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# A Brief Review on Human-Wildlife Conflict and Its Consequence in Ethiopia

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**Abstract:** The human-wildlife conflict is the name given to the conflict between humans and wild animals. It hurt people as well as wild creatures. Even though it is well-known and happens everywhere, the vulnerability of developing countries is greater than that of developed countries. In Ethiopia, human-wildlife conflict is a major concern, particularly among those who live near protected areas. In Ethiopia, a lot of research has been done to determine the magnitude and intensity of the animal conflict. The investigations, on the other hand, are limited to a single area and animal species. The goal of this review is to give an overview of the scale of the human-wildlife conflict in Ethiopia. The damage of habitat has increased human-wildlife conflict. The destruction of natural wildlife habitats occurs when forest areas are cleared for food and crop cultivation. Construction projects for roads and railways, dams, housing and infrastructure, energy production, and a variety of other development projects are among them. These people raise cattle, goats, and sheep by migrating from one location to another in search of grazing water and grass, which they do primarily on a seasonal basis whether it's within a country or across international borders. The human population has risen overtime at the expense of other species on the planet, such as wild animals. In Ethiopia, crop damage is also a major source of human-wildlife conflict. People's negative views and perceptions of wildlife have an impact on the intensity and scope of this conflict. This is primarily due to wild animals migrating near human settlements and living near humans as a result of disruption or loss of their natural habitat. Both wildlife and humans suffered as a result of this battle. To reduce the severity of the problem, raising awareness among the local rural community and improving wildlife management policies are critical.

**Keywords:** Ethiopia, Wildlife, Coexistence, Conflict

## 1. Introduction

Human-wildlife conflict is defined as any interaction between humans and wildlife that hurts social, economic, or cultural life, wildlife conservation, or the environment [35]. It has an impact on both wild animals and humans, as well as the economy. Human-wildlife conflict has a variety of negative consequences for both humans and animals [59]. Crop destruction, livestock predation, property damage, and the extinction of wildlife populations are all common effects of human-wildlife interactions [61]. Human-wildlife conflict is a global problem that varies according to geography, land use patterns, human behavior, and the habitat and behavior of wildlife species or individual animals within species [35].

The conflict between humans and wild animals has persisted for as long as there have been humans living, and people and Wild animals have shared the same habitats and resources for a long time. The animals with which they shared their habitats and shelters preyed on the early hominids, according to the fossil record. For example, forensic evidence recently revealed that the Taung cranium, which was discovered in South Africa in 1924 and is possibly the most renowned hominid fossil, originated from a kid slain by an eagle two million years ago [11]. In today's world, human-wildlife conflict exists in some form or another in every corner of the globe. Bears raid trash cans in national parks and even on the outskirts of cities in the northern United States, waking up inhabitants and causing chaos in the streets. Deer crashes with autos harm an average of 29,000 people each year in the United States, costing more than $1

billion in damages [15]. Wolves killed 2,806 domestic animals in Alberta, Canada, over 14 years (1982-1996), cattle are the most common, but dogs, horses, sheep, chickens, bison, goats, geese, and turkeys are also common. Wolves murdered 728 animals, mostly sheep and cattle, in Idaho, Montana, and Wyoming (USA) between 1987 and 2001 [43].

Direct feed use by wild rabbits during droughts in Australia resulted in fewer animals, lower wool clipper sheep, lower lambing percentages, worse weight increase, lower wool quality, and earlier stock fatalities [49]. The conflict between humans and wildlife is growing more widespread in many parts of the world, and it has been the focus of recent conservation efforts [19, 44]. More human and wildlife populations are competing for resources as human populations grow, especially in emerging countries [14]. Crop raiding is simply defined as wild animals traveling from their natural environment to farmland to graze on crops grown for human use and trade [33, 52].

