

The Opportunities and Challenges of Protected Areas and Eco-tourism Development in Ethiopia

Abdulkadir Mohammed

Mattu University ,Bedele Campus, Department of Eco-tourism and Biodiversity Conservation

Email : abdulkadirmohammed86@gmail.com

Abstract

Protected areas are protected area mainly designed for the protection and conservation of natural, historical and associated cultural resource. Ethiopia is endowed with the vast array of ecotourism resources including cultural, historical and natural resources which are ideal for the development of sustainable ecotourism ventures. Ethiopia depends heavily on protected areas (PAs) for wildlife and forest conservation. About 14% of the total land area of the country is covered by officially defined protected areas such as National park, wildlife sanctuary, wildlife reserve, and controlled hunting area, priority forest area and biosphere reserve. People out approach” protected area management to participatory protected area management, wildlife development, conservation and utilization proclamations, diversified floral and faunal species are major opportunities for PA management in Ethiopia. Even it has various opportunities in different part; the areas have been challenged largely by natural and human-induced constraints. The review revealed that grazing, expansion of farmland, cutting living tree, conflict, inadequate coordination among stakeholder are the major management problems of the PAs. Ecotourism use diverse nature, landscapes and biodiversity as major tourist attractions. Protected areas such as national parks are becoming major ecotourism sites.

Keywords: Protected Area, Ecotourism, Flora, Fauna, Ethiopia

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INTRODUCTION

A protected area,"geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values"(Dudley,2008).

According to Watson et al. (2014), and Vreugdenhil et al., (2012), protected areas preserve iconic landscapes and species for the sake of conservation, social and economic development. With 14% of its landmass protected, Ethiopia's protected area system is larger than the average worldwide. For the conservation of its biodiversity, wildlife, and forests, Ethiopia has developed protected areas, the most popular of which are its national parks (Debelo, 2012; Stellmacher, 2007)

The Ethiopian Highland Plateau and the dry Horn of Africa are features of the biogeography. Due to their high rates of endemism, these regions are regarded as biodiversity hotspots of international significance(EWCA, 2012; IBC, 2014). Also due to a Wide difference in rainfall, humidity, temperature, and soils have been caused by this topographic diversity, which spans a 4620-meter elevation range. The nation is home to ten different ecosystem types and six of the world's major terrestrial biomes, including alpine, coniferous forests, deciduous forests, tropical rainforests, savannas, and deserts (BIDNTF, 2010, IBC, 2014).

With more than 20 national parks, 4 wildlife sanctuaries, more than 2 Wildlife Reserves, more than 17 Controlled Hunting Areas, 7 Open Hunting Areas, more than 3 Community Conservation Areas ,more than 18 controlled hunting areas , two pilot projects ,and 4 biosphere reserves Ethiopia has a strong potential for ecotourism and protected area development (Young, 2012; EWCA, 2012 , and Tessema.,2019; Teshome *et al.* 2020).

Additionally, Ethiopia is home to 314 different kinds of mammals, including 57 endemic species—18.5% of all mammals. 39 (12.4%) of the 314 mammal species, including 16 threatened and 4 near-threatened endemic species, are currently globally threatened, while 74 (23.5%) of these species' populations are on the decline. Similar to this, 36 bird species are threatened globally, and nearly a quarter (214 species) of all bird species found in Ethiopia are experiencing population declines. 26 (10%) of the 253 species of reptiles known to exist in Ethiopia are endemic to the country while 71 amphibians are known from the country, of which 30 are endemic species (Largen & Spawls 2010). MoCT, 2017; Tessema, 2019; Tesema *et al.*, 2022).

In addition, the country has more than 6,000 species of vascular plants, including 625 endemic species, 669 near-endemic species, and one endemic plant genus, 201 species of reptiles, including 14 endemic species, 23 species of amphibians, including 23 endemic species, and 150 freshwater fish, including 6 endemic species (Amare 2015). Despite the fact that protected areas in the nation are crucial for the preservation of biodiversity, they also offer other crucial advantages for both local people and the overall national economy. According to Kelboro and Stellmacher (2012), Amare (2015), and Muluaem and Tesfahunegny (2016), deforestation, soil

degradation, grazing, habitat loss and destruction, illegal agricultural expansion, habitat degradation, and misuse of the nation's natural resources are all contributing to the degradation and challenges facing these protected areas in the country today.

