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The Major Factors Biodiversity Loss and Conservation Measures in Ethiopia: Systematic Review

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Abstract

Though there is a wealth of theoretical evidence to support the economic and social causes of biodiversity loss, empirical evidence for the majority of these connections is scant, if not non-existent. The loss of biological diversity is exacerbated by habitat loss, the introduction of foreign species, over-harvesting of biodiversity resources, and species uniformity in agriculture. All of these variables have one thing in common: they are all driven by humans. In this area, more research is required. It's also contested and questioned if existing biodiversity-conservation measures are capable of effectively counteracting the loss of biodiversity-related cultural values, biological species, and ecosystems due to these primary drivers of biodiversity loss. This comprehensive study examines the economic and societal aspects that contribute to Ethiopia's biodiversity loss, as well as potential opportunities. It also identifies potential roadblocks and future directions that should be pursued. In the analysis, only theoretical considerations and overviews of current estimations are considered. To scale up biodiversity conservation loss, better promotion of practical conservation approaches, community-based management techniques, and sector-based conservation and integration should be adopted throughout the entire resource region.

Keywords: Ethiopia; Threat; Preservation; Biodiversity

Introduction

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. This is influenced 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 significant reserves of crop genetic diversity, with 11 cultivated crops having their diversity center in the country. The wide range of conditions found in the country's highlands has resulted in the occurrence of a large number of endemic species. Ethiopia's flora 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 fifth largest floral country in tropical Africa, according to reports. The faunistic diversity of the country is astounding. The 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 fish species (including over 87 species from the Baro River and 16 from Lake Abaya), 324 butterfly species, and 63 amphibian species live in Ethiopia [1].

Ethiopia is home to 31 different native animal species. The Walia Ibex (Capra walle), Gelada Baboon (Theropithecus gelads), Starck's Hare (Lepus Starcki), Mountain Nyala (Tragelaphus buxtoni), and Ethiopian Wolf (Canis simensis) are among the larger mammals, with 2, 9 and 15 species of bats, insectivores, and rodents, respectively, accounting for the remaining 83.9 percent. Among the globally vulnerable mammal species identified in Ethiopia are the Black Rhinoceros Diceros bicornis, Grevy's Zebra Equus grevyi, African Wild Ass Equus africanus, Walia Ibex Capra walle, and Ethiopian Wolf Canis simensis. Ethiopia has 861 indigenous avifauna species, according to its avifauna. Using scientifically valid quantitative criteria, the Ethiopian Wildlife & Natural History Society (EWNHS) has identified 69 Important Bird Areas (IBAs) that are also important for a large number of other taxa. The current protected areas, as well as a slew of new ones, are included. Increased biodiversity loss during the human-induced effect is particularly concerning, given mounting evidence of the importance of biodiversity for supporting ecosystem functioning and services, as well as preventing ecosystems from tipping into undesirable states (Fisher and Turne 2008) [2].

A diversity of functional response mechanisms to environmental change among species maintains an ecosystem's resilience. As a result, ecosystems with low degrees of response variation among functional groups are more susceptible to perturbations (such as sickness) and more likely to encounter catastrophic regime shifts (both managed and unmanaged) (Brown and McLachlan 2002). Currently, the rate of global extinction far outpaces the rate of speciation, making species extinction the primary driver of global biodiversity changes. The average extinction rate. Accelerated species extinction is putting ecosystems' biotic potential to function under novel environmental and biotic conditions in jeopardy (Zomer et al. 1999) [3].

Since the Anthropogenic period began, humans have increased the rate of species extinction by 100–1000 times the background rates that were usual throughout Earth's history, culminating in a current global average extinction rate of 100 E/MSY (Mace et al. 2005). Approximately 25% of species in well-studied taxonomic groups are threatened with extinction at the moment (ranging from 12 percent for birds to 52 percent for cycads). The bulk of extinctions occurred on marine islands until recently (after 1500). However, due to land-use

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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. The 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].