Ethiopia is one of the world's most geographically and biologically varied countries. It covers a total area of 1,023,050 $km^2$. It consists of a large mountain ringed by desert lowlands. From alpine moorlands to lowland savannas and desert regions, as well as extensive wetlands, it boasts a broad diversity of fauna and habitats [31]. Many indigenous flora and animals can be found in the highlands. They have less species variety than the country's lowlands. The difficult topography is the main reason for the occurrence of diversified animals and a huge number of indigenous species. This contributed to the creation of separate and diverse ecological environments. Biological resources are found in a variety of biomes, including the Afrotropical highlands, Sudan-Guinea, the Sahel-Transitional Zone, and the Somali-Masai Biome [1, 10]. Ethiopia is home to 861 bird species, 277 mammal species, 201 reptile species, 63 amphibian species, and 150 fish species [50]. The area is considered to be home to 31 mammals, 16 birds, 24 amphibians, 9 reptiles, and 40 fish [50]. The country's biodiversity is not evenly distributed. Large animal species, for example, are prevalent in the arid south. On the other hand, in the highlands, where there is a large population, there are many lesser numbers of species. Ethiopia's natural ecosystems have been transformed for millennia due to human and natural forces. Agricultural and pastoral land has been converted to the majority of the highlands and some of the lowlands. The vegetation has been used for a variety of reasons, including fuelwood, construction, and other uses. As a result, the country's natural resources are now mostly relegated to a few protected regions [50]. The main aim of the review is to compile the interaction of human-wildlife and its impacts.

# 2. Review of Related Literature

### *2.1. Human-Wildlife Conflict: Definition & Concept*

Conservationists use the term "human-wildlife conflict" to characterize the conflict between wild animals and humans. It exists in various forms all around the world, although it is more prevalent in developing countries [13]. Various researchers and groups working in the field have provided various meanings for the term. To begin, the World-Wide Fund for Nature defines it as any human-animal interaction that hurts human social, economic, or cultural life, wildlife conservation, or the environment, according to the World-Wide Fund for Nature. According to the WWF, human-animal conflict is a type of conflict that can be started by humans or wildlife and has serious effects for both parties involved [35].

Similarly, in their review, the USGS (United States Geological Survey) (2003) emphasizes the importance of taking into account the two settings, namely, wildlife acts by human goals and engages in human activities that risk wildlife's safety. As a result, they described it as follows: Conflict between humans and wildlife arises when wildlife's needs and behavior negatively impact human aims, or when human goals negatively impact wildlife requirements. Human reactions to interactions are the most important component in determining the outcome of human-wildlife conflicts [60].

### *2.2. Human-Wildlife Conflict Causes*

In their distinct research settings, various researchers have explored the decisive variables that promote conflicts between humans and wildlife at various times. The following section highlights the primary reasons for human-wildlife conflict as recognized by many researchers from around the world, with a focus on Ethiopia. The area's primary drivers of HWC were identified as habitat degradation, closeness to natural forest, and increased subsistence use [5]. The battle between rising human populations and wildlife for dwindling living places and resources is the primary cause of human-wildlife conflict around the world [34, 3]. Forests, savannahs, and other ecosystems are being converted into agrarian or urban regions. Agglomeration has resulted in a substantial reduction in wildlife habitat as a result of rising needs for food production, land, raw materials, and energy [38].

There are numerous aspects, ranging from wild animal population growth to human population growth, that could be blamed for the principal causes of human-wild animal conflict [30]. More humans mean more farmed land, which means more human-wildlife interaction. The world population is expected to increase by more than half in the next fifty years, from six billion in 2000 to more than nine billion in 2050, and the increase in both wildlife and human population creates competition for limited natural resources, resulting in conflict [48].

Crop devastation, livestock predation, human death, and injury are all common outcomes of human-wildlife interactions. Elephants, buffalo, lions, and hippopotamus, for example, are responsible for human deaths and injuries in Cameroon [5]. Conflicts between humans and wild animals occur when one party's actions hurt the other. It acknowledged that people have had a significant impact on animals and the environment in a variety of ways, including habitat loss, pollution, exotic and invasive species

introduction, and spread, overexploitation, and climate change. Human-wildlife conflicts vary based on factors such as location, land use patterns, human behavior, and the habitat and behavior of wildlife species or individual animals within species [26, 17].

### *2.3. Conflict Between Humans and Wild Animals and Its Effects on Humans*

The consequences of human-wildlife conflict can have far-reaching social, economic, and cultural consequences for people. As [8] points out, the consequences range from obvious economic hardship to less visible consequences such as increased opportunity costs and reduced quality of life, the consequences are numerous. Aside from the direct consequence of depredation, living near wild animals might entail a range of other expenditures. According to [8, 23], this occurrence may result in human property destruction, agricultural raiding-related economic losses, and harassment.

