

SHORT COMMUNICATION

ASSESSMENT OF ATTITUDE AND PERCEPTION OF THE LOCAL COMMUNITY TOWARDS VULTURES IN AND AROUND WOLKITE TOWN, SOUTHWESTERN ETHIOPIA

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ABSTRACT: Vulture populations are facing a huge decline throughout the world and most of the species are listed as threatened. Their decline can have negative impacts on various aspects of the environment, including human beings. Understanding local communities' attitudes and perceptions are essential to identify wildlife conservation challenges and developing sustainable wildlife conservation. There is limited study on threats, attitudes, and perceptions of local communities towards vulture species in the study area. Therefore, the present investigation generates substantial information regarding the attitudes and perceptions of the local community towards vultures in Wolkite town, which is an important foraging area for vultures. A questionnaire survey was used with both open and closed questions related to how frequently vultures have been observed on their private property and the population trend, their attitude and perception towards vultures in and around the town, as well as the threats to vultures. It was employed in 80 purposefully selected households located near the vultures' feeding and roosting sites. Data were analyzed using both qualitative and quantitative analysis techniques. There was a significant correlation between some socioeconomic variables such as level of education, age, respondent occupation, residency, and positive attitude towards vultures. The attitudes of the local community towards vultures were influenced by the physical and behavioural characteristics of the species. Respondents' age, education, gender, willingness to participate, and understand the benefits of vultures significantly influenced conservation attitudes. Communities are well aware of the decline of vultures but do not understand the ecological importance of vulture species. Hence, thorough awareness-creation activities should be promoted to conserve vulture species.

Key words/phrases: Attitude, Conservation, Local community, Perception, Threats, Vultures.

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INTRODUCTION

Vultures play a critical environmental role by consuming larger amount of carcasses than other scavengers, cleaning up the environment, and reducing the cost and spread of disease (Markandya *et al.*, 2008; Ogada *et al.*, 2011). Vultures have stronger immune systems than other vertebrates due to their feeding ecology and evolved mechanisms to prevent infection that occurs in the carcasses (Chung *et al.*, 2015). They also have a great contribution to nutrient recycling dynamics by increasing the decomposition rate of carcasses and positively affecting the transmission of nutrients to the soil (Ogada *et al.*, 2012). They also provide important ecosystem services like disposing of organic waste in cultivated areas, control of facultative mammalian scavengers and help in preventing the spread of diseases such as anthrax, rabies, and tuberculosis (Campbell *et al.*, 2016). However, vulture populations are facing a huge decline in many areas of their geographical distribution throughout the world (Henriques *et al.*, 2018). Hence, most species are listed as threatened (Virani *et al.*, 2010; Ogada *et al.*, 2011). Their decline can have negative impacts on various aspects of the environment, including human health, economic, cultural, religious values and ecosystem (Ogada, 2011).

Poisoning and sanitary regulations are recognized as the major causes of the decline of vultures predominantly in European and Asian regions (Ogada, 2011; Ogada *et al.*, 2012). Food shortage, collisions and electrocutions with power lines, illegal hunting or harvesting of their eggs, disturbance, and habitat loss (roosting and breeding sites) are also identified as causes of vulture populations decline (Ogada *et al.*, 2012). Different researchers reported that vultures are becoming restricted to protected areas in different regions of Africa and the importance of protecting them beyond the boundaries of wildlife reserves is considered paramount to their future conservation (Virani *et al.*, 2011; Ogada *et al.*, 2012). Their decline has been recorded in different regions of Africa (Ogada and Keesing, 2010; Virani *et al.*, 2011; Krüger *et al.*, 2013; Ogada *et al.*, 2015; Mullie *et al.*, 2017; Murn *et al.*, 2017; Thorley and Clutton-Brock, 2017). Therefore, identifying the existing threats is essential to applying practical conservation strategies for vultures. Moreover, understanding local community attitudes and perceptions in specific areas is also very important to identify the existing wildlife conservation challenges and develop sustainable wildlife conservation plans (Baral and Gautam, 2007).

