

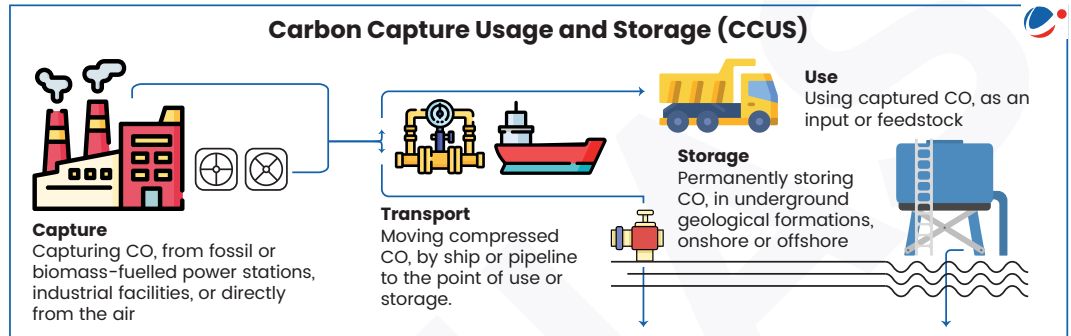
NEWS TODAY

First of its kind R&D Roadmap to Enable Net Zero Targets through CCUS launched

Prepared by **Department of Science & Technology (DST)**, the roadmap offers **Three Phased Research & Development Program** in **Carbon Capture, Usage and Storage (CCUS)**.

Three Phases Include

- Integration of the current state-of-the-art CCUS technologies or their improved versions as **End-Of-Pipe (EP)** solution in the existing emitting industries.
- Integration of **advanced CCUS technologies** in **new industrial manufacturing plants** using CCUS Compliant Design (CCD).
- Integration of **emerging CCUS technologies** like photo-bio-electro-catalytic conversions as **CCUS in One Pot (COP)** strategy in **new low-emission industrial manufacturing technologies**.



About CCUS

- Technologies that enable the **mitigation of carbon dioxide (CO₂) emissions** from large point sources like power plants, or removing existing CO₂ from atmosphere and **storing it either in seawater, deep-sea sediments, or geological sites, etc.**

Role of CCUS in Mitigating Climate Change

- **Reducing emissions in 'hard-to-abate' industries:** Mainly industries that are difficult to decarbonise including **iron, steel and chemicals**.
- **Producing low-carbon electricity and Hydrogen:** CCUS can be installed on power plants running on coal, gas, biomass or waste.
- **Removing existing CO₂ from atmosphere:** Through either **Bioenergy with Carbon Capture and Storage (BECCS)** or **Direct Air Carbon Capture and Storage (DACCS)** – both having technological foundation with CCUS.
 - ⊕ DACCS enables the capture of CO₂ **directly from the atmosphere** while BECCS can result in CO₂ removal on a **net basis** where the biomass is sustainably sourced.

NITI Aayog & IBM Unveil Roadmap to Make India a Top3 Quantum Economy by 2047

The roadmap "Transforming India into a leading Quantum-Powered Economy" will help to build a home grown quantum computing ecosystem and capture a major share of the global quantum market.

- It aims to incubate at least 10 globally competitive quantum startups, each surpassing USD 100 million in revenue and capturing over 50% of the value in the global quantum software and services market by 2035.

Status in India of Quantum Technology

- **Talent Pool:** India ranks **2nd** globally in the number of graduates in quantum-relevant fields (approximately 91,000), behind only the EU.
- **State-Level Competition:** Different states are actively building their own ecosystems. For example, Karnataka has established the **Quantum Research Park (QuRP)**, and Andhra Pradesh recently launched the **Amaravati Quantum Valley (AQV)**.

