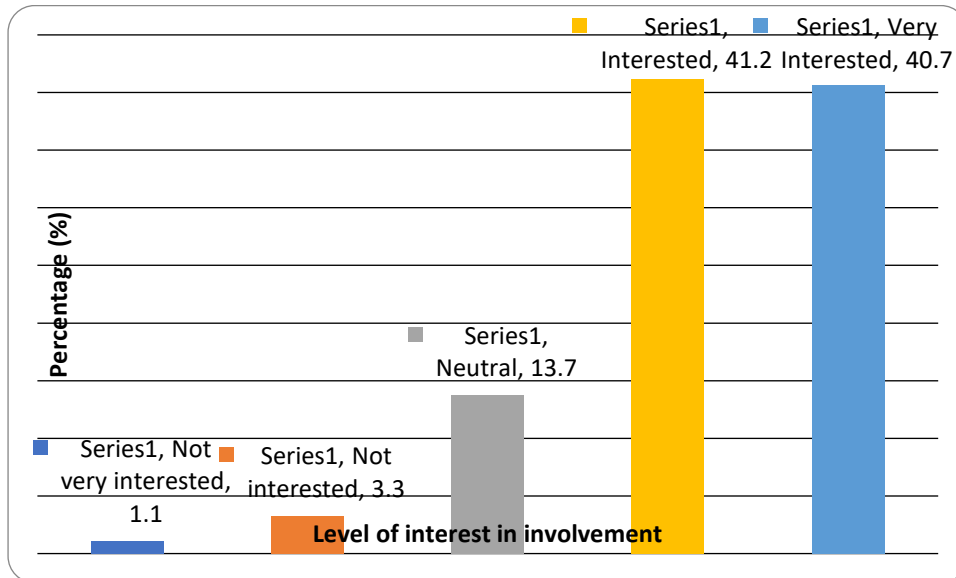
Figure 2. Local community interest in knowing about the conservation of the park and park resources

Level of awareness of communities about the objectives of conservation of the park and park resources—About the level of awareness of communities about the objectives of conservation of the park and park resources, the analysis indicated that 83% of the respondents showed interest. (Fig. 3) Further analysis using Kruskal-Wallis One Way ANOVA revealed a statistically significant difference in community responses with $F_{(3, 205)} = 4.661$, $p = 0.004$, $\alpha = .05$.
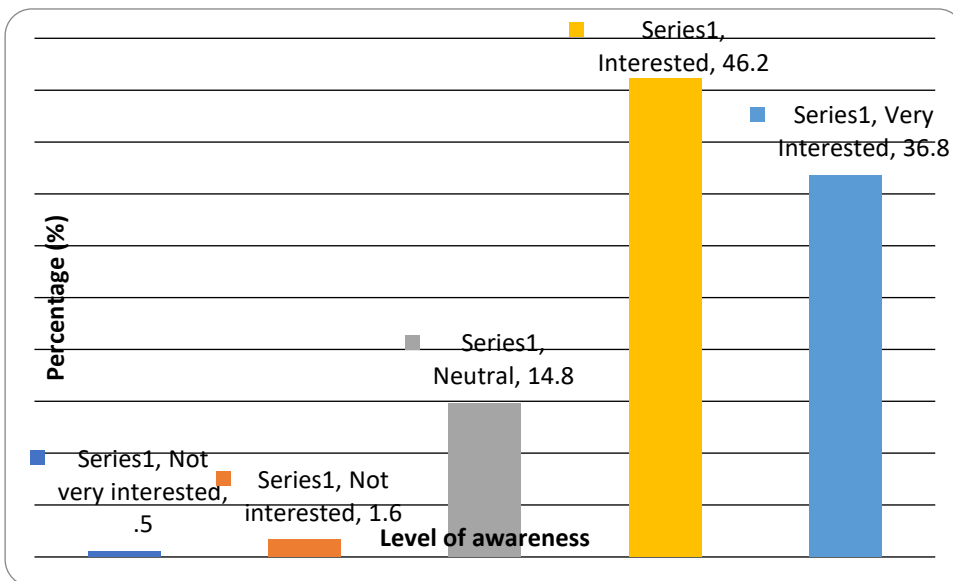
Figure 3. Level of awareness about the objectives of conservation of the park and park resources

Level of interest in involvement in the conservation of the park and the park resources—The level of community interest in involvement in the conservation of the park and park resources revealed that 41.2% of the respondents in the park adjacent communities were "interested" and over 40.7% were "very interested." When combined, the overall community interest in involvement in the

conservation of the park and park resources totals 81.9%. (Fig. 4) Further analysis using Kruskal-Wallis One Way ANOVA revealed a statistically significant difference in community responses with $F_{(3, 205)} = 4.053$, $p = 0.008$, $\alpha = .05$.

