

Forum: United Nations Environment Program

Issue: Measures to tackle the issue of the global decline in biological diversity

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Introduction

In today's world, on average there has been a 60 percent decline since 1970 in the number of vertebrates alone. According to the Royal Society, there are now 37,400 plant and animal species reported to be in danger of going extinct. That is approximately 28 percent of the 134,000 species that the international Union for Conservation of Nature (IUCN) Red List has rated as endangered. As the number of species and habitats decreases, biodiversity continues to be threatened. Wildlife numbers dropped by 68% between 1970 and 2016. Extinction is also causing the elimination of some species, resulting in irrevocable biodiversity loss. Current extinction rates are 100 times higher than baseline rates, indicating a catastrophic extinction event. These numbers may not affect our daily lives just yet, but why wait till it does?

The main problems with the decrease in biological diversity around the world is the extinction of species, threat to human beings, proliferation of pests, and increasing carbon dioxide emissions. All of these are consequences of human intervention in the ecosystem. Human intervention such as climate change, pollution, destruction of habitats, invasive alien species, and overexploitation of the natural environment.

People rely on biodiversity in ways that are not always obvious or valued in their daily lives. Human health ultimately depends on ecosystem services and goods, which are necessary for good human health and prosperous livelihoods, such as the availability of fresh water, food, and fuel sources. If ecological services are no longer sufficient to meet social requirements, the loss of biodiversity may have serious direct effects on human

health. Changes in ecosystem services have an indirect impact on local migration, livelihoods, income, and, on rare occasions, even political strife.

Additionally, the biological diversity of microbes, plants, and animals has enormous advantages for the fields of biology, medicine, and pharmacology. A better understanding of the earth's biodiversity leads to important medical and pharmaceutical breakthroughs. The search for potential cures for various diseases and health issues may be hampered by biodiversity loss. Biological diversity is essential in our daily lives since it is a valuable resource that has aided humanity's development throughout generations.

Definition of Key Terms

Biological diversity

The three components of biological diversity—genetic, species, and ecosystem—are referred to as the world's diversity of species and ecosystems, as well as the ecological processes to which they contribute.

Biological Variability

The appearance of variances in the degree of reaction among individuals in the same population given the same quantity of a substance can be described as biological variation or variance.

Alien Species

A species that has spread beyond its historically known natural range as a result of intentional or unintentional human dissemination, also known as an exotic or introduced species.

Invasive Species

Invasive species are those that are intentionally or unintentionally brought into an ecosystem where they do not naturally occur and endangered habitats, ecosystems, or

native species. Because of their high reproductive rates, these species become invasive by competing with and replacing native species that naturally occur in that area. Unintentional introduction can occur as a consequence of accidents or transportation; intended introduction can occur as a result of importing animals or plants or genetically modifying organisms.

Ecosystem

Ecosystems are self-regulating groups of plants and animals that interact with one another and with their nonliving surroundings, which include forests, wetlands, mountains, lakes, rivers, deserts, and agricultural landscapes. Ecosystems are vulnerable to disturbance since a single component's stress can disrupt the entire balance. They are also highly susceptible to pollutants. Many ecosystems have already been lost, and many more are threatened. The world's forests are home to around half of all biodiversity. They are, however, declining at an increasing rate every year. In 2022, more than 15 billion trees around the world have been lost due to deforestation.(Kilgore) 34% of the world's tropical forests have been completely destroyed till now.(“Only a Third of the Tropical Rainforest Remains Intact”)

Endangered species

A technical classification term referring to a species that is on the verge of extinction throughout all or a large portion of its range. The World Conservation Union classifies a species as endangered if the causes that cause its vulnerability or decline continue to exist.

Extinction

The natural failure of a species to adapt to environmental change; the failure of a species to reproduce and the death of all remaining members of the species.

Indicator species

A species whose status offers information about the general condition of the environment and other species within it.

Genetic diversity

The number of genes in a population, species, variety, or breed.

Species diversity

The number and diversity of species found in a specific region.

Ecological diversity

The range of ecosystems that exist within a broader area, from biome (the biggest ecological unit) to microhabitat.

Global diversity

The overall variability of living forms is characterized as global biodiversity, which is the measure of biodiversity on Earth.

Ecosystem services

The direct and indirect advantages of biodiversity and ecosystems to humanity. These "services" include providing people with raw resources, creating circumstances for income and mental and physical health (through tourism, recreation, and enjoying nature), and controlling climate, water, pollution, and disease.

