

NEWS TODAY

India's three more wetlands added to Ramsar Sites List

These wetland include

Wetland	Specifications
Nanjarayan Bird Sanctuary (Tamil Nadu)	<ul style="list-style-type: none"> ➤ Nanjarayan Lake a large shallow wetland named after King Nanjarayan (who restored and repaired it). ➤ It depends on heavy rain water flow from Nallar drainage. ➤ Acts as feeding and nesting habitat for resident and migratory birds; water source for agricultural purpose.
Kazhuveli Bird Sanctuary (Tamil Nadu)	<ul style="list-style-type: none"> ➤ Brackish shallow lake located on Coromandel Coast in North of Pondicherry. ➤ Connected to Bay of Bengal by brackish Uppukalli creek and Yedayanthittu estuary. ➤ Lies in Central Asian Flyway of migratory species. ➤ Breeding ground for birds, fish; source for aquifer recharge; houses highly degraded mangrove patches containing Avicennia species
Tawa Reservoir (Madhya Pradesh)	<ul style="list-style-type: none"> ➤ Located inside Satpura Tiger Reserve and borders Satpura National Park and Bori Wildlife Sanctuary. ➤ Constructed at confluence of Tawa and Denwa rivers. <ul style="list-style-type: none"> ⊕ River Tawa (left bank tributary of Narmada River) originates from Mahadeo Hills. ⊕ Rivers Malanni, Sonbhadra and Nagdwari are major tributaries of reservoir.

About Wetland

- An **area of land that is saturated with water**.
- **Wetland must meet at least 1 of 9 criteria** like regularly supports **20,000 or more water birds**, or conserving **biological diversity** etc.
- Now, **total Ramsar Sites in India is 85**. **Tamil Nadu** has **maximum Ramsar Sites**.

Agriculture Minister inaugurates AI based platform, National Pest Surveillance System (NPSS)

NPSS will provide regular correct **pest management advisories** and will **promote Integrated Pest Management**.

- It is under **Directorate of Plant Protection, Quarantine & Storage (Ministry of Agriculture)**.

Need for NPSS:

- To effectively reduce farmers' **dependence on pesticide retailers** & address **overuse of pesticides**.
- **Pest attacks** causes losses up to **20%** in food production.

AI & Agriculture

AI can be used as viable solutions to address **food inadequacy, climate change, low yield** etc.

Applications of AI in Agriculture

- **Diagnostic:** Identifying water stress, pest and diseases infestation
- **Prescriptive:** Soil health analysis, prescription of fertilizer. E.g. **SENSAGRI: SENsor based Smart AGRiculture"**
- **Advisory:** Weather advisory, irrigation scheduling
- **Predictive:** Yield prediction, pest attack forecasting & early warning e.g. **BharatAgri App**

Challenges in adoption of AI in Indian Context

- **Policy issues:** incomprehensive data governance, rights, enforcement, regulations, etc.
- **Farmers' attitude:** risk-aversion and resistance to change, lack of trust in technology.
- **Marginalization and digital divide:** Absence of enabling Digital infrastructure prevents smallholders from using advanced technologies.
- **High Initial investment:** poses a barrier for small-scale farmers

Way forward:

- **Continued investment** in research & Infrastructure.
- **Providing financial support and subsidies** to Research Institute to develop region specific AI models and Application.

Initiatives for promoting AI in Agriculture

- **Kisan e-Mitra** : AI-powered chatbot to assist farmers on PM Kisan Samman Nidhi scheme.
- **AI for Agriculture Innovation (AI4AI) initiative**, launched by the World Economic Forum.
 - ⊕ Under it, **'Saagu-Baagu'** initiative was launched to **promote innovation in agriculture in Telangana**.
- **AI based analytics** for crop health monitoring using Satellite datasets for rice and wheat crops.

Premature Human Deaths linked to declining Vulture Population

According to a recent study, **half a million humans** may have died prematurely from 2000 to 2005 due to **functional extinction of vultures** in India.

Findings of Study:

- **Keystone Species:** Clean up disease-ridden carcasses; also reduce populations of other scavengers' e.g. **feral dogs & Pathogens**.
- **Human Health Crisis:** Declined vulture population increased **human mortality by over 4%** because of negative shock to sanitation (**Increased Pathogens**).
- **Economic Costs:** Nearly **\$70 billion** is annual **monetary damage** from this public health crisis.

