Review of Challenges and Possible Solutions for Wildlife Conservation in Ethiopia

ABSTRACT

Ethiopia is endowed with a large variety of native plant and animal species within its diverse climate and topography. Around 320 mammalian species, including 39 endemics, 918 bird species, including 19 endemics, 240 reptile species (16 endemics), 71 amphibian species (30 endemics), 172 freshwater fish species, including 38 endemics, and more than 1225 insect species have been scientifically reported in Ethiopia. However, Ethiopia's wildlife is in peril right now. Therefore this review was aimed to identify the major challenges of wildlife conservation in Ethiopia and to suggest a possible solution based on the review results. Deforestation, road kills of wildlife along highways, wildlife trafficking, lack of law enforcement, climate change, human-wildlife conflict, and land-use change are the identified challenges of wildlife conservation in Ethiopia. Develop a collaborative approach, invasive species utilization, promote community involvement and awareness creation are the suggested strategy that can bring solutions to the challenges of wildlife conservation.

Keywords: *Human wildlife conflict, protected area, Wildlife conservation, wildlife trafficking*

1. INTRODUCTION

Biodiversity refers to the diversity of life forms found on Earth, including millions of animals, plants, and microorganisms, as well as their distinctions, genes, and intricate systems. The interaction between humans and nature began millions of years ago when humans were first created. During the hunt and gathering, their bonds grew more powerful. Currently, the term "wildlife" refers to all non-domesticated living organisms found in the wild, including those not employed for recreational hunting (non-game species). As a result, wildlife refers to the diversity of all living organisms found in the wild on the earth, at the genetic, species, and ecosystem levels.(Mulualem and Tesfahunegny, 2016b) The conservation of wildlife biodiversity is motivated by two main factors. The first is a moral justification, and the second is the worth of human life. Furthermore, due to the commodities and services it provides, biodiversity is critical to human growth. Biological goods and processes are projected to account for 40 percent of the world economy(Christ et al., 2003). However, biodiversity is disappearing at a rate several times faster than natural extinction on a global basis. Uncontrolled land conversion, climate change, pollution, unsustainable natural resource harvesting, and the introduction of exotic species are some of the reasons that contribute to this(Christ et al., 2003).

According to the report from the Ethiopian Biodiversity Institute (EBI), Ethiopia is endowed with a large variety of native plant and animal species within its diverse climate and topography (EBI 2014). Around 320 mammalian species, including 39 endemics, 918 bird species, including 19 endemics, 240 reptile species (16 endemics), 71 amphibian species (30 endemics), 172 freshwater fish species, including 38 endemics, and more than 1225 insect species have been scientifically reported in Ethiopia. **(**Teketay, 2001**;** Amare, 2015b**).** As a result, Ethiopia is one of the few countries in Africa with the most diverse mammalian faunas, as well as a rich natural legacy. Similarly, the country is rich in floral diversity, with over 6500 different types of vascular plants (with 625 endemic and 669 near-endemic species, and one endemic plant Genus). So, it is ranked as the fifth-largest floral country in tropical Africa(Birhan and Gebreyes, 2015).

National parks, wildlife reserves, and sanctuaries are all employed to manage and safeguard the country's wildlife resources. They are known as key conservation areas, and they

encompass about 2.9 percent of the country's total surface area (Birhan and Gebreyes, 2015). Ethiopia now has about 55 protected areas, 22 national parks, 19 regulated hunting zones, 10 open hunting areas, 3 wildlife sanctuaries, and 2 wildlife reserves in the region. The Simian Mountains and Gambella national parks have received gazette notifications thus far, whereas the others on the list, as well as the national forest priority areas, have not (Marino, 2003 cited in(Wassie, 2020)).

As a result, however, many of the country's protected areas are hemmed in and heavily exploited by adjacent agrarian and pastoralist groups (Birhan and Gebreyes 2015). As a result of this circumstance, occupied resources are increasingly vulnerable to degradation. Wildlife in Ethiopia has major aesthetic value to tourists who want to see and appreciate wild game species, especially when done within their natural environment. Wildlife resource offers a range of goods such as hides, skins, ivory, horns, meat traditional medicine, and subsistence hunting (Tefera 2011). To get the most out of the situation, the government is putting effort into developing a wildlife development and preservation strategy that is in line with the country's goals as well as existing international and natural resource development and conservation principles. As a result, the country's vast wildlife diversity draws a large number of tourists from both within and beyond the country, generating significant money(Eshetu, 2014).