The industrial revolution

An Industrial Revolution is the transformation of a society from an agriculture to a modern economy dominated by industry, machines, and technology.

Key Issues

Decrease in biodiversity lowers an ecosystem's productivity

Biodiversity concerns not just the wealth of nature, but also its health. The loss of biodiversity weakens ecosystems' ability to function effectively and efficiently, and hence nature's ability to provide a healthy environment. This is especially crucial in a changing climate, since biodiversity loss reduces nature's resilience to change. It is also crucial for individuals from lower socioeconomic backgrounds, who are more directly dependent on the environment than others and will be struck the hardest and earliest as a result of their existing sensitivity to climate change.

Although some biodiversity loss is natural, the current rate of extinction is unprecedented, being up to 1,000 times greater than natural background rates. Development experts must participate since the present pace of loss threatens important development goals.

Economic Cost of Lost Biodiversity

Biodiversity depletion has an impact on the economic system in a number of ways. Many societies value the availability of plants, animals, and other species as commodities because they provide food, building materials, and medicines. The loss of biodiversity among these key natural resources jeopardizes global food security as well as the development of new medications to combat future diseases. Ecosystems that have been oversimplified and homogenized can likewise constitute an aesthetic loss.

Economic scarcity among common food crops may be more visible than biodiversity loss in ecosystems and landscapes remote from global markets. Cavendish bananas, for example, are the most commonly imported variety to nontropical countries, but scientists note that the variety's lack of genetic diversity makes it vulnerable to Tropical Race (TR) 4, a fusarium wilt fungus that blocks the flow of water and nutrients and kills the banana plant. TR4 may push the Cavendish banana to extinction in future disease outbreaks, according to experts. Since 1900, 75 percent of food crops have gone extinct, owing largely to an overreliance on a few high-yielding crop varieties. Food security is compromised by reduction of agricultural biodiversity since varieties may be susceptible to disease and pests, invading species, and climate change. Similar patterns

may be seen in animal production, where high-producing cattle and poultry breeds are preferred over lower-producing, wilder breeds.

Reduced Food Security

Biodiversity loss does not simply occur as a result of deforestation or poaching. Another culprit is the introduction of new species. These new species enhance competition among locals and frequently result in the demise of indigenous populations. This is also happening on farms around the world, where alien varieties of cattle are displacing natives. This means that the world's cattle population is shrinking and becoming more vulnerable to disease, drought, and climate change, resulting in a loss in overall food security.

Simply put, reduced biodiversity implies fewer plants, animals, and microorganisms that are essential for pollination, water purification, and soil fertility. This makes it more difficult for the agriculture business to cultivate the foods required to feed our ever-increasing population.

Increased Contact with Disease

The loss of biodiversity has two major consequences for human health and disease spread. For starters, it raises the amount of disease-carrying animals in local communities. According to research, the species that are best adapted to live in dangerously fragmented ecosystems are also the most prolific infection carriers. As habitats are fragmented and reduced in size, these animals become increasingly abundant, outnumbering species that do not normally spread illness. Simultaneously, habitat fragmentation brings humans closer and more frequently into contact with disease-carrying species. High levels of biodiversity may be a source of pathogen transmission, although biodiversity loss can also enhance transmission by increasing the number of infection-competent hosts.

More Unpredictable Weather

Unseasonable weather, extreme weather, and weather that deviates from historical norms are major issues that can result in drought, disaster, and relocation. The extinction of species, even those replaced by invasives, has been linked to increasingly unpredictable weather. Ecosystem destruction affects nature's ability to regulate greenhouse gas (GHG) emissions and defend against extreme weather, hastening climate change and increasing vulnerability to it.

Loss of Livelihood

If ecosystem services are no longer adequate to meet social requirements, biodiversity loss can have substantial direct human health consequences. Changes in ecosystem services have an indirect impact on livelihoods, income, local migration, and, on occasion, may even instigate or intensify political strife. From fishermen to farmers, biodiversity, or just healthy ecosystems, is critical to sustaining livelihoods. When ocean ecosystems, for example, fail, entire societies established on the bounty they supply crumble. Whether it's due to pollution, overfishing, ocean acidification, or a mix of these and other factors, humans are responsible for the demise of the ecosystems that surround them.

