

ECOLOGY AND BIODIVERSITY PROTECTION AND CONSERVATION: ISSUES AND CHALLENGES

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ABSTRACT

This planet is full of diversity amongst the species which were here since the beginning of life, but we can't say for how long this biodiversity will exist. Due to some very careless actions by humans some species have extinct and many are in danger of getting extinct soon. Agriculture is a leading threat to many species. Almost 80% of threatened species are affected by more than one threat. Biodiversity is very important for us, plants – mainly trees – dominate life on Earth: they account for more than 82% of biomass. Humans account for just 0.01% of biomass. After considering the damage done to the environment governments have taken many steps for protection and conservation through which we are successful to save some species from getting extinct.

OBJECTIVE

Objective of this research is to study about the biodiversity and how different steps are taken to protect the biodiversity of this planet. Is Steps taken by United Nations are protecting our environment!

SOURCE OF DATA

Data for this paper is secondary data, and is taken from various external source such as government statistics, and international organizational body's websites. i.e. www.iucnredlist.org, ourworldindata.org, news.mongabay.com, www.worldwildlife.org.

RESEARCH METHODOLOGY

Secondary research also known as desk research; it is a research method that involves compiling existing data source from a verity of channels. This includes internal resource (e.g.-house research) or, more commonly, external source (such as government statistics, organizational bodies, and the internet).

KEYWORDS: Biodiversity, Species richness, Species evenness, Diversity, IUCN

ECOLOGY AND BIODIVERSITY

We the human, the most intelligent species of the earth who have found the way of converting anything as usable energy for our means, have found way to explore the space are dreaming of residing outside earth and developing a civilization on other planets. We

have forgotten that before looking at other places we first must learn to live with our own fellow species on our own planet. Today humans have developed so much that we can even touch the sun sitting millions of miles away from the sun but we do not have time to look at our backyard and think about the majestic biodiversity lying there from the beginning of human history. In the period from about 1760 to sometime between 1820 and 1840 is the phase of industrial revolution. The Industrial Revolution has been criticized for leading to immense ecological and habitat destruction, certain studies state that over 95% of species have gone extinct since humanity became the dominant species on earth. It has also led to immense decline in the biodiversity of life on earth. Before going through how the industrialization destroyed the biodiversity of this planet, we first must know about what biodiversity actually is,

- **BIODIVERSITY (1)**

- Biodiversity is the variety of plant and animal life in the world or in a particular habitat.
- Biodiversity is measured by two major components: **species richness**, and **species evenness**.

1. Species richness

- It is the number of species found in a community.

2. Species evenness

- Species evenness is a measure of the relative abundance of the different species making up the richness of an area.

According to scientists there are total 2.13 million identified and described species in the world that includes 1.05 million species of insects, 423373 species of plants, 19,000 species of fish, 11,000 species of birds, and 6,000 species of mammals. This is only a small share of the total number of species on Earth. There are millions more species yet to be discovered and described.

- **ECOLOGY (2)**

The study of the relationship between all living organism and their surroundings

How many species do we know?

Before we look at estimations of how many species there are in total, we should also ask ourselves that the question of how many species we know that we know. Species that we have identified and named. This is only a fraction of the actual number of species on Earth because there are so many that we haven't yet found or studied.