Wolkite town is one of the emerging towns with fast urbanization in the southwestern part of Ethiopia. There are different food sources in the area that serve as ephemeral sources of food for vultures and other scavengers. There are abattoirs and open dumpsites in and around the town that serve as “vulture restaurants”. Birds are attracted to the landfill site for different reasons, including the presence of food sources in the waste stream, and available habitat for shelter, perching, and nesting areas (Maurice *et al.*, 2020). Among the eight species of vultures in Ethiopia, seven species (except Egyptian vulture, (*Neophron percnopterus*)) were recorded in this area in 2017. African white-backed vultures (*Gyps africanus*), hooded vultures (*Necrosyrtes monachus*), and Rueppell’s Griffon (*Gyps rueppellii*) vultures were the most abundant species in the area (Seyoum Kiros *et al.*, 2018). Despite the presence of different vulture species in the town, so far there is no in-depth study on threats, attitudes and perceptions of local communities towards vultures in Ethiopia, including the present study area. Therefore, the present investigation generates substantial information regarding the attitude and perception of the local community towards vultures in and around Wolkite town, Ethiopia.

MATERIALS AND METHODS

Description of the study area

The study was carried out in two vulture feeding and roosting sites, an abattoir and a dumping site in and around Wolkite town (Fig. 1). Wolkite town is an administrative city of the Gurage zone located at a distance of 158 km away from Addis Ababa in the southwest direction. The dumping site is found at the edge of forest areas around 7.5 km from Wolkite town. This is a kind of permanent open waste disposal site, which serves as a main dumping site for the town. *Eucalyptus* and *Acacia* trees (*Acacia mellifera* and *Acacia senegal*) are the main plant species found around this site. The abattoir is located at the centre of Wolkite town where a high human population settlement occurs. There are big trees within one km radius around the abattoir.

Data collection

To understand the attitude and perception of the local community towards vultures, a questionnaire survey was employed with 80 purposely selected adult respondents located nearby the feeding and roosting (abattoir and the dumping) sites. The questionnaire survey had both open and closed questions related to how frequently vultures have been observed on their private property and the population size, their attitude and perception

towards vultures in and around the town, and the threats to vulture populations.

Respondents' privacy and confidentiality were protected and information was only shared within the research team. The research was conducted using the ethical clearance obtained by the Addis Ababa University, College of Natural and Computational Sciences. Institutional Ethical Review Board.

