

2.2 Threats to Biodiversity

Extinction is a natural event and is a routine from geographical perspective. We know that most of the species that have ever lived have gone extinct. In modern era, due to human actions, species and ecosystems are threatened with destruction to an extent rarely seen in the past history. In a short period of time due to events of mass destruction, many species have been threatened. We can attribute the loss of species and ecosystem to the accelerating transformation of the earth by a growing human population. As the human population passes the figure of 6 billion, we have transformed, degraded or destroyed roughly half of the world's forests. We appropriate most available freshwater and harvest virtually all the available productivity of the oceans. No wonder that species are disappearing and ecosystems are being destroyed. The some of the major threats involved in adversely affecting the global biodiversity are discussed in six broad categories as under: -

a. Over-hunting

Over-hunting has been a significant cause of the extinction of hundreds of species and the endangerment of many more. Most extinctions over the past several hundred years are mainly due to over-harvesting for food, fashion and profit. Commercial hunting, both legal and illegal (poaching), is the principal threat. The annual global trade is estimated to be at least US \$5 billion, with perhaps one-quarter to one-third of it illegal. Sport or recreational hunting causes no endangerment of species where it is well regulated, and may help to bring back a species from the edge of extinction. While over-hunting, particularly illegal poaching, remain a serious threat to certain species for the future, it is globally less important than other factors mentioned below: -

b. Habitat loss, degradation, fragmentation

Habitat loss, degradation, and fragmentation are important causes of known extinctions. As deforestation proceeds in forests, this promises to become the main cause of mass extinctions caused by human activity.

All species have specific food and habitat needs. The more specific these

needs and localised the habitat, the greater the vulnerability of species, to loss of habitat to agricultural land, livestock, roads and cities. In the future, the only species that survive are likely to be those whose habitats are highly protected, or whose habitat corresponds to the degraded state associated with human activity.

Tropical forests are so important because they harbour at least 50%, and perhaps more, of the world's biodiversity. The original extent of tropical rain forests was 15 million km². Presently, it is about 7.5-8 million km² indicating that almost half of it is gone. The current rate of loss is estimated at near 2% annually (100,000 km² destroyed, another 100,000 km² degraded). While there is uncertainty regarding the rate of loss, and what it will be in future, the likelihood is that tropical forests will be reduced to 10-25% of their original extent by late twenty-first century.

Habitat fragmentation is a further aspect of habitat loss that often goes unrecognised. The forest, meadow, or other habitat that remains generally is in small, isolated bits rather than in large, intact units. Each is a tiny island that can at best maintain a very small population.

For the future, habitat loss, degradation and fragmentation combined is the single most important factor in the projected extinction crisis.

c. Invasion of non-native species

Invasion of non-native species is an important and often overlooked cause of extinctions. Of all documented extinctions since 1600, introduced species appear to have played a role in at least half. The clue is the disproportionate number of species lost: some 93% of 30 documented extinctions of species and sub-species of amphibians and reptiles, 93% of 176 species and sub-species of land and freshwater birds, and only 27% of 114 species and subspecies of mammals.

d. Domino effects

Domino effects occur when the removal of one species or the addition of another species affects the entire biological system. Domino effects are especially likely when two or more species are highly interdependent, or when the affected species is a "keystone" species, meaning that it has strong connections to many other species. A keystone species is one whose influence on others is disproportionately great. Thus, a keystone species is one whose presence or absence both directly and indirectly influences other species through food web connectivity. Contrary to what some may

Domino effect: The situation in which one event causes a series of related events, one following another.



think, not all species are "keystones", and it requires careful experimental studies to identify keystone species.

e. Pollution

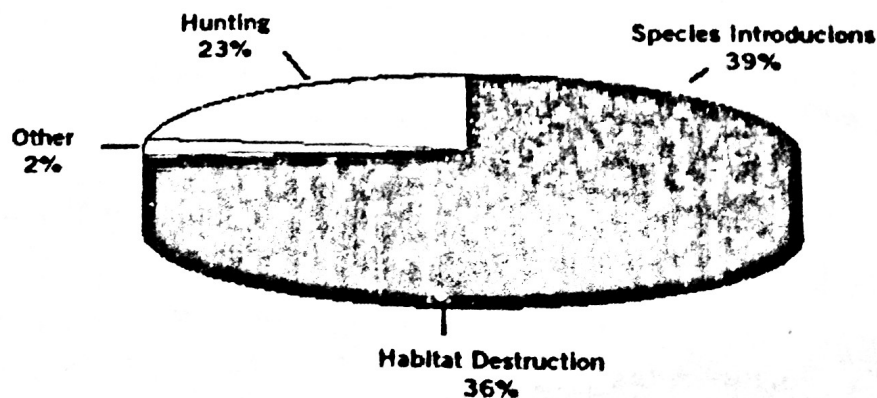
Pollution from chemical contaminants certainly poses a further threat to species and ecosystems. While not commonly a cause of extinction, it likely can be for species whose range is extremely small, and threatened by contamination.

f. Climate change

A changing global climate threatens species and ecosystems. The distribution of species is largely determined by climate, as is the distribution of ecosystems and plant vegetation zones. Climate change may simply shift these distributions but, for a number of reasons, plants and animals may not be able to adjust. The pace of climate change almost certainly will be more rapid than most plants are able to migrate. The presence of roads, cities, and other barriers associated with human presence may provide no opportunity for distributional shifts. Parks and nature reserves have fixed locations. With further warming, many of the mountaintop species will likely to be eliminated. A changing climate will have many other effects. Agricultural production likely will show regional variation in gains and losses, depending upon crops and climate. Some coral reefs will expand, and others will contract or die off. Ecological changes due to an altered climate are difficult to forecast, but expected to be serious.

As a consequence of these multiple forces, many scientists fear that by end of next century, perhaps 25% of existing species will be lost.

**Known Causes of Animal Extinctions
Since 1600**



World Conservation Monitoring Centre

All of these threats have put a serious strain on the diversity of species on earth. According to International Union for Conservation of Nature (IUCN), globally about one third of all known species are threatened with extinction. It includes 29% of all amphibians, 21% of all mammals and 12% of all birds. In case, the increasing tendency of these threats are not curtailed and properly addressed, the world will be facing another mass extinction with dire consequences to the environment and human health and livelihood.

Facts

- Coral reefs provide food, storm protection, jobs, recreation and other income sources for more than 500 million people worldwide yet 70% of coral reefs are threatened or destroyed.
- 19,265 species out of the 59,507 so far assessed are threatened with extinction.
- Of the world's 5,494 mammals, 78 are Extinct or Extinct in the Wild, with 191 Critically Endangered, 447 Endangered and 496 Vulnerable.
- 1,910 of the planet's 6,312 amphibians are in danger of extinction, making them the most threatened group of species known to date.
- Since 2000, 6 million hectares of primary forests are been lost each year.
- 35% of mangroves have been lost in just 20 years.