According to [42], human-wildlife conflict can result in a variety of negative consequences for human well-being. Significant changes in living patterns may cost humans their lives. Carnivores encounter more domestic animals and humans, according to [42]. Such an interaction can put people in danger while also increasing economic losses. [34] also suggested that human-wildlife conflict could hurt people and their resources. Predation of domestic animals, crop destruction, and human death are the most common types of wildlife damage to humans [53].

### *2.4. The Impacts of Crop-raiding Wild Animal Conflict*

Large mammals cause crop loss among agriculturalists in protected areas in many African and Asian countries, and this is one of the most common causes of human-wildlife conflict. When compared to the harm caused by invertebrates and rodents, the extent of damage is almost considerable at the global level. However, in areas with a huge number of animals, the entire season's output could be lost in a single night [44]. Wildlife damage varies widely from one location to the next, and farmers' ability to avert losses varies as well. Farmers are sometimes the cause of crop loss by continuing to charge the land's plant structure closer to protected zones, resulting in crop loss. Wild herbivores are likely to be attracted to the new vegetation [40]. Crop raiding and hunting may be linked, with farmers' tolerance for animals being reduced as a result of crop-raiding. Crop-raiding in Asia and Africa is little known, despite increasing population density in rural areas and faster conversion of forest to farms [32, 39].

Even though the human-wildlife conflict has not been thoroughly tracked or quantified. Problem animals can cause anywhere from 10% to 100% of crop damage, depending on region and crop type. According to [44], crop loss along the Kibale National Park boundary is between 4 and 7 percent, equating to about US$6 per farmer or US$ 100 per kilometer of boundary each year. According to [16], the production of a highly attractive and nutritious seasonal crop like maize, which attracts monkeys and other wild animals, entails significant losses and, as a result, substantial guarding investments. Farmers' plight a complete garden, especially in locations where baboons, vervet monkeys, bush pigs, and porcupines wreak havoc, causing substantial and perhaps catastrophic losses [36].

Crop raiding is a severe problem, according to [36], because crop-robbing animals can have a devastating impact on the standard of living of peasants whose entire livelihood is based on subsistence farming. He calculated that in situations when farmers defended their crops, the loss was 30%, and in situations where there was no protection at all, the loss was 90%. A severe food shortage existed, as did rising food costs, increased hunger and illness, and the rural agricultural society became increasingly destitute. The majority of children do not attend school, and in circumstances when farmers protect their crops, children are compelled to miss school to protect the harvests [47].

### *2.5. Human-Wildlife Conflict's Effects on Wildlife and Conservation*

Human-animal conflict is becoming a more severe impediment to wildlife conservation, and it may result in a drastic reduction in the number of wildlife populations. This has been noted by several academics who work in the field [25], for example, claims that human-animal conflict is one of the most serious threats to many wildlife species' survival. Roads, dams, and utilities are all examples of development that help people go about their daily lives. However, by propagating unforeseen environmental repercussions, these activities jeopardize long-term sustainable growth. Uncontrolled secondary human migration, illegal logging, poaching, and resource extraction are all prevalent development effects [21].

The conflict between humans and wild animals is becoming a bigger problem for wildlife protection [18]. Humans can experiment with a variety of techniques to reduce conflict with wildlife. Reduce the number of attacks on livestock by using livestock guarding dogs, electric fencing, better livestock enclosure construction, poisonous collars, disrupting stimuli, and other unpleasant tactics. All of this has the potential to have a significant impact on wild-animal populations [37, 58]. Given the high level of conflict that frequently occurs when people and animals coexist, focusing on keeping wildlife mainly contained within the world's current protected areas may appear to be an easy answer [7, 54]. The existing network of protected areas encompasses more than 11% of the Earth's surface [42], which is unlikely to be enough to ensure the long-term survival of many of these threatened species. To begin with, official protection may not equate to successful conservation on the ground, particularly in locations where local people rely on reserves for supplies like honey, firewood, or subsistence hunting [9, 12]. Many reserves are too small to enable long-term conservation of large-bodied animals, which have wide home ranges [16, 56].

### *2.6. Public Perceptions Toward Wildlife*

Conflicts between local people and wildlife are now considered a serious conservation issue [57]. The difficulty linked with wildlife has a strong influence on the rural residents living near protected areas who have a conservation mindset [20]. People who live near protected areas and are unable to prevent wildlife losses are more likely to have a negative attitude toward wildlife [6]. In groups with a subsistence economy, even slight losses might lead to an unfavorable attitude toward animals [17].