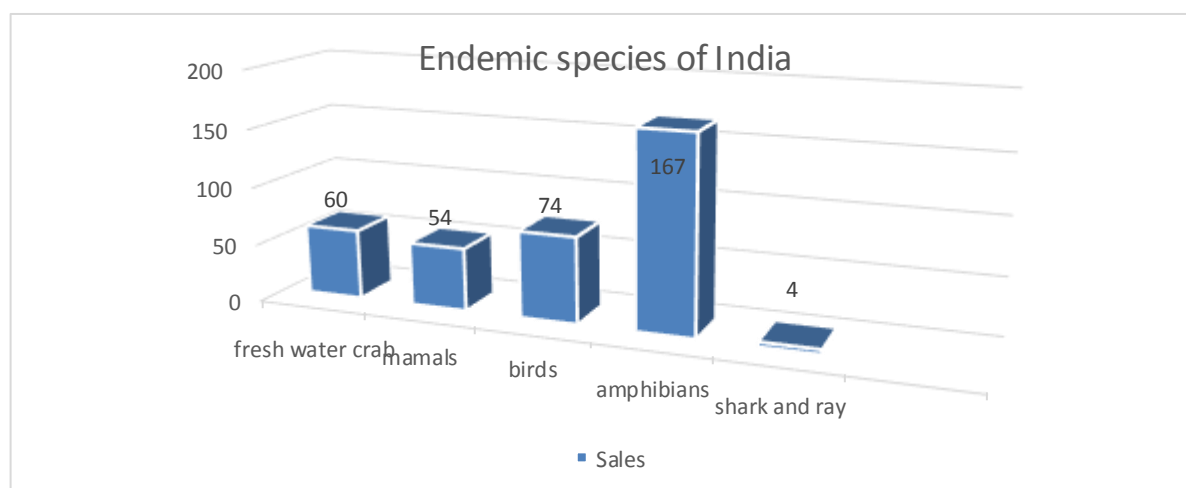
The IUCN Red List tracks the number of described species and updates this figure annually based on the latest work of taxonomists. In 2021 it listed 2.13 million species on the planet. In the chart we see the breakdown across a range of taxonomic groups – 1.05 million insects; over 11,000 birds; over 11,000 reptiles; and over 6,000 mammals.

Entity	Number of described species	Entity	Number of described species
All groups	2130023		
Amphibians	8395	Flowering plants	369000
Arachnids	110615	Fungi and protists	141381
Birds	11162	Green algae	12090
Brown algae	4381	Gymnosperms	1113
Corals	5610	Horseshoe crabs	4
Crustaceans	80122	Insects	1053578
Ferns and Allies	11800	Invertebrates	1491386
Fishes	36058	Lichens	17000
Mosses	21925	Mammals	6578
Mushrooms	120000	Mollusca	83706
Other invertebrates	157543	Red algae	7445
Plants	423373	Reptiles	11690
Vertebrates	73883	Velvet worms	208

(Source-IUCN red list 2021)

India is recognized as one of the mega-diverse countries, rich in biodiversity and associated traditional knowledge. India has 24.62% of its geographical area under forest and tree cover. With just 2.4% of the land area, India accounts for 8.1% of global species diversity even while supporting almost 18% of the human population.

India has many endemic species which means those species which are only found naturally inside Indian Territory, the number of endemic species is shown in below diagram.



IMPORTANCE OF BIODIVERSITY

Biodiversity is very important component of life. Each and every organism provides vital service for the existence of life in this planet. Even a single organism that exist in our surrounding is very important to us. Biodiversity is needed to maintain balance in the ecosystem. It plays vital role to the natural function of the ecosystem. The bio-geocycle

that runs and maintains the balance in nature are because of the activity of the biodiversity. More diverse the ecosystem is, more productive and balanced is the ecosystem.

Biodiversity provides variety of food for the planet, and is the main source of the food, Food we eat (i.e.) plant or animal is biodiversity. Human gets almost 80% of food supply from 20 kinds of the plants.

Biodiversity has economic importance as well, it is source of income for many people. It provides raw materials such as fiber, oil, dyes and many other, for industries. Biodiversity is the major source of medicine and medical research.

Thus, we can say that without biodiversity there would not be this much diversity in the products we use, in the food we eat, in the medicine we consume.

ISSUES AND CHALLENGES

Although, human is totally based upon the nature but he is the major reason of biodiversity loss. Biodiversity loss includes the worldwide extinction of diverse species, as well as the local reduction or loss of species in a certain habitat, resulting in a loss of biological variety. This biodiversity loss has resulted in a biodiversity crisis being driven by many human activities which push beyond the planetary boundaries and so far has proven irreversible.