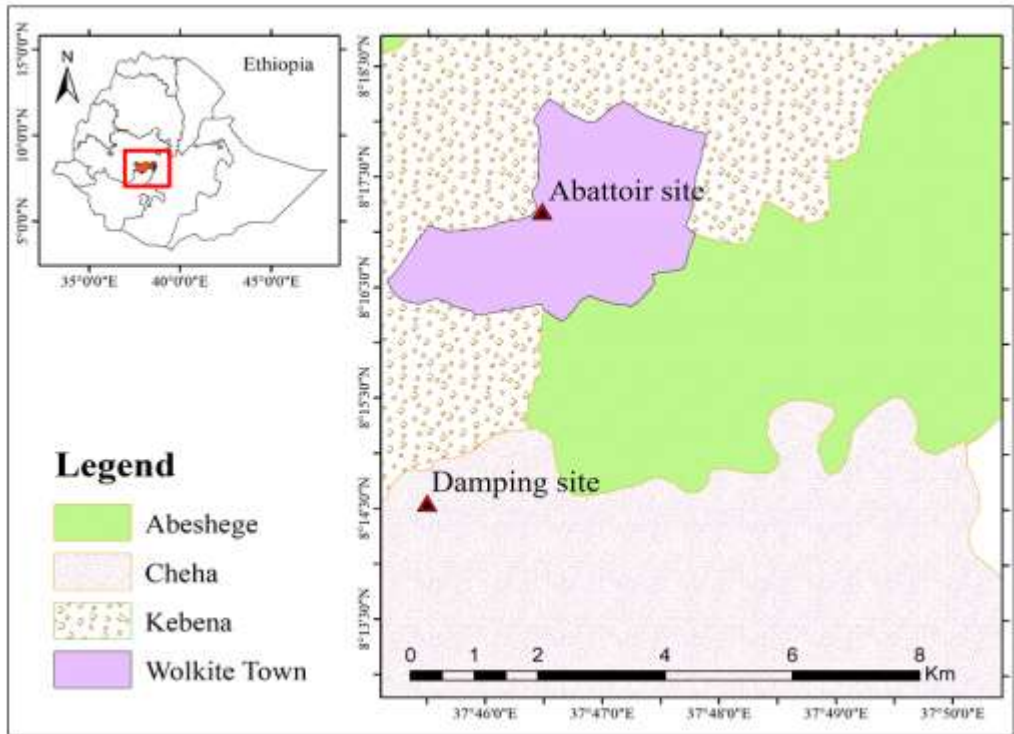


Fig. 1. Map of Wolkite town (shown in purple) and locations of study sites.

Data analysis

Both qualitative and quantitative data analyses were used to determine the link between human activities and their physical environment (Tashakkori and Teddlie, 2003; Johnson and Christensen, 2004). Qualitative statements were used to determine the implications of the attitudes expressed and to provide supplementary explanations for the patterns found in the quantitative variables. The qualitative information provided an in-depth understanding of the respondents' feelings and opinions, both of which were instrumental in drawing conclusions on possible patterns of behaviour. Quantitative data were analyzed using one-way ANOVA and chi-square

tests. Pearson correlation analysis was also applied to show the relationship between socio-demographic variables and attitudes towards vultures (Eric, 2012).

RESULTS

Demographic characteristics

Out of the 80 selected respondents, 63 respondents (79%) were males and 17 respondents (21%) were females. Half of the respondents (50%) were between 18 and 35 followed by age between 36 and 59 years (37.5%) and 12.5% were above 60 years old. More than 80% of the respondents were literate and had completed primary education. Nearly 48% of the respondents were self-employed followed by 33.8% working as government employees and 18.8% who were housewives (Table 1).

Table 1. Socio-demographic characteristics of the respondents.

Variable	Description	n	%	X^2	df	P
Gender	Male	63	78.8	26.5	1	0.00
	Female	17	21.3			
Age	18-35	40	50	17.5	2	0.00
	36-59	30	37.5			
	>60	10	12.5			
Education	Illiterate	15	18.8	17.5	3	0.00
	Primary School	35	43.8			
	Secondary school	20	25			
	College/University	10	12.5			
Occupation	Government employee	27	33.8	18.2	2	0.00
	Self employed	38	47.5			
	Dependent	15	18.8			
Residence	Near abattoir	70	87.5	45	1	0.00
	Near dumping site	10	12.5			

n = number of samples, X^2 = Chi-square, df = degree of freedom, p = the probability of significance level at 95% confidence interval

All respondents observed vultures in their surroundings and about 20% in their private compound. Respondents' ability to identify vultures was positively correlated with their level of education ($r = 0.67$, $p < 0.05$). There was also a significant positive correlation between a respondent's ability to identify the various vulture species and the age of the respondents whereas, older respondents were better at identifying vultures based on their life experience ($r = 0.55$, $p < 0.05$).

Perception and attitude of the local community

Respondents' attitudes towards vultures showed no significant relationship with the level of education ($r = 0.69$, $p > 0.05$), age ($r = 0.67$, $p > 0.05$), occupation ($r = 0.70$, $p > 0.05$) and residency status ($r = 0.69$, $p > 0.05$).

However, more than 70% of the respondents perceive vultures unattractive and not appealing to see them in their compound. Few respondents (13%) considered vultures as a sign of bad luck associating them with the spirit of death. None of the respondents attempted to kill any vultures, and most respondents (80%) agreed that large trees, on both research sites, have decreased alarmingly and as a result, the vulture population has declined (50% of the respondents). However, 31% of the respondents reported observing the vulture population increase from time to time in the abattoir.