Human attitudes and ideals toward animals differ between and within segments of society [29]. Rural dwellers' attitudes about wildlife may be similar to those of urban residents, except that they are more personally affected by the benefits and difficulties brought by wildlife. Farmers, on the other hand, are one group of people whose views on wildlife differ from those of other stakeholders [4]. They continue to consider its worth, and they're more concerned about how wildlife affects their financial line [46]. In any case, public understanding of the environment and population challenges is critical for successful conservation initiatives; hence, local people's attitudes regarding crop-raiding wild animals should be investigated [37].

### *2.7. Human-Wildlife Conflict Prevention Strategies*

Researchers from all across the world have made many suggestions for viable measures to help decrease human-wildlife fights [38]. This section summarizes some of the observed results of researchers from around the world who have studied this case. [2] stressed the significance of paying more attention to pestilence discourses that might emerge among disenfranchised local populations living near dangerous animals, as well as the cultural, economic, and political situations and global connections that produce them [55]. In contrast to what is prevalent in the West, where the activities of culturally enriched animals are entwined in understandings of social interactions, such discourses may involve a considerably larger sense of reciprocity with the animal world [22]. The increased diversity of stakeholders has produced new management difficulties when it comes to using traditional wildlife management methods [18]. Hunting, fishing, and trapping are examples of population management strategies that are becoming increasingly undesirable in some circumstances [51]. Increased privacy, property damage, and safety concerns may worsen the problems. (1) the identification of clearly defined objectives; (2) the establishment of clear definitions before dealing with issues; (4) the inclusion of activities that promote teamwork; (5) the avoidance of substitutions to maintain continuity; and (6) putting in place principles and activities that encourage active listening [2].

In this climate, wildlife managers may need to shift their attention from maximizing wildlife populations to the more challenging task of maximizing wildlife values for civilization [24, 28, 41]. One of the most difficult aspects of attempting to attain this optimum is that the rewards and obligations have not been properly dispersed across society's many groups [27, 45, 62].

## 3. Conclusion

Crop damage caused by wild animals was seen as a major barrier to people's livelihoods. Wild animal visits to farms, crop destruction, and agriculture closeness to the park were the causes of human-wild animal conflict. Crop raiders account for the majority of human-wildlife conflict, with Anubis baboons, vervet monkeys, wild pigs, common warthogs, Cape buffalo, Hippopotamus, African elephants, and porcupines being the most frequently recorded crop raiders. Guarding is a common crop-raiding deterrent tactic used by farmers in many protected areas across the country. Farmers also employ fences and deterrent techniques to keep crop raiders away from their crops. The goal of guarding was to kill the animals with stones or other dangerous tools. This suggests that a comprehensive wildlife conservation education program is urgently needed to inform farmers living in conservation areas about the purpose and benefits of wildlife conservation, the causes of human-wildlife conflict, and ways for reducing various types of conflict. Farmers must take responsibility for safeguarding their crops, which necessitates aiding them in developing locally relevant plans to successfully reduce crop loss. Authorities in protected areas should strengthen their efforts to mitigate the effects of human-wildlife conflict.

## References

[1] Abunie, L. (2000). The challenges of conserving Ethiopian wildlife: overview. *Walia*, *2000* (21), 56–62.

[2] Acha, A., & Temesgen, M. (2015). Approaches to human-wildlife conflict management in and around Chebera-Churchura National Park, Southern Ethiopia. *Asian Journal of Conservation Biology*, *4* (2), 136–142.

[3] Acha, A., Temesgen, M., & Bauer, H. (2018). Human--wildlife conflicts and their associated livelihood impacts in and around Chebera-Churchura National Park, Ethiopia. *Society & Natural Resources*, *31* (2), 260–275.

[4] Alemkere, A. (2018). Perception, attitude and impacts of local communities on Senkele Swaynes Hartebeest Sanctuary, Ethiopia. *International Journal of Biodiversity and Conservation*, *10* (8), 337–347.

[5] Amaja, L. G., Feyssa, D. H., & Gutema, T. M. (2016). Assessment of types of damage and causes of human-wildlife conflict in Gera district, south western Ethiopia. *Journal of Ecology and the Natural Environment*, *8* (5), 49–54.