Vultures in India

- **Large carrion-eating birds** found mainly in tropics and subtropics.
- **9 species of vultures** are found in India. Out of them, **3 species are migratory** (Cinereous vulture, Griffon vulture and Himalayan vulture).
- **Conservation status:** Protected under Schedule (1) of Wildlife Protection Act 1972.
- **Threats:** Loss of natural habitats due to anthropogenic activities, Food scarcity, Exposure to drug diclofenac, Electrocutation etc.

Vulture Conservation Initiatives

- Ban on **Veterinary use of Diclofenac (2006)**, Ketoprofen and Aceclofenac (2023).
- **Action Plan for Vulture Conservation** in India 2020-25.
- **Vulture Conservation Breeding Centre** in Pinjore, Haryana.
- **Vulture restaurants** in Koderma, Raigad etc.



Next Industrial Revolution will be bio-economy driven: Union Minister of Science & Technology

It was highlighted by Minister in 4th edition of Global Bio-India 2024.

- Global Bio-India is a **strategic initiative by Department of Biotechnology** and its Public Sector Unit, Biotechnology Industry Assistance Research Council (BIRAC).

About Bio-Economy

- Bio-Economy is **knowledge-based production and use of biological resources, processes and methods** to provide **goods and services** in a **sustainable manner** in all economic sectors.
 - ⊕ **Important sectors are:** Bioindustrial, Biopharma, Bioagriculture etc.
- Bio-Economy Status
 - ⊕ **Grown from \$10 billion in 2014 to over \$130 billion in 2024.**
 - ◆ Projection to reach **\$300 billion by 2030.**
 - ⊕ India ranks **12th globally in terms of bio-manufacturing.**

Significance of Bio-Economy

- **Reduces reliance on fossil fuels**, decreases greenhouse gas emissions and promotes sustainability.
- **Promote circular economy**, minimizing waste and maximizing resource efficiency. E.g. agricultural waste can be converted into biogas
- **Pivotal role in India's economy**, contributing 4% to GDP and employing over 2 million people.
- Advancements in bio-based technologies can **enhance agricultural productivity, pest resistance, food security** etc.

Challenges faced by Bio-Economy sector

- **Uncertain regulatory structure** and lack of uniform industry standards.
- **Scarce state-of-the-art research centres** and insufficient R&D fund allocation.
- **Ethical challenges based** on principle of Responsible Research and Innovation. E.g. Genetic modification.

Initiatives and Policies to boost Bio-Economy

- **BIRAC** plays a crucial role in nurturing biotech innovation ecosystem in India.
 - ⊕ It has established various industry focused schemes like **Biotechnology Ignition Grant Scheme, BioNEST, etc.**
- **Policy measures:** National Biofuel policy, 2018; National Biopharma Mission, National Mission on Bioeconomy etc.
- **Biological Research Regulatory Approval Portal (BioRRAP)** launched as a single gateway for regulatory approval for biological research.

WHO declared Monkeypox outbreak a Public Health Emergency of International Concern (PHEIC)

Decision came on advice from **International Health Regulations (IHR) Emergency Committee**.

- Following an **Mpox outbreak in Democratic Republic of Congo (DRC) and outside Africa**, it was declared as global PHEIC for **second time in two years**.

About Mpox

- **Viral illness** caused by **monkeypox virus**, a species of **genus Orthopoxvirus**.
- **First detected in humans in 1970 in DRC**.
- **Spreads via close contact** and tends to cause flu-like symptoms and pus-filled skin lesion.
- Occurs mostly in **central and western Africa**, and **affects primarily (but not only) gay, bisexual etc**.
- **Vaccines and therapeutics** developed for **smallpox** and approved for use in some countries **can be used for mpox** in some circumstances.

About PHEIC

- **As per IHR (2005), an outbreak qualifies as a PHEIC if it is unusual or unexpected; it has potential for international spread; and may require an immediate international action.**
 - ⊕ **IHR, 2005** is a **binding international legal agreement** involving 196 countries across globe, including all Member States of WHO.
- PHEIC represents the **highest level of alert issued by WHO** under IHR.
 - ⊕ Since 2009, **WHO has declared seven international public health emergencies**, including H1N1 influenza pandemic, polio outbreak, Ebola outbreak (West Africa), Zika epidemic, Ebola outbreak (Congo), COVID-19 and Mpox.

ISRO launches Earth Observation Satellite EOS-08

Satellite has been launched under **SSLV-D3/EOS-08 mission** by the Small **Satellite Launch Vehicle (SSLV)-D3** from Satish Dhawan Space Centre, Sriharikota.

- Mission configuration is set to operate in circular **Low Earth Orbit** at an **altitude of 475 km** (inclination of 37.4°), with a **mission life of 1 year**.
- **SR-0 DEMOSAT** was also onboard which was **developed by Space Kidz India**.