Figure 4. Level of interest in involvement in the conservation of the park and the park resources

Level of community involvement in park programmes─Local community involvement in park programs varied. Analysis of whether communities participate in park programs, Kruskal-Wallis One Way ANOVA test revealed statistically significant results for participation in decision making processes ($F_{(3, 205)} = 6.053$, $p = 0.001$, $\alpha = .05$) and benefit sharing program ($F_{(3, 205)} = 2.505$, $p = 0.041$, $\alpha = .05$), and no statistically significant results in resolution of human-wildlife conflicts ($F_{(3, 205)} = 3.777$, $p = 0.062$, $\alpha = .05$).

Impact of wildlife on people's lives and livelihoods─The wildlife protected areas and resources therein impact the local communities affecting their people's lives and livelihoods through loss of crops without compensation (38%), loss of livestock through injury, and transmission of zoonotic diseases (27%), loss to human life (18%), depriving the community of access to land for production activities (11%), and law enforcement operations disturb community (6%). (χ^2 (4, N=208) =9.031, p=0.000, Cramer's Value=.374). In responses to the question "as a community adjacent to the park, what do you value most", 26.5% indicated wildlife resources and their conservation, 24.1% indicated that they valued community activities (e.g cultivation, livestock farming, etc), and 49.4% indicated that a combination of both conservation and community activities was more valuable. (χ^2 (2, N=208) =15.031, p=0.020, Cramer's Value=.233)

Best practices to improve community attitudes

The local communities proposed best practices to park management to improve community attitudes towards the wildlife PAs, and these were: supporting community livelihood/economic options (45%), empowering the local communities (37%), increasing conservation education and awareness (12%), and strengthening park regulations, policies and laws (6%) (χ^2 (3, N=208) =41.531, p=0.000, Cramer's Value=.493).

Discussion

Community perceptions and attitudes towards wildlife and its conservation in Kibale and Queen Elizabeth Conservation Areas are influenced by various socio-demographic factors mainly gender, age, education level, and distance of household from the park boundary. The results of our study support earlier observations by other studies (Byer, 1996; Snyman, 2012; Gandiwa et. al, 2013). Community perceptions are affected by different socio-demographic factors (Snyman, 2012). Age has a significant positive correlation with conservation perceptions (Tessema et al., 2007; Snyman, 2012). This finding supports our first hypothesis that there is a strong relationship between socio-demographic variables and perceptions and attitudes of local communities towards parks and wildlife. Other studies (Kideghesho et al., 2007; Manyama et al., 2014; Masud & Kari, 2015; Mutanga et al., 2015) also reported a correlation between the level of education and conservation attitudes. Better-educated people may be better able to understand the role of protected areas in conservation, as well as the environmental services they provide (Tessema et al., 2010; Allendorf et al., 2012). Further, the distance of the respondent from the park boundary has a significant effect on the attitudes held by individuals. Those from villages bordering protected areas were more negative towards the protected areas than the other group from villages located further from protected areas (Mariki, 2013; Kirumira et al., 2019). The negative attitude is probably due to the costs incurred by local communities from problem animals and vermin through the destruction of crops and livestock, and loss of human life in communities adjacent to the PAs.

The perceptions of the local community towards wildlife conservation were majorly positive. The majority of the local communities acknowledged the existence of the park, its attributes, and its resources. This positive community perception could be influenced by the knowledge and awareness of the park and its park's attributes mainly park management, park boundaries, and knowledge of legal and illegal activities with associated punishments. Further, local communities derive benefits from the parks mainly resource access and use, revenue sharing grants, community tourism

