CAUSES OF BIODIVERSITY LOSS

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Abstract. *The most unique feature of Earth is the existence of life and the most extraordinary feature of life is its bio-diversity. The environmental impacts of biodiversity loss have attracted considerable interest and controversy over the past decades. The vast majority of the world's nations declared that human actions were dismantling the earth's ecosystems, eliminating genes, species and biological traits at an alarming rate. Our main task in the future is to preserve the environment.*

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The term biodiversity was coined in 1985. Also in each country there exists a "**Red book**" is a list of rare and endangered animal species, plants and fungi, supplemented by information about them in the modern world[1]. Interesting fact – the International Day for Biological Diversity (or World Biodiversity Day) is a United Nations – sanctioned international day for the promotion of biodiversity issues. It is currently held on May 22. The International Day for Biological Diversity falls within the scope of the UN Post-2015 Development Agenda's Sustainable Development Goals. In this larger initiative of international cooperation, the topic of biodiversity concerns stakeholders in sustainable agriculture; desertification; land degradation and drought; water and sanitation; health and sustainable development; energy; science; technology and innovation, climate change, and disaster risk reduction; ocean and seas; forests; vulnerable groups including indigenous people; and food security. The critical role of biodiversity in sustainable developmet was recognized in a Rio+20 outcome document, "the World we Want: a Future for All". Biodiversity is important in natural as well as artificial ecosystems and biodiversity refers to the variety of life on Earth. It includes the number of plants, animals, and microorganisms from Earth's vastly different ecosystems such as polar ice caps, colar reefs, tundra, deserts and rainforests. Biodiversity is divided into three types[7].

1. Species diversity – is defined as the number of different species present in an ecosystem and relative abundance of each of those species. Diversity is greatest when all the species present are equally abundant in the area. There are two constituents of species diversity:

Species richness: Number of different species present in an ecosystem. Tropical areas have greater species richness as the environment is conducive for a large number of species

Species evenness: Relative abundance of individuals of each of those species. If the number of individuals within a species is fairly constant across communities, it is said to have a high evenness and if the number of individuals varies from species to species, it is said to have low evenness. High evenness leads to greater specific diversity. It is possible in an ecosystem to have high species richness, but low species evenness.

For example:

In a forest, there may have a large number of different species (high species richness) but have only a few members of each species (low species evenness)

1. **Species diversity** varies in a different geographical location with tropics having highest and declines as we move towards poles. The most species-rich environments are tropical rainforests, coral reefs and ocean bottom zone. Species richness increases with increasing explored area. In a healthy ecosystem, diverse and balanced number of species exist to maintain the balance of an ecosystem. In an ecosystem, all the species depend on each other directly or indirectly. So to make a more efficient, productive and sustainable ecosystem, it is important to maintain high species diversity.

2. **Genetic diversity** - genetic diversity refers to the range of different inherited traits within a species. In a species with high genetic diversity, there would be many individuals with a wide variety of different traits.

Genetic diversity is critical for a population to adapt to changing environments. If a highly selected and low diversity strain, like fish populations grown for aquaculture, is introduced into the wild population, it will reduce the population's ability to adapt to changes.

3. **Ecological diversity** - ecosystem diversity deals with the variations in ecosystems within a geographical location and its overall impact on human existence and the environment. Ecosystem diversity addresses the combined characteristics of biotic properties (biodiversity) and abiotic properties (geodiversity). It is a variation in the ecosystems found in a region or the variation in ecosystems over the whole planet. Ecological diversity includes the variation in both terrestrial and aquatic ecosystems. Ecological diversity can also take into account the variation in the complexity of a biological community, including the number of different niches, the number of and other ecological processes. An example of ecological diversity on a global scale would be the variation in ecosystems, such as deserts, forests, grasslands, wetlands and oceans. Ecological diversity is the largest scale of biodiversity, and within each ecosystem, there is a great deal of both species and genetic diversity[6].

Biodiversity is distributed on the planet and is richest in the tropics. The tropical forests ecosystems contain approximately 90 percent of the world's species but cover less than 10 percent of Earth's surface. Marine biodiversity tends to be highest in areas with high sea temperature. Coral reefs are considered to be the most biologically diverse of all marine ecosystems, supporting on estimated 25 percent of all marine life and 32 percent of the current 34 existing animal phyla. Yet they cover a mere 0.2 percent of the ocean floor.

Importance of biodiversity

Biodiversity is indeed, extremely important to the well-being of Planet Earth. Firstly, its increase ecosystem productivity each species in an ecosystem has a specific role to play. Most of these are interdependent on each other for their survival. Secondly, support number of plants species - this results in a greater variety of crops. Thirdly, promote soils formation and protection the greater variety of plants helps in formation of soil and makes it rich in nutrients. Fourthly, aid in breaking down pollutants – plants utilize carbon dioxide for photosynthesis. More the greenery in area, lesser is the pollution level in the air. Fifthly, offer environments for recreation and tourism. Places with greenery and flowing rivers, mountains, beaches offer great recreation facilities for humans.

Contribution of scientists

Research on biodiversity loss was done by John P. Rafferty (John P. Rafferty writes about Earth processes and the environment. He serves currently as the editor of Earth and life sciences, covering climatology, geology, zoology, and other topics that relate to the natural world. Prior to joining Encyclopedia Britannica in 2006, he held teaching positions at Lewis University, Roosevelt University, and the University of Illinois at Urbana-Champaign.) Biodiversity loss describe the decline in the number, genetic variability, and variety of species, and the biological communities in a given area. This loss in the variety of life can lead to a breakdown in the ecosystem where decline has happened.