Ethiopia's wildlife is in peril right now. Different variables, such as political, economic, social, and biological limits, impose constraints on animal populations and their management. Habitat destruction, fragmentation, political instability and policy flaws, poaching, a lack of commitment from government officials, a lack of funds, the expansion of large-scale agriculture, the illegal exploitation of available resources, and a lack of skilled manpower in the field are among the most serious issues (Tefera 2011). Due to these all the major challenges of wildlife conservation in Ethiopia is needed to be reviewed with its possible solution.

2. Challenges of Wildlife Conservation in Ethiopia

2.1. Deforestation and Forest Degradation

Deforestation, which leads to land degradation, poses a global threat to many wild animals and their natural habitats, affecting their lifestyles in their chosen environments. Ethiopia's forest cover used to cover about 40% of the territory a century ago, but it is now only 3%. (Badege Bishaw, 2001). Deforestation has resulted in the extinction of a variety of species, resulting in a major loss of biodiversity. More than 17.1% of the country's territory is now protected. However, much of this is forest land that is currently used for farming, grazing, fuelwood, and construction. If just category I and II protected areas (i.e. National Parks and Wilderness Areas) are considered, approximately 2.7 percent of the land surface is only protected at this level, which is lower than its neighboring countries(Amare, 2015)(figure1). Over time, the human population in the vicinity of most protected areas has changed in terms of size, density, and livelihood practices(Masanja, 2014). Uncontrolled logging, illicit charcoal production, and fuelwood gathering are only a few of the major sources of deforestation that have a direct impact on large mammal habitats, which is important for tourism. Furthermore, such actions compel the protected area's visual charm to deteriorate, affecting tourism and wilderness (Amare, 2015) . (Figure 2)

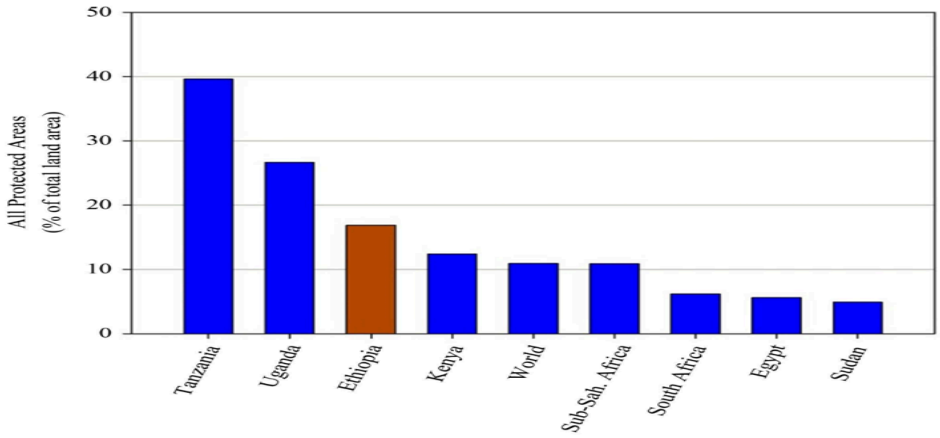


Figure 1 Comparison of the land surface within protected areas of Ethiopia with another country (referenced from Amare, 2015b)

Figure 2 Deforestation practices (Photo taken from Amare, 2015b).

2.2. Road kills of Wildlife along Highways

The road sector is a critical component of a country's infrastructural development. Biological resources found close to an economic corridor's highway, must be carefully planned in both pre and post-construction impact assessment methods. If development goals are not prioritized in the road sector, wildlife species are killed on the road. Some of the observed roadkill records are reported in Eastern Ethiopia protected areas are shown in Figure3 (Mulualem and Tesfahunegny, 2016b) The longest road in the country, stretching from Awash to Djubti port, is the country's most important commercial corridor. Within the roadway, however, there are three wildlife-protected areas: Awash National Park, Yangudi Rasa National Park, and Allideghi Wildlife Reserve (Habtamu, 2014; Tezera, 2015). The road passes through the intended areas' fragmented landscape, which is devoid of wildlife crossing features. Furthermore, the ecological safety management of wildlife-vehicle incidents is ineffective, resulting in the death of wildlife of conservation concern (Getachew & Weldemariam, 2016).

Figure 3 Road kills of wild animals in various parts of Ethiopian protected areas (referenced from(Mulualem and Tesfahunegny, 2016b)).

