# Community Attitude towards Wildlife Conservation: Insights from Hirpora Wildlife Sanctuary, Kashmir Himalayas

## Tariq Ahmad Bhat[1]*, Syed Tanveer[1] and Khursheed Ahmad[2]

[1]* Department of Zoology, University of Kashmir, Srinagar, 160001

[2] Division of Wildlife Sciences, Faculty of Forestry, SKUAST-Kashmir

**Corresponding Author Email:** tariqbhat2525@gmail.com.

**ABSTRACT**

Local attitudes toward wildlife have been shown to be crucial to wildlife conservation success Therefore, we designed a survey to capture community perceptions in this regard at Hirpora Wildlife Sanctuary. A semi-structured interview was conducted with 400 respondents living along the fringe areas of the Hirpora Wildlife Sanctuary. Data was collected by gender, age, profession, marital status, and education. Chi-square and Generalized Linear Modeling were used to examine relationships between variables. The analysis revealed that 51% of respondents have a negative attitude toward wildlife conservation. Gender, age, education, and income source were all factors impacting local people's attitudes toward wildlife in the area. People's opinions toward problem animals were influenced negatively by livestock depredation and crop damage. Promoting environmental education through sensitization is crucial to changing indigenous people's perceptions and attitudes towards protected areas.

**Keywords:** *Attitude, Conservation, Conflict, Awareness, Socioeconomic status*

## INTRODUCTION

Sociocultural adaptations to the environment have played a large role in the current conservation of biodiversity (Martin *et al.,* 2016). Identifying priority conservation areas is crucial to preserving dwindling biodiversity (Geldmann *et al.,* 2013) and protected areas networks are playing an important role in conserving it. However, declaring the protected areas is a contentious issue. The conservationist and governments consider protected areas as effective conservation strategies, while others who depend on these protected areas for their livelihood perceive them as threats (Brockington & Wilkie, 2015). This negative interaction is primarily due to the human-wildlife interaction and constrain to their dependency on forest resources (Sillero-Zubiri *et al.,* 2007). The positive attitudes toward conservation play a vital role in the conservation of wildlife and long run sustenance of the protected areas. It is therefore crucial to understand how local people view conservation in order to improve relationships between them and protected areas (Ciocănea, Sorescu, Ianoşi, & Bagrinovschi, 2016; Mir, Noor, Habib, & Veeraswami, 2015). The human-wildlife interaction constitute a multi–disciplinary area of study that deals with several human and wildlife factors (Conover, 2002). People's attitude towards wildlife and a robust scientific understanding of animal ecology play an important role to manage wildlife conflicts (Naughton-Treves and Treves 2005). People's attitudes toward wildlife differ according to their spatial location and interaction with wildlife (Sitati *et al.,* 2003). Studies suggest that people tend to be more positive when they are benefited from protected areas (Scanlon & Kull, 2009) and engage in conservation efforts (Infield & Namara, 2001), resulting in a greater conservation impact (Struhsaker *et al.,* 2005).

Moreover the restriction of natural resources can hamper these people's ability to meet their basic livelihood needs (Amoah & Wiafe, 2012). Contemporary wildlife management has become so conflict-ridden as a result of these contrasting value positions (Bruskotter *et al.,* 2019; Manfredo *et al.,* 2017). Creating protected areas does not only make it impossible for people to obtain resources, but it can also result in hardship (Mfunda, 2010; Masud *et al.,* 2014). Local communities residing near these protected areas may suffer significant losses (such as raided crops, livestock losses, property damage) (Vedeld *et al.,* 2012) leading to negative attitudes (Baral & Heinen, 2007; Kideghesho *et al.,* 2007; Manyama *et al.,* 2014. Numerous studies have examined attitudes towards wildlife in Asia (Allendorf 2007; Ambastha *et al.,* 2007), and a few in the Himalaya. The present study assessed the effect of socio-demographic and socio-economic factors on attitudes towards conservation awareness and status of human wildlife conflict in the Hirpora Wildlife Sanctuary (HWLS) Jammu and Kashmir. This is the first study to examine community perceptions of Hirpora Wildlife Sanctuary and suggest the factors which influence the local attitudes towards conservation. It could offer insights into the factors that influence local attitudes, and help reduce residents' abhorrence of wildlife by improving ties with the sanctuary.