Recommendations of Roadmap

- **Expand the Quantum Workforce:** Grow the scientific, deep engineering and professional deployment-ready workforce in 2-3 years.
- **Prioritization of Top 3-5 Quantum Opportunity Areas:** Such as secure communication and Health and Pharma, Cryogenics, Financial services, logistics etc.
- **Accelerate Lab-to-Market Transition:** Significantly improve ease of doing research, of technology validation and of taking technology from lab-to-market, within 2 years.
- **Lead in Global Standard Setting:** Engage actively with global standards bodies and take leadership in international standard setting related to quantum technologies to ensure that Indian products have access to global markets.
- **Make Indian domicile attractive for startups:** So that >90% deep tech Indian startups choose to stay domiciled in India.

About Quantum Technology

- **Definition:** Quantum technology is a class of technology that works by using the principles of quantum mechanics (the physics of sub-atomic particles), including quantum entanglement and quantum superposition.
- **Classified into four major vectors:** Quantum Computing, Quantum Communication (Utilizing concepts like quantum key distribution (QKD)), Quantum Sensing and Metrology, Quantum Materials.

Food Irradiation serves as Safe Food Processing Technique backed by strong Scientific Validation

The technique showcases **no toxicological, nutritional, or microbiological issues** and has been endorsed by reputed scientific bodies including the **American Medical Association**.

About Food Irradiation

- It is a **physical process** in which **food and agricultural commodities**, in pre-packed form or in bulk, are exposed to a **controlled amount of radiant energy** to **achieve desirable effects**.
 - ⊕ E.g., **Radiolysis** (splitting of water due to interaction with radiation) of **water molecules** (major constituent of food and cells of insects and pathogens) helps in food preservation.
- **Significance:** Inhibition of sprouting, delay in ripening, killing of insect pests, parasites, pathogenic and spoilage microorganisms, while **preserving the food quality**.
- **Ionizing radiations** act through **two basic processes**:
 - ⊕ **Primary Processes:** Causing Formation of **ions or excited molecules** by direct deposition of energy.
 - ⊕ **Secondary Processes:** Involving interaction of products of primary events. They are affected by variables like **water content, oxygen, and pH of food**.
- Products of primary and secondary processes are called **radiolytic products**, which cause almost **negligible chemical changes in the food**.

Food Irradiation in India

- **Ministry of Food Processing Industries** supports setting up of multiproduct food irradiation units under - **Integrated Cold Chain & Value Addition Infrastructure (Cold Chain scheme)** of Pradhan Mantri Kisan Sampada Yojana (PMKSY).
- As of August 2025, **16 project proposals** have been approved for setting up of multi-product food irradiation units, of which **9 are operational**.

Types of Radiation Used In Food Irradiation



Gamma rays

- Generated from radioactive forms of **Cobalt-60**.
- **Board of Radiation and Isotope Technology (BRIT)** under Department of Atomic Energy, India supplies Cobalt-60 for **food irradiation**.



X-rays

- Produced by **reflecting a high-energy stream** of electrons off a target substance into food.
- Commonly used in **medicine and industry**.



Electron beams

- **High-energy electrons stream** from an accelerator is directed onto food.
- Provides **rapid processing**.

Parliamentary panel seeks full operationalisation of Lokpal's inquiry and prosecution wings.

The Committee notes that **despite statutory requirements** under the **Lokpal and Lokayuktas Act, 2013**, the **inquiry and prosecution wings of Lokpal** remain inadequately operationalised.

About Lokpal and Lokayuktas Act, 2013

- The act mandates **establishment of the Lokpal at the union level and Lokayukta at the state level** to deal with **complaints relating to corruption** against certain public functionaries.
- It also contains provisions for establishment of :-
 - ⊕ **Inquiry Wing (Section 11) headed by the Director of Inquiry:** For the purpose of conducting preliminary inquiry into any offence alleged to have been committed by a public servant punishable under the **Prevention of Corruption Act, 1988**.
 - ⊕ **Prosecution Wing (Section 12) headed by the Director of Prosecution:** For the purpose of prosecution of public servants in relation to any complaint by the Lokpal under this Act.

