

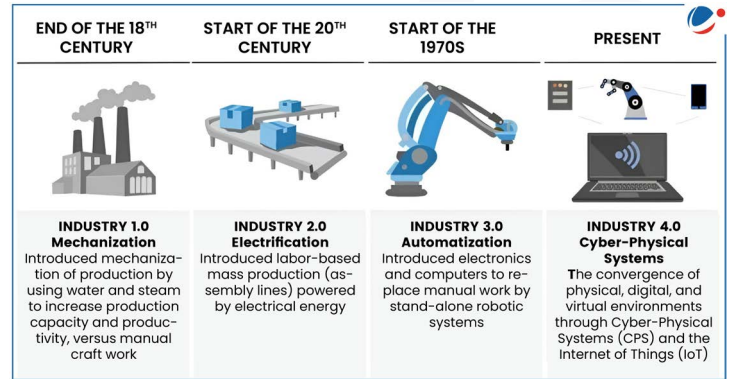
NEWS TODAY

Centre for the Fourth Industrial Revolution Network 2023-2024 Impact Report by WEF

The Report highlights powerful initiatives, such as drones delivering healthcare in India and how innovation can tackle global challenges.

Key Highlights of the report

- **Seven core thematic areas of research and impact generation:** ushering in the Intelligent Age; agriculture; health and biotechnology; the energy transition; etc.
- **Impact of 4th IR**
 - ⊕ **Improved transportation:** Integrating autonomous mobility into the national transport system can reduce traffic accidents, improve transport efficiency and create jobs as seen in Saudi Arabia.
 - ⊕ **Alternative proteins:** Initiative seeks to incubate alternatives by developing innovative protein sources, such as plant-based, cultivated proteins for food security.
 - ⊕ **Improving lives of farmers:** The Saagu Baagu pilot program in Telangana, involving 7,000 chili farmers, showed that agritech can significantly improve farmer incomes and reduce agriculture's environmental impact.



India's Initiatives for Industrial Revolution 4.0

- **AI for India 2030 initiative:** By the Ministry of Electronics and Information Technology.
- **Artificial Intelligence for Agricultural Innovation (AI4AI):** With collaboration with World Economic Forum and Ministry of Agriculture.
- **National Mission on Interdisciplinary Cyber Physical System (NM-ICPS):** By Department of Science & Technology, to enhance start-ups, Human Resource and skill-sets in emerging areas.

Nature Study suggests global decline in intraspecific genetic diversity

The study has analyzed data spanning 3 decades and examined >600 species of animals, plants and fungi across terrestrial and marine ecosystems.

- **Genetic Diversity** refers to the range of inherited traits within a species critical for a population to adapt to changing environments. It is essential for long-term survival of species populations and ensuring ecosystem resilience.

Key findings of the study

- **Extent of genetic loss:** 2/3rd of studied populations experienced decline in genetic diversity, with less than half receiving any conservation management.
- **Impact Areas:** Genetic loss occurred regardless of IUCN status and is not exclusive to rare and threatened species.
 - ⊕ The loss of genetic diversity was high especially among birds and mammals.
- **Conservation Measures:** Habitat restoration, disease control, captive breeding can help in reversing genetic loss.