Among the respondents, 35% of them reported seeing vultures throughout the year while 20% of the respondents only saw vultures during the wet season, and 25% only observed vultures during the dry season. In addition, most (75%) of the respondents had a positive attitude toward vultures, while about 15% of the respondents had a negative attitude and the rest (10%) had a neutral impression. On the other hand, 50% of the respondents do not have knowledge about the role of vultures on the environment. Only 19% of the respondents knew of the ecological importance of vultures.

Conservation of vultures

Regarding the reasons why the vulture population is declining in the study area, about 38% of the respondents reported shortage of food and 22% reported habitat loss as a major threat. In addition, accumulation of non-palatable waste materials in the dumping site (15%), electrocution (10%), poisoning (8%), the purposive firing of waste (5%) and unknown threats (2%) were reported as additional threats to vultures on both study areas.

No intentional killing for the purpose of traditional use was observed in the area. There were also no dead vultures observed during the data collection but respondents around the waste dumping site (10%) reported a mass death of vultures that foraged on poisoned animal carcasses. Regarding how respondents dispose of livestock carcasses, most (78%) of the respondents stated they placed them in open fields while the remaining 22% burnt the carcass (Table 2).

Table 2. Attitudes and perceptions of the local community towards vultures (%).

Attitudes and perceptions	Agree	Disagree	Neutral
Consider vultures are unattractive	75	25	0
Consider vultures as a symbol of bad luck	13	87	0
Have observed decrease in vegetation cover	80	5	15
Vultures have an important role in the environment	18.8	31.2	50
Decline of vulture population in the area	50	31.3	18.7
Observed mass death of vultures	10	72.5	17.5
Intentional or unintentional killing of vultures	0	100	0

Attitudes and perceptions	Agree	Disagree	Neutral
Challenge faced from the presence of vultures	43.8	50	6.3
Presence of free-ranging domestic animals	90	10	0
Vultures killing livestock	25	75	0
Carnivores observed in area	100	0	0
Practice of visiting veterinarians	15	85	0
Providing medicine to sick domestic animals	11.3	89.7	0
Observed people poison carcasses to target vultures	0	100	0
Use of vulture parts as medicines	0	100	0

Most of the respondents had at least one domestic animal in their household and about 15% sought veterinary advice when their livestock faced health problems. Regarding the impact of vultures on their livestock, about 25% of respondents confirmed that vultures rarely kill small-sized livestock and chicken and vultures are reservoirs of communicable diseases.

About 50% of the respondents did not agree to support the conservation of vultures. However, most respondents (75.5%) agreed that awareness creation is mandatory (Table 3). The positive attitudes of the local people toward vulture conservation show a negative correlation ($r = -0.86$, $p < 0.05$) with age but a positive correlation ($r = 0.71$, $p < 0.05$) with education level. There was a significant relationship between recognition of the need for vulture conservation and the respondent's financial situation ($r = 0.68$, $p < 0.05$); financially better-off respondents showed a more positive attitude toward vulture conservation than poorer ones and their dependents.

Table 3. Conservation challenges of vultures.

Conservation issues	Agree	Disagree	Neutral
Should vultures be conserved?	10	50	20
Vultures can serve as a source of income from tourism	0	100	0
Vultures combat the spread of diseases	0	100	0
Education is important to vulture conservation	75.5	24.5	0
I am willing to participate in any awareness creation events	0	100	0
I am willing to participate in vultures conservation	81	10	9

DISCUSSION

The majority of respondents in the study area had positive attitudes toward vultures. The attitudes of the local community towards vultures were influenced by the physical and behavioural characteristics of the species. Even though the local community had a positive attitude toward vultures, they do not want to see them near their houses. People preferred to conserve familiar, attractive or beneficial birds, ignoring those like vultures and other scavenger species, despite their socio-cultural, economic and ecological

importance (Serpell, 2004; Martín-López *et al.*, 2007; Reimer *et al.*, 2013).

Conservation attitudes are influenced by socioeconomic variables such as gender, education, occupation, household affluence, and or local people's participation in conservation issues (Sah and Heinen, 2001). Favourable attitudes towards vultures may not be positively correlated with beneficial action. Although people were aware of decreasing populations of vultures and were in favour of habitat conservation, their actions were detrimental to vultures in some cases such as burning carcasses, chasing and disturbance activities (Samuel *et al.*, 2018).

