K **:** Ethiopia; reat; Preservation; Biodiversity

I

Ethiopia is a biodiversity hotspot that requires regional and international attention. It has a diverse range of environments, from humid forests and large marshes to the deserts of the Afar Depression. is is in uenced by climate, topography, and vegetation. Ethiopia is one of the world's twelve recognized ancient countries for crop plant diversities, according to Edwards (1991), and contains signi cant reserves of crop genetic diversity, with 11 cultivated crops having their diversity center in the country. e wide range of conditions found in the country's highlands has resulted in the occurrence of a large number of endemic species. Ethiopia's ora is diverse, with an estimated 6,500 to 7,000 higher plant species, with about 15% of them being unique. Ethiopia is the world's h largest oral country in tropical Africa, according to reports. e faunistic diversity of the country is astounding. e larger mammals are mostly found along the south and southwest borders of the country, as well as in nearby areas. In the northern mountain massifs, endemic mammals such as the Walia Ibex, Semien Fox, and Gelada Baboon can be found. 277 mammalian species, 861 bird species, 201 reptile species (including over 87 snakes, 101 lizards, and 13 tortoise and turtle species), 145 freshwater sh species (including over 87 species from the Baro River and 16 from Lake Abaya), 324 butter y species, and 63 amphibian species live in Ethiopia [1].

Ethiopia is home to 31 di erent native animal species. e Walia Ibex (Capra walle), Gelada Baboon (eropithecus gelads), Starck's Hare (Lepus Starcki), Mountain Nyala (Tragelaphus buxtoni), and Ethiopian Wolf (Canis simensis) are among the larger mammals, with

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change, species introductions, and, increasingly, climate change, about half of all documented extinctions have occurred on continents in the last 20 years, indicating that biodiversity is now threatened globally.

e average global extinction rate is anticipated to increase by a factor of ten throughout this century, to 100010 000 E/MSY (Costanza et al. 1997) [4].

e relevance of biodiversity management has just recently been

e impact of air pollution on biodiversity is enormous. e atmosphere, lithosphere, and hydrosphere all su er from pollution. Air pollution is more harmful to lower life forms than it is to higher life forms. Plants are frequently hurt more than animals on land, but this is not the case in fresh water. With the exception of a few species, most species are disappearing as a result of pollution. In order to maintain their biological activity, plants require atmospheric gases such as air on a regular basis [15]. ere are two categories of pollution sources: xed and many point sources. Stationary point sources include wood-burning res (on a small scale) and coal combustion in coal- red power plants (on a large-scale). Automobiles and other mobile vehicles are typical instances of numerous point sources. The Environmental Protection Agency (EPA) is a federal agency that protects the environment (1997). The greatest major source of pollution in the atmosphere is carbon monoxide-emitting vehicles. Then there's sulphur-emitting industry, steam and electric power plants, space heating, and rubbish burning. The vital biogeochemical cycle has been disturbed by environmental pollution and brutal exploitation (Bodkin and Keller, 1998) [16].

Water contamination, among other things, has the ability to cause long-term alterations in biodiversity. When many pollutants are introduced into water bodies, harm is caused to ecosystems, human health, and water-based activities (swimming, diving, shing, etc.). Warm water from nuclear power facilities, as well as bacteria from untreated sewage, pollute the water. It has far-reaching rami cations, including as contamination of ground and surface fresh water, oceans, and rains (in the form of acid rain). In most modern industrial countries, industry is the most major source of pollution, accounting for more than half of all water pollution and the most harmful contaminants. e e uent, or waste-bearing water, is discharged into streams, lakes, or oceans, where it disperses polluting substances and releases massive volumes of chemicals, nutrients, and organic matter (Walday, M. & Kroglund, T., 2002) [17].

E

Eutrophication is one of the most visible long-term changes. is phenomenon occurs in aquatic ecosystems such as lakes, ponds, sluggish rivers, and river mouths. Certain algae thrive when they have a consistent source of nutrients (mainly phosphorous and nitrogen). ese algae absorb an enormous amount of oxygen during their breakdown. ere are fewer animals that can thrive in such a sti ing aquatic environment. Humans and wildlife are ghting for space all across the world (Mekete Belachew, 1996) [18].

