UNDERSTANDING & PREDICTING THE DRIVERS OF BIODIVERSITY LOSS: A REVIEW

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ABSTRACT:

Year 2020 is considered as the super year for nature and biodiversity. Biodiversity (Animal, Plants and Microorganisms) have wide range in the ecosystem sustainability. Biodiversity is broadly classified into three groups i.e. genetic diversity, species diversity and ecosystem diversity. There is vast range of drivers responsible for biodiversity loss. These are Habitat destruction, changing life style and pollution, increasing number of alien / exotic / invasive species, human encroachment / over-exploitation of natural resources, ecological and biomedical manipulation, agricultural intensification, genetic pollution / hybridization, climate change, human overpopulation, extensive use of chemical fertilizers / pesticides etc. Biodiversity loss results in loss of genetic diversity, soil erosion and landslides, desertification of productive land, loss of pollinators, natural calamities.
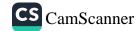
Keywords: Biodiversity, Habitat destruction, Agricultural intensification, Natural calamities.

INTRODUCTION:

Biodiversity is the key for food security and nutrition; and contributes to the achievement of Sustainable Development. The 1992 Convention on Biological Diversity (CBD) carries an internationally accepted definition of biodiversity as " the variability among living organisms from all sources, inter alia, terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part, this includes diversity within species, between species and of ecosystems" (Glowka *et,al., 1994).

According to UNEP (United Nation Environment Programme) estimated approximately 9.0 to 52 million of species exit on earth . The words major biodiversity is in south countries in its tropical forests having 50-150 trees per hectare. It consists at least half of the worlds living species. In India about 2.1 million species have been identified till date, while many more species are believed to exit. India's position is ten in the world and fourth in Asia in terms of plant diversity.

Table-1. Number of species of major/ component groups of Biodiversity.

Major/Component group		Described	Global estimate (described + undescribed)
Chordates		64,788	~80,500
↳	Mammals	5,487	~5,500
↳	Birds	9,990	>10,000
↳	Reptiles	8,734	~10,000
↳	Amphibia	6,515	~15,000
↳	Fishes	31,153	~40,000
↳	Agnatha	116	unknown
↳	Cephalochordata	33	unknown
↳	Tunicata	2,760	unknown
Invertebrates		~1,359,365	~6,755,830
↳	Hemichordata	108	~110
↳	Echinodermata	7,003	~14,000
↳	Insecta	~1,000,000 (965,431–1,015,897)	~5,000,000
↳	Arachnida	102,248	~600,000
↳	Pycnogonida	1,340	unknown
↳	Myriapoda	16,072	~90,000
↳	Crustacea	47,000	150,000
↳	Onychophora	165	~220
↳	non-Insect Hexapoda	9,048	52,000
↳	Mollusca	~85,000	~200,000
↳	Annelida	16,763	~30,000
↳	Nematoda	<25,000	~500,000
↳	Acanthocephala	1,150	~1,500
↳	Platyhelminthes	20,000	~80,000
↳	Cnidaria	9,795	unknown
↳	Porifera	~6,000	~18,000
↳	Bryophyta	16,236	~22,750
↳	Algae (Plant)	12,272	unknown
↳	Vascular Plants	281,621	~368,050
Fungi		98,998 (incl. Lichens 17,000)	1,500,000 (incl. Lichens ~25,000)
↳	Viruses	2,085	400,000

CAUSES OF BIODIVERSITY EXTINCTION:

Most of the causes associated to biodiversity extinction are anthropogenic. These are:

1. Habitat destruction/ Deforestation and habitat loss: Habitat destruction and deforestation has played a key role in extinction which occurs when natural habitats are modified for human needs. Habitat size and number of species are systematically related. Habitat loss can lead to habitat fragmentation which is very critical for large territorial animals such as tigers, lions, elephants. Breeding of these animals occurs only they have living in a large habitat.

2. Invasive/ Exotic/ Alien species: Invasive species are plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health. Invasive species eliminates native species by occupying their niches (Adopt to the habitat) uses of resources of native species competing with native species causing diseases to native species.

3. Hybridization (Fusion of unrelated plants) and Genetic Pollution: Green revolution popularized hybridization for increased yield. Hybrid seeds originated in developed countries further hybridized with local varieties (in developing countries). This is to create high yield strains resistant to local climate and diseases. Hybridization is the side effect of invasion. The high yielding breeds results into genetic erosion and gene pollution in wild species.Genetic pollution occurs by uncontrolled hybridization.

4. Over exploitation of natural resources: It takes place when a resource is consumed at an unsustainable rate. The over exploitation in the form of Overhunting, Excessive logging, Poor soil conservation in agriculture and Illegal wild life trade.

5. Climate change: Global warming is one of the major threat to global biodiversity. Coral reefs (biodiversity hot spots and they are under water ecosystem held together by calcium carbonate) will be lost in 20 or 40 years if global warming continues at the current rate. Carbon dioxide concentration in the atmosphere affects morphology of plants.

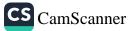**6. Diseases**: Diseases can eliminate species from earth. The cause of disease may be natural anthropological Human activities sometimes speedup the severity of natural diseases Introduced species may carries pathogens along with them.

7. Population explosion: Biodiversity is the life supporting system. Therefore, for its sustainability and well being of all the organisms on this earth planet we have to neutralise

the threats to biodiversity by reducing all our adverse activities. directly Population and pollution are directly proportional to each other.

Some of the other causes responsible for biodiversity loss are: changing life style of humans which results into various types of pollutions, Urbanization, agricultural intensification, ecological and bio-medical manipulation, extensive use of chemical fertilizers etc.

IMPACTS OF BIODIVERSITY LOSS:

1. Loss of genetic diversity and opportunity to use it for crops, medicines etc.
2. Droughts and floods.
3. Soil erosion and landslides.
4. Desertification, mineralization and water logging of productive lands.
5. Water pollution and loss of water.
6. Decrease in crop yield due to decrease in pollinators, seed dispersal.
7. Coastal erosion (Strom and Tsunami damage.)

CONSERVATION OF BIODIVERSITY:

Biodiversity conservation refers to the protection, upliftment and management of biodiversity in order to derive sustainable benefits for present and future generations. Following conservation measures will be used to conserve biodiversity.

1. Preservation of unique ecosystems (hotspots) which inhabits endemic species.
2. Efficient use of natural resources.
3. Poaching and hunting of wildlife should be prevented.
4. Need of public awareness.
5. In-situ and ex-situ conservation.

6. CONCLUSION:

Biodiversity offers many natural resources which could greatly add to the security of our food, medicine, wood products, water, Soils formation, Nutrient storage and recycling, Pollution breakdown and absorption, climate stability, maintenance of ecosystems and Recovery from unpredictable events. Biodiversity is the life supporting system. Therefore, for its sustainability and well being of all the organisms on this earth planet we have to

neutralise the threats to biodiversity by reducing all our adverse activities. Three factors such as afforestation, enforcement and awareness initiatives are proven to be counter the declination of biodiversity.

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