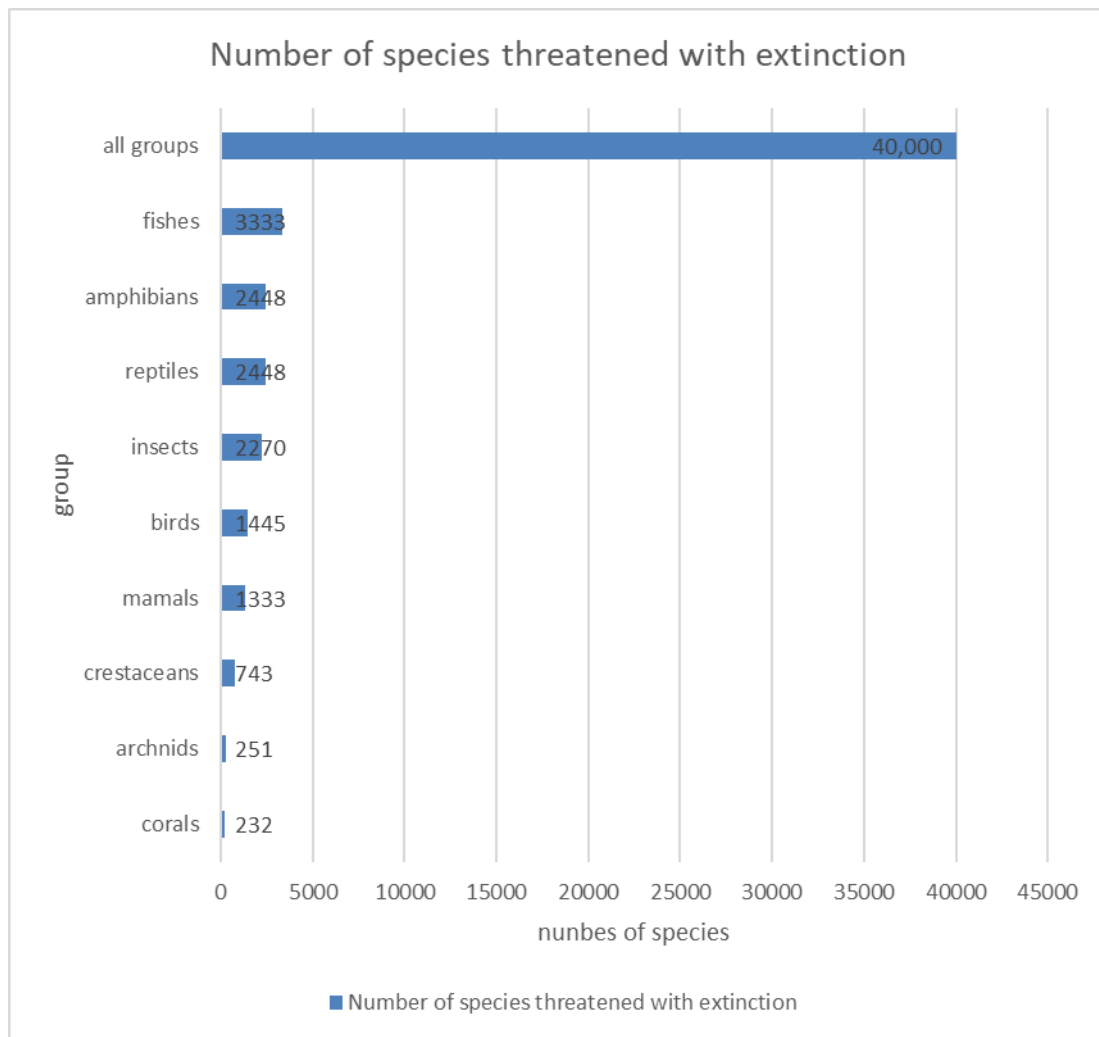
The International Union for Conservation of Nature's Red List of Threatened Species has evolved to become the world's most complete information source on the global extinction risk status of animal, fungus and plant species. According to IUCN red list 2021 more than 40,000 species are threatened with extinction.