The relevance of biodiversity management has just recently been acknowledged. Humanity has relied on natural resources since its inception as Homosapiens. Throughout millennia, human knowledge and technology have grown in leaps and bounds. Although the shift from the Stone Age to the Iron Age was gradual at first (e.g., the transition from the Stone Age to the Iron Age), as time passed, the gaps in technical improvement (revolution) became smaller and smaller, and the rate of knowledge and skill acquisition increased [5]. Despite this massive collection of information and capacities, a simple truth has just recently become apparent: unless the world's natural resources are safeguarded, the world's population will continue to decline (Girma Tadese, 2001). In order to acquire a more true global view of the environment, it is required to concentrate actions at the local, national, and regional levels. (J. M. Blackwell and colleagues, 1991) The 'poverty-biodiversity-poverty' vicious circle was identified as the difficulties of developing countries, particularly the least developed countries, the majority of which are in Africa and include Ethiopia, became a topic of debate and study [6]. To put it another way, people in poor countries rely on natural resources more than those in developed countries, particularly renewable resources, and this reliance leads to resource depletion and deterioration. Anthropogenic impacts are the primary cause of environmental degradation and depletion; however, as human populations grew, there were fewer and fewer natural resources to be utilized on a long-term basis, necessitating resource overexploitation and mining to satisfy more and more people with fewer and fewer resources. There are numerous and intricate explanations behind this predicament (Mekete B., 1996). The review's main goal is to put together and construct a scenario analysis on biodiversity loss, as well as to recommend present conditions in future conservation with developmental challenges, and to identify bottlenecks and opportunities for biodiversity loss [7].

Major Causes of Biodiversity Loss in Ethiopia

Changes in natural land use, pollution, and variations in CO2 concentrations in the atmosphere, changes in the nitrogen cycle and acid rain, climate change, and the introduction of exotic species are all major contributors to biodiversity loss. Human-induced biodiversity loss is caused by habitat fragmentation, threat fragmentation, degradation, or loss, over-exploitation of natural resources, pollution of air and water (by various activities such as agriculture), the introduction of non-native (alien, or exotic) species, and climate change-induced biodiversity loss, with these factors inextricably linked with some or all of them. Exotic species are also less of a worry in tropical forests than in temperate areas, because tropical forests contain so much diversity that newcomers have a difficult time establishing themselves (Shibru Tedla and Kifle Lemma, 1999) [8].

Habitat Destruction and Fragmentation

Habitat destruction is the process of destroying natural habitats so that the species that live there can no longer survive. As a result of this process, species that formerly used the location are relocated or eliminated, reducing biodiversity. Habitat destruction is primarily caused by human activity in order to harvest natural resources for industrial production and urbanization. The loss of habitats for agriculture is the primary cause of habitat degradation. Mining, logging, trawling, and sprawling cities are all necessary (Bisanda S., 2003). At the moment, habitat loss is the primary cause of extinction all across the planet. It's a natural environmental shift brought on by habitat fragmentation, geological processes, and climate change, as well as human activities such as the introduction of exotic species, ecosystem nutrient depletion, and other human activities. Fragmentation is a major danger to biodiversity and ecosystem services such as pollination, seed dispersion, herbivores, and carbon sequestration around the world (Brooks et al 2002) [9].

Every year, millions of hectares of tropical forest are burned, leaving small islands of forest surrounded by a sea of pastures, crops, and scrubby regrowth. As a result, our planet's fractured terrain is rapidly becoming one of its most common features. In terms of ecology, habitat fragments differ from entire habitat, and they are frequently biologically depauperate. This can occur for a number of reasons. For starters, habitat damage is not always random. Humans tend to clear land near productive, well-drained soils and avoid areas with steep or dissected topography. As a result, habitat remnants are often limited to areas with poor soils, rugged topography, and little species diversity. Second, due to their limited size, habitat fragments only represent a small percentage of the habitat diversity accessible in a given area (Wilcox, 1980) [10].

Edge effect

An edge is the boundary, or interface, between two biological groups or between distinct landscape components. There are edges, for example, where older wooded patches meet recently harvested cut blocks, or where woods meet rock outcrops, riparian zones, grasslands, or other types of harvest or development stages. Acetone is a zone of transition between two natural populations (Forman, 1995). A multitude of factors, including the type of edge present, can cause edge effects [11]. Edges might be "natural" or "man-made." Topographic differences (e.g., the so-called tree line, the boundary where tree growth gives way to alpine conditions on mountains or grasslands in low-elevation dry valleys), soil type (e.g., the transition from boggy, peat soils to upland humus soils); presence of open water (e.g., lake or geomor); presence of open water (e.g., lake or geomor); presence of open water (e.g., lake or (Thomas et al. 1979). When an opening is properly oriented and sized, winds may penetrate a short distance into the forest before diminishing. If the winds are strong enough, wind throw can occur in the upwind margins of the forest interior (Chen et al. 1991) [12].

An Invasive species

A species is a plant or animal that is not native to a certain place (introduced species invasive) and has the potential to spread, harming the environment, the human economy, and/or human health. Weed is a term used to describe a non-native or invasive species that has spread widely. However, not all introduced species are harmful to the environment (Charles Elton, 1958) [13]. Ecosystems where native species are fully used might be thought of as zero-sum systems, with every gain for the invader resulting in a loss for the native. Unilateral competitive domination (and the loss of native species as a result of increased teinvader populations) is not the rule, however. For lengthy periods of time, invasive species coexist with native species, and as the invading species' population grows larger and denser and it adjusts to its new environment, its superior competitive capacity becomes apparent [14].

