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The Road to Sustainable Development: Existing Problems and Solutions

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ABSTRACT

The debate about developing countries having to choose between economic growth and biodiversity protection has been going on for a long time. This paper sought to add to existing literature written on that topic by exploring the relationship between economic growth and biodiversity loss. It argued that in the long term, developing countries need to protect biodiversity as a prerequisite for economic growth to occur and that the severe impact of biodiversity loss on vulnerable indigenous communities is a reason enough to make the protection of biodiversity a priority. The researcher first identified the primary reasons for why biodiversity occurs, then advocated for the prevention of biodiversity by exploring two impacts of biodiversity loss: the impact on indigenous communities and the impact on economic growth. The paper then briefly also explained the policies that both governments, as well as nongovernment actors, can implement in order to tackle biodiversity loss and protect our environment.

KEYWORDS: Biodiversity, Sustainable Development, Economic Growth, Indigenous communities

INTRODUCTION

Over twenty-eight years have passed since the 1992 Rio Earth Summit where the first global commitment for biodiversity conservation was agreed upon. Despite numerous international scientific studies and policy agreements confirming that conservation and sustainable use of biological diversity is a global priority, worldwide trends in biodiversity continue to decline. There has largely been indiscriminate destruction of biodiversity with little to no regulation by the governments of developing nations.

Aim:

The aim of this paper is to evaluate the impact of biodiversity loss on indigenous communities and the economy as a whole and recommend policies to conserve biodiversity.

Objective:

The paper explores the following objectives:

1) To study the reasons behind biodiversity loss.
2) To analyze the impact of biodiversity loss on economic growth.
3) To observe the impacts of biodiversity loss on indigenous communities.
4) To suggest solutions to conserve biodiversity.

Operational definitions:

Biodiversity: The biodiversity of a particular area is defined by the diversity of all living organisms from all sources, including, inter alia, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems. It "includes diversity within species, between species and of ecosystems" in which they live [1].

Species: A biological species is a group of organisms that reproduce amongst each other and produce fertile offspring [1].

Data Collection:

The data collection procedure primarily involves an in-depth study and analysis of previously published research papers and other credible secondary sources like books, journals, reports, and speeches, all of which are mentioned in the references section. The secondary data collected was divided into distinct themes relevant to the paper and analyzed further.

Results and Discussion:

This section of the paper is divided into 4 parts: First, it talks about the factors leading to biodiversity loss; Second, it discusses the impacts of biodiversity loss on indigenous communities; Third, it talks about the effect of biodiversity loss on economic growth as a whole; and finally, it recommends policies to tackle biodiversity loss.

What are the factors which lead to biodiversity loss?

The use of pesticides in agriculture is one of the primary factors leading to the loss of biodiversity. Reference [2] notes that the commercialization of agriculture through the usage of crossbreed, composite, and hybrid varieties has resulted in biodiversity loss. Given that these are approved by international organizations and agricultural trade agreements, farmers often overuse them, thus causing the erosion of genetic and agrosystem diversities. Reference [3] also argues that deforestation - which is also severely unreported and unregulated - is driving down biodiversity loss in India. They note that if current levels of deforestation go unchecked, only 10 percent of the land of the Indian Himalayas will be covered with dense forest, thus wiping out a quarter of the endemic species that currently exist, including 366 endemic vascular plant taxa and 35 endemic vertebrate taxa.

`In addition, the impact of organic pollution is a grave concern as well. Reference [4] also observes that the effect of industrial pollution severely damages aqua ecosystems and ultimately results in communities consisting of only a few tolerant species. The paper observes that the result of acidification - in particular, the acidifying effect of sulfur and nitrogen - has had a profound impact on the biodiversity of lakes and rivers, specifically the ones situated near areas of high economic activity and urbanization.

Reference [5] analyses multiple reasons which drive biodiversity loss as well. First, the author notes that demographic change - population growth is associated with more resource consumption, and leads to the intensification of land use since more people need food to eat. Interestingly, the expansion and improvement of technology in the developed world has allowed per capita consumption to rise significantly. Secondly, inequality and poverty are massive drivers of biodiversity loss. This is because often low-income communities cannot afford to take environmentally conscious decisions because meat, for example, is cheaper than plant-based products in most countries. In addition, export-oriented industrialization in developing nations leads to the exploitation of natural resources in developing countries - primarily to benefit the rich in developed nations. Perhaps most importantly though, it is the complicity of governments that leads to large-scale environmental degradation and biodiversity loss. The first way that governments are complicit is through encouraging perverse policies that promote traditional development goals: industrialization, export expansion, and increased food production. Secondly, the entire international community, in general, is migrating towards a much more free-market approach: organizations like the WTO which support large-scale liberalization often do not take into account the environmental damage that occurs.