Objectives of EOS-08 mission:

- Designing and **developing a microsatellite**,
- Creating payload instruments compatible with the **microsatellite bus**,
- **Incorporating new technologies** required for future operational satellites.

Payloads of EOS-08 Mission:

- **Electro Optical Infrared Payload (EOIR) payload:** To take images in Mid-Wave & Long Wave Infrared band for applications like Disaster Monitoring, Environmental Monitoring etc.
- **Global Navigation Satellite System- Reflectometry (GNSS-R) payload:** Uses **remote sensing** for measuring ocean winds, soil moisture, Himalayan cryosphere, etc,
- **SiC UV Dosimeter:** Monitor UV irradiance at Gaganyaan mission's crew module viewport, serving as a high-dose alarm sensor for astronaut safety.

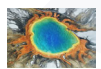
About Earth observatory satellites (EOS)

- EOS or Earth remote sensing satellites are designed for Earth observation (EO) from orbit.
 - ⊕ EO refers to **collecting information** about activities on Earth, both natural and artificial, including **physical, chemical, biological and human systems**.
- **Applications:** Used in Early warning systems, environmental impact monitoring etc.

About Small Satellite Launch Vehicle (SSLV)-D3:

- **SSLV-D3** is the third developmental flight of SSLV.
- SSLV is **capable of launching Mini, Micro or Nano satellites** (10 to 500 kg mass) into **500km planar orbit**.
- It uses three solid fuel-based stages **and a final liquid-fuel based stage**.
- **Benefits:** Low cost, low turn-around time, flexibility in accommodating multiple satellites, launch on demand feasibility, minimal launch infrastructure requirements, etc.

Also in News



Extremophile

New study highlighted that microwave ovens host thriving microbial communities and extremophiles.

About Extremophile

- Extremophiles are **organisms with the ability to thrive in extreme environments** under **high pressure, temperature, radiation, salinity** etc. E.g. Archaea thrive in extreme environment.
- Unique enzymes used by these organisms, **called "extremozymes"**, enable these organisms to function in such forbidding environments.
- Plays crucial role in **maintaining plant growth and crop productivity in regions** with adverse conditions.
- Applications in **biotechnology, biodegradation, bioremediation, biorefinery** along with other industries like pharmaceuticals, food, agricultural, cosmetics, and textile.



Gallantry awards

President has approved 103 Gallantry awards to Armed Forces and Central Armed Police Forces personnel on Independence Day 2024.

About Gallantry Awards

- **Order of precedence of awards:** Param Vir Chakra, Ashoka Chakra, Mahavir Chakra, Kirti Chakra, Vir Chakra and Shaurya Chakra.
- **Announced twice in a year** - first on occasion of Republic Day and then on occasion of Independence Day.
- **Wartime Gallantry Awards i.e. Param Vir Chakra, Maha Vir Chakra and Vir Chakra** instituted in 1950.
- **Ashoka Chakra Class-I, Class-II and Class-III** were instituted in 1952. Later renamed as **Ashoka Chakra, Kirti Chakra and Shaurya Chakra** respectively in 1967.
 - ⊕ These are **Peacetime Gallantry Awards**.



Prokaryotes

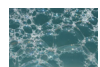
Scientists have found that Prokaryotes are **remarkably resilient to climate change** and may **dominate marine environment**.

About Prokaryotes

- **Microscopic single-celled organisms** including bacteria, blue green algae, etc.
- **Absence of a defined nuclear region, and membrane-bound cell organelles.**
- Have a **single chromosome**.

Eukaryotes

- Includes **plants, animals and fungi**.
- Have a **well-defined nucleus** as well as **membrane- enclosed organelles**.
- Eukaryotic cells may be **either unicellular or multicellular**.
- Have **multiple chromosomes**.
- All **eukaryotic cells are not identical**. Plant and animal cells are different as former possess cell walls, plastids and a large central vacuole are absent in animal cells.



Biosurfactants

Researchers highlight that biosurfactants can be produced using green substrates from agro-industrial waste.

Surfactants

- A **surfactant (surface-active agent)** is a substance that, when added to a liquid, reduces its **surface tension**, thereby **increasing its spreading and wetting properties**. E.g., Detergent.