2.3. Wildlife Trafficking As a Conservation Threat

According to Mulualem and Tesfahunegny(2016), Electronic devices and other items are the current pragmatic emphasis of the customs authority. However, such locations are vulnerable to the trafficking of wild animal trophies and skulls, which have commercial value in the global criminal market. Local commuters going through the highway from Addis Ababa to Eastern destinations are not checked as part of the conservation crime monitoring system used by law enforcement authorities at checkpoints on Awash transit routes. Poachers may take advantage of this opportunity to traffic wildlife over international borders(Mulualem and Tesfahunegny, 2016b). Mamo *et al.*, (2018) also reported that poaching is one of the main conservation challenges (23.36%) in the case of the Alledeghi wildlife reserve (figure4).

From 2011 to 2019, 842 animal seizure reports were documented in Ethiopia, representing 19 different species (3 reptiles, 4 birds, and 12 mammal species). Elephant ivory and ivory goods, however, were overwhelmingly the most frequently seized (94 percent), followed by Leopard (skin and claws) and Hippopotamus tusks. Leopard claws, teeth, and skins; Lion teeth and bones; Cheetah teeth and three live cubs; and 50 raw and eight worked hippo tusks were among the items (Tessema *et al.*, 2021). (Table 2)

In 2014 alone, more than 100 persons were arrested in the country in association with the illegal ivory trade and trafficking, with most being transit passengers at Bole International Airport(BIA) in Addis Ababa and some as departure passengers(Mulualem and Tesfahunegny, 2016a). Thus, there is an indication that the ivory trade still occurs within Ethiopia, although it is highly hidden. According to Ethiopia's National Ivory Action Plan, authorities have arrested over 700 people for ivory trafficking in the last five years, many of whom are Chinese nationals (IPPF, 2016 cited in (Mulualem and Tesfahunegny, 2016a))

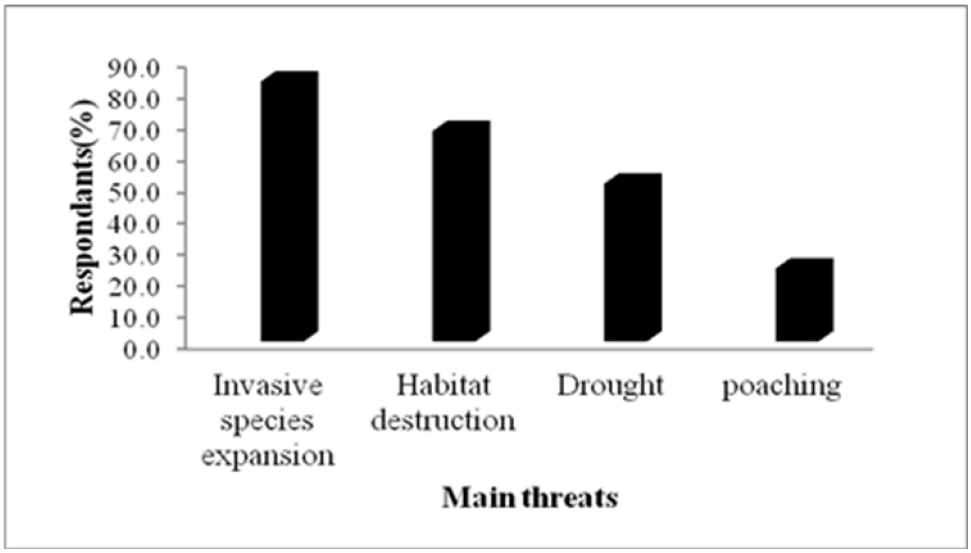


Figure 4 main conservation challenges in Allideghi wildlife reserve (Mamo et al.,2018)

Nationalities from 41 nations were involved in illegal wildlife trafficking within and through Ethiopia. Chinese nationals accounted for the majority of traffickers (668 instances, or 79% of all cases), followed by Ethiopians (38 cases, or 5%), Nigerians (14 cases, or 2%), and Americans (2%). There were 133 (18%) female traffickers and 800 (82%) male traffickers among the 833 seizure occurrences that recorded the trafficker's gender. The average age of traffickers was 40.41 (±0.79) years, with a range of 15 to 88 years (Tessema *et al.*, 2021).