[6] Amare, A., & others. (2015a). Conservation Challenges of Gibe Sheleko National Park, Southwestern Ethiopia. *Natural Resources*, *6* (04), 286.

[7] Amare, A., & others. (2015b). Wildlife resources of Ethiopia: Opportunities, challenges and future directions: From ecotourism perspective: A review paper. *Natural Resources*, *6* (06), 405.

[8] Andereck, K. L., Valentine, K. M., Knopf, R. C., & Vogt, C. A. (2005). Residents' perceptions of community tourism impacts. *Annals of Tourism Research*, *32* (4), 1056–1076.

[9] Aseres, S. A., & Sira, R. K. (2021). Ecotourism development in Ethiopia: Costs and benefits for protected area conservation. *Journal of Ecotourism*, *20* (3), 224–249.

[10] Ayechew, B., & Tolcha, A. (2020). Assessment of Human-Wildlife Conflict in and Around Weyngus Forest, Dega Damot Woreda, West Gojjam Zone, Amhara Region, Ethiopia. *Int. J. Sci. Eng. Sci.*, *4*, 0–10.

[11] Berger, J. (1999). Anthropogenic extinction of top carnivores and interspecific animal behaviour: implications of the rapid decoupling of a web involving wolves, bears, moose and ravens. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, *266* (1435), 2261–2267.

[12] Berhanu, K., & Teshome, E. (2021). Opportunities and challenges for wildlife conservation: The case of Alatish National Park, Northwest Ethiopia.

[13] Blair, A. (2009). Human-wildlife conflict in Laikipia north, Kenya: comparing official reports with the experiences of Maasai pastoralists.

[14] Bradley, C. A., & Altizer, S. (2007). Urbanization and the ecology of wildlife diseases. *Trends in Ecology \& Evolution*, *22* (2), 95–102.

[15] Conover, M. R., Pitt, W. C., Kessler, K. K., DuBow, T. J., & Sanborn, W. A. (1995). Review of human injuries, illnesses, and economic losses caused by wildlife in the United States. *Wildlife Society Bulletin*, 407–414.

[16] Damiba, T. E., & Ables, E. D. (1993). Promising future for an elephant population--a case study in Burkina Faso, West Africa. *Oryx*, *27* (2), 97–103.

[17] Datiko, D., & Bekele, A. (2013). Conservation challenge: human-herbivore conflict in Chebera Churchura National Park, Ethiopia. *Pakistan Journal of Biological Sciences: PJBS*, *16* (23), 1758–1764.

[18] Dixon, A. B., Hailu, A., Semu, T., & Taffa, L. (2009). Local responses to marginalisation: human—wildlife conflict in Ethiopia's wetlands. *Geography*, *94* (1), 38–47.

[19] Else, J. G., & Lee, P. C. (1986). Primate-human conflict. Primate Ecology and Conservation. Cambridge, UK: Cambridge University Press. P, 213–214.

[20] Eshete, G., Tesfay, G., Bauer, H., Ashenafi, Z. T., de Iongh, H., & Marino, J. (2015). Community resource uses and Ethiopian wolf conservation in Mount Abune Yosef. *Environmental Management*, *56* (3), 684–694.

[21] Fekensa, T., Tesfahunegny, W., & Mekonnen, A. (2018). Impact of human activities on biosphere reserve: A case study from Yayu Biosphere Reserve, Southwest Ethiopia. *International Journal of Biodiversity and Conservation*, *10* (7), 319–326.

[22] Fenta, M. M. (2014). Human-wildlife conflicts: case study in Wondo Genet district, southern Ethiopia. *Agriculture, Forestry and Fisheries*, *3* (5), 352–362.

[23] Fowler, C., & Mooney, P. R. (1990). *Shattering: food, politics, and the loss of genetic diversity*. University of Arizona Press.

[24] Gebeyehu, G., & Bekele, A. (2009). Human-wildlife conflict in Zegie peninsula (Ethiopia) with emphasis on grivet monkey (Cercopithecus aethiops aethiops). *SINET: Ethiopian Journal of Science*, *32* (2), 99–108.

[25] Gemeda, D. O., & Meles, S. K. (2018). Impacts of human-wildlife conflict in developing countries. *Journal of Applied Sciences and Environmental Management*, *22* (8), 1233–1238.