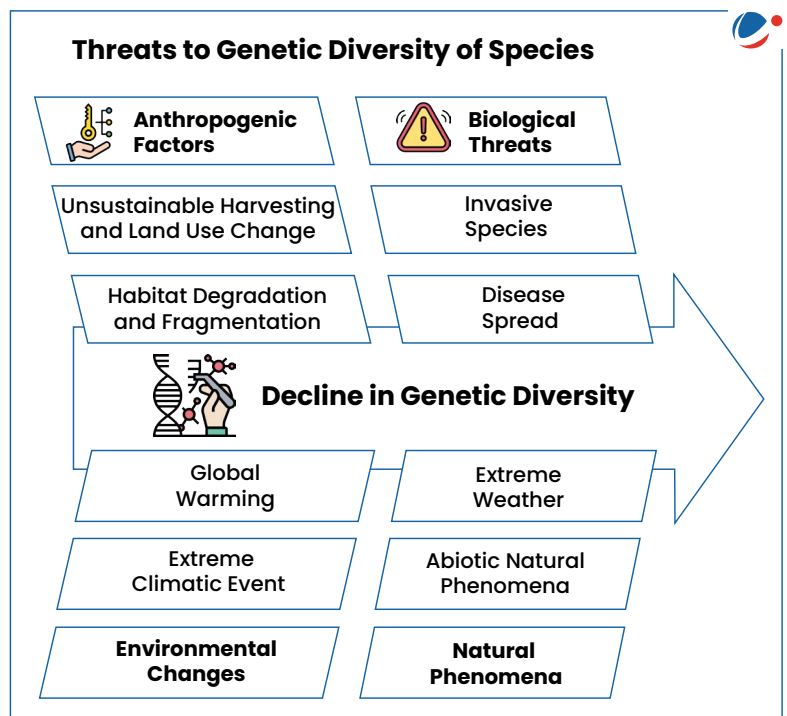
Various Initiatives

- **Convention on Biological Diversity's Kunming-Montreal Global Biodiversity Framework:** It includes targets for safeguarding genetic diversity of all species.
- **In-situ Conservation:** Protected Areas, National Parks etc. E.g. Project Tiger.
- **Ex-situ Conservation:** Zoological Parks, Gene Banks etc.
- **Technological Advancement:** Environmental DNA (eDNA), Genome Sequencing, DNA Barcoding.

Conclusion

Maintaining genetic diversity safeguards biodiversity against future environmental changes and ensures the continued benefits that nature provides to society.

Threats to Genetic Diversity of Species



China's Experimental Advanced Superconducting Tokamak (EAST) creates new record in Fusion reaction

EAST, also known as **China's Artificial Sun**, maintained a **steady-state high-confinement plasma operation for 1000+ seconds** reaching a temperature of 100 million °C.

➤ A tokamak is a machine that confines a plasma using magnetic fields in a donut shape to harness the energy of fusion.

Significance of this achievement:

- **Step towards fusion-based nuclear reactors** which can act as **alternatives to other sources of clean energy** such as wind, solar etc.
- Can **address world energy crisis & problem of climate change**.

Advantage of nuclear fusion

- **High Energy Output** – It produces greater amounts of energy than any other source.
- **Abundant & affordable fuel** – It uses cheap input materials, available in almost limitless supply. **E.g., deuterium, tritium, hydrogen, Lithium**
- **Environment friendly** – It has a zero-emission footprint and it does not contribute to greenhouse gas emissions or global warming
- **Safe and Clean Process** – Fusion reactors produce helium, an inert gas. They also generate and recycle tritium, a radioactive substance with a short half-life. As a result, fusion **does not produce long-lived radioactive nuclear waste**.

Nuclear Fusion and Fission

- Nuclear fusion is the process by which **two light atomic nuclei combine to form a single heavier one** while releasing massive amounts of energy.
- Nuclear fission **splits a heavy element (with a high atomic mass number) into fragments**, releasing energy.
- Nuclear fusion produces more energy than nuclear fission.

Challenges in nuclear fusion

- **Extreme Temperature Requirement:** Fusion requires temperatures of hundreds of millions of degrees Celsius, even higher than the Sun's core.
- **Plasma containment:** At such high temperatures, matter exists only in the plasma state (atoms get split into positively and negatively charged particles). Keeping plasmas stable in order to extract energy is difficult.
- **Magnetic Confinement:** The plasma must be suspended within a confined space using strong magnetic fields to prevent contact with reactor walls.

Indian AI model likely in 6 months: Union Minister for Electronics & Information Technology

The Minister also launched a call for proposals under the **India AI Mission** inviting startups, researchers, and entrepreneurs to support development of indigenous foundational AI models using Indian datasets.

Features of Indian AI model

- **Graphics Processing Units (GPUs):** It will be initially launched with 10,000 GPUs with plans to expand to 18,693 GPUs.
 - ⊕ GPU is a specialized processor which can process many pieces of data simultaneously, making them useful for machine learning, video editing etc
- **Cost effective:** India's AI Model computation will cost <100 rupees per hour after 40% government subsidy. Presently global models computation costs 2.5 to 3 dollars per hour usage.
- **Multidimensional Usages:** create scalable and impactful AI solutions across sectors such as healthcare, education, agriculture, climate, and governance

Need for Indigenous AI models

- **Boosting Innovation and Research:** To achieve global standards and address unique challenges and opportunities within the Indian context.
- **Focus on Ethical AI:** For prioritization of **ethical AI practices, with a focus on inclusivity, fairness and the elimination of biases** and address the diverse cultural, and societal context of the country.
- **Strengthening digital Sovereignty:** Enhancing nation's ability to control its digital infrastructure and include control over the entire AI supply chain, from data to hardware and software.
- **Security and data protection:** Safety initiatives, including AI Bias Mitigation, Explainable AI frameworks, and AI Privacy Strategies, aiming at protecting data from foreign models.