Table 1 Summary of wildlife trafficking related arrests in Ethiopia Source:(Mulualem and Tesfahunegny, 2016a)

Year	# Arrests overall	# Arrests at BIA			Value of fines (in ETB)	**Nationality of Arrests** Ethiopian/Chinese/ Other
		Departure	Transit	Total		
2010	109	--	--	--	500,000	All Ethiopian
2011	249	59	145	204	1.7 million	45 / 185 / 19
2012	123	4	114	118	1.5 million	6 / 107 / 11
2013	147	7	131	138	110,000	9 / 125 / 13
2014	106	5	95	100	>500,000	6 / 91 / 9

2.4. Invasive species

Invasive species reduce biodiversity by competing for food and habitat with native species and modifying the physical environment in such a way that native species are displaced. In Ethiopia, around 35 invasive weed species have been found, all of which are wreaking havoc on local species(Mulualem and Tesfahunegny, 2016a). By delaying seed germination and reducing plant growth in terms of roots, shoots, leaf area, stem diameter, and plant height(Mangla *et al.*, 2008), Prosopis reduced rangeland and free movements of wildlife(Wale *et al.*, 2017) and suppressed the growth of grasses under its canopy and biodiversity(Hundessa and Fufa, 2016). The introduction of invasive alien species, particularly in the eastern and southern lowlands of Ethiopia, is a major cause of the loss of biodiversity. Accordingly, 83% expansion of alien plan species was reported as the main conservation challenge in Alledeghi Wildlife Reserve (Mamo *et al.*, 2018) (figure4).

2.5. Land conversion/ land-use change

In most Eastern African countries' protected areas, land use modification is prevalent due to rising human and animal populations(Pomeroy *et al.*, 2003). The loss of biodiversity has been linked to the conversion of natural vegetation cover to other uses such as farms, grazing grounds, human settlements, and urban areas (Maitima *et al.*, 2004). For example, Awash national park discovered that between 1972 and 2006, dispersed bushland was reduced by 29.4 percent, whereas grassland developed rapidly by 14.2 percent between 1972 and 1986 and by 10.5 percent between 1986 and 2006. Furthermore, bare land expanded rapidly in and around

ANP, in addition to the ever-increasing need for farm and pasture land. For example, between 1972 and 2006, 4.9 percent of Mount Fentale's area became barren ground(Belay et al., 2014) The increase of commercial farming and land alienation by Ittu migrants, as well as the loss of Kereyu community pastureland outside the park, have all contributed to the park's decline (Ayalew, 2009). Permanent communities in and around the park are a major contributor to the park's resources being overburdened(Temesgen and Warkineh, 2018).

Table 2 The number of seizures and items of animal species (excluding elephant) represented in the nine years (2011–2019) Illegal Wildlife Trade seizures data (referenced from(Tessema *et al.*, 2021)).

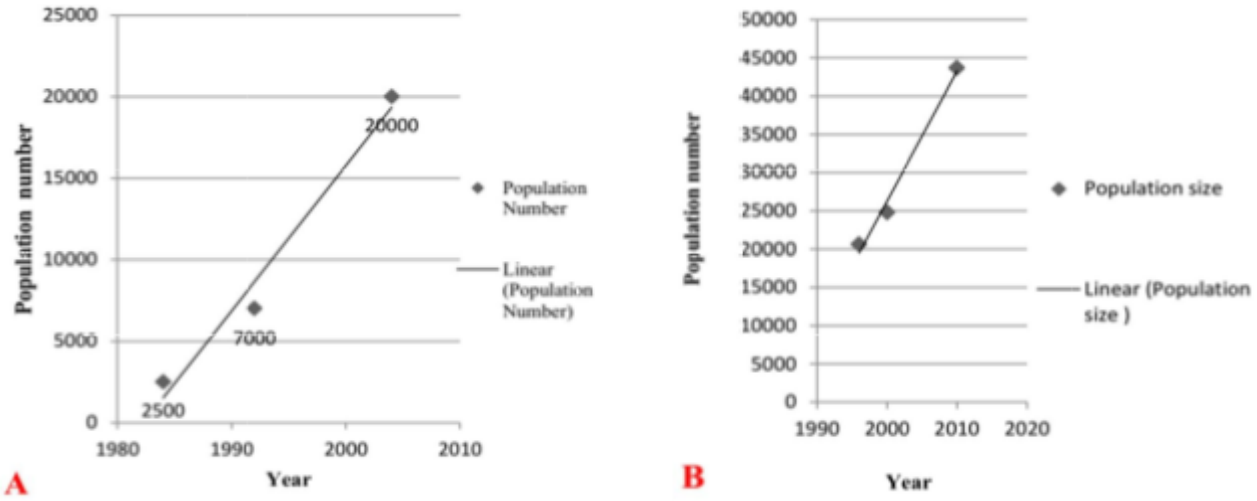
Species	Body parts/items	No. seizures	No. items
Cheetah	Cubs, teeth	2	7
Crocodile	Skin, Bag made of skin	1	1
Duiker	Horn	1	1
Egyptian goose	Live	1	1
Gazelle	Poached (whole part)	6	6
Giant Forest Hog	Tusk	2	3
Guinea fowl	Live	1	1
Hippo	Tusk (raw/worked), necklace	10	58
Klipspringer	Skull	1	1