Major Parties Involved and Their Views

Indonesia

The Indonesian archipelago consists of approximately 17,000 islands, with approximately 990 permanently inhabited. In Indonesia, there are seven major biogeographic regions centered on the major islands and their surrounding seas. It is home to 10% of the world's flowering species and is one of the world's centers for plant cultivar and domesticated livestock agrobiodiversity. In terms of fauna diversity, Indonesia is home to approximately 12% of the world's mammals, ranking it second only to Brazil on a global scale. Indonesia ranks fourth in the world with approximately 16% of the world's reptiles and 35 primate species. Furthermore, with 17% of all bird species

and 270 amphibian species, Indonesia ranks fifth and sixth in the world, respectively. (Biosafety Unit)

Habitat degradation and fragmentation, landscape changes, overexploitation, pollution, climate change, alien species, forest and land fires, and the country's economic and political crises are the main factors affecting biodiversity loss and species extinction in Indonesia.

The National Development Planning Agency created the Biodiversity Action Plan for Indonesia in 1993. (BAPI). Prior to CBD ratification in 1994, the document was published. The BAPI prioritized both on site and off site conservation measures, both inside and outside of protected areas. A second document, titled "Indonesian Biodiversity Strategy and Action Plan (IBSAP)," was created in 2003 with the goal of achieving five goals.

The first is to encourage changes in the attitudes and behaviors of Indonesian individuals and society, as well as in existing institutions and legal instruments, in order to raise community concern about biodiversity conservation and utilization in accordance with national laws and international conventions. The second step is to use scientific and technological inputs, as well as local knowledge. The third step is to implement balanced biodiversity conservation and sustainable use. The fourth step is to fortify institutions and law enforcement. The fifth and final goal is to resolve natural resource conflicts. IBSAP implementation is voluntary, and no coordination mechanisms to monitor and evaluate implementation have been established.

Malaysia

The main causes of biological diversity loss in Malaysia to date have been habitat loss or conversion and economic exploitation of natural resources. A growing cause of the loss of biological diversity, though, is the ongoing structural changes in the Malaysian economy. Industrial pollution, not habitat loss, is now more likely to pose a greater danger to biological diversity.

Papua New Guinea

The biodiversity of Papua New Guinea is still under threat from a number of different practices, including illegal and/or unsustainable logging, subsistence exploitation, monoculture palm oil, commercial mining, road construction, invasive and/or alien species, and unsustainable fishing. Global climate change and rising weather variability are aggravating these environmental concerns by increasing the frequency of forest and savanna fires, flood events, coastal erosion, and seawater intrusion.

China

The WWF (World Wide Fund for Nature) monitored 2,419 representative populations of 682 vertebrate species in China and discovered that nearly half of the country's terrestrial vertebrate species have disappeared in the past 40 years. The greatest risks to biodiversity in China come from habitat loss and the degradation of the natural environment brought on by human activity and industrialization. Significant risks to amphibians, reptiles, and mammals include overhunting and climate change.

India

India is the second most populated country in the world, with a population of around 1.4 billion, and thanks to rising salaries, consumption has recently been rising across all economic classes. Due to the conversion of land for cultivation, cattle grazing, urbanization, mining, and industrial development, natural habitat is being lost, fragmented, and degraded. Through increasing pesticide exposure, habitat destruction, and loss of habitat variability, agricultural intensification endangers a variety of species. In wild animal populations, proximity to humans and cattle increases parasite burdens, competition for food and water, and disease transmission. Lastly, global risks like global climate change are contributing to a rise in forest fire and ice-melting incidents, endangering species that live in susceptible habitats including coastal regions, dry deciduous forests, and the Himalayas. Initiatives to restore habitat are also severely undermined by high population density in some areas.

Australia

With Australia registering the greatest rate of mammalian extinction in the world over the past 200 years, more than 50 animal and 60 plant species have gone extinct. There will be more. According to conservative estimates, the interconnected pressures of climate change, land use practices, habitat loss, and invasive species put more than 1,800 plant and animal species, woodlands, forests, and wetlands at risk of extinction. Conservationists claim that the decreasing trend might be reversed, but only with significant government action.

The United States of America

The loss of wetlands, the damming and interruption of waterways, invading species, exotic wildlife illnesses, and climate change are only a few of the causes of biodiversity loss. The US also keeps expanding the development of our country's land environments. The main reasons for species decreasing in the United States are habitat loss and degradation together. Weak legislation, poor enforcement, and little budget make the issues worse. A study that appeared in Biological Conservation found that the time it takes for a proposed species to be designated as endangered or vulnerable under the U.S. Endangered Species Act (ESA) ranges from 12 to 40 years. Recent issues in ecology research also found that just 5% of the plants and animals that are finally classified receive enough financing for conservation, with the majority of the effort going to a small number of well-known species. (“The U.S. Biodiversity Crisis”)