Pollution

The impact of air pollution on biodiversity is enormous. The atmosphere, lithosphere, and hydrosphere all suffer 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]. There are two categories of pollution sources: fixed and many point sources. Stationary point sources include wood-burning fires (on a small scale) and coal combustion in coal-fired 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 Pollution

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, fishing, etc.). Warm water from nuclear power facilities, as well as bacteria from untreated sewage, pollute the water. It has far-reaching ramifications, 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. The effluent, 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].

Eutrophication

Eutrophication is one of the most visible long-term changes. This 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). These algae absorb an enormous amount of oxygen during their breakdown. There are fewer animals that can thrive in such a stifling aquatic environment. Humans and wildlife are fighting for space all across the world (Mekete Belachew, 1996) [18].

Climate Change

Climate change is threatening biodiversity. While a certain level of temperature volatility is required for ecosystem survival and function, a rapid shift 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 often 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 significantly greater changes than world averages, although secondary effects affect 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 shifting 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. This 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 drift, 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).

Population Explosion

Important habitats, as well as ecosystems, are being lost or degraded. Biodiversity is crucial to human well-being because it guarantees that ecosystems that support human life function properly. The genetic pool, distribution, and diversity of species and ecosystems are all examples of biological diversity [23]. Ecosystems have been subjected to considerable changes and stress during the previous century, notably after 1950, when unprecedented levels of human population growth combined with human activities (Rockström et al.2009). As a result of pollution, climate change, and direct human actions, many species are approaching critical population levels. In 2002, the Convention on Biodiversity (CBD), an international agreement aimed at conserving the planet's biodiversity and equitably sharing its benefits, set a goal of "significantly decreasing" biodiversity loss by 2010 (Rockström, J et al. 2009) [24].

Overexploitation

When a renewable resource is exhausted to the point of no return, overexploitation, also known as overharvesting, happens. According to ecology, overexploitation is one of the five key activities that endangers global biodiversity. Overuse of natural resources can lead to resource degradation, including extinction. Overuse of natural resources can lead to resource degradation, including extinction. On the other hand, as shown in the section on fisheries below, overexploitation can be viable. A resource's quantity or quantity can have an impact on its quality (Grafton et al.2007). Overgrazing in stock management, overlogging in forest management, overdrafting in aquifer management, and endangered species monitoring can all be employed instead of overexploitation in the context of fishing. Humans aren't the only ones who take advantage of others [25]. Overexploitation of native flora and fauna by introduced predators and herbivores, for example, does not have to be unsustainable or result in resource degradation. Depletion

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

Biodiversity Conservation Difficulties and Opportunities

Difficulties

Lack of Understanding: (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). The 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].

Lack of Professionalism and Technical Standards: 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].

Top-Down Planning Approach to Technical Assistance: 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 confidence, and demonstrates flexibility 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].

Weak linkages among various disciplines: 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].

Policy, Legislation and Implementation Constraints: Ethiopia has a number of significant environmental regulations and projects in place. On the other hand, developing solid policies and strategies is not a goal in and of itself. The 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 effective and sustainable resource management approaches. More policies and methods are needed, and some of them need to be tweaked (Pender et al.2002) [30].

Socio-economic and Bio-physical Constraints: 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 influencing 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 significant 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, desertification, and drought [31].

Frequent Restructuring of Government Institutions: 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 staff, results in high staff turnover, wastes institutional capacity, and causes dissent [32].

Incomplete Technology Packages: A lack of proper integration of introduced practices with 13 indigenous knowledge and practices, an insufficient 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 different communities when introducing technologies are among the other factors reported by stakehol (Nair, P. K. R. and Muschler, R. G., 1993) [33].

Lack of Participation in Resource Management: 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].

Opportunities

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

Existence of Environmental Policies and Strategies: Ethiopia has made admirable efforts to address environmental degradation through policy and strategy responses (Gedion, 2001). One of Ethiopia's most important umbrella policies is the Environmental Policy. This plan addresses a wide range of environmental concerns, both sectoral and cross-sectoral. The 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].

Rich experience on participatory watershed management: Genuine community participation at all levels of the decision-making process is one of the most crucial conditions for effective 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 beneficial experiences. Lakew and his associates (Lakew et al., 2000) [37].

Organizational setup of MoARD and National Research System: 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 implementation of sustainable land management becomes much more likely. The existence of global research companies in the country is another opportunity for gaining foreign experience (MoARD & WB, 2007) [38].