[26] Ghoddousi, A., Buchholtz, E. K., Dietsch, A. M., Williamson, M. A., Sharma, S., Balkenhol, N., Kuemmerle, T., & Dutta, T. (2021). Anthropogenic resistance: accounting for human behavior in wildlife connectivity planning. *One Earth*, *4* (1), 39–48.

[27] Girmay, T., & Teshome, Z. (2017). Human-wildlife conflicts in and around Choffa forest, Hawzien Woreda, eastern Tigray, northern Ethiopia: implication for conservation and conflict resolution. *International Journal of Science and Research*, *6*, 2319–7064.

[28] Goudar, K. S., Alemu, H., & Ibrahim, H. (2017). Assessment of Human-Wildlife Conflict in and Around Gemshat Forest Area, Wollo, Amahra Region, Ethiopia. *Abyssinia Journal of Science and Technology*, *2* (2), 1–10.

[29] Kebede, A. G., Bekele, M., & Woldeamanuel, T. (2014). Natural resource use conflict in Bale Mountains National Park, Southeast Ethiopia. *International Journal of Biodiversity and Conservation*, *6* (12), 814–822.

[30] Ladan, S. I. (2014). Examining human wild life conflict in Africa. International Conference on Biological, Civil and Environmental Engineering (BCEE-2014) Retrieved from: Http://Dx. Doi. Org/10.15242/IICBE. C-0314043 on May, 22, 2016.

[31] Leishman, M. R., Gallagher, R. V, Catford, J. A., Grice, T., Morgan, J., & Setterfield, S. (2017). Invasive plants and pathogens in Australia. *Australian Vegetation*, 207–229.

[32] Linkie, M., Dinata, Y., Nofrianto, A., & Leader-Williams, N. (2007). Patterns and perceptions of wildlife crop raiding in and around Kerinci Seblat National Park, Sumatra. *Animal Conservation*, *10* (1), 127–135.

[33] Mackenzie, C. A., & Ahabyona, P. (2012). Elephants in the garden: financial and social costs of crop raiding. *Ecological Economics*, *75*, 72–82.

[34] Madden, F. (2004). Creating coexistence between humans and wildlife: global perspectives on local efforts to address human--wildlife conflict. *Human Dimensions of Wildlife*, *9* (4), 247–257.

[35] Manual, H. W. C. (2005). Wildlife Management Series, WWF-World Wide Fund for Nature (formerly World Wildlife Fund) Southern African Regional Programme Office (SARPO).

[36] Martin, G. (2012). Game changer: animal rights and the fate of Africa's wildlife. Univ of California Press.

[37] Megaze, A., Balakrishnan, M., & Belay, G. (2017). Human--wildlife conflict and attitude of local people towards conservation of wildlife in Chebera Churchura National Park, Ethiopia. *African Zoology*, *52* (1), 1–8.

[38] Mekonen, S. (2020). Coexistence between human and wildlife: the nature, causes and mitigations of human wildlife conflict around Bale Mountains National Park, Southeast Ethiopia. *BMC Ecology*, *20* (1), 1–9.

[39] Mekonen, S., Chinasho, A., Berhanu, K., & Tesfaye, S. (2017). Threats and conservation challenges of wildlife in Harenna Forest, Harenna Buluk District, South East Ethiopia. *International Journal of Biodiversity and Conservation*, *9* (7), 246–255.

[40] Messmer, T. A. (2000). The emergence of human--wildlife conflict management: turning challenges into opportunities. *International Biodeterioration \& Biodegradation*, *45* (3–4), 97–102.

[41] Mohammed, N., Goudar, K. S., Getachew, G., & Ibrahim, H. (2017). Human-wildlife conflict: intensity of domestic damage caused by wild animals around Yegof National Forest Priority Area, South Wollo, Amhara Region, Ethiopia. *International Journal of Conservation Science*, *8* (3).

[42] Mojo, D., Rothschuh, J., & Alebachew, M. (2014). Farmers' perceptions of the impacts of human--wildlife conflict on their livelihood and natural resource management efforts in Cheha Woreda of Guraghe Zone, Ethiopia. *Human--Wildlife Interactions*, *8* (1), 7.