## MATERIAL AND METHODS
### Study area
A 341km² Hirpora wildlife sanctuary (Fig.1) is located in the Pir Panjal range, 70 km southwest of Srinagar, J&K. It lies in the Shopian district of Kashmir between 33.683°N and 74.717°E at an altitude of 2300-4610 m above mean sea level. Forests, pastures, scrubland, and water bodies enhance the beauty of the sanctuary (Ahmad *et al.,* 2015). In the eastern portion of the terrain, the slopes are gentle to moderately steep, while in the upper north and western sections, the slopes are steep and cliffy. The southern and south-eastern portions are moderately steep. There is a rich diversity of flora and fauna in this area. Pir Panjal Markhor (*Capra falconeri*), Himalayan musk deer (*Moschus leucogaster*), Himalayan black bear (*Ursus thibetanus*), Himalayan brown bear (*Ursus arctos*), Leopard (*Panthera pardus*), Red fox (*Vulpes vulpes*), and Tibetan wolf (*Canis lupus*) are the main faunal elements of the sanctuary. A mixed coniferous forest, deciduous subalpine scrub forest, and subalpine pastures form the vegetation of the sanctuary. The coniferous forests consist of Kail pine (*Pinuswallichiana*) with spruce (*Piceasmithiana*) and fir (*Abiespindrow*), fir dominates subalpine forests, and deciduous sub-alpine scrub is dominated by Himalayan birch (*Betulautilis*), Juniper (*Juniperus communis*), and wild rose (*Rosa macrofolia*) (Ahmad *et al.*, 2011).
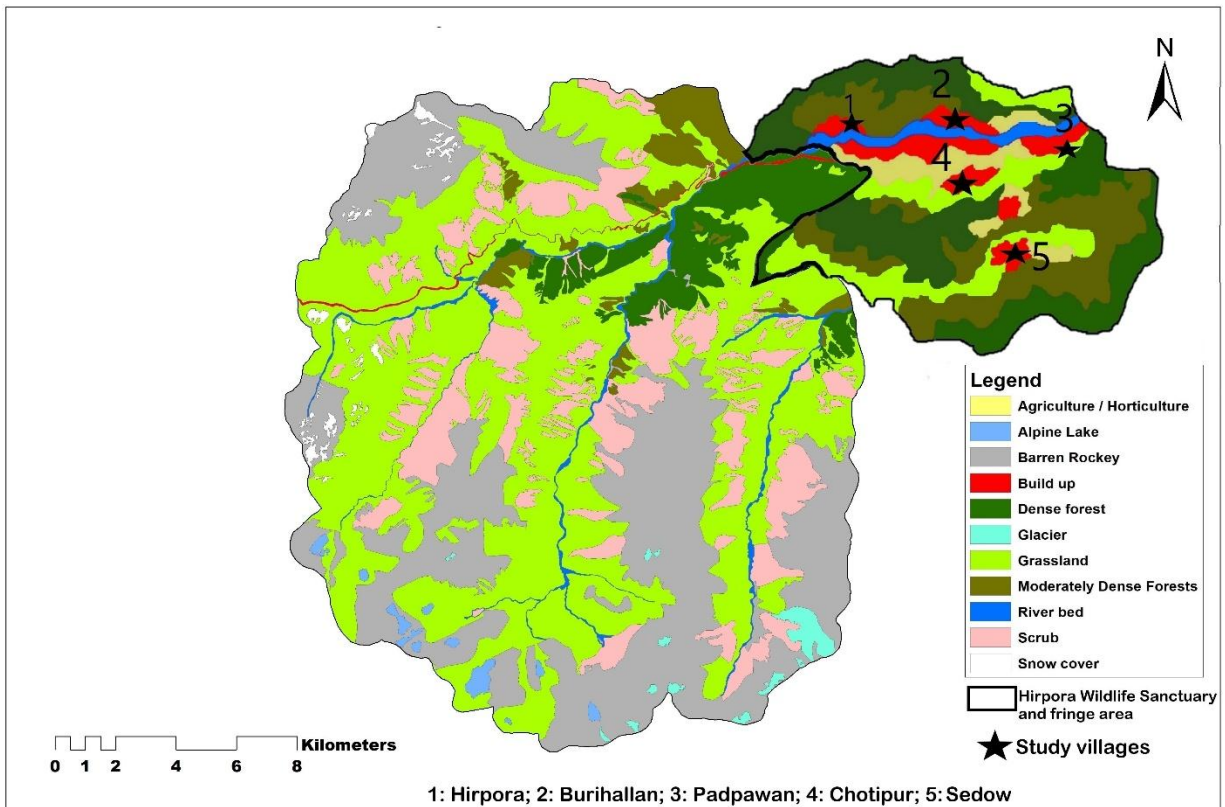
**Fig. 1.** Location of the study area and surrounding villages in Hirpora Wildlife Sanctuary

## Data collection

A semi structured interview method was used to collect the data for this article. Stratified random sampling was used to select households in the sample villages (Hirpora , Padpawan, Burihallan, Sedow and Chotipur) (Fig. 1) to collect primary socio-economic data on the demographic structure of the household, educational status, occupational pattern, income pattern, expectations and their perception on conservation values of wildlife. The questionnaire was prepared in English language and later was translated into the native language by a translator so that all the respondents would understand easily. A total of 400 respondents constituting 14% of the total population were interviewed. The questionnaire assessed the perception of people towards wildlife conservation, status of human wildlife conflict in the study area and seek their suggestions for coexistence between people and wildlife. Interviews with local people were conducted to assess the effectiveness of mitigation strategies in controlling disputes.