Parliamentary Committee Report

- **Findings:**
 - ⊕ **Inquiry Wing:** Using officers on **deputation temporarily, but full operationalisation incomplete**.
 - ⊕ **Prosecution Wing:** Only a **small number of cases** have reached the prosecution stage so far, and thus a **full-fledged separate wing has not yet been set up**.
- **Recommendations :** The Committee reiterates that both wings must be fully constituted within six months and urges urgent steps to operationalise both the Inquiry and Prosecution Wings.

About Lokpal

- **Composition of Lokpal:** Consists of a Chairperson and up to **8 Members, with 50% being Judicial Members**.
 - ⊕ **Chairperson** is a person who is or has been a Chief Justice of India or is or has been a Judge of the Supreme Court.
 - ⊕ **Judicial Member** is a person who is or has been a Judge of the Supreme Court or is or has been a Chief Justice of a High Court
- **Composition:** **At least 50% of total Members must be from SC, ST, OBC, Minorities, and women.**
- **Term for members:** 5 years or **till the age of 70 years**.
- **Expenses of Lokpal:** Administrative expenses of the Lokpal, including all salaries, allowances and pensions shall be charged upon the Consolidated Fund of India
- **Complaint against Public Servant can be filed by :** Individual, Society, Association of Persons, Trust , Company , Limited Liability Partnership, Statutory Board , Corporation , Statutory Authority

State of Digital Public Infrastructure (DPI) in India 2025 Report Released

Prepared by IIM Bangalore's Center for Digital Public Goods, the report argues that India has built a "middle-path" digital model balancing public and private sector serving as a **template for Global South**.

About DPI

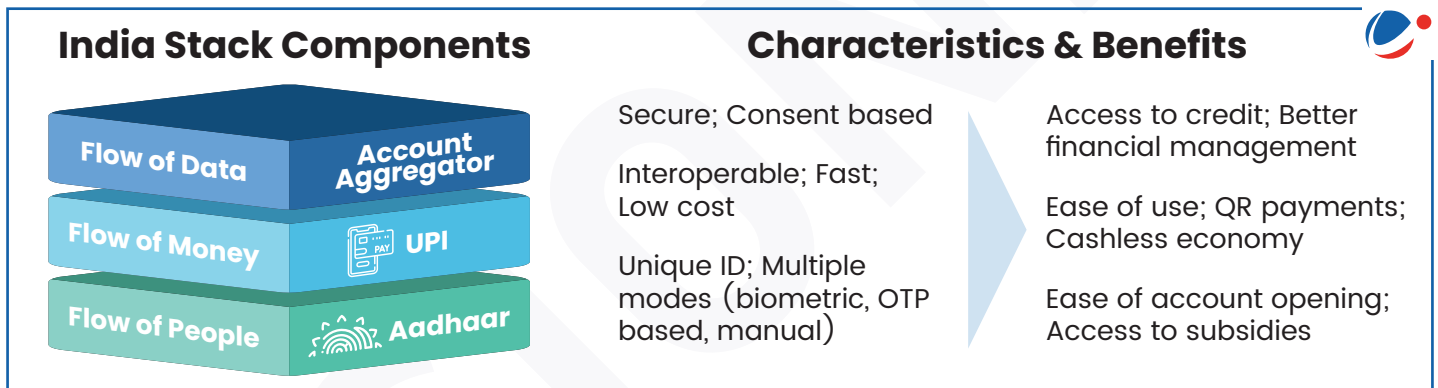
- An **infrastructure-based approach** using technology to achieve **societal goals** through an ecosystem **comprising technology, markets and governance**.
- It involves **shared digital systems** built on **open standards and specifications** in **public interest**.
- **Condition for an Initiative to Operate as DPI:**
 - ⊕ **Reach and Scale:** Third parties should be able to utilise the infrastructure as a building block to innovate and offer diverse final services.
 - ⊕ **Principle of non-exclusivity:** Infrastructure to be **non-discriminatory** in nature and inclusive by design.
- **Significance:** **Financial Inclusion** (Jan Dhan- Aadhar- Mobile Trinity); **Public Service Delivery** (E.g., DPI enabled Direct Benefit Transfer); Innovation; Empowerment of Citizens, etc.