Biodiversity losses from disturbances caused by humans tend to be more severe and longer-lasting. Humans, their crops, and their food animals take up an increasing share of Earth's land area. Half of the world's habitable land (some 51 million square km) has been converted to agricultures and some 77 percent of agricultural land (some 40 million square km) is used for grazing by cattle, sheep, goats and other livestock. Researchers have identified four important drivers of biodiversity loss:

1. Invasive species which are non-native species that significantly modify or disrupt the ecosystems they colonize may outcompete native species for food and habitat, which triggers population declines in native species. Invasive species may arrive in new areas through natural migration or through human introduction.

2. Habitat loss and degradation - which is any thinning, fragmentation, or destruction of an existing natural habitat—reduces or eliminates the food resources and living space for most species. Species that cannot migrate are often wiped out.

3. Pollution – which is the addition of any substance or any form of energy to the environment at a rate faster than it can be dispersed, diluted, decomposed, recycled, or stored in some harmless form—contributes to biodiversity loss by creating health problems in exposed organisms. In some cases, exposure may occur in doses high enough to kill outright or create reproductive problems that threaten the species' survival.

4. Climate change associated with global warming – which is the modification of fossil fuels is caused by industry and other human activities. Fossil fuel combustion produces greenhouse gases that enhance the atmospheric absorption of infrared radiation (heat energy) and trap the heat, influencing temperature and precipitation patterns.

I also consider that human activity has been causing extinctions of different species. The two main causes of species extinction are change of their habitats and overexploitation of natural resources. When humans artificially transform the environment, they destroy vegetation and animals' natural habitat. For instance, to build new roads people are cutting down the trees and cementing the soil, altering the environment. Because of that, a lot of species are dying out. Also, when the activities connected with capturing and harvesting a natural resource are too intense in a particular area, the resource becomes exhausted. For example, too frequent fishing does not leave enough time for fish to reproduce and makes them disappear. In other words, human activities often deplete local flora and fauna and cause loss of bio-diversity[4].

Some possible solutions to this problem are protecting natural areas and promoting awareness among people. By protecting areas where human activity is limited and avoiding overexploitation of its resources, we can save the untouched environment and prevent species from dying out. Moreover, the next step in fighting bio-diversity loss is informing the general population

about the dangers of this problem. This way, people will be more conscious of the environment and will not overuse or destroy its resources.

Overall, people's activities that change the environment have negative impact on the world's ecosystem. However, we can significantly lessen the extinction of species by protecting natural areas and enlightening people as to this problem.

Another issue is that biodiversity loss affects economic systems and human society. Humans rely on various plants, animals, and other organisms for food, building materials, and medicines, and their availability as commodities is important to many cultures. The loss of biodiversity among these critical natural resources threatens global food security and the development of new pharmaceuticals to deal with future diseases. Simplified, homogenized ecosystems can also represent an aesthetic loss. Some 75 percent of food crops have become extinct since 1900, largely because of an overreliance on a handful of high-producing crop varieties. This lack of biodiversity among crops threatens food security, because varieties may be vulnerable to disease and pests, invasive species, and climate change. Similar trends occur in livestock production, where high-producing breeds of cattle and poultry are favored over lower-producing, wilder breeds [3]. Mainstream traditional medicines can be derived from the chemicals in rare plants and animals, and thus lost species represent lost opportunities to treat and cure. For example, several species of fungi found on the hairs of three-toed sloths (Bradypus variegatus) produce medicines effective against the parasites that cause malaria (Plasmodium falciparum) and Chagas disease (Trypanosoma cruzi) as well as against human breast cancer [2].

The solution of these problems lies on our shoulders and everyone is responsible for the preservation of the environment. We must protect our nature for the future generations. Here some tips for saving the environment:

1. Save water – conserving water is one of the main environmental protection actions and it is one of the actions that you should instill in your children. Turn off the bathtub with a shower, or flush the toilet with the water saver feature. These small changes will be good for the planet and will also help you cut down on your water bills.

2. Reduce the amount of plastic – another must-do when it comes to recycling is to reduce the amount of plastic. Avoid buying water bottles and use flasks instead, avoid plastic straws and do not buy packaged juices.

3. Buy in glass – at the time of purchase, you can make countless improvements to your daily life in order to contribute to caring for the environment while reducing waste at the same time. Of those products that are sold in packages, teach your children to choose and buy those that are sold in glass packaging. Glass breaks down faster and is less polluting than plastic, and you can also give it a second life. For example, you can renovate the pantry and store food in those glass containers that you were going to throw away instead of plastic jars.

4. Use public transport – teach your children to use public transport, you will not only save money for the whole family, but also help reduce environmental pollution. If you have the opportunity to walk to move around the city, use it. You will exercise while walking.

5. Do not throw away used batteries. Batteries contain various metals, including mercury, lead, cadmium, nickel, cooper, zinc, magnesium, and lithium. If we throw them away with ordinary garbage, all this ends up in the soil. One battery pollutes 20 m² of land. Put a bin for batteries at home, and when it is full, take them to any store in your city[5].

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