## Data analysis

Analyses were conducted using R programming software v. 4.0.2 (R Core Team 2020). Chi-square tests based on the number responses by respondents were used to identify whether there exist significant differences in the response of the respondents by gender, age, profession,

education, marital status, socio-economic status and annual income (i) awareness towards conservation (ii) human wildlife conflict (iii) mitigation measures and (iv) recommendation for human wildlife conflict mitigation.

For the wildlife and its conservation related questions, Generalized Linear Model (GLM) was used in R program software for further analysis. A total of six variables were analyzed, including respondents by gender, age, profession, education, marital status and annual income that are expected to potentially impact respondents' attitudes toward wildlife and its conservation. Initially, the full model was created with all predictor variables, and then additional new models were created by simplifying the full model in order to evaluate the explanatory variables. The model selection was done using the corrected Akaike's information criterion (AICc), a modified version of AIC that includes a bias correction term for small sample sizes (Anderson and Burnham,2002). In general, the model with the smallest AICc is considered the best fit model. (Anderson and Burnham, 2002). Finally, for the selected best fit model, we interpreted the effect of variables on attitudes based on the parameter estimates (β) and plotted the relationship of the significant variables by means of Sankey diagrams. A Sankey chart is a sort of depiction that shows how data moves from one set to another. The entities that are linked are known as nodes, and the interactions are known as connections. Custom colors are allocated to nodes and links in the Sankey graph. Nodes and connections are assigned different color schemes based on their color choices. They symbolize the transfer of data from one entity to another. The entity from which

data flows is referred to as a node; the origin node is the node from which the flow term originated, and the access point from which the flow finishes is the aim base station.

## Results and Discussion
### Demographic and socioeconomic attributes of respondents

Of the total 400 respondents included in the present study, about 71% (n = 285) were male and 29% (n = 115) were female. Age wise, about 31% (n = 125) of the respondents were between 18 and 30 years, about 35% (n = 138) were between 31 and 45 years, about 21% (n = 83) were between 46 and 60 years and the remaining 13% (n= 54) belonged to the age groups of 61–90 years. Furthermore, 28%, (n = 111) of the respondent achieved primary education, 20% (n = 80) achieved secondary education, 7% (n = 26) achieved education at the college and university level each, while as the rest of the 45% (n = 183) respondents were illiterate. The majority of the respondents were farmers (ca. 46%, n = 183), followed by businessmen and household wives (21%, n= 84 each) and government employees (ca. 12%, n = 49). Moreover, majority of the respondents were married (ca. 75%, n = 301), followed by unmarried (ca. 13%, n = 54), separated (ca. 8%, n= 31) and widow (ca. 4%, n = 14).

### Awareness towards wildlife conservation

Using a generalized linear model, attitudes toward wildlife conservation were analyzed with age, gender, education, marital status, profession, and income as predictor variables. Age explained the most variation in attitude (table 1). The 18-30 year age group showed the most (62.4%) support for

conservation among respondents, whereas the 61-90 year age group showed most resistance (77.78%). There was a statistically significant difference between the ages of the respondents regarding wildlife conservation awareness (χ2 = 27.05, df = 3, p 0.001). A low level of education might explain the low level of awareness in the 61-90 year age group. The same findings were found by Carter, Riley, Sortridge, Sherstha and Liu (2014) in Nepal's Chitwan national park. The knowledge of people around Serrengeti National Park varied with age as reported by Massy and Roskaft (2013) and Richard *et al.*, (2014). A person's awareness about wildlife depends mostly on their experience gained from living and coexisting with wildlife for a long time (Barlow and Jung, 2012; Mmassy and Rosskaft, 2013; Tessema *et al.,* 2010). In our study area, older people were less aware of wildlife conservation. Positive attitude towards conservation was expressed by illiterate villagers than well-educated individuals. Several studies have found that well-educated villagers are more likely to hold positive attitudes towards conservation than less educated individuals (Karanth, 2012; Shrestha and Alavalapati 2002; Xu and Lu 2006). According to

another study (Songorwa 1999), education may increase opposition to conservation measures. Conservation strategies may not necessarily be benefited by education (Kideghesho *et al.,* 2007). Furthermore, among respondents, farmers (54.10%) and government employees (55.10%) showed strong positive attitudes towards wildlife conservation, whereas businessmen and household wives (64.29% each) showed more negative attitudes. Although these results differ from those reported by Sarkar *et al.,* 2013. According to Sarkar et al., farmers exhibit a negative attitude because crop raiding by wildlife directly impacts their livelihoods. Ochieng *et al.,* 2021 found that awareness of traditional wildlife conservation methods and attitudes towards wildlife conservation is related to gender and household size. Traditional wildlife conservation methods were known to household heads who were 50 years or older. A positive attitude was more likely to be experienced by those from smaller household sizes (6 persons). The difference in opinion between the professions on awareness for wildlife conservation was statistically significant ($\chi^2$ = 13.56, *df* = 3, *p* < 0.01). Gender, education and income was not a significant factor.