Kudu	Poached (whole part)	1	1
Leopard	Claws, teeth, skins	16	114
Lion	Claws, teeth, Bones	5	17
Lovebird	Live	7	17
Ostrich	Eggs	2	3
Porcupine	Spikes	1	27
Python	Skin, Bag made of skin	2	2
Tortoise	Live	2	2
Warthog	Tusk, figurine, keyholder, candle holder	13	37
Total		59	299

For example, permanent settlements were reported in four sub-districts on the Oromiya side of the park: Gelcha, Benti, Kobo, and Debi(Belay et al., 2014). Another sign of settlement in the park is the construction of different public service buildings (schools, clinics, millhouses, storehouses, waterworks, etc.) by the Gudina Tumsa Foundation, an NGO founded by the Kereyu community (Mekonnen *et al.*, 2010).

Berhanu and Teshome(2018) also reported that human settlements programs have been undertaken in adjacent areas of the park; in line with that there has been agricultural expansion, demand for grazing land and investors are plowing arable land up to the park, in the case of Alatish national park.

The conservation and management of Ethiopia's national parks are being influenced by population increase(Israel et al., 2016; Gashaw, 2015). Existing settlements are growing and new settlements are appearing in previously unsettled and environmentally sensitive areas in Ethiopian National Parks as a result of population growth (for example, Bale Mountains National Park (Gashaw, 2015), Awash National Park (Zerga, 2015), Gambella National Park (Aneseyee, 2016), Simien Mountains National Park (UNESCO, 2015). Land-use conversion (the conversion of natural vegetation cover to other uses such as farming, grazing land, human settlements, and urban centers) has an impact on the conservation and administration of national parks as a result of population increase. Figure 5 A-D depicts population growth trends within and surrounding districts of some Ethiopian national parks.



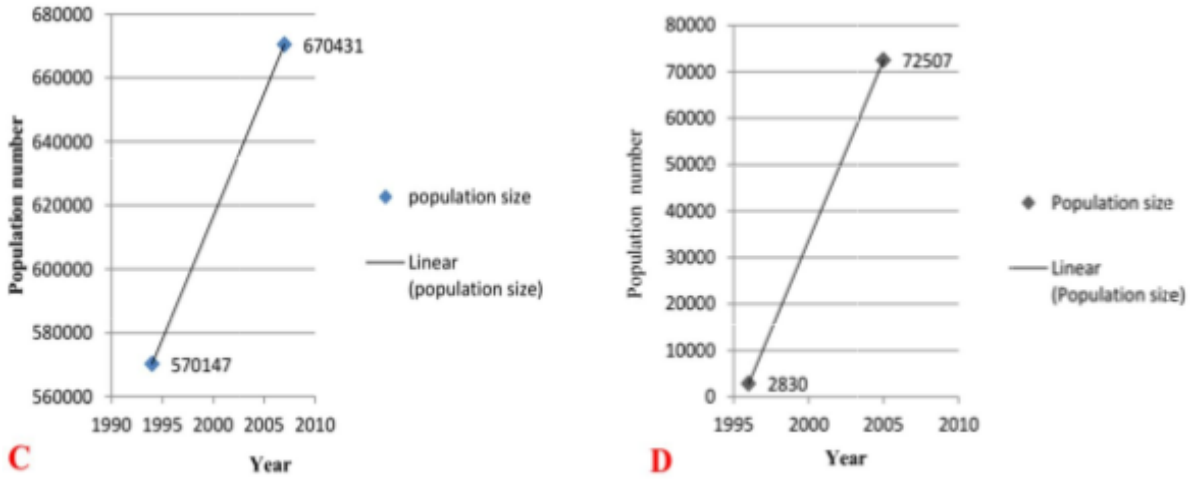


Figure 5 Population growth trendA) in Bale Mountain national park, B) in Abjata-Shalla-Lakes National park, C) in Simien Mountain National park adjacent Districts, D) in Arba-Minch town which is the nearest town to Nechsar National park. source : (Abebe and Bekele, 2018).