Development of Issue/Timeline

Date	Event	Outcome
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1740	The industrial revolution	The Industrial Revolution had a huge impact. It had a significant impact on the economy, the ecology, and nearly every element of society. Some of these changes were beneficial, but others had long-term detrimental consequences. Almost half of Britain's natural biodiversity has vanished over the ages, with farming and urbanization attributed to the industrial and agricultural revolutions as key contributors. The majority of earth pollution is caused by the combustion of fuel, notably in manufacturing industries.
1800	Population of the world is around 1 billion.	7.6% of land around the world is converted for human use. Loss 1.8% of species in the ecosystem.
1980	Biodiversity crisis	At the National Forum on Biodiversity, the "biodiversity crisis" emerged as a significant conservation concern. Global species extinction was accelerating to the point where Earth was entering its sixth major extinction event, the fifth having occurred 65 million years ago when dinosaurs and countless other creatures vanished forever.
1900	Population of the world was fewer than 2 billion	16.9% of land around the world is converted for human use. Loss 4.9% of species in the ecosystem.
1914-1918	World War I	Weapons use, damage of structures and oil fields, fires, military transport movements, and chemical spraying are all instances of the devastation that conflict may cause to the environment. Air, water,

		<p>and soil are polluted, humans and animals are slaughtered, and numerous health effects are experienced by those that remain alive. As a result, human conflict has the potential to have a wide range of effects on biodiversity as well as ecosystem structure and function.</p> <p>Because of the landscape changes produced by trench combat, World War I had the greatest environmental impact. Trenching resulted in grassland trampling, plant and animal crushing, and soil churning. Erosion was caused by forest logging in order to expand the network of ditches. Soil structures were drastically affected, and if the battle had never occurred, the landscape would very certainly look very different now. Another negative aspect was the use of poison gas. Gases were strewn across the trenches in order to murder men on the opposing front. Carbonyl chloride was the most lethal of the gasses, killing 100,000 people. Battlegrounds were contaminated, and the majority of the gas evaporated into the atmosphere. Unexploded munitions posed serious problems in previous battlegrounds after the war. Because environmental regulation prohibits the detonation or burial of chemical weapons at sea, the cleanup was and continues to be an expensive process. The majority of WWI participants signed a pact</p>
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		prohibiting the use of gaseous chemical weapons in 1925.
1939-1945	World War II	During World War II, the shelling of towns and the devastation of forests, farms, transportation systems, and irrigation networks had terrible environmental impacts, and by the end of the war, there were about 50 million refugees and displaced persons. Throughout history, attempts to harm the environment have been defined as a tactic of war against the formal enemy and a technique of spreading panic in the general public. During WWII, there were numerous incidents of dike breakage, dam destruction, and scorched earth retreats. Natural catastrophes and buried land mines interact to obstruct efforts to demine areas and safeguard inhabitants.
1945	Hiroshima atomic bomb detonation	Nuclear bombs are dangerous weapons that produce cataclysmic explosions by splitting uranium or plutonium atoms in atomic bombs or fusing hydrogen atoms in hydrogen bombs. When a nuclear weapon is detonated, it creates a fireball, shockwaves, and strong radiation. A mushroom cloud is formed by vaporized debris and disperses radioactive particles into the atmosphere, contaminating the air, soil, water, and food supply. Fallout can have far-reaching environmental consequences when carried by wind currents. Most

		<p>life forms in the target zone or up to 3 miles away from the explosion are instantly killed by nuclear weapons. Nuclear weapons detonated above ground can release radioactive particles into the stratosphere, resulting in worldwide fallout. Nuclear bombs emit even more fallout than nuclear power plant accidents. Radiation can cause DNA changes in humans, plants, and animals, which can have negative repercussions. A nuclear war's dense smoke would block sunlight and plunge the planet into darkness. Plant life would die without warmth and sunlight for photosynthesis, causing catastrophic famine up the food chain. The deployment of nuclear warheads on a small scale might destroy the ozone layer, shorten the growing season, raise temperatures, and expedite the effects of global warming.</p>
2000	Population more than 6.1 billion	39.3% of land around the world is converted for human use. Loss 13.6% of species in the ecosystem.
2015	The Paris Agreement	The Paris Agreement is a legally enforceable international climate change accord. It was adopted by 196 Parties at COP 21 in Paris on December 12, 2015, and went into effect on November 4, 2016. Its goal is to keep global warming considerably below 2 degrees Celsius, preferably 1.5 degrees Celsius, compared to pre-industrial levels. Countries intend to accomplish this long-term temperature objective

		by peaking global greenhouse gas emissions as soon as possible in order to achieve a climate neutral planet by mid-century. The Paris Pact is a pivotal event in the international climate change process because it brings all nations together for the first time in a binding agreement to undertake aggressive efforts to combat climate change and adapt to its repercussions.
2100(Green model)	Population estimated to be 10.9 billion	33.4% of land around the world would be converted for human use. Loss 11.6% of species in the ecosystem.
2100(Current model)	Population estimated to be 10.9 billion	49.1% of land around the world would be converted for human use. Loss 17% of species in the ecosystem.