Availability of both Indigenous Knowledge and Scientific Technologies: Local communities have a variety of indigenous knowledge and traditions that can be further developed to guarantee sustainable land resource management. Furthermore, during the last four decades, research in the country has produced or generated a variety of technologies for land resource management, including several novel and revolutionary soil and water conservation strategies (Yeraswork, 2000, Gete et al., 2006) [39].

Existence of Donor Support and Development Partners: According to Pender et al. (2002) and the MoARD SLM Secretariat, some donors and development partners are interested in aiding programs to improve land resource management (2008). The main challenge here is making the greatest use of the resources provided. This is due to a high level of bureaucracy in resource consumption, much of which derives from donor procedures and requirements, as well as a lack of donor resource harmonization [40].

Conservation Oriented Crop Combination Land Management: The core concepts include incorporating conservation into the farming work cycle and ensuring that farming methods do not just require a few new inputs but also provide farmers with instant financial rewards (Wood, 1990; Nair and Muschler, 1993). This method appears to combine three broad techniques for controlling soil erosion proposed by Belay (1992): agronomic methods, which aim to control erosion by improving vegetative cover; soil management techniques, which aim to control erosion by improving soil particle aggregation; and structural soil conservation methods, which aim to control erosion by shortening the length of the soil particles [41]. This approach includes tied ridges, bunds, fanya juu terraces, bench terraces, and hillside terraces; diversion ditches (cut-offs), rivers, and particular water harvesting structures (Thomas, 1984; MOA, 1986). Crop rotation; livestock farming integrated with arable cultivation; the cut and carry method of using degraded pasture, controlled grazing, and tethering; and widespread use of semi-permanent crops like enset (false banana) and cassava or self-seeding and volunteering crops like legumes and sweet potatoes are just a few examples. It's no surprise that agroforestry is becoming more popular (Nair and Muschler, 1993; Blackwell, 1991; MOA, 1986) [42].

Agro Forestry Practice: Agroforestry is a new term for a group of old-fashioned activities (Nair and Muschler, 1993). Woody perennials (trees, shrubs, palms, bamboo, and so on) are intentionally used alongside agricultural crops or animals on the same land-management units, in some sort of spatial arrangement or temporal sequence. Agro forestry, according to Nair and Muschler, is a hybrid of agriculture and forestry that includes mixed land-use methods that have evolved to meet the unique needs and conditions of tropical developing countries. From basic shifting cultivation to complex hedgerow intercropping systems, agro forestry encompasses a wide range of techniques [44-46]. All of the diverse systems have in common the planned growth or retention of trees with crops or animals in interacting combinations for multiple products or advantages from the same management unit (Nair and Muschler, 1993). Because trees are scattered across farms rather than concentrated in plantations, agro forestry makes them more accessible and spreads their benefits more widely. Agroforestry programs are also known to be 10-20% less expensive than government-run fuel wood plantings (Postel and Heise, 1988) [47-49].

Conclusion

The preservation of biological diversity on the globe is an important goal in and of itself. Food, agriculture, medicine, and industry, among other things, all benefit from biodiversity. It is also pleasing to the eye and enjoyable to use. Habitat loss, not plant and animal extinction, poses the greatest threat to biodiversity. Population growth causes human settlements to expand, resulting in increasing need for food, fuel, and building materials. Modernization of agriculture also poses a threat to possibly important local crops. On a worldwide scale, it is estimated that over 1000 animal species and sub-species are under threat of extinction at a rate of one per year, while 20,000 flowering plants are considered endangered (UNEP, 2004). This paper examines a number of real-world scenarios in which biodiversity loss is explained by the interaction of a number of socioeconomic variables, as well as decision-making and policy decisions in distinct environmental contexts. This study focuses on real-world examples while also placing the considerable literature and ongoing research on biodiversity loss in context by focusing on marine, coastal, wetlands, and forest habitats. According to most scenario forecasts, biodiversity loss is expected to intensify in the next decades.

A number of frameworks for evaluating the complex interaction of stressors and factors affecting biodiversity have been created in the past. The common thread that runs through all of these hypotheses is that human-induced ecological disturbance causes much of the pressure on biodiversity, which presents itself in a variety of complex pathways spanning several physical and temporal dimensions. Biome, geography, and climate, as well as the sort of pressure (i.e. over-exploitation of wildlife vs. habitat change), the economic backdrop in the biodiversity-hosting country, trade patterns, governance structures, and other factors, all have an impact on how biodiversity is lost. Environmental effects such as air pollution, edge impact, invasive species, habitat degradation and fragmentation; and climate change (e.g., global warming) are of great concern as a result of growing levels of biodiversity loss. Problems with biodiversity loss, on the other hand, not only impact environmental conditions, but also have negative effects for a country's economy, long-term growth, and people's health, eventually leading to species extinction.

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