So, specific research questions were developed as a result of the review effort. These were: (1) what are the main difficulties facing Ethiopian protected areas? and (2) What opportunities do protected areas now have in the nation? 3. What function does a protected area play in the growth of ecotourism? (4) What are the takeaways from this experience and how may Ethiopia's protected areas and ecotourism be developed sustainably going forward?

The IUCN clarified the implication of different types of protected areas under six management categories (IUCN, 1994; Table 1.1).

Table 1.1 Categories of protected areas and targeted management objectives

Category Type	Primarily management objective
Ia Strict Natural Reserve	Scientific purposes
Ib Wilderness Area	Wilderness protection
II National Park	Ecosystem protection and recreation
III Natural Monument	Conservation of specific natural feature
IV Management Area	Conservation by management intervention
V Landscape/seascape protection	lands/seas cape conservation or recreation
VI Managed Resource Protected Area	Sustainable use of natural resources

Source :IUCN,1994

OBJECTIVE

- ✚ To identify the major threatening factors for wildlife protected area in Ethiopia
- ✚ To determine the major opportunity of Eco tourism and protected area develop[ment in Ethiopia)
- ✚ To review the relationship between eco tourism and protected area
- ✚ To the way forward for the sustainable development and conservation of protected area

Methods

This study is based on thorough literature review. The methodological approach adopted was a literature search and synthesis of relevant peer-reviewed articles and related literature. Relevant literatures to protected area management at national and global scales, Ethiopia's protected area management, development and conservation policy and reports were reviewed conceptually. The selection of literature was mainly based on search engines and plat forms from Google Scholar, Web of Science, Research Gate, Science Direct, and many other scientific journals publishing websites. The peer-reviewed ones were given higher priority in shaping the conclusion of the paper, while unpublished sources served as background material and sources of supplementary reading.

Several keywords were used in searching English-language electronic papers available up to the end of June 2023. These include "protected area" ; "national park" ; "biodiversity conservation"; "challenges of protected area" ;; "ecotourism development"; "habitat loss" ; "invasive species" ; "human induced factors"; "natural resource management"; "protected area management"; "agricultural expansion" ; "endemism" ; "flora diversity" ; "faunal diversity"; "deforestation"; "human and wild life conflicts". As a result, more than 1200 papers were retrieved from the search hits. From these, a total of 300 papers were used for review and synthesis. Finally, by avoiding duplications, only 190 papers that include original research articles (n=122), reviews (n=21), books and book sections (n=19), working papers and conference proceedings (n=5), policy documents (n=2), and organizational reports (n=21) were reviewed and combined.

Major challenges of protected in Ethiopia

- ✚ Habitat loss

According to the FAO Global Forest Resources Assessment (FRA) 2020, between 1990 and 2020, 420 million hectares of forest were deforested (converted to other land uses) in the world . This is a result of the greater demands placed on agriculture by current farming techniques and the fiercer competition for natural resources(Food and Agriculture Organization , 2017). Also According to Batool and Hussain (2016), the fragmentation and degradation of natural habitat result in a decline in the population size, abundance, genetic diversity, and eventual extinction of wildlife. Furthermore, 34 percent of agricultural land is affected by human-induced degradation; one-fifth of this land is in sub-Saharan Africa, followed by Southern America (17 percent); North America and South Asia each contribute 11 percent to global degradation; and, in terms of region, South Asia is the most affected, with 41 percent of its area suffering from this problem (FAO, 2021).

Deforestation is the primary driver of biodiversity loss, and degradation associated to changes in land use and cover costs Ethiopia roughly 4.3 billion dollars year (Federal Democratic Republic of Ethiopia (FDRE), 2005). Deforestation, which results in habitat loss, poses a threat to the majority of Ethiopia's protected areas

(Young et al., 2020). According to Kasso and Bekele, (2014) habitat fragmentation has a long-term impact on the genetic composition and demography of species. These include a reduction in habitat size, disturbance/edge effects, mortality, such as the killing of wild animals on the side of the road, isolation of the animal population, and corridor. The majority of Ethiopia's protected areas are affected by habitat loss due to a number of factors, including poaching, overgrazing, settlement, cultivation/subsistence farming, human-induced wildfire, canal construction, conversion of grassland and bush land, and conflicts between humans and wildlife (Tesema, 2019; Tesema et al., 2022).