**Table 1.** Attitude of respondents towards wildlife conservation among demographic and socioeconomic variables around HWS

| Category | Variable | Attitude towards conservation | | Statistics | | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | $\chi^2$ | df | P |
| Gender | Male | 139 | 146 | 1.75 | 1 | 0.19 |
| | Female | 47 | 48 | | | |
| Age (in years) | 18-30 | 78 | 47 | 27.05 | 3 | 0.001 |
| | 31-45 | 63 | 75 | | | |
| | 46-60 | 33 | 50 | | | |

|  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
|  | 60-90 | 12 | 42 |  |  |  |
| Education | Primary | 47 | 64 | 3.76 | 4 | 0.04 |
|  | Secondary | 39 | 41 |  |  |  |
|  | College | 5 | 11 |  |  |  |
|  | University | 4 | 2 |  |  |  |
|  | Illiterate | 91 | 96 |  |  |  |
| Marital status | Unmarried | 23 | 31 | 7.29 | 3 | 0.06 |
|  | Married | 150 | 151 |  |  |  |
|  | Separated | 9 | 22 |  |  |  |
|  | Widowed | 4 | 10 |  |  |  |
| Annual income | Below average | 98 | 75 | 16.92 | 2 | 0.001 |
|  | Average | 60 | 112 |  |  |  |
|  | Above average | 28 | 27 |  |  |  |
| Occupation | Farmer | 99 | 84 | 13.56 | 3 | 0.01 |
|  | Businessman | 30 | 54 |  |  |  |
|  | Household wife | 30 | 54 |  |  |  |
|  | Govt. employee | 27 | 22 |  |  |  |

**Factors influencing the respondents' attitude towards awareness for wildlife conservation**
The results of the generalized linear modeling (GLM) revealed that the model that best explained respondents' attitudes toward awareness for wildlife conservation included only one variable i.e., age (Fig.2; Table 2).

**Table 2.** Summarized results of variable identified in the best-fit model on respondents' attitudes toward awareness for wildlife conservation. (Note "*" = p <0.05, "**" = p <0.01)

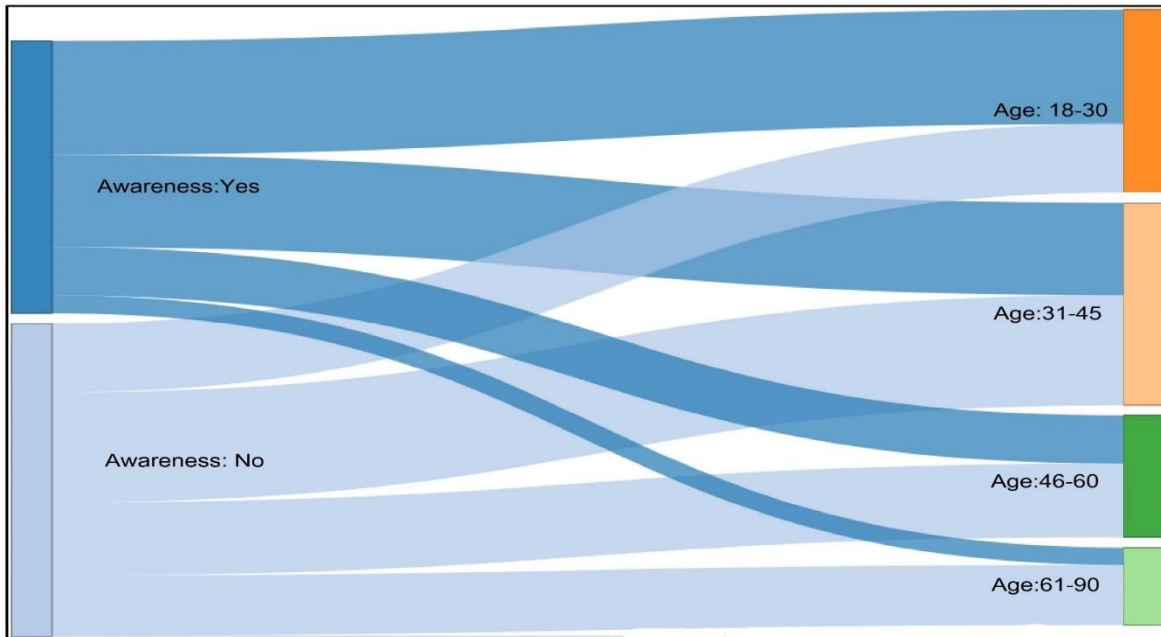| Variable | Parameter estimate (β) | Standard error | P value |
|---|---|---|---|
| Intercept | 0.25160 | 0.09673 | 0.00929 ** |
| Age | 0.080171516 | 0.03908 | 0.04024 * |

**Fig. 2.** Sankey diagram showing the relationship between the respondents' attitudes toward awareness for wildlife conservation and the best predictor (age).