[43] Musiani, M., Mamo, C., Boitani, L., Callaghan, C., Gates, C. C., MATTEI, L., VISALBERGHI, E., BRECK, S., & VOLPI, G. (2003). Wolf depredation trends and the use of barriers to protect livestock in western North America. *Conservation Biology*, *17* (6), 1–10.

[44] Naughton-Treves, L. (1997). Farming the forest edge: vulnerable places and people around Kibale National Park, Uganda. *Geographical Review*, *87* (1), 27–46.

[45] Nibret, B., Yihune, M., & Takele, B. (2017). Human-wildlife conflict in Choke Mountains, Ethiopia. *International Journal of Biodiversity and Conservation*, *9* (1), 1–8.

[46] Nishizaki, N. (2004). Resisting imposed wildlife conservation: Arssi Oromo and the senkelle swayne's hartebeest sanctuary, Ethiopia. *African Study Monographs*, *25* (2), 61–77.

[47] Orkin, K. (2010). In the child's best interests? Legislation on children's work in Ethiopia. *Journal of International Development*, *22* (8), 1102–1114.

[48] Pomeroy, R., Parks, J., Mrakovcich, K. L., & LaMonica, C. (2016). Drivers and impacts of fisheries scarcity, competition, and conflict on maritime security. *Marine Policy*, *67*, 94–104.

[49] Runga, J. (1971). Review (Tussock Grasslands and Mountain Lands Institute) no. 21 (1971).

[50] Saavedra, D., & Dantart, L. (2009). The Abune Yosef Massif: Birds and Mammals of a Hidden Jewel of Ethiopia.

[51] Shanko, G., Tona, B., & Adare, B. (2021). Human-Wildlife Conflict around Belo-Bira Forest, Dawro Zone, Southwestern Ethiopia. *International Journal of Ecology*, *2021*.

[52] Sillero-Zubiri, C., & Laurenson, M. K. (2001). Interactions between carnivores and local communities: conflict or co-existence? *Conservation biology series-cambridge-*, 282–312.

[53] Sillero-Zubiri, C., Sukumar, R., & Treves, A. (2007). Living with wildlife: the roots of conflict and the solutions. *Key Topics in Conservation Biology*, 266–272.

[54] Sillero-Zubiri, C., & Switzer, D. (2001). Crop raiding primates: searching for alternative, humane ways to resolve conflict with farmers in Africa. *Wildlife Conservation Research Unit, Oxford University, Oxford*.

[55] Tamrat, M., Atickem, A., Tsegaye, D., Nguyen, N., Bekele, A., Evangelista, P., Fashing, P. J., & Stenseth, N. C. (2020). Human--wildlife conflict and coexistence: a case study from Senkele Swayne's Hartebeest Sanctuary in Ethiopia. *Wildlife Biology*, *2020* (3).

[56] Tefera, M. (2011). Wildlife in Ethiopia: endemic large mammals. *World Journal of Zoology*, *6* (2), 108–116.

[57] Tessema, M. E., Ashenafi, Z. T., Lilieholm, R. J., & Leader-Williams, N. (2007). Community attitudes towards wildlife conservation in Ethiopia. *Proceedings of the 2007 George Wright Society Conference, Assessing Public Attitudes and Experiences*.

[58] Tessema, M. E., Lilieholm, R. J., Ashenafi, Z. T., & Leader-Williams, N. (2010). Community attitudes toward wildlife and protected areas in Ethiopia. *Society and Natural Resources*, *23* (6), 489–506.

[59] Thirgood, S., Woodroffe, R., & Rabinowitz, A. (2005). The impact of human-wildlife conflict on human lives and livelihoods. *CONSERVATION BIOLOGY SERIES-CAMBRIDGE-*, *9*, 13.

[60] Whitehouse-Tedd, K., Abell, J., & Dunn, A. K. (2021). Evaluation of the use of psychometric scales in human--wildlife interaction research to determine attitudes and tolerance toward wildlife. *Conservation Biology*, *35* (2), 533–547.

[61] Woodroffe, R., & Ginsberg, J. R. (1998). Edge effects and the extinction of populations inside protected areas. *Science*, *280* (5372), 2126–2128.

[62] Yihune, M., Bekele, A., & Tefera, Z. (2009). Human-wildlife conflict in and around the Simien Mountains National Park, Ethiopia. *SINET: Ethiopian Journal of Science*, *32* (1), 57–64.