Deforestation

According to FAO, (2018) indicated by Global Forest Resource Assessment (2020), deforestation is the conversion of forest to other land uses independently, whether human-induced or not, referring to the Permanent reduction of the tree canopy cover below the minimum 10% threshold. It includes areas of forest converted to agriculture, pasture, mining, and urban areas. Deforestation Clearance of forest for the sake of charcoal making and production are the factors for land cover change in ASLNP (Yohannes et al., 2017). The government initially prohibited the use of grazing lands by agro pastoral populations in the park without proper consultation or compensation. Then, local communities cleared Acacia woodland as a reaction, and much of the forest surrounding Lake Abijata has been removed by communities for purposes like charcoal production [Yohannes et al., 2017].

Exploitation of wood for the purpose of fuel and construction materials is one of the main challenges in protected areas such as (BMNP) Bale Mountains National Park and (LANP) Loka Abaya National Parks in Ethiopia. The dependence of local people on park resources to meet their energy demand and construction materials need is leading to intense deforestation and destruction of biodiversity in different national parks in Ethiopia [Temesgen , 2017 , Menbere ,2021).

Over grazing

The shifting natural plant cover in and around protected areas is a result of the growing cattle population. This is true in Ethiopia's protected regions, where communities with a nomadic lifestyle are common. This was the issue hurting the park's natural forest in Abijata-Shalla Lakes National Park (Yohannes et al., 2017). According to Asefa et al. (2015), livestock grazing had a negative effect on the Bale Mountains' bird population through changing species' habitats and the makeup of assemblages. Similar research in the national parks of Omo, Mago, Kefta Sheraro, and Chebera Churchura found that overgrazing has increased as a result of the involvement of pastoralists, whose subsistence depends on the care of livestock. Along with having negative effect on the park's biodiversity and ecosystem, this is causing friction between the pastoral communities and the management organization of the park (Tesema et al., 2022). Furthermore , humans and livestock encroachments forced and excluded the mountain nyala from using their optimum habitats in Munessa forest (Tadesse *et al.*, 2013).

Agricultural expansion and settlement

According to Belay et al. (2014), the growth of farming in Awash National Park significantly reduced the most crucial habitat for wild animals. Also A significant concern to the loss of biodiversity, according to Wakjira et al. (2015), is the continued expansion of agricultural land in Bale Mountain National Park. High potential locations include Awash, the Rift Valley Lakes, the Omo River Delta, the Mount Bale Massif, Lake Stefanie, Maji, the Dabus Valley, and the Gambella region, where agriculture, pastoralism, and land investment are the main types of land use changes (Vreugdenhil et al., 2012). The main issues in managing wildlife in protected areas are population growth, agricultural expansions, and animal grazing. In Bale Mountain National Park, there have been intermittent increases in human settlement growth that have led to disproportionate losses of wildlife habitats in their natural settings (Hansilo and Tiki, 2017).

Climate change and the introduction of exotic species

According to Kathiresan (2004) and Kathiresan et al. (2005), invasive species are one of the main dangers to native species and ecosystems around the world. There are about 35 IAPS in Ethiopia. Some of these species include *Prosopis juliflora*, *Parthenium hysterophorus*, *Eichhornia crassipes*, *Lantana camara*, and Acacia species, which are the major threats to biodiversity losses. Water bodies, wetlands, disturbed vegetation types (e.g. Acacia-Commiphora vegetation type), agro-ecosystems, road sides, urban green areas, range lands are under threat of IAPS nowadays in the country (Shiferaw et al .,2018). Both climate change and invasive species are the two main threats for both plant and animal species in PAs.

The consequences of climate change on biodiversity are more severe where the area has high biotic diversity and the study also in the threshold of extinction [Rutherford et al., 1999]. The same is true in Ethiopia where the country has high species diversity. Moreover, the other consequences of climate change are range shifts that may cause the species to move out from the range of protected areas. These range dynamics due to

climate change will reduce the suitability of reserving wildlife in fixed protected areas [Hannah et al., 2007].