**Attitude towards human-wildlife conflict**

Our study used GLM to investigate respondent's attitude towards human wildlife conflict as the dependent variable and gender, age, profession, marital status, education and income as the independent variables. Education was the only variable significantly related to respondents' attitudes toward human wildlife conflict. Compared to those educated at university level (50%), respondents educated at primary, secondary, and college levels (54.95%, 52.5%, and 68.75%) showed a more positive attitude towards human wildlife conflict (Table 3). A significant effect of education level on attitudes towards human-wildlife conflicts is also evident in the results ($\chi 2 = 16.02$, $df = 4$, $p < 0.01$). There was a more negative attitude toward wildlife conservation in areas where people suffered losses due to depredation and crop damage. Animals that were preying on their livestock or damaging their crops were killed or trapped by these individuals. Results here support findings by Nyahongo and Røskaft (2011), Bandara and Tisdell (2003), Kideghesho (2010) and Holmern and Røskaft (2014), who found that humans' attitudes toward wildlife are shaped by conflicts between wildlife and humans. Hampson *et al.*, (2015) found that local people were more inclined to respond to a predator or problem animal when they face conflict caused by depredation or crop damage.

**Table 3.** Depicting the perception of respondents towards status of human wildlife conflict in the study area

| Category | Variable | Status of HWC | | Statistics | | |
|---|---|---|---|---|---|---|
| | | Increased | Decreased | $\chi^2$ | df | P |
| Gender | Male | 172 | 113 | 3.78 | 1 | 0.052 |
| | Female | 82 | 33 | | | |
| Age (in years) | 18-30 | 86 | 39 | 7.63 | 3 | 0.054 |
| | 31-45 | 80 | 58 | | | |
| | 46-60 | 59 | 24 | | | |
| | 60-90 | 29 | 25 | | | |
| Education | Primary | 61 | 50 | 16.02 | 4 | < 0.01 |
| | Secondary | 42 | 38 | | | |
| | College | 11 | 5 | | | |
| | University | 3 | 30 | | | |
| | Illiterate | 137 | 50 | | | |
| Marital status | Unmarried | 33 | 21 | 8.44 | 3 | 0.05 |
| | Married | 193 | 108 | | | |
| | Separated | 15 | 16 | | | |
| | Widowed | 13 | 1 | | | |
| Annual income | Below average | 128 | 45 | 15.72 | 2 | <0.001 |
| | Average | 92 | 80 | | | |
| | Above average | 34 | 21 | | | |
| Occupation | Farmer | 126 | 57 | 25.39 | 3 | <0.001 |
| | Businessman | 34 | 50 | | | |
| | Household wife | 62 | 22 | | | |
| | Govt. employee | 32 | 17 | | | |

**Factors influencing the respondents' attitude towards human wildlife conflict**

The results of the GLM revealed that the model that best explained respondents' attitudes towards human wildlife conflict included education only (Fig. 3; Table 4).

**Table 4.** Summarized results of variable identified in the best-fit model on respondents' attitudes towards human wildlife conflict.

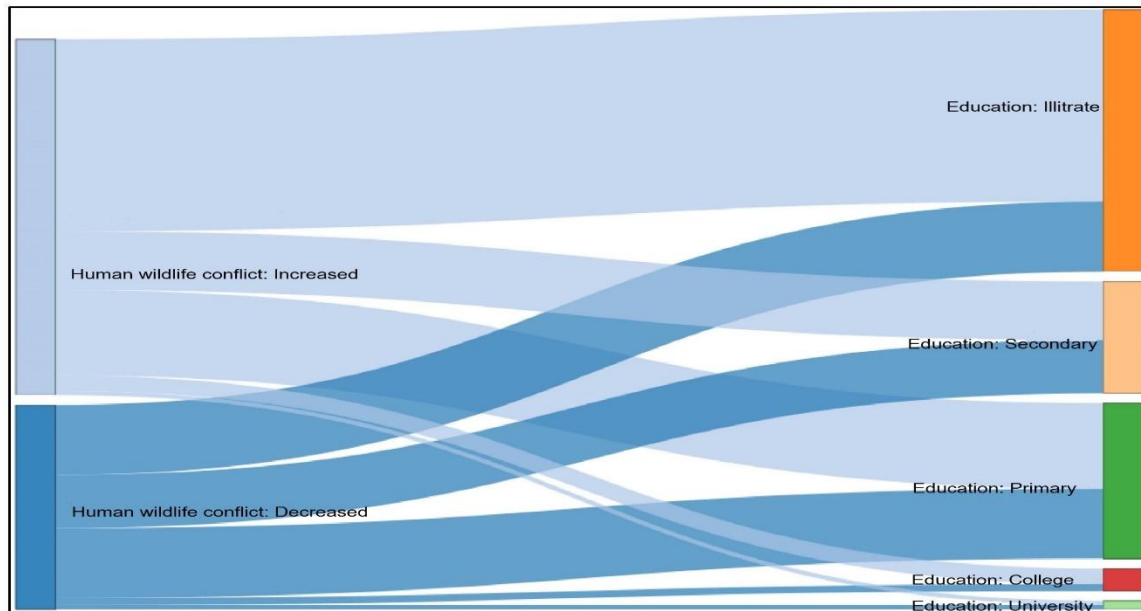| Variable | Parameter estimate (β) | Standard error | P value |
|---|---|---|---|
| Intercept | 0.42646 | 0.08555 | 6.2e-07 *** |
| Education | -0.03676 | 0.02686 | 0.127 |