About Biosurfactants

- They are **active compounds** that are produced at **microbial cell surface** or **excreted**, and **reduce surface and interfacial tension**.
- Produced by **bacteria, yeasts, and filamentous fungi**.
- **Microbial surfactants advantages over synthetic ones:**
 - ⊖ **Low toxicity and high biodegradability.**
 - ⊖ **Remain active at extreme pH and salinity.**



Amrit Bharat Station Scheme

Dahisar and Kandivali in Mumbai have been added to the **Amrit Bharat Station Scheme**

About Amrit Bharat Station Scheme

- **Ministry of Railways**
- **Objectives:** To **develop/upgrade railway stations** to provide enhanced and **modern facilities to passengers**.
 - ⊖ Intends to **upgrade and modernize** a total of **1275 stations**.
- Involves a **long term vision** creating **Master Plans** like better accessibility, free Wi-Fi, promoting initiatives like **'One Station One Product'**, etc.
- Seamless multi-modal connectivity and to enable the **station function as a city center**, act as a **driver of local economy** and **facilitate Transit Oriented Development**.



Gross environment product Index

Uttarakhand has **become the first Indian state to launch** a Gross environment product Index (GEPI).

About GEPI:

- GEPI is a **novel method to evaluate ecological development** caused by human interventions.
- **Four pillars of GEPI:** Air, soil, tree and water.
- **Formula:**
 - ⊖ **GEPI index = (Air- GEP index + Water- GEP index + Soil-GEPI index + Forest-GEP index)**
- **Significance:**
 - ⊖ Help assess the **impact of anthropological pressure** on our ecosystem and natural resources.
 - ⊖ Also calculates what we **put back into the environment**.
 - ⊖ **Quantifies contributions** of natural ecosystems to the economy and overall welfare.



Californium

A package suspected to contain Californium was seized in Patna.

About Californium

- Silvery white **Synthetic radioactive element** with **Atomic Number 98**.
 - ⊖ A **synthetic element** is an element of the Periodic Table that has been created in a lab.
- Discovered by **Stanley Thompson, Kenneth Street et al.** in 1950 and named after University of California.
- It is **highly radioactive** (very strong neutron emitter) and **prohibitively expensive**.
- **Applications:** Portable metal detectors, gold and silver ore identification, help start up nuclear reactors etc.
- **Threats:** Can damage genetic makeup, Hazardous to health(due to radioactivity) etc.



Dengue

Indigenous tetravalent dengue vaccine, DengiAll has proceeded toward its **phase-3 clinical trials**.

- Trial would be conducted with collaboration of **Indian Council of Medical Research** and **Panacea Biotec**.

Dengue (Break-Bone Fever)

- **Viral infection** that transmits with bite of an **infected female Aedes mosquitoes** (also responsible for chikungunya, Zika).
- Dengue is **found in tropical and sub-tropical climates worldwide**, mostly in urban and semi-urban areas.
- It can escalate to **severe conditions like dengue hemorrhagic fever and dengue shock syndrome** in adults.
- Currently, there is no **antiviral treatment or licensed vaccine** against dengue in India.

Personality in News



Sri Aurobindo Ghose

Prime Minister paid homage to Sri Aurobindo on his Birth Anniversary.

About Aurobindo Ghose (15 August 1872 – 5 December 1950)

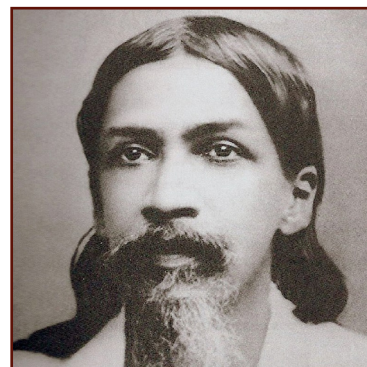
- Born in **Kolkata, West Bengal**.
- He was an **Indian nationalist, poet, philosopher, and yogi**.

His Contributions:

- He was one of the founders of **youth club Anushilan Samiti**.
- Was arrested in connection with the **Alipore Bomb Case (1908)**.
- Associated himself with journals like **Jugantar, Bande Mataram, and Karmayogi**.
- Established **Sri Aurobindo Ashram in Pondicherry** in 1926.
- Emphasized on the concept of **spiritual nationalism** & conceptualized **Integral Yoga system**.
- **Books:** The Life Divine, Savitri, Essay on the Gita, The Synthesis of Yoga, Defense of Indian Culture, etc .

Values:

- Fortitude, Spiritual nationalism, sacrifice, etc.



AHMEDABAD



BENGALURU



BHOPAL



CHANDIGARH



DELHI



GUWAHATI



HYDERABAD



JAIPUR



JODHPUR



LUCKNOW



PRAYAGRAJ



PUNE



RANCHI