enterprises/opportunities, employment opportunities, environmental services, appreciation wildlife and beauty, culture-related benefits, scholarships, and to a limited extent wildlife use rights. These benefits create a positive perception of the local communities toward wildlife conservation. The benefits boost positive attitudes and perceptions toward conservation (Byer, 1996). This supported our second hypothesis that there is a strong relationship between community perception and conservation of parks and wildlife. Further, local communities had mixed perceptions of wildlife conservation. Some communities perceived the parks as areas majorly for conservation of wildlife, and tourism development; and that they do not support community livelihood improvement initiatives. This perception is likely due to the awareness and knowledge about the park and the conservation of park resources. However, other communities perceive the parks as non-contributing towards the betterment of the community, and this perception could be due to the costs local communities incur as a result of the problem of animals and vermin from the parks. This finding corroborates that of a similar study conducted in Southeastern Zimbabwe (Gandiwa et al., 2013) where communities had mixed perceptions of wildlife conservation. This perception may indicate that the communities generally understand the importance of wildlife conservation (Gandiwa et al., 2013; Muboko et al., 2014; Matema & Andersson, 2015).

The local communities also expressed mixed attitudes towards the park and park resources. The friendly attitude expressed by the majority of the community members was probably due to the conservation education and awareness, quick response by park rangers to scare away stray wild animals back into the wild, and the benefit-sharing program-especially resource access. And because of this gesture, the communities reciprocate by reporting illegalities inside the park-to-park management. However, the negative attitude was probably due to restrictions on resource access and use, poor handling of victims of illegal entry into the parks and wildlife reserves, and the costs incurred by communities regarding loss of crops and livestock and injury or even death to humans as a result of problem animals and vermin from the parks. Communities did not appreciate the fact that their villages bordered the PAs due to the costs they incurred from living closer to PAs, e.g., loss of crops and livestock due to wildlife depredation (Gandiwa et. al, 2013). This supported our third hypothesis that there is a strong relationship between community attitudes and the conservation of parks and wildlife.

Despite the mixed attitudes, the enormous expression of interest in knowing about conservation of the park and park resources, and interest in involvement in conservation programs could be not only

due to the value the communities attach to the park, park resources, and their conservation, but also the conservation awareness and education by park management. Further, local communities felt that living adjacent to the national parks and wildlife reserves is more of a liability than an asset due to their negative impacts on communities depriving the community of access to land, transmitting zoonotic diseases to livestock, and escalating human-wildlife conflict which adversely affects people's livelihoods.

In addition, the hostility in the handling of victims illegally found in the wildlife-protected areas by park management negatively impacts local people's attitudes and perceptions towards the parks and wildlife. The local communities view the handling, including punishments, of victims as too harsh and stringent. These punishments included imprisonment, fines, and community service which deprive the victims of their provisional responsibility to their households and stiffens community-park relations. In extreme cases, the victims suffer injury and even death. However, the punishments by the parks may also foster compliance with parking laws, instill discipline amongst the local communities, and also help observe the park boundaries. The community conservation perceptions on the punishments to people who enter the parks illegally could be an indication that the victims are from within the park adjacent to local communities, and or the victims are their relatives from parishes away from the park boundaries.

The local communities proposed to park management best practices to improve community attitudes towards the wildlife PAs, and these are mainly: empowering the local communities, supporting community livelihood and economic options, improving the handling of victims arrested in illegalities in the parks, and increasing awareness on park laws, policies, and regulations. If benefits are extended to local people and if negative impacts associated with living close to protected areas are mitigated (Lewis, 1996) then community attitudes towards the wildlife protected areas would improve.

Conclusion

The study established that socio-demographic factors mainly gender, age, education level, and distance of household from the park boundary influence local community perceptions and attitudes towards wildlife conservation. The perceptions of local communities towards wildlife conservation were partly positive due to community knowledge of the existence of the park, its attributes, and resources, and its benefits to the community; and partly negative due to the hostility of the park law enforcement team shown in the handling of victims illegally found in the park and costs incurred.

They perceive the parks as areas majorly for conservation of wildlife, and tourism development. However, park management does not support community livelihood improvement initiatives. Further, local communities had mixed attitudes towards the park and park resources and this influences their contribution to wildlife conservation and related issues. Their attitudes are dependent on the level of conservation education and awareness, level of interest in knowing about conservation of the park and park resources, interest in involvement in conservation programs, management of the resource access and use initiative, handling of victims of illegal entry into the parks, and the costs incurred by communities as a result of invasion by wild animals and vermin. To improve community perceptions and attitudes towards the wildlife PAs, park management should emphasize community empowerment, livelihood improvement, strengthening conservation education and awareness, and integration of community perceptions and attitudes in the park management plans.

Acknowledgments

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