This may result in competition for resources and changes in the way predators interact with their prey. Moreover, the PAs character limited wildlife mobility to relocate to new geographic areas in response to climate change [Newmark, 2008]. Climate change is also having significant effects on wildlife and their ecosystems. These were caused due to the occurrence of invasion by new plant and animal species including plants, animals, and pathogens; reductions in population size mainly for boreal or montane species; an increase in dissemination of wildlife diseases and parasites, and increased spread of invasive species [Mawdsley et al., 200]. In a normal circumstance, diseases are transmitted directly from infected to healthy ones through infected prey or biting insects. However, indirectly the occurrence of climate change enhanced the rate of disease transmission and increased pathogens within intermediate hosts and vector [Hofmeister et al., 2010]. The introduction of non-native species has its drawbacks on the wildlife resources of the country. For example, *Prosopis juliflora* species was introduced in Ethiopia around the 1970s in semi-desert and desert parts of the country for watershed protection.

This area hosts many endemic plant and animal species. It harbors vulnerable and threatened wild mammals like African Wild Ass (endemic) and Grevy's Zebra. However, the introduced species is an invader and took advantage of the native species. It reduced the native browsing trees/shrubs and grasses which is a feed of both the wild and domestic animals in the region and denied access to available grasses [Abebe, 2012].

Human wild life conflict

Human-wildlife Conflict is defined as any interaction between people and wildlife that has a detrimental effect on the environment or the conservation of wildlife populations (WWF, 2005). Conflict between humans and wildlife arises when human needs conflict with those of wildlife (Messmer, 2010). In addition, the loss of habitat brought on by human activities like agriculture, urbanization, and deforestation results in an ever-increasing encroachment on wildlife habitats (Sharma, 2011).

Such encroachment activities into wildlife's natural habitat lead to an increase in habitat fragmentation and subsequent habitat compression into smaller pockets, where frequent interactions between animals and humans result in conflict (Kumar, 2012; Wale et al., 2017).

The main factors contributing to human-wildlife conflict in Chebera-Churchura National Park are habitat degradation, wildlife poaching, wildfires, crop raiding, livestock predation, attacks by wildlife on humans, traditional hunting, and usage of skins and horns for cultural purposes (Acha et al., 2017). Similarly, conflicts between people and wild animals in and around Borena Sayint National Park are brought on by crop damage caused by wildlife (Biset et al., 2019).

Opportunity of pa development in Ethiopia

Ethiopia is biodiversity hot spot

Ethiopia is one of the world's top 25 biodiversity hotspots, with two of the world's 34 biodiversity hotspots, the Eastern Afromontane and the Horn of Africa hotspots (EBI, 2014; Amare, 2015). The country's biogeography is characterized by two different features: the arid horn of Africa (Ogaden) and the mosaic highland plateau (Young J, 2012), which result in an exceptionally diverse and unique flora and fauna. This wildlife diversity is a big draw for tourists; ecotourism development helps the country's economy and protects the country's future protected areas (Vreugdenhil et al., 2012). Further more, From the desert of the Danakil Depression, the world's lowest dry land point at 116 meters below sea level, to Ras Dashen Mountain (Africa's second-highest peak and roof) at 4543 meters above sea level, the country boasts a diverse and contrasting landscape (Tefera, 2011).

All the major ecosystems of the country have been represented in this protected areas system. These diverse ecosystems and variable climate conditions have contributed to high diversity of species (Yalden, 1992). Therefore, thus far 320 species of mammals (57 are endemic), 926 species of birds (18 endemic), 242 species of reptiles (15 endemic), 73 species of amphibians (30 endemic), 180 species of fish (41 endemic), about 6500 species of vascular plants (700 endemic) (Lepage, 2006 and Tessema et al., 2022).

Faunal Diversity

Currently, around 320 species of mammal including 39 endemics (both small and large mammals), 918 birds with 19 endemic species, 240 reptiles (16 endemics), 71 amphibians (30 endemics) and 172 freshwater fishes with 38 endemics and more than 1225 insects recorded in Ethiopia (Amare, 2015). Therefore, Ethiopia has one of the most diverse mammalian faunas in Africa and the great attractions of its wildlife heritage.