Though vultures are not attractive to the majority of the respondents due to their physical appearance and way of feeding, there was no attempt or intentional poisoning to get rid of these birds in the town or at dump sites. Vultures are considered unattractive and unsightly species of birds in different areas (Baral and Gautam, 2007). Understanding the importance and environmental services of vultures and other scavengers for the local community might increase positive attitudes and initiate conservation activities (Ballejo *et al.*, 2019; García-Alfonso *et al.*, 2019).

Creating awareness about the importance of vultures can also support conservation programs as accurate information is helpful for increasing positive attitude towards the species and promoting local support for their conservation (Baral and Gautam, 2007; Martín-López *et al.*, 2007; Ghimire *et al.*, 2014). Positive attitudes and perceptions toward species support conservation activities and help to decrease potential threats to the species such as scarcity of food, habit loss, disturbance, intentional poisoning, and killing. These might also help to minimize human and livestock lethal diseases like anthrax and rabies by protecting species such as vultures (Sharma *et al.*, 2019; Katuwal *et al.*, 2021). Anthropogenic factors such as human-induced fire, disturbance from humans such as waste collectors, dogs, and cattle, habitat loss, and accumulation of various non-edible waste products such as glass fragments, metal objects, and stone, sticks and plastic bottles which can be taken by vultures, and feeding competition were found to be threats in the study area. Such materials were also reported as lethal causes for vultures by Houston *et al.* (2007). High human population growth and rapid urbanization affect food availability and reduce the quality and safety of trophic resources (Olea and Mateo-Tomas, 2009). Such types of threats to vultures could be minimized by the awareness and participation of local people in conservation activities and participatory discussion (Galligan *et al.*, 2014; Paudel *et al.*, 2016).

Carcass burial and burning practices are also reported in some areas (Baral and Gautam 2007; Karmacharya, 2011). Carcasses are purposely burned to minimize the spread of communicable diseases (Ballejo *et al.*, 2019). In the study area, at the abattoir site, carcasses were set on fire after a few days to decrease the smell and volume. Burning also decreased the food availability for vultures' at the dumping site and increased the carbon emission to the atmosphere (Santangeli *et al.*, 2019). Vultures have become targets of unintentional poisoning of carcasses at the dumping site. As the waste material collectors at the dumping site reported, vultures were killed by secondary poisoning from carcasses. Such kind of poisoning has also been reported in different areas (Monadjem *et al.*, 2004; Clements *et al.*, 2013). Secondary poisoning in different parts of the world, especially in sub-Saharan African countries is associated with banned pesticides and rodenticides which are freely available in local markets (Virani *et al.*, 2011; Ogada, 2014; Santangeli *et al.*, 2016). The death of vultures due to poisoned carcasses reported from this study area might be insignificant but such incidents may increase in the future, particularly for the killing of other scavengers unless local people's awareness is raised about pesticide applications. Also, there are reports that show the deaths of hundreds of vultures from a single poisoned animal carcass (Whitfield *et al.*, 2004a; 2004b; Ortega *et al.*, 2009). Therefore, awareness about the positive impact of vultures on the environment and human beings and the negative consequences of the application of pesticides is essential.

The high accumulation of plastic bags and bottles in dumping areas also raises concerns. In our study area, rubbish dumps are the primary source of food for vultures but they have a high accumulation of non-edible materials due to poor management of open dumping. Plastic rubbish remains in the environment for longer period and can cause adverse impacts on the biodiversity of a particular environment. When organic items are mixed with plastic and ingested, it poses a lethal risk to vultures (Santangeli *et al.*, 2022).

CONCLUSION

Age, education, gender, willingness to participate, and understanding of the benefits significantly influenced conservation attitudes. People near the abattoir and dumping sites are well aware of the decline of vultures but do not understand the ecological and environmental value of vulture species. Even so, there was no attempt of killing vultures in the area despite the local people's perception of vultures as being unappealing. The willingness of

locals to participate in awareness creation and conservation activities is a good initiation for the conservation of vultures.

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