Key Highlights of India's DPI (Report)

- **Co-creation Model: Government-driven, and private-sector-energized.** E.g. UIDAI's Aadhaar partners with Private enrolment agencies, biometric device manufacturers, etc.
- **Building Blocks Approach:** Integrating DPI and DPG offering speed and scale of services.
 - ⊕ E.g., **DigiYatra** (DPG or technological assets/open-source software) using Aadhar (DPI) offers paperless travel experience.
- **Expansion into Diverse Sectors:** Acting as a key pillar of India's Growth Strategy. E.g., agriculture (Agri-stack), logistics (ULIP), and education (DIKSHA).

India's DPI Ecosystem: India Stack

- It comprises **three core public utilities** - identity, payments, and data.



Also In News



Organization for Security and Cooperation in Europe (OSCE)

Ukraine says it wants 'real peace, not appeasement' with Russia at the Organization for Security and Cooperation in Europe.

About OSCE (Secretariat: Vienna)

- It is the **world's largest regional security organization**.
- **Participating States:** 57 from **North America, Europe and Asia** (India is not a member).
 - ⊕ All participating States have equal status and decisions are made by consensus.
- **Mandate :** It works for stability, peace and democracy for more than a billion people, **through political dialogue about shared values and through practical work that makes a lasting difference**.
- **Governance structure:** **Summits** (highest decision-making body), **Forum for Security Co-operation** (Dealing with the politico-military dimension of security) etc.



Afar Region

Scientists chose Afar region for analysing **plate tectonic theory**.

About the Afar region

- Covers **northeastern part of Ethiopia** where **Red Sea meets the Gulf of Aden**.
- **Three rift systems:** Main Ethiopian, Red Sea and the Gulf of Aden Rift converge here forming a **triple junction**.
- **Afar depression or Danakil depression:** Forms northern part and is largely a desert scrubland with shallow salty lakes and volcanoes.
- **Awash River valley:** Forms the southern part.
- Much of the region is **below sea level** and is one of **Earth's hottest places**.
- Known for **early hominid fossil** finds including 'Lucy', an Australopithecus afarensis.



Mahad Satyagraha

Mahad marks the birthplace of one of **India's first human rights movements initiated by Dr. B. R. Ambedkar.**

About Mahad Satyagraha

- **Date & Place:** Started on 20 March 1927 at **Chavdar Tale, Mahad (Maharashtra).**
- **Objective:** To secure the right of untouchables to access public drinking water, which was denied due to caste discrimination.
- Key associates of **Dr. B. R. Ambedkar** included **Anandrao Chitre, Bapu Sahastrabudhe, Sambhaji Gaikwad, Ramchandra More.**
- **Symbolic Act:** Ambedkar and followers drank water from the public tank, asserting that essential resources like water cannot be monopolised by upper castes.
- **Ideological Message:** Water is a basic human right, not a caste privilege; aimed at breaking social exclusion rooted in untouchability.
- **Manusmriti Dahan (Burning):** On 25 December 1927, Ambedkar burned Manusmriti publicly, **rejecting the caste system.**
- **Significance:** It marked the first major civil rights movement of Dalits under Ambedkar.



New GI Tagged Products in Tamil Nadu

Tamil Nadu added five more products to its growing list of **Geographical Indication (GI) registrations.**

Products Include

- **Woraiyur cotton sari:** Native to **Tiruchi district.**
- **Kavindapadi nattu sakkarai:** A jaggery powder.
- **Namakkal makkal pathirangal:** Soapstone cookware.
- **Thooyamalli rice variety:** Meaning 'pure jasmine', is a traditional sambha-season rice variety grown over 135 - 140 days.
- **Ambasamudram choppu saman:** Wooden toys.