Floral diversity

The floral part of Ethiopia varies from montane forests with coniferous and broadleaved forests, vast savannah, steppes and to deserts are interrupted by lakes with acacia commiphora woodland ecosystem, crossed by rivers

and streams accompanied by galley forests. The flora and topography also provides another excitement for tourists. However Ethiopia has diverse floral diversity, more than 6500 species of vascular plants (with 625 endemic species and 669 near-endemic species, and one endemic plant genus) and ranked the fifth largest floral country in tropical Africa (Tewolde Berhan, 1991, Young J, 2012).

Expansion of Protected Area

Ethiopia has 104 protected areas covering 200,074 km² of land (UNEP-WCMC & IUCN, 2019h). The country has a wide variety of PAs at different ecological sites and has great economic and environmental importance beyond its fundamental role in the conservation of wildlife (Mengist, 2020). Potential for Tourist Destination Protected areas are the main focus for the maintenance of biological diversity and contribute for economic developments of a nation. The forest cover of Ethiopia declined from 47% to only 3% for the past few decades due to ever increasing population and anthropogenic effect (Amare 2015).

Ethiopia had more than 55 protected areas covers currently about have more than 17.1% of its land, ranked third in African country next to Tanzania and Uganda (Amare 2015). This crisis seems under recovering slowly in the future. The country is one of few countries where the establishments of protected areas are increasing. For example, Ethiopia had only two protected areas (namely; Awash and Simien Mountains National Park) before 40 years and today has more than 55 protected areas (including 21 national parks) to protect and conserve the natural ecosystems and wildlife heritage of the country. Conversely, those protected areas are exposed to severe pressure, which threatens their existence and sustainability due to anthropogenic effects (Amare 2015).

Table: Regional statistics reports on protected and conserved areas Coverage in Ethiopia

Number of protected areas	Terrestrial area covered in protected areas (km ²)	% of terrestrial area covered in protected areas	% of terrestrial area covered in protected and conserved areas	% of terrestrial area that is protected and connected
104	200 074	17.62%	14.00%,	8.28%

Source : UNEP-WCMC & IUCN (2019a).

Table: National designations of protected and conserved areas in Ethiopia

National designation	Number	Area (km ²)
Sanctuary	4	11037
National park	13	23672
Wild life Reserve	8	23392
National Forest priority Area	58	44132
Controlled Hunting area	18	151577

Source: UNEP-WCMC & IUCN (2019h).

Protected and conserved areas designated as global sites of importance in Ethiopia

Global designation	No of sites
UNESCO Man and Biosphere Reserves	5
UNESCO World Heritage Sites (natural or mixed)	1

Source: Ramsar (2019); UNESCO (2019a, 2019b).

Priority areas for conservation

3sites	67 sites	79sites
Alliance for Zero extinction site	Important bird & Biodiversity area	Key biodiversity area

Source: Alliance for Zero Extinction (AZE) Secretariat (2019); BirdLife International (2019b, 2019c)

Presence of indigenous knowledge system of protected area management

The indigenous ecological knowledge (Gada system) play an important role for sustainable management of natural resource and maintaining ecosystem equilibrium (Melaku Getahun, 2016). The Gada law declaration, on hartebeest killing by Arsi Oromo in and around Senkalle wild life sanctuaries is an indication of effective wild life and protected area management by indigenous knowledge system (Asefa et al., 2019).

Ways forward

The following points are forwarded as a solution for the sustainable eco tourism development in Ethiopia . Therefore, properly addressing the following points can help to improve the status of PAs and the wellbeing of wildlife.

- ✚ Formulating effective management policy and strategies for the protected area of the country and local community settled around the protected area .

- ✚ Early involvement of local community in decision making is so important for sustainable management of the protected area.
- ✚ Encouraging and integrating the indigenous knowledge system in the management of protected area.
- ✚ Eco tourism development in and around the protected area is important and development of community based eco tourism enterprise reduce pressure on protected area . encouraging ecotourism activities like renting of pack animals, being local guidance, and selling of cultural materials.
- ✚ Prevention and control over Invasive species and formulating the policy to control those species is also important .
- ✚ avoiding development programs at the cost of PAs. Road construction and commercial farming are factors that reduce the size of PAs and increase the vulnerability of wild animals in Ethiopia. .
- ✚ expanding education, awareness, and scientific research on biodiversity in and around protected area should be given priority.
- ✚ Making scientific research is also valuable to look better solution for the enhancement of conservation areas in general and wildlife species in particular.

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