C C

Climate change is threatening biodiversity. While a certain level of temperature volatility is required for ecosystem survival and function, a rapid shi is detrimental to life variety. Climate change is expected to exacerbate biodiversity loss in the future. Many species may be unable to adapt to rapidly changing and o en unfavorable conditions, placing them at risk of extinction [18]. CO_2 levels in the atmosphere are predicted to climb over the next century, making it one of the most important drivers of global biodiversity loss. In the last 100 years, global average temperatures have increased by 0.2°C every decade since the 1970s, while global average precipitation has increased by 2%. Furthermore, climate change occurs in a wide range of places. (D. Pearce) (1991) [19].

Tropical forest ecosystems, for example, are prone to signi cantly greater changes than world averages, although secondary e ects a ect other ecosystems and areas. Variations in the frequency and intensity of severe events, which can impact biodiversity, are linked to anthropogenic climate change, as are changes in average temperatures, precipitation, and sea level [20]. Climate change may have been the cause of several recent species extinctions. Many species' ranges have migrated poleward and upward in elevation over the last century, and this trend is unlikely to reverse. Local populations are incorporating more warm-adapted species. As a result of phonological changes in populations, such as shi ing breeding cycles or deferred peaks of growth periods, species relationships are being decoupled. Phonological changes in blooming plants may cause incompatibilities between plant and pollinator populations. is could lead to the extinction of both plants and pollinators, with predictable consequences for mutuality network structure (Blackwell, J. M. et al, 1991) [21].

Temperature, rainfall, severe events, CO2 concentrations, and ocean dynamics are all likely to have an impact on biodiversity at all levels, including gene, species, and habitat diversity. Climate change can lower genetic variety of populations at the most fundamental level of biodiversity due to directional selection, genetic dri , population divergence, and rapid migration. As a result, population adaptation to changing environmental conditions becomes less likely, increasing the risk of extinction [22]. As a result of current globalization trends, there is more rivalry for natural resources among a variety of stakeholders with varying interests all over the world (Omann and Jaeger Clim approach. Ecol. Econ., 2009).

E CBD

of a resource's quantity or number, on the other hand, might have an impact on its quality (Gra on et al.2007).

B C D

D

L : (Mahmud et al., 2005), (Pender et al.,2005), (Pender et al.,2005), (Pender et al.,2005), (Pender et al.,2005), (Pender et al.,2005), (Pender et al.,2005), (Pender et al.,2005), (Pender et al.,2005), ((MoARD and WB ,2007). e relationship between environment and development in general, as well as poor public participation and community-based groups in environmental management initiatives, are some of Ethiopia's present environmental concerns. Furthermore, poor farming practices, along with a lack of awareness and consciousness, have a key role in the degradation of natural resources, such as forest destruction, soil degradation, and water resource degradation (Girma, 2001) [26].

L : Another important stumbling block is that the creation of physical soil and water conservation measures is considered as the principal means of slowing land deterioration, not just among policymakers but also among many experts. Almost usually, the outcomes are rushedly evaluated and appraised, with little consideration for their intended purpose. In addition, the technological prerequisites for successful maintenance and use of these procedures are usually disregarded (Ruttan and Vernon W., 1988) [27].

-D A A : Although alleviating the country's current level of poverty is a top concern, technology dissemination takes time and necessitates a methodical plan that addresses community needs, builds competence and con dence, and demonstrates exibility and risk sharing. Long-term sustainability is more likely to be achieved if development is driven from the bottom up and addresses farmers' and communities' current needs and constraints. Quick solutions have trumped sustainability, quantity has trumped quality, area coverage has trumped impacts, and command and control has trumped involvement in the expansion system (Yeraswork Admassie, 2000) [28].