Lastly, the introduction of alien invasive species in a region also leads to biodiversity loss [6]. Exploring this further, it was observed that invasive alien species are responsible for destroying existing biodiversity in the region due to competition for resources, as well as habitat changes initiated by the invasive alien species which benefit the alien species. For example, the New Zealand screw shell, Maoricolpus roses, which was introduced to Tasmania from New Zealand in the 1920s changes the seabed habitat, covering soft sediments with its hard shell, and provides attachment points for other marine fauna (including another invasive alien marine species, Undaria pinnatifida). In addition, when it has died, its shell provides abundant homes for a particular hermit crab that can use its heavy tapered

shell, thereby shifting the pre-invasion food web. This ensures that particular species which are not favored by the invasive species undergo extinction [7].

Impact of biodiversity loss on indigenous communities

The previous section examined various reasons why biodiversity loss occurs, and this section will be analyzing the impact of biodiversity loss on indigenous communities and their livelihood.

Reference [8] notes that biodiversity loss has meant the land available for farming has decreased massively. In particular, traditional farming practices which are followed by farmers in Asia and South America are threatened because of warming surfaces. One of the primary causes of increasingly warm surfaces is deforestation which is linked to biodiversity loss. In addition, it is important to note the history of indigenous people being ruled under oppressive structures and denied political rights because past injustices against indigenous communities have meant that in the present too, these communities do not have access to political power and hence are excluded from government decisions which lead to biodiversity loss [9].

Reference [10] also observes that apart from the obvious impact of decreasing forest area negatively affecting indigenous groups, biodiversity loss has resulted in crucial resources being taken away from these communities. Industrialization has ensured that processes like resource extraction from forests that indigenous communities depend on are increasing massively. In Brazil, for instance, the timber forests have been destroyed because of timber needed for industrial production - thus depriving indigenous communities of crucial resources.

Reference [11], in addition, identifies that as the area of protected forest in the Western Ghats in India decreased by 53 percent, the size of the tribal communities' gathering areas prominently reduced, resulting in a decline in their collection of non-timber forest products and increased de- pendency on forest plantations labor for their livelihood. This is especially significant as the tribal communities still prefer to depend on natural forests for their sustenance. More importantly, the paper explains the worrying trend of the conversion of natural forests into plantations, which considerably reduces the ecological value of an area, undermines ecosystem services, and decreases access to land for indigenous communities. For hunter-gatherers that are wholly dependent on land use, this form of biodiversity loss leads to them losing their livelihoods. Reference [12] explains the reasoning behind this: most plantations are built on indigenous land, and are owned and managed by profit-hungry plantations that do not employ indigenous people on their land and have no regard for environmental protection.

Apart from material harms like economic loss, indigenous communities also suffer cultural damage due to biodiversity loss. Indigenous people see forests as a source of life: they have cultural ties with the ecosystem in which they live. For example, The Talaandig people of Bukidnon province see the forest as an integral element of nature that corresponds to the integrity of the cultural personality of their tribe. The forest is viewed as a source of life that cannot be isolated from the earth, as well as language and the spirits that promote and develop the social, economic, political, and spiritual cultures of the tribe. Thus, it can be inferred that the factors that perpetuate biodiversity loss are a massive attack on the cultural identity of indigenous people [13].

Impact of biodiversity on economic growth

The general consensus, and as also observed by this paper itself, is that countries face a tradeoff between environmental protection and economic growth. However, this paper will establish why in the long term, the loss of biodiversity owing primarily to processes like deforestation and industrialization will negatively impact economic growth.

A - *Bioremediation and Biotreatment*

Reference [14] examines this relationship between biodiversity loss and economic growth by highlighting the impact of biodiversity loss on agricultural systems: Pollinators, including bees and butterflies, provide significant environmental and economic benefits to agricultural ecosystems. This includes adding diversity and productivity to food crops. The importance of such pollinators is evidenced by how as much as one-third of the world's food production relies directly or indirectly on insect pollination. Habitat fragmentation and loss adversely affect pollinator food sources, nesting sites, as

well as mating sites, causing drastic declines in the populations of wild pollinators. This is particularly important for agrarian and underdeveloped economies that are primarily dependent on agriculture for driving economic growth.