Previous Attempts to Solve the Issue

Convention on Biological Diversity

A legal framework for the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the utilization of genetic resources has been ratified by 196 countries and is known as the Convention on Biological Diversity (CBD). Its overarching goal is to promote behaviors that will result in a sustainable future. All aspects of biodiversity are covered by the Convention on Biological Diversity, including species, ecosystems, and genetic resources. It spans all conceivable fields, from science, politics, and education to agriculture, business, and culture, among others, that are directly or indirectly related to biodiversity and its function in development. Every two years, the ultimate authority of

all nations (or Parties) that have ratified the treaty meets to assess progress, establish priorities, and agree on work plans.

The UNGA Resolution designating 2011-2020 as the UN Decade on Biodiversity, as well as major conservation organizations, have embraced the ambitious Global Strategy for Biodiversity for 2011-2020 that the CBD has adopted. The CBD has been successfully coordinating with the other global biodiversity conventions and treaties, major relevant UN Organizations, and other relevant international organizations. Although not yet at the scale and speed required to reverse the ongoing crisis and decrease of biodiversity, the CBD has been highly successful in advocating and directing the creation and implementation of the global biodiversity agenda.

Restoration of habitats

The planned rehabilitation of an area to rebuild a functioning ecosystem is known as habitat restoration. Understanding species life cycles and interactions, as well as the food, water, nutrients, space, and shelter required to support species populations, is essential for successful habitat restoration. When habitats cannot be restored to their previous size or condition, land that connects open spaces and habitats, known as wildlife corridors, can be set aside to allow animals to persist in and around human-occupied regions. Marshes, for example, provide crucial resting places for migratory birds, bridges allow animals to traverse motorways, and protected creek ecosystems provide room for plants and animals even in urban areas. Places such as Canada have started projects to restore the natural habitats of many endangered species.

Parks Canada's Conservation and Restoration Program (CoRe) projects are as diverse as the 33 national parks, national historic sites, and national marine conservation areas in which they are located. 40 CoRe projects are currently being developed, or recently completed. Across the country, there is a wide range of conservation issues, approaches, and accomplishments. Thirty-four percent of projects are aimed at reintroducing endangered species. 41 percent are dealing with invasive species. In 29 percent of projects to restore species and ecosystems, prescribed or controlled fire is

used. Fifty-one percent involve the reintroduction of species into our protected heritage areas. Approximately half of all projects are collaborations with Indigenous communities or partners, which contribute significantly to their success. Stakeholders, partners, visitors, and Canadians are all involved in a variety of virtual and in-person experiences across all projects. Project leaders have met a national goal of meeting at least 60% of their ecological targets by innovating, learning, and adapting to sometimes relatively new conservation issues.(Parks)

Possible Solutions

Protecting habitats

The overarching reason for loss in biodiversity is the destruction of habitats for human use. Wildfires are one of the most common strategies used by people to clear land for agriculture and buildings. Wildfires are a natural part of the carbon cycle, and the carbon dioxide they emit is quickly absorbed by young trees. However, when a forest is cut down, burned, and not allowed to recover, all of its carbon is converted into carbon dioxide, which contributes to the greenhouse effect. Pollution and climate change have also had an impact on sea life, but the changes affecting the environment the most are those induced by overfishing. Overfishing happens when fish are caught in the ocean at a rate that exceeds the rate at which populations can regenerate. Many other sea animals, such as oysters, have been severely overfished, and the methods used to collect them now require scraping the ocean floor, catching unwanted fish, and ruining the environment all at the same time. Governments can prevent this by installing laws which restricts access to critical wildlife habitats, especially nesting denning sites, so they are left undisturbed.

Substitute products

Obtaining the resources needed to make the items we consume is extremely harmful to biodiversity. Meat consumption, baked products containing palm oil, mass-produced-cheap apparel, and the use of plastic straws are all examples. One of the

most basic solutions to biodiversity loss is to replace items with sustainable and ecologically friendly alternatives.

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