



Sixth Mass Extinction

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Why in News

Recently, the researchers have observed that the **ongoing sixth mass extinction** is one of the **most serious environmental threats** to the existence of civilisation.

Mass extinction refers to a substantial **increase in the degree of extinction** or when the Earth **loses more than three-quarters of its species** in a geologically **short period of time**.

Since life first evolved on the planet, a short geological period of time is defined as **less than 2.8 million years**.

History of Mass Extinction

So far, the Earth has experienced **five mass extinctions**.

Era	Impact and Possible Reasons
First Mass Extinction: End Ordovician, 444 million years ago	<ul style="list-style-type: none">• 86% of species lost• Severe ice age that lowered sea levels, possibly triggered by the uplift of the Appalachians. The newly exposed silicate rock sucked CO₂ out of the atmosphere, chilling the planet.
Second Mass Extinction: Late Devonian, 383-359 million years ago	<ul style="list-style-type: none">• 75% of species lost• With the emergence of land plants, their deep roots stirred up the earth, releasing nutrients into the ocean. This might have triggered algal blooms which sucked oxygen out of the water, suffocating bottom dwellers like the trilobites.

Third Mass Extinction: End Permian, 252 million years ago

- 96% of species lost
- A cataclysmic eruption near Siberia blasted CO₂ into the atmosphere. Methanogenic bacteria responded by belching out methane, a potent greenhouse gas. Global temperatures surged while oceans acidified and stagnated, belching poisonous hydrogen sulfide.

Fourth Mass Extinction: End Triassic, 201 million years ago

- 80% of species lost
- No clear causes have been found.

Fifth Mass Extinction: End Cretaceous, 66 million years ago

- 76% of all species lost
- Volcanic activity and climate change along with asteroid species

Key Points

- **Background:**

- The five mass extinctions that took place in the **last 450 million years** have led to the **destruction of 70-95%** of the species of plants, animals and microorganisms that existed earlier.
- All these extinctions were caused due to the **catastrophic alterations** to the environment, such as massive volcanic eruptions, depletion of oceanic oxygen or collision with an asteroid.

After each of these extinctions, it took millions of years to regain species comparable to those that existed before the event.

- **Ongoing Sixth Mass Extinction:**

- It has been observed that the sixth extinction is **human-caused** and is **more immediate** than climate destruction. Thus, the ongoing sixth mass extinction is referred to as the **anthropocene extinction**.

Currently, only an **estimated 2% of all of the species** that ever lived are **alive** but the **absolute number** of species is **greater than ever before**.

- It is described as the most serious environmental problem since **the loss of species will be permanent**.

The loss of species has been occurring **since human ancestors developed agriculture over 11,000 years ago**. Since then, the human population has increased from about 1 million to 7.7 billion.

- **Outcomes of the Study:**

- The study has described sixth mass extinction as the most **serious environmental problem**.
 - The study analysed **29,400 species** of terrestrial vertebrates and concluded that over **515 of them are near extinction**.
 - Most of these 515 species are from South America (30%), followed by Oceania (21%), Asia (21%) and Africa (16%) among others.
- It has also observed that the **disappearance** of these populations has been **occurring since the 1800s**.

- **Impacts:**

- The extinction of the species causes **tangible impact** such as in the form of a loss in crop pollination and water purification.
- Further, if a species has a specific function in an ecosystem, the loss can lead to consequences for other species by **impacting the food chain**.
- When the number of individuals in a **population or species drops too low**, its contributions to ecosystem functions and services **become unimportant**.
- The effects of extinction are expected to worsen the **genetic and cultural variability** which would change entire ecosystems.

When genetic variability and resilience is reduced, its contribution to **human welfare may be lost**.

Way Forward

- The current **Covid-19 pandemic** is also linked to the wildlife trade. It has been also predicted that there will be more pandemics if we continue destroying habitats and trading wildlife for human consumption as food and traditional medicines.
- In general, **loss of biodiversity** in a region may lead to (a) decline in plant production, (b) lowered resistance to environmental perturbations such as drought and (c) increased variability in certain ecosystem processes such as plant productivity, water use, and pest and disease cycles.

Source:IE