Ethiopian Wolves are at risk from close interactions with domestic dogs as a result of the spread of villages(Vial, 2010). Furthermore, residents living inside or near the park make extensive use of the park's resources. In the past, growing human settlement and more intensive resource use led to environmental degradation in terms of soil erosion and vegetation loss(Vial, 2010). In line with this Gambella national park forest land decreased from 43.56 percent to 31.53 percent in 2000, a reduction of 53,027 hectares (12.03 percent), while woodland decreased from 39,372.3 hectares to 32,450.18 hectares (1.58 percent). In general, forest land, woodland, and shrubland decreased, whereas grassland, bare land, and shrubland increase. Forest land decreased by 53,306 ha (12.19 percent) between 2000 and 2010, from 137,858 ha to 84,552 ha. In addition, woodland was reduced by 1.70 percent (7,424.18 ha). Grassland, bare ground, and water bodies, on the other hand, all increased by 11.86%, 1.57%, and 0.46 percent, respectively(Aneseyee, 2016).

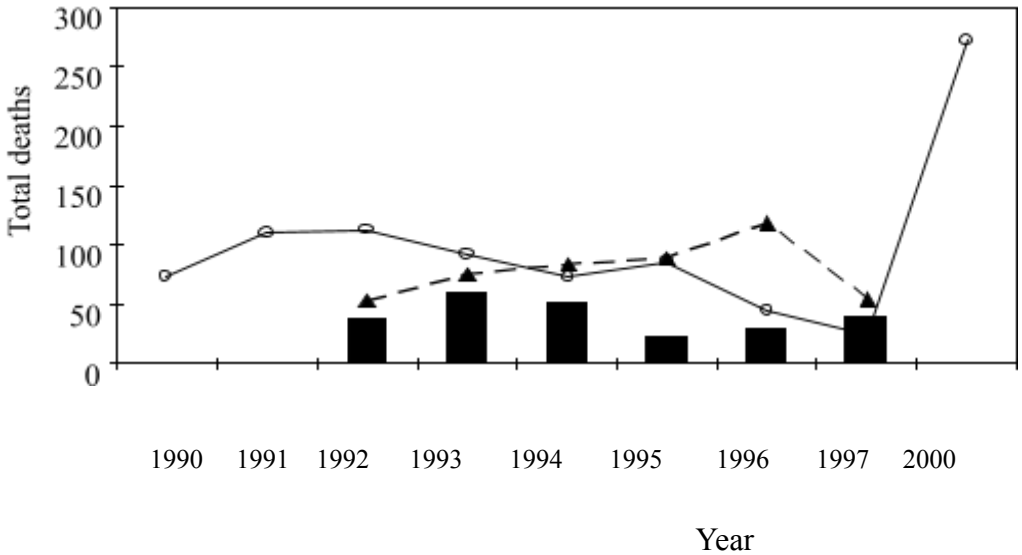
2.6. Human and wildlife conflict

Human-wildlife conflicts are a worldwide issue that affects many countries where human and wildlife needs overlap(Dickman, 2010; Hoffman and O'Riain, 2012; Abachebsa, 2017). It is

mostly caused by human activities such as logging, animal husbandry, agricultural expansion, and development projects, which result in habitat loss, degradation, and fragmentation.

Carnivores attacking and killing livestock or humans, species raiding crops, competition for game and/or resources, disease exchange between livestock and wildlife, and revenge killing are all examples of human-wildlife conflicts (Madden, 2008). Crop raiding is a common example of human-wildlife conflict, and it has a direct impact on local people's support for wildlife protection. According to Worku (2019) Conflict exists in the communities of Marwuha and Diza Gumuz, where wild animals such as apes (*Cercopithecus patas*), monkeys (*Papioanubis*), and warthogs (*Phacochoerus aethiopicus*) damage crops, and Leopards (*Panthera pardus*), lions (*Panthera leo*), hyenas (*Hyaena*), and crocodiles also prey on domestic animals.

This is consistent with the findings of a study undertaken by Wale *et al.*,(2017) which focused on the Babile elephant sanctuary, Awash national park, and the Kuni-Muktar mountain nyala sanctuary. The situation is even worse in the Babile elephant sanctuary, which is expanding its agricultural and communities. Elephants are regularly disturbed here, either by poachers or by local communities. Elephants were chased by residents to preserve their crops from elephant damage. Poachers killed elephants with poisoned darts or rifles, according to scouts, and more than eight elephants were killed in 2016 in this manner(Wale *et al.*, 2017). As shown in figure 6 the study conducted in Kenya also confirms this.