**Fig. 3.** Sankey diagram showing the relationship between the respondents' attitudes toward human wildlife conflict and the best predictor (education).

**Attitude towards mitigation measures**

Gender wise, both man and women were more likely to express fencing as the mitigation measure (33.68% and 41.74% respectively). However, the difference in the opinion towards different mitigation measures between the gender was not statistically significant ($\chi^2$ = 7.05, *df* = 5, *p* = 0.22). More support for fencing as mitigation measure among respondents was shown by the age groups of 18-30, 31-45 and 46-60 years (39.2%, 40.58% and 33.73% respectively), while as the more support for noise making among respondents was shown by the age group of 61-90 year (35.19%).

Further, the differences in opinion with age towards different mitigation measures was statistically significant ($\chi^2$ = 33.29, *df* = 15, *p* < 0.01). Among all the mitigation measures, strong opinion towards fencing was shown by respondents having below average annual income (58.96%), whereas stronger attitude towards dogs as a mitigation measure was displayed by respondents belonging to average and above average annual income (24.42% and 32.73%) (Table 5). The difference in opinion towards different sources of mitigation measures with annual income was statistically significant ($\chi^2$ = 84.91, *df* = 10, *p* < 0.001). All other variables were non-

significant. A conventional approach in Africa is to use disturbance shooting, killing problem wild animals, and fencing as a means of mitigating human-wildlife conflicts (Parker *et al.,* 2007).

**Table 5.** Depicting the perception of respondents towards mitigation measures in the study area

| Category | Variable | Mitigation Measures | | | | | | Statistics | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Fencing | E. Fencing | Scare crows | P. guards | Dogs | Noise | $\chi^2$ | df | P |
| Gender | Male | 96 | 5 | 36 | 41 | 54 | 53 | 7.05 | 5 | 0.22 |
| | Female | 48 | 2 | 21 | 11 | 19 | 14 | | | |
| Age (in years) | 18-30 | 49 | 2 | 14 | 14 | 32 | 14 | 33.29 | 15 | <0.01 |
| | 31-45 | 56 | 2 | 22 | 18 | 24 | 16 | | | |
| | 46-60 | 28 | 1 | 15 | 13 | 8 | 18 | | | |
| | 60-90 | 11 | 2 | 6 | 7 | 9 | 19 | | | |
| Education | Primary | 30 | 3 | 27 | 15 | 25 | 11 | 47.08 | 20 | <0.001 |
| | Secondary | 20 | 3 | 12 | 11 | 21 | 13 | | | |
| | College | 4 | 0 | 1 | 2 | 2 | 7 | | | |
| | University | 3 | 0 | 0 | 1 | 1 | 1 | | | |
| | Illiterate | 87 | 1 | 17 | 23 | 24 | 35 | | | |
| Marital status | Unmarried | 20 | 1 | 4 | 6 | 10 | 13 | 20.04 | 15 | 0.17 |
| | Married | 112 | 6 | 39 | 40 | 57 | 47 | | | |
| | Separated | 8 | 0 | 11 | 3 | 3 | 6 | | | |
| | Widowed | 4 | 0 | 3 | 3 | 3 | 1 | | | |
| Annual income | Below average | 102 | 2 | 18 | 18 | 13 | 20 | 84.91 | 10 | <0.001 |
| | Average | 32 | 5 | 25 | 28 | 42 | 40 | | | |
| | Above average | 10 | 0 | 14 | 6 | 18 | 7 | | | |
| Occupation | Farmer | 84 | 1 | 20 | 31 | 24 | 23 | 77.27 | 15 | <0.001 |
| | Businessman | 9 | 3 | 8 | 10 | 27 | 27 | | | |
| | Housewife | 38 | 1 | 17 | 1 | 16 | 11 | | | |
| | Govt. employee | 13 | 2 | 12 | 10 | 6 | 6 | | | |

**Factors influencing the respondents' attitude towards mitigation measures**
The results of the GLM revealed that the model that best explained respondents' attitudes towards mitigation measures included a combination of age, gender and income of the respondents with the gender variable marginally significant (Fig. 4; Table 6).