: Gete et al. (2006) say that despite the government's large investments in constructing the institutional structure for national agricultural research, education, and extension systems, there are no strong functional linkages between them. A lack of coordination among research, extension, and education has slowed formal technological growth and the transmission of ideas from academics to local specialists and communities, particularly farmers [29].

, L I C : Ethiopia has a number of signi cant environmental regulations and projects in place. On the other hand, developing solid policies and strategies is not a goal in and of itself. e various policies' objectives can only be realized if and only if they are properly implemented. Other policies and strategies, such as regional investment policies, are inhibiting the proper implementation of e ective and sustainable resource management approaches. More policies and methods are needed, and some of them need to be tweaked (Pender et al.2002) [30].

- B - C : Numerous socioeconomic and biophysical constraints hinder decisions to invest in and maintain appropriate environmental policy. To begin with, poverty, which continues to plague the majority of Ethiopians, is one of the most fundamental challenges in uencing environmental resource management. Because the impoverished are compelled to mine quickly dwindling natural resources in their surroundings, it's a long-term problem that's wreaking havoc on the ecosystem. As a result, environmental degradation and the country's rising poverty are inextricably linked (MoARD & WB, 2007). Among the biophysical constraints, climate variability is a signi cant factor. Ethiopia's dry regions (arid, semi-arid, and dry sub-humid zones), which cover more than 70% of the country's land area, are especially vulnerable to climate change, deserti cation, and drought [31].

F G I : Despite the fact that land degradation has been a priority for the country, Gete et al. (2006) and MoARD & WB (2007) claim that natural resource management institutions have frequently been restructured, which undermines a sense of ownership by program sta , results in high sta turnover, wastes institutional capacity, and causes dissent [32].

I : A lack of proper integration of introduced practices with 13 indigenous knowledge and practices, an insu cient number of available technologies to address the needs of the country's diverse agro-ecological conditions, and a failure to take into account the socio-economic context of di erent communities when introducing technologies are among the other factors reported by stakehol (Nair, P. K. R. and Muschler, R. G., 1993) [33].

L M : Due to a lack of public participation in resource management, centrally controlled projects such as collectivization, villagization, and resettlement, as well as reforestation and soil conservation campaigns and tree-cutting prohibitions, have sparked considerable criticism. Furthermore, traditional land users have received little, if any, consideration in the state sector's land development activities. Delineation of national parks in areas traditionally used by pastoralists and/or agro-pastoralists; development of large fuel wood plantations in mixed small-holder agriculture areas; massive fuel wood plantings in mixed small-holder agriculture areas are only a few instances (FAO, 1986) [34].

E orts by the government and non-governmental organizations to halt biodiversity loss have achieved some positive achievements as well as a number of potential outcomes. e proper use of these examples is regarded to be the starting point for fostering e ective initiatives in the country to improve ecosystem resource management. So far, most research has centered on identifying problems or limitations rather than maximizing potential. is section focuses on some key opportunities to help improve intervention quality and scale up successful solutions [35].

E E : Ethiopia has made admirable e orts to address environmental degradation through policy and strategy responses (Gedion, 2001). One of Ethiopia's most important umbrella policies is the Environmental Policy. is plan addresses a wide range of environmental concerns, both sectoral and cross-sectoral. e primary purpose is to ensure that natural, human-made, and cultural resources, as well as the environment, are used and managed sustainably (EPA, 1997) [36].

: Genuine community participation at all levels of the decision-making process is one of the most crucial conditions for e ective land resource management programs. Despite the fact that there are a number of concerns that need to be investigated further, the country has a number of bene cial experiences. Lakew and his associates (Lakew et al., 2000) [37].

M A D :

Decentralized government has been brought down to the local community level by the MoARD's organizational structure, which comprises regional and local agriculture bureaus that reach down to the kebele level, with three development agents in each kebele. When the national agricultural research system, which is made up of one federal and regional institute with research centers covering almost all of the country's major agro-ecological zones, and the system of higher learning institutes are combined, the country's successful

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