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In Depth – Biodiversity: Warning Bells

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Relentless pursuit of economic growth coupled with climate change has brought an unprecedented one million species at the doorstep of extinction. This is the finding of a landmark UN report (known as the **Global Assessment**) on the damage done by modern civilisation to the natural world. The report compiled by 145 expert authors from 50 countries is based on the review of about 15,000 scientific and government sources. Also, **the report is the first comprehensive look in 15 years at the state of planet's biodiversity.**

Biodiversity

- It refers to **all the varieties of life that can be found on Earth** (plants, animals, fungi and microorganisms) as well as to the **communities that they form and the habitats in which they live**.
- **The Convention on Biological Diversity, Article 2:** Biological Diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
- It can be understood at three levels:
 - **Species diversity** refers to the variety of different species (plants, animals, fungi and microorganisms) such as palm trees, elephants or bacteria.
 - **Genetic diversity** corresponds to the variety of genes contained in plants, animals, fungi and microorganisms. It occurs within a species as well as between species. For example, poodles, German shepherds and golden retrievers are all dogs, but they all look different.
 - **Ecosystem diversity** refers to all the different habitats - or places - that exist, like tropical or temperate forests, hot and cold deserts, wetlands, rivers, mountains, coral reefs, etc. Each ecosystem corresponds to a series of complex relationships between biotic (living) components such as plants and animals and abiotic (non-living) components which include sunlight, air, water, minerals and nutrients.

Key Findings from the UN Report

- **More than half a million species on land have insufficient habitat for long term survival** and are likely to become extinct. An average of 25% of animals and plants are now threatened.
- Global trends in insect population are not known but rapid decline in some locations have been documented.
- Forests have been cleared at astonishing rates especially in tropical areas. Between 1980 and 2000, 100 million hectares of tropical forests were lost.
Urban areas have more than doubled since 1992.
- **Soils are being degraded** as never before **reducing the productivity of 23% of the land surface of the earth**.
- More than a third of the world's land surface and nearly 75% of world's freshwater resources are now devoted to crop or livestock production.
- **Plastic pollution has increased ten folds since 1980**. Every year, the world dumps 300-400 million tonnes of heavy metals, solvents and other wastes into the water.

Environmental Problems

Plastic Waste

- About 8 million tonnes of plastic enter the sea every year. **At this rate, world will face a future with more plastic in the ocean than fish by the year 2050.**
- Plastic is manufactured from the elements and chemicals derived from petroleum substances which is the reason behind it producing toxic effects through various chemical reactions from the initial production to its use and finally as a trash.
- It is severely dangerous for human beings and organisms.

Plastic waste not only affects a sea life but also the sea salt.

- More than 90% sea organisms are eating plastic in some form whereas in 1960s this figure was only 5%.
- Plastic flows into seas from sewers, construction activities, fishing, shipping etc.
- **Waste management is easy if at individual level, one resorts to 3Rs : Reduce, Reuse and Recycle.**

Microplastics

- Microplastics are **small plastic pieces** less than five millimeters long, which aquatic life and birds mistake for food.
- Microplastic includes microbeads that are used in cosmetics and personal care products, industrial scrubbers which are used for aggressive blast cleaning, microfibers used in textiles and virgin resin pellets used in plastic manufacturing processes.
- High level of microplastics are found in the Pacific, Atlantic and the Indian Ocean.

Climate Change

- Climate change is another environmental problem that has surfaced in the last couple of decades.
- It happens due to the pollution of the atmosphere by greenhouse gases and other contaminants.
- It **affects** the fundamental requirements for remaining healthy i.e. **air, drinking water, food and shelter.**
- **Global warming**, that happens due to changes in climate, has observable effects on the environment such as shrinking glaciers, earlier break up of ice on rivers and lakes, increased droughts, extreme weather etc.

Deforestation

- It has been estimated that around half of the world's mature forests have been cleared by humans.

- Forests are an essential part of the global ecosystem and the biosphere. **They help to regulate climate, protect soils from erosion and provide habitat to vast number of plants and animal species.**

Land Degradation

- It is a problem in virtually every terrestrial ecosystem that is reducing the welfare of more than three billion people.
- A recent assessment has found that **only a quarter of land on earth is substantively free of the impacts of human activities and this is projected to decline to just one-tenth by 2050.**
- The ongoing degradation has many impacts on species, the quality of habitats and the functioning of ecosystems.

Overpopulation

- It is one of the crucial current environment problems.
- Population explosion in less developed and developing countries is **draining the already scarce resources.**
- Recent analysis have revealed that even if the destruction of natural resources ends now, it would take 5-7 mn years for the natural world to recover.

Light Pollution

- **The inappropriate or excessive use of artificial light, known as light pollution has serious environmental consequences for humans and wildlife.**
- It washes the star light in the night sky, interferes with astronomical research, disrupts ecosystem, has adverse health effects and wastes energy.
- Excessive artificial light leads to **adverse behavioural changes in insect and animal population.** Artificial light confuses an animal's natural body cycle, thus also affecting its immune system.
- Light pollution can be tackled by switching off the lights when and where ever necessary.

Impact of human activities on other species:

- **Many scientists feel that the world is in the middle of a sixth major mass extinction, one caused solely by human beings.**
- The Living Planet Report, 2018 has found that **human activity has killed 60% of the earth's mammals, birds, fish and reptiles since 1970.** The earth has lost about half of its shallow water corals in the past 30 years.

- Despite current laws, millions of exotic and wild birds are exploited, hunted and sold as part of a illegal wildlife trade.
Birds are one of the nature's best scavengers helping in eliminating waste and hazardous remains and reducing the spread of disease to humans and other animals.

Bees

- Bees are the **extraordinary creatures that exist in all types of climates around the world.**
- Bees, are in fact, **keystone species with others dependent on them for survival.**
- Pollination not only makes food available for other organisms but also allows floral growth which provides habitat for animals.
- As pollinators, bees also **contribute billions to the world economy.**
Agricultural economies like India face high risk from the bee decline. Without them, India's food production will reduce by one-third as out of the 160 million hectares cropped area in India, some 55 million hectares depend on honey bees for pollination.
- **For the past decade, there has been continuous drop in the worldwide bee population.**

Biodiversity needs to be considered as an equally important issue as the climate change. The decline in biodiversity is not just an environmental issue but also an economic, security, moral and ethical issue. The biggest challenge and opportunity lies in changing approach towards development. People need to shift to clean technologies for protecting the nature. Ultimately, the world needs to come together to make a global deal to save nature.