Extinction of species have been a natural part of the planet's evolutionary history. But when people ask the question of how many species have gone extinct, they're generally talking about the number of extinctions in recent history. Species that have gone extinct, mainly because of human pressures. In the following chart we see these estimates for different taxonomic groups. It estimates that almost 900 species have gone extinct since year 1500.

Entity	Number of extinct species Since 1500	Entity	Number of extinct species Since 1500
Amphibians	35	fungi	0
Arachnids	9	insects	63
birds	159	Mollusca	299
chromists	0	Other animals	7
corals	0	plants	122
crustaceans	11	reptiles	30
fishes	80	other	85
Total		900	

(Source-IUCN red list)

While many species have gone extinct, some are threatened with extinction. Total 40,000 species in this planet are threatened with extinction. Some of which are given in the below chart.



(Source-IUCN red list)

PROTECTION AND CONSERVATION

For millennia, humans have transformed the world's landscape with the enlargement of agricultural land, and more recently, the growth of urban infrastructure. Excluding ice and desert land half of the world's habitable land is now used for agriculture. In the process, we have lost one-third of the planet's forests and large areas of wild grasslands, peatlands and other environments.

This has come at a severe price of biodiversity. Habitat loss has been, and continues to be, one of the major threats to wildlife. One way to protect habitats, ecosystems and vulnerable species is to reserve protected areas for them. These are designated areas where there are tighter regulations on infrastructural growth efforts or agricultural and closer monitoring of human invasion.

Globally 14.6% of total land has been designed as protected area. 16% of total global forest fall within legally protected forest area. We have seen a significant rise in international cooperation on conservation in recent decades. Amongst the bad news on wildlife losses, conservation has saved tens of birds and mammal species from extinction. In the below chart we have discussed the %share of land by different protected areas in the world from year 2000 to 2021. (4)

year	protected forest area	imp sites for terrestrial biodiversity	imp sites of mountain biodiversity	imp sites of fresh water biodiversity	marine territorial waters
2000	14.12%	26.04%	24.92%	28.13%	-
2005	-	36.67%	30.20%	35.75%	-
2010	16.81%	39.48%	35.90%	40.14%	-
2015	17.74%	42.13%	38.43%	42.22%	-
2016	17.65%	42.50%	38.83%	42.56%	8.75%
2017	17.70%	42.85%	39.09%	43.03%	11.46%
2018	17.75%	43.52%	40.07%	43.78%	11.48%
2019	17.76%	43.83%	40.43%	44.09%	-
2020	17.81%	43.97%	40.49%	44.19%	-
2021	-	43.99%	40.49%	44.22%	-

(Source -World Database on Protected Areas (4))

Steps taken by Indian government towards conservation

India has 19.77% of its total land protected forest area. It is 2% more than the world average of protected forest area 17.81%. Many other protected areas are reserved for terrestrial biodiversity, fresh water biodiversity and marine territorial waters are also protected in India. Trend of which from 2000-2021 is given in below chart.

year	protected forest area	Imp terrestrial biodiversity sites	imp mountain biodiversity sites	imp sites of fresh water biodiversity	marine territorial waters
2000	15.88%	1.43%	1.12%	2.56%	-
2005	-	1.43%	1.12%	2.56%	-
2010	19.65%	1.43%	1.12%	2.56%	-
2015	19.74%	6.11%	9.75%	7.78%	-
2016	19.75%	6.23%	9.96%	8.18%	0.17%
2017	19.76%	6.23%	9.96%	8.18%	0.17%
2018	19.76%	6.23%	9.96%	8.18%	0.17%
2019	19.76%	6.23%	9.96%	8.18%	-
2020	19.77%	6.23%	9.96%	8.18%	-
2021	-	6.23%	9.96%	8.18%	-

(Source -World Database on Protected Areas (4))

CONCLUSION

In the process of development, we have wiped out many species and lost one third of planets forest to agriculture. After considering the damage to the environment, the steps taken by government were very important for protecting and conservation the wild species. By setting up protected areas and strict wildlife (protection) laws, some of the species are now out of danger. By sustainable development and sustainable use of natural resources, one day this planet will be safe for all organisms.

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