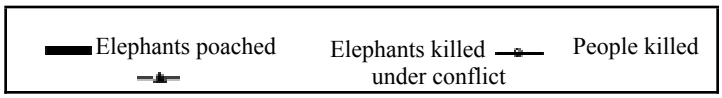


Figure 6Trends in elephant deaths, and wildlife-caused human deaths, in Kenya (referenced from (Western and Waithaka, 2005)).

2.7. Climate Change

Climate change is having an impact on ecosystem health and the services they provide (Keenleyside *et al.*, 2014). Climate change, according to(EBI, 2014), is one of the most serious direct threats to Ethiopia's biodiversity, driven by greenhouse gas emissions, deforestation, and unsustainable land-use patterns. National parks and other protected areas in the country are currently threatened by climate change(Sefi *et al.*, 2017). Climate change has caused a shift in species migration and distribution (by lowering suitable habitat and increasing the pace of habitat fragmentation), as well as an increase in invasive species such as *Acacia drepanolobium* (EBI, 2014).

2.8. Law enforcement

There are some key concerns in the Ethiopia fight against poaching and illegal wildlife trade. This involves, among other things, a lack of law enforcement capacity, poor collaboration and coordination between wildlife and other law enforcement authorities at all levels, low detection and seizure rates, and a lack of a central database and information-sharing platforms among stakeholders(Tessema *et al.*, 2021).

Law enforcement is the most effective strategy to prevent additional biodiversity loss and is required for proper protected area management as a public good(Fischer, 2008). However, one of the threats in eastern Ethiopia's protected zones is a lack of law enforcement. Settlements, agriculture, poaching, and other activities are prohibited within protected areas, but there has been no effective law enforcement to prevent such activities in eastern Ethiopia's protected areas(Wale *et al.*, 2017).

Conflict over resource utilization between Issa (Somali) and Afar tribes, for example, resulted in the park areas being scrambled for grazing and settlement by chasing away the scouts in Yangudi-Rassa national park. Arabs, on the other hand, come to Afar from Djibouti under the pretense of aid and illegally hunt wild animals, including wild ass, by paying local guides.

These individuals were apprehended in Serdo kebele while hunting *soemmering gazelle* with the help of the local population and taken to Semera, but they were later freed without punishment. In the same year, a poacher who killed one elephant was apprehended by scouts and freed without punishment. Such behaviors depressed the scout, putting elephants' and wildlife' lives in jeopardy(Wale *et al.*, 2017).

Similarly, due to a lack of law enforcement, scouts in the Babile elephant sanctuary were unable to prosecute unlawful poachers or members of the community. During a patrol in the sanctuary in 2016, one scout was slain. In the same year, a poacher who killed one elephant was apprehended by scouts and freed without punishment. Such actions disheartened the scout, putting elephants' and wildlife' lives in jeopardy(Wale *et al.*, 2017).

3. The possible solutions

3.1. Invasive Species Utilization

As a general rule for all invasive plant species, special effort should be paid to preventing actual and potentially invasive alien species from establishing themselves in national parks(Yohannes et al., 2011). Because eradicating them after they have established themselves can be difficult (for example it is possible to take the case of Prosopis juliflora).

Furthermore, as Yohannes et al., (2011) point out, extreme caution should be exercised while planting or introducing new plant species into park areas. Although there is currently no enforceable regulation governing the usage of alien species, national parks should have their processes in place to manage the entry of new plant species into the park to prevent the spread of invasive species(Abebe and Bekele, 2018).

Parks should restrict intensive grazing since it can aid the development of invasive plants by trampling and defoliating established species, lowering their competitive power and generating barren patches, as well as disturbing nutrient cycles(Kimball and Schiffman, 2003). In addition, using plant species that limit invading species' growth, as well as insects and pathogens (such as the leaf-feeding beetle Zygograma bicolorata in the case of Parthenium hysterophorus) as biological control methods, can aid in the biological management of invasive species(Sefi *et al.*, 2017).