More importantly, the paper also observes that biological organisms play a crucial role in bioremediation and biotreatment. Approximately 75% (by weight) of the 100,000 chemicals released into the environment can be degraded by biological organisms and these organisms then carry out bioremediation and biotreatment. The savings gained by using bioremediation instead of the other available techniques to remediate chemical pollution worldwide gives an annual benefit of 135 billion dollars. Most of these biological organisms are present in soil and water, and thus it is crucial that governments take action to preserve their ecosystems.

B - *Poverty Reduction*

Biodiversity conservation and poverty reduction are directly linked too. Since bridging inequalities is one of the fastest ways of achieving rapid economic growth, it is important to examine the part that biodiversity plays in this process. Reference [15] notes that the poor are disproportionately dependent on biodiversity for their sustenance. Apart from the analysis provided in the previous section of the dependence of indigenous communities on biodiversity loss, various other communities are also dependent on biodiversity. In particular, the paper identifies various mechanisms that can reduce poverty in rural areas; all of these mechanisms are dependent on preventing biodiversity loss: non-timber forest products, community timber enterprises, payments for environmental services, nature-based tourism, fish spillover, mangrove restoration, protected area jobs, agroforestry, grasslands management, and agrobiodiversity conservation.

C - *Impact on Healthcare systems:*

Reference [16] observes that one of the most important impacts of biodiversity loss is the disastrous impact on healthcare systems all across the world. Given that human health is directly linked to food production and since biodiversity affects food availability, it also affects health. Poor land management and over-use often reduce soil biodiversity and make the soil less able to suppress disease-causing organisms or purify water.

In addition, loss of crop diversity, and subsequent reliance on agrochemicals to compensate for plants' lack of disease resilience and/or for poor soil, can expose both people and the environment to pollutants [17].

Reference [16] points out that about 60 percent of the world's population uses traditional medicines - which are derived from plants that are being destroyed rapidly. Reference [18] examines the implications of this fact further by observing that biodiversity loss that reduces the availability of traditional medicines compromises the health of low-income communities who cannot afford to buy modern medicines. Additionally, it also limits ecosystems' evolutionary potential to continue to produce new, therapeutic plant varieties.

The reason why the impact of biodiversity loss on healthcare systems is important is that countries need a healthy population in order to work productively in the economy, as well as to reduce the massive overburdening of their healthcare systems.

Policies to tackle biodiversity loss

This section of the paper will evaluate existing mechanisms to tackle biodiversity loss in countries and suggest additional policy solutions.

A - *Intensification of Agricultural Productivity*

Reference [19] highlights that one of the most pressing concerns that lead to the loss of biodiversity is the indiscriminate use of forest land for agriculture. In order to solve this problem, policies like land reform and land-titling programs that address the issues of inequitable land distribution and encourage a more permanent and sustainable agricultural system can potentially relieve the pressure on forest land - leading to less deforestation.

B - *Establishment of Protected Areas*

Reference [20] notes that the increased government funding towards the establishment of protected areas is an incredibly important step in tackling biodiversity loss. The paper further notes that what is crucial is choosing the correct regions for conversion into protected areas such as national parks or wildlife reserves: Biodiversity hotspots are not inherently the pre-eminent choice in building natural reserves: taking complementarity into account and protecting areas with lower diversity but more endemic species would lead to the identification of a combination of sites that

maximizes the number of covered species. Reference [20] further enriches this analysis by observing that a site choice that also takes into account the economic value of the land in alternative uses can sometimes achieve the same level of species coverage for a fraction of the cost (or a larger coverage given the available budget for conservation).

C - *Role of Businesses and the Financial Sector*

Reference [21] observes that the decisions of business and the financial sector can prevent biodiversity loss. Their reach is global and their decisions can address biodiversity impacts across the entire huge supply value chain. However, whether they have incentives to act in ways beneficial for the environment is contentious. Reference [22] notes that there are existing pressures on companies to carry out Corporate Social Responsibility (CSR) initiatives that can directly improve biodiversity in a particular area. Many companies have tied executive compensation directly to the fulfillment of CSR goals - which has resulted in biodiversity prevention efforts by big corporations who are often the biggest drivers of biodiversity loss. Reference [23] further adds to the theme by exploring the relationship between CSR and biodiversity through analyzing the incentive structures of 12 different companies. The results of the study clearly show that companies are attempting to include biodiversity in their CSR policy, and these companies have imposed codes of conduct, including biodiversity criteria (e.g. NTA8080, ASC), to suppliers, along with being involved in the development of sectoral sustainability platforms and/or development of sustainability standards (including biodiversity), and giving financial support to (local or international) nature organizations.

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