Indian Initiatives to Develop indigenous AI model

- **IndiaAI Mission:** to Strengthen the AI Innovation Ecosystem
- **IndiaAI Safety Institute under the Safe and Trusted Pillar of the IndiaAI Mission:** to address AI risks & Safety challenges
- **IndiaAI Innovation Centre:** To develop and deploy large multimodal models (LMMs) and domain-specific foundational models.

Supreme Court (SC) Issues Directions to Curb Tanneries' Pollution in Palar River

These directions were issued in accordance with a judgment passed in **Vellore Citizens Welfare Forum vs. Union of India (1996)**.

- In this judgement, the SC observed that **"Precautionary Principle"** and **"Polluter Pays Principle"** are essential features of "Sustainable Development."
- ⊕ **Polluter pays' principle** is a practice where those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment.
- ⊕ **Precautionary principle** enables decision-makers to adopt precautionary measures when evidence of environmental or human health hazard is uncertain.

Key Highlights of SC Directions

- The State Government to **pay compensation** to affected individuals which is to be recovered from the polluters as per **'polluter pays' principle**.
- The SC asked State to constitute an **expert committee to assess and audit the ecological damage** and suggest remedial measures.

Palar River Pollution due to Tanneries

- The **Palar River** in Tamil Nadu is heavily **polluted by tanneries** which discharge **untreated chemical effluents**, including toxic heavy metals like **chromium**.
- **Tanneries** are factories where **animal hides are processed and transformed into leather**.
- The **untreated discharge from tanneries** causes irreversible damage to the water bodies, groundwater and agricultural lands etc.

SC Judgements Regarding Constitutionalization of Environmental Issues

- **Rural Litigation and Entitlement Kendra vs. State (1988)**: Recognized the **right to live in a healthy environment** as part of Article 21 of the Constitution.
- **M.C. Mehta vs. Union of India (1987)**: Acknowledged the right to live in pollution free environment as a part of fundamental right to life under Article 21 of the Constitution.
- **T.N. Godavarman Thirumulpad vs Union Of India & Ors (1996)**: Expanded 'forest' meaning to preserve green expanses, irrespective of their nature, classification or ownership.

Also In News



UN Peacekeeping (Blue Helmet)

Recently, UN Resident Coordinator in India highlighted that building lasting partnerships is essential for Blue Helmets to effectively tackle global threats.

- **"Blue Helmets"** refers to **United Nations (UN) peacekeepers** as they use blue helmets while carrying out peacekeeping missions around the world.

About UN Peacekeepers

- **Origin**: Began in **1948** when the **UN deployed military observers to West Asia** to observe the **Armistice Agreement**.
- **Deployment Mechanism**: **UN Security Council** by adopting a resolution.
 - ⊕ **Budget and resources** are subject to **General Assembly** approval.
- **Principles of Peacekeeping** are based on **Consent of the parties, Impartiality, Non-use of force except in self-defence and defence of the mandate**
- **Department of Peace Operations (DPO)** of **UN provides political and executive direction** to peacekeeping operations.



Kara Sea

Recently, a **Russian Nuclear-powered vessel '50 Let Pobedy'** collided with a cargo vessel in the Kara Sea.

About Kara Sea

- It is a shallow marginal sea of the **Arctic Ocean** located to the **north of Siberia, Russia** formed due to **melting of glaciers in the last Ice Age**.
- **The Barents Sea** lies to the west and the **Laptev Sea** to the East.
- It is regarded as **one of the coldest seas in the world**.
- **Rivers draining into Kara Sea**: Kara, Ob, Pyasina, Yenisei.
- **Important Islands**: Bely, Dikson, Kamennyye, Oleni, and Taymyr Islands.





Digital Payments Index (DPI)

Recently, RBI published the Reserve Bank of India–Digital Payments Index (RBI-DPI).