**Table 6.** Summarized results of variables identified in the best-fit model on respondents' attitudes toward mitigation measures. (Note "*" = p <0.05, "***" = p <0.001, "·" = <0.1).

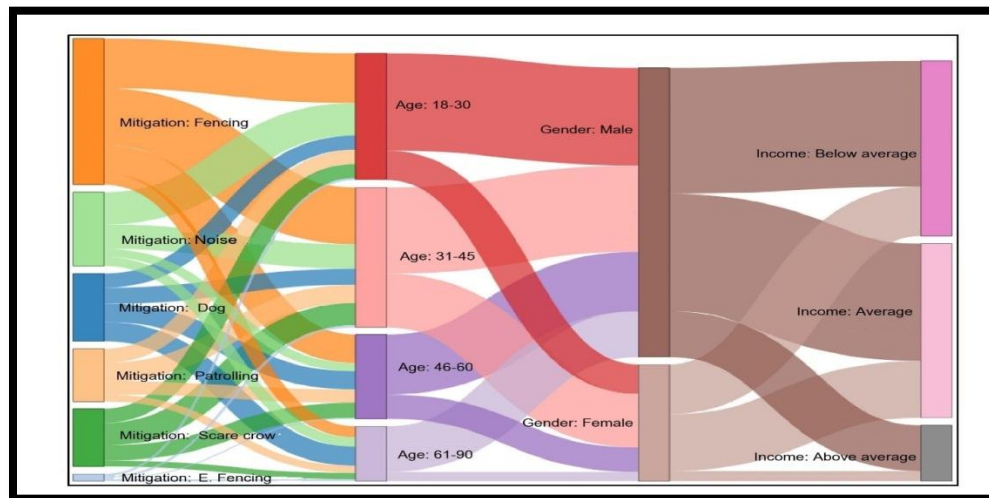| Variable | Parameter estimate (β) | Standard error | P value |
|---|---|---|---|
| Intercept | 0.75719 | 0.12580 | 1.75e-09 *** |
| Age | 0.05537 | 0.02686 | 0.0392 * |
| Gender | -0.11816 | 0.06333 | 0.0621· |
| Income | 0.25567 | 0.03869 | 3.90e-11 *** |



**Fig. 4.** Sankey diagram showing the relationship between the respondents' attitudes toward mitigation measures and the best predictors (age, gender and income).

**Recommendation by respondents for human-wildlife conflict mitigation**
Responses were analyzed for differences in recommendations regarding human wildlife conflict mitigation based on selected socioeconomic factors, including gender, age, education, profession, marital status, and income. Responses were influenced significantly by gender, age, profession, and education for recommendations for human wildlife mitigation (Table 7). Significant correlates of recommendation attitude were gender and age, with men preferring compensation as a major human-wildlife

conflict mitigation measure (39.65%) while females preferred killing (40%). The difference in the opinion towards different human-wildlife conflict mitigation measures between the gender was statistically significant ($\chi^2$ = 59.21, *df* = 3, *p* <0.001). The age groups of 18-30, 31-45, and 46-60 years showed the most support for compensation as the major human-wildlife conflict mitigation measure (40%, 27.54 %, and 33.73 % respectively), while the age group of 61-90 years tended to show more support for killings (40.74%). Moreover, there were significant differences in opinions regarding human-wildlife conflict mitigation measures according to age ($\chi^2$ = 29.80, *df* = 9, *p* < 0.001). Compared to older generations who support killing as an effective strategy to mitigate HWC, the 18-60 age group supports compensation. The results here corroborate those reported by Nyahongo and Roskaft (2011) and Holmern and Roskaft (2014), who noted that conflict between wildlife and humans can influence people's attitudes toward wildlife. According to Hampson *et al.* (2015) local people facing conflicts with predators or problem animals are more likely to retaliate.

**Table 5.** Depicting the perception of respondents towards recommendation of mitigation measures in the study area

| Category | Variable | Recommendation for Mitigation | | | | Statistics | | |
|---|---|---|---|---|---|---|---|---|
| | | Killing | Compensation | Fencing | Translocation | $\chi^2$ | df | P |
| Gender | Male | 43 | 113 | 29 | 100 | 59.21 | 3 | <0.001 |
| | Female | 46 | 24 | 30 | 15 | | | |
| Age (in years) | 18-30 | 20 | 50 | 23 | 32 | 29.80 | 9 | <0.001 |
| | 31-45 | 25 | 38 | 23 | 52 | | | |
| | 46-60 | 22 | 28 | 8 | 25 | | | |
| | 60-90 | 22 | 21 | 5 | 6 | | | |
| Education | Primary | 36 | 26 | 21 | 28 | 28.45 | 12 | <0.01 |
| | Secondary | 20 | 25 | 9 | 26 | | | |
| | College | 1 | 9 | 2 | 4 | | | |
| | University | 0 | 1 | 3 | 2 | | | |
| | Illiterate | 32 | 76 | 24 | 55 | | | |
| Marital status | Unmarried | 10 | 20 | 7 | 17 | 7.47 | 9 | 0.59 |
| | Married | 70 | 106 | 43 | 82 | | | |
| | Separated | 4 | 9 | 7 | 11 | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Widowed | 5 | 2 | 2 | 5 | | | |
| Annual income | Below average | 34 | 69 | 25 | 45 | 5.19 | 6 | 0.52 |
| | Average | 42 | 52 | 27 | 51 | | | |
| | Above average | 13 | 16 | 7 | 19 | | | |
| Occupation | Farmer | 25 | 74 | 26 | 58 | 89.80 | 9 | <0.001 |
| | Businessman | 12 | 25 | 4 | 43 | | | |
| | Household wife | 42 | 16 | 20 | 6 | | | |
| | Govt. employee | 10 | 22 | 9 | 8 | | | |