About GI Tags

- Sign used on products with **specific geographical origin** and possessing qualities due to that origin.
- Regulated under **Geographical Indications of Goods (Registration & Protection) Act, 1999.**
- Provided for **10 years** and **can be renewed.**



Karthigai Deepam Festival

The Karthigai Deepam festival celebration **recently began in Tamil Nadu.**

About Karthigai Deepam Festival

- Three-day festival falling in month of **Karttikai (November-December).**
- Coincides with **full moon or pournami day.**
- It witnesses the **lighting of clay oil lamps** or agal vilaku to ward off evil spirits.
- Honours **Lord Karthikeya or Lord Murugan.**
- It finds references in **Tamil Literature called Ahananuru**, a collection of poems and among one of great books of **Sangam literature.**
- **Avaiyyar**, renowned woman of Sangam age also mentions it in her poems.



Large Exposures Framework (LEF) limits

Reserve Bank of India has tightened rules for foreign bank exposure to overseas branches such as LEF limits.

About Large Exposures Framework Limit

- LEF is a prudential regulation aimed at **curbing concentration risk by limiting how much any single borrower or group of related borrowers can borrow from one bank**, or how much exposure a bank can have to them.
- A "large exposure" is defined as any exposure to a counterparty (or a group of connected counterparties) equal to or above 10% of the bank's eligible capital base.

Recent changes by RBI

- It has brought amendments to the Large Exposures Framework (LEF) and Intragroup Transactions and Exposures (ITE) and has clarified certain methodological norms for calculating large exposures and intragroup dealings.
- It also asked banks to frame strong policies for managing concentration risks related to single counterparties, interconnected groups, and specific sectors.



DHRUVA

The Department of Posts proposes DHRUVA as an initiative to create a digital addressing system thereby enabling "Address as a Service" (AaaS) in India.

About DHRUVA

- It stands for **Digital Hub for Reference and Unique Virtual Address.**
- It is an interoperable, standardised, and user-centric digital addressing system.
- **Purpose:** To replace textual addresses with UPI-like digital labels such as "name@entity", which act as proxies for physical addresses.
- **How it Works:** Users share an address label instead of typing full details, and firms can access the full address and coordinates instantly with user consent.
- **Foundational Layer: DIGIPIN: geo-coded based on latitude-longitude.**



Seahawk Helicopters

The USA welcomed India's decision to sign a \$946 million sustainment package for **MH-60R Seahawk helicopters.**

About Seahawk Helicopters

- Equipped with advanced weapons, sensors and avionics suite, it is a **maritime variant** of the **Blackhawk helicopter.**
- Part of 24- aircraft Foreign Military Sale contract signed with **US government.**
- **Features:** Designed for **anti-submarine warfare (ASW), anti-surface warfare (ASuW), search and rescue (SAR), medical evacuation (MEDEVAC) and vertical replenishment (VERTREP).**
- **Significance:** Enhance India's **blue-water capabilities.**



Exercise GARUDA SHAKTI

Exercise GARUDA SHAKTI has commenced at the Special Forces Training School, Bakloh, Himachal Pradesh.

Exercise GARUDA SHAKTI

- **Type:** Bilateral.
- **Participating counties:** India– Indonesia Joint Special Forces.
- **Edition:** The 10th edition.
- **Aim:** To strengthen mutual understanding, cooperation and interoperability between the Special Forces.



AHMEDABAD



BENGALURU



BHOPAL



CHANDIGARH



DELHI



GUWAHATI



HYDERABAD



JAIPUR



JODHPUR



LUCKNOW



PRAYAGRAJ



PUNE



RANCHI