About RBI-DPI

- **Objective:** capture the extent of digitisation of payments systems & measure the adoption of online transactions
- **Released frequency:** Semi-annual (March & September).
- **Base Period:** March 2018.
- **Parameters involved:**
 - ⊕ Payment Enablers
 - ⊕ Payment Infrastructure (demand-side factors)
 - ⊕ Payment Infrastructure (supply-side factors)
 - ⊕ Payment Performance and
 - ⊕ Consumer Centricity.



TDSAT

Telecom Disputes Settlement & Appellate Tribunal (TDSAT) stayed the penalties imposed by Telecom Regulatory Authority of India (TRAI) on Telecom companies for not being able to curb spam.

About TDSAT

- It is a **statutory body** set up by an amendment to the TRAI Act, 1997 in 2000.
- **Function:** To adjudicate disputes, dispose of appeals and protect interests of service providers and consumers
- **Composition:** Chairperson and two Members appointed by the Central Government.
- **Powers and Jurisdiction:**
 - ⊕ Original and appellate jurisdiction in regard to Telecom, Broadcasting and Airport tariff matters.
 - ⊕ Only appellate jurisdiction in Cyber (IT) matters.
 - ⊕ It is guided by the Principles of Natural Justice and has power to regulate its own procedure.



Navika Sagar Parikrama-II

Recently, the INSV Tarini under Navika Sagar Parikrama-II, successfully passed through Point Nemo.

- **Point Nemo** is the location in the South Pacific Ocean that is farthest from land.

About Navika Sagar Parikrama-II

- It is an ambitious **circumnavigation of the globe** undertaken by two female officers of the Indian Navy.
- This expedition, aboard the Indian Naval sailing vessel (INSV) Tarini, aims to cover over 21,600 nautical miles.
- First edition of Navika Sagar Parikrama concluded in 2018.



Typhon mid-range missile system

The Philippines offered to remove the Typhon mid-range missile system, a U.S. missile system, if China ceases its aggressive actions in the South China Sea.

Typhon mid-range missile system

- **The US army's Strategic Mid-Range Fires (SMRF) System** is also known as the "Typhon" missile system.
- **Missiles:** can launch both SM-6 missiles and Tomahawk cruise missiles.
 - ⊕ **Standard Missile 6 (SM-6)**, is United States military extended-range anti-air warfare (ER-AAW) missile.
- **Aim:** addresses the need for a flexible, mobile solution capable of neutralizing high-value enemy targets, such as air defense systems.



Market Infrastructure Institutions (MIIs)

The SEBI issues guidelines for the evaluation of the performance of statutory committees of market infrastructure institutions (MIIs).

- Under the guidelines, MIIs are required to appoint an **independent external agency** to evaluate their performance and the functioning of their statutory committees.
 - This needs to be done **once every three years**.
- About Market Infrastructure Institutions (MIIs)**
- These are **organizations that provide the infrastructure for trading securities** & are regulated by SEBI.
 - It includes **stock exchanges, depositories, and clearing corporations**.
 - **Purpose:** Enabling trading, securing investor holding, transaction settlement etc.



Ad-hoc judges

Supreme Court has relaxed a condition pertaining to appointment of ad-hoc judges to High Courts that was laid in the case of Lok Prahari vs Union of India (2021).

- One of the conditions in Lok Prahari versus Union of India case, 2021, states that ad hoc judges can be appointed to High Courts only if their judicial vacancies crossed 20% of the sanctioned strength.

Present Status:

- Now, each High Court can appoint around 2-5 ad-hoc judges, provided the number does not exceed 10% of the sanctioned strength of the concerned High Court.

Place in News



Republic of Guinea (Capital: Conakry)

- Guinea has successfully eliminated the gambiense form of human African trypanosomiasis (HAT), also known as sleeping sickness.

Political Features

- Guinea is a country of western Africa, located on the Atlantic coast.
- **Boundaries:** Guinea-Bissau (northwest), Senegal (north), Mali (northeast), Côte d'Ivoire (southeast), and Liberia and Sierra Leone (south).

Geographical Features

- **Climate:** Tropical (hot and humid).
- **Mountain Ranges:** Nimba, Loma, Fouta Djallon etc.
- **Major Rivers:** Niger, Gambia, Bafing & Bakoye (headwaters of Senegal River) etc.
- **Highest Peak:** Mount Nimba



AHMEDABAD BENGALURU BHOPAL CHANDIGARH DELHI GUWAHATI HYDERABAD JAIPUR JODHPUR LUCKNOW PRAYAGRAJ PUNE RANCHI