**Factors influencing the respondents' attitude towards recommendation for human-wildlife conflict mitigation**

The results of the GLM revealed that the model that best explained respondents' attitudes towards recommendation for human wildlife conflict mitigation included a combination of age, and gender (Fig. 5; Table 6).

**Table 6.** Summarized results of variable identified in the best-fit model on respondents' attitudes towards human wildlife conflict. (Note "*" = $p < 0.05$, "**" = $p < 0.01$, "***" = $p < 0.001$).

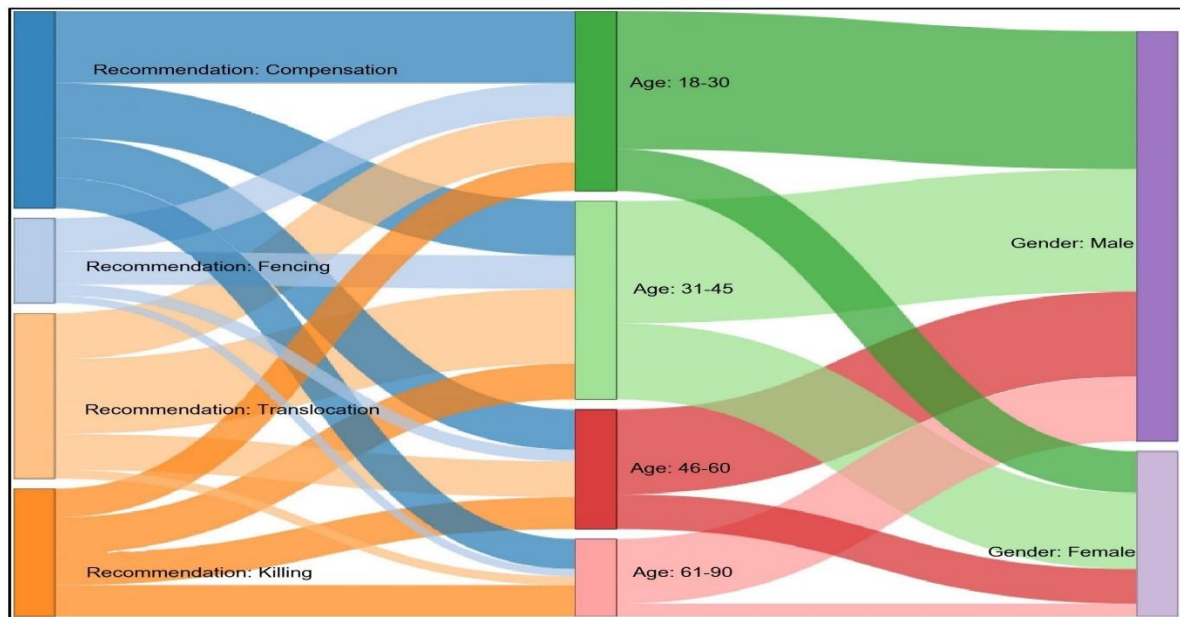| Variable | Parameter estimate ($\beta$) | Standard error | P value |
|---|---|---|---|
| Intercept | 1.36384 | 0.11810 | 2e-16 *** |
| Age | -0.07490 | 0.03144 | 0.01721 * |
| Gender | -0.22773 | 0.07364 | 0.00199 ** |

**Fig. 5.** Sankey diagram showing the relationship between the respondents' attitudes towards recommendation for human wildlife conflict mitigation and the best predictors (age and gender).

## CONCLUSION

Wildlife conservation was mildly known among locals. Local people's attitudes towards wildlife conservation were influenced by their age, occupation, education level, and marital status. People's attitudes toward wildlife conservation were negatively affected by increasing livestock depredation and crop damage. Conservation education programs should be developed in local communities that border protected areas. Primary schools should introduce conservation education and encourage parents to enroll their children there. By educating, raising awareness of wildlife, and engaging communities, we can improve the perceptions of wildlife among local communities.

## ACKNOWLEDGEMENTS

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