3.2. Promote community involvement and awareness creation

The community in the national park is helping to safeguard the park from fires, wildlife, and forest fires, as well as vaccinating domestic dogs, repairing fences, and reporting illegal activity(Gashaw, 2015). As a result, it is thought that resource management is most effective when local people are involved in all stages of the process, from planning to implementation(Aramde et al., 2012). The state's relationship with the local Guji agro-pastoralist community in Nech Sar National Park, southern Ethiopia, will continue to be hostile and affect both sides unless the state includes the local Guji agro-pastoralist community in the park's planning, management, and benefit by recognizing their customary rights and knowledge(Asebe, 2012). As a result, community participation at all stages of the management process is critical.

The first step in preserving protected areas should be raising public awareness. Protected places must be understood by local communities in terms of environmental, social, and economic value(Kebede et al., 2014). For example, the Bale mountain national park's establishment is critical for soil erosion control, obtaining consistent rainfall, and other reasons(Asmamaw and Verma, 2013). As a result, raising awareness helps to reduce the number of trees that are cut down. This also boosts the population of wild animals, including Mountain Nyala, which boosts economic returns by boosting tourism in the area (Asmamaw and Verma, 2013). As a result, before establishing any protected area, it is necessary to raise public awareness.

Increasing the level of climate change mitigation mechanisms and awareness creation can also play a crucial role (EBI, 2014). Increase afforestation, reforestation, and forest management to increase carbon sequestration in forests and woodlands also help to overcome the climate change problem which may also reduce the pressures that peoples exert on national parks.

3.3. Collaborative Approach and future direction

Wildlife legislation, seizure, arrest, reporting, information sharing, and technology use processes should be covered in capacity development training for EthiopianWildlife

Conservation Authority employees and other relevant local and national law enforcement authorities and other stakeholders. Maintaining existing local, national, and worldwide collaboration systems should be viewed as a critical opportunity to combat Illegal wildlife trade(Tessema *et al.*, 2021). In line with this Mulualem and Tesfahunegny(2016) also stated that various institutions, such as the Ethiopian Revenue and Customs Authority, the Ethiopian Wildlife Conservation Authority, the Ethiopian Biodiversity Institute, Ethiopian postal office, Federal and regional policy offices, Ethiopian wildlife conservation Authority, the Ethiopian Environmental and Forest Research Institute, and other governmental organizations, should work together to address the current wildlife trafficking crisis.

Above important, Ethiopian customs and tax officials should be able to identify and correctly handle species that are widely trafficked both within the country and beyond borders. Furthermore, law enforcement units of Ethiopia's wildlife conservation authority should collaborate with stakeholders such as ranchers, local communities, and other law enforcement agencies to develop and implement area-specific security strategies to combat poaching threats and other wildlife crimes(Mulualem and Tesfahunegny, 2016a). In Kenya's wildlife department, such best practices have been shown to minimize the size of wildlife trafficking(Karanja, 2012).

According to Berhanu and Teshome(2018), at least the principal plants, as well as endangered and rare elephants, lions, leopards, and kudu, should be inventoried and monitored regularly. To accomplish so, permanent human resources, particularly plant and animal science professionals, should be recruited and engaged to assure sustainability and preservation for future generations to enjoy. And also there should be a way for the community to use the pasture at the park's periphery or collect through a cut-and-carry system during long dry seasons and drought periods, and there should be a way for the community to use the pasture at the park's periphery or collect through a cut-and-carry system during long dry seasons and drought periods. At the same time, the park's future wildlife management plan may need to include compensation and benefit-sharing systems. As a result, all parties will have a significant chance to design and implement community-based wildlife management systems that at the very least address the pastoral communities' core needs(Biru et al., 2017).

4. CONCLUSION AND RECOMMENDATION

Generally, based on the reviewed scientific findings, it is possible to conclude that, deforestation, road kills of wildlife along highways, wildlife trafficking, lack of law enforcement, climate change, human-wildlife conflict, and land-use change are major challenges for wildlife conservation in Ethiopia. Develop a collaborative approach, invasive species utilization, promote community involvement and awareness creation are the suggested strategy that can bring solutions to the challenges of wildlife conservation. In addition, especially awareness-raising and capacity-building efforts could be extended to the local people who settled near the buffer zone and adjacent areas of the park and particularly to immigrant communities to create awareness about sustainable utilization of resources and the values of conservation of wildlife and other natural a resource of the park. It would be wise to increase their involvement in conservation and urgently. Resolutions for human-wildlife conflict such as people looking after their livestock and crops better, and using replicas (fear-provoking stimuli) to protect damages of wildlife on farms, and seeking alternative means of livelihood for hunters, fishermen such as agriculturalists, as the region is very fertile.

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