VISIONIAS INSPIRING INNOVATION

NEWS TODAY

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Technology could Enhance Transparency but not Replace Human Conscience in Justice: CJI

CJI emphasised that the values of **discretion, empathy and judicial interpretation** is **irreplaceable** and technology should be **anchored in constitutionalism** for Justice.

Key Applications of Technology in Judiciary

- **Automated Case Management: Smart scheduling, Case prioritization,** and **Proactive Backlog Reduction** using **Deep Learning** and **Machine Learning algorithms.**
- **Predictive Analysis: Analysis of historical judgments** and **case data** to offer predictive insights.
- **Optical Character Recognition (OCR) and Natural Language Processing (NLP): Document digitization, ensuring faster processing and reducing errors.**
- **Blockchain Technology:** Maintenance of **Judicial deposits registers, prevent record tampering, etc.**
- **AI-Chatbots:** For User assistance offering real-time information, procedural guidance, and **essential legal updates.**

Key Initiatives to Integrate Technology with Judiciary

- **National Judicial Data Grid (NJDG):** Creates **database** of orders, judgments, and cases, under the **eCourts Project.**
- **Case Information Software (CIS) based on customized Free and Open-Source Software (FOSS):** Implemented in the District Courts and High Courts.
- **eCourts Mission Mode Project:** Under the **National eGovernance Plan,** implemented with e-Committee, **Supreme Court and Department of Justice under three phases:**
  - **Phase I (2011-2015):** Involved computerization of the District Courts.
  - **Phase II (2015-23):** Provides **High Courts** as Implementing Agency for projects under its jurisdiction.
  - **Phase III: Union Budget (2023-2024),** announced Rs. 7000 crores for its implementation.

Key Challenges Associated

Biasness: AI algorithms may generate biased results, resulting in unfair or discriminatory decisions.	**Technical malfunctions:** Coupled with **poor digital connectivity** in rural areas disrupting smooth functioning.	**Data Security:** Data breaches could harm Court's integrity as they carry sensitive data for the **adjudicatory process.**	**Legitimacy and Authenticity:** Concerns regarding **legitimacy of witnesses' identities.**

Study explores the feasibility of deploying SAI at lower cost with existing aircrafts

Stratospheric aerosol injection (SAI), is a type of **geo-engineering technique** involving **Solar Radiation Management (SRM).**

About Geo-Engineering

- It is the **intentional large-scale intervention** in the **Earth's climate system** to **counter climate changes.**
- **It is of two Types:**
  - **Carbon Dioxide Removal (CDR): Approaches, practices,** and **technologies** that remove and durably store CO_2 from the atmosphere.
    - E.g., **Direct air capture and carbon storage (DACCS), Biochar** (can be used as a **growing medium** aiding vertical farming, promote nitrogen fixation, water retention).
  - **Solar Radiation Management (SRM):** It refers to **deliberate, large-scale actions** intended to **decrease global average surface temperatures** by increasing the **reflection of sunlight away from the Earth.**

About SAI

- **SAI** is a **type of SRM** that **mimics** the **planet cooling effects** of **volcanic eruptions** by **injecting sulfur dioxide (SO_2)** directly into the stratosphere where it forms **sunlight-reflecting sulfate aerosols.**
  - Aerosols are **small particles** suspended in the atmosphere like **mineral dust, smoke, volcanic ash, etc.**

Benefits and Challenges with SAI

Benefits	Challenges
▪ Offset some effect of **increasing GHGs** on **global** and **regional climate.** ▪ **Cheap, quick,** compared to CDR technologies. ▪ **Temporarily prevents localised disasters** like heatwaves, etc.	▪ Cause **Moral hazards,** reduces motivation for **net carbon emissions reductions.** ▪ **Scientific and Ethical implications** of weather modifications. ▪ **Lack of research** to analyse the unintended consequences. ▪ **Global effects** of aerosol injection **can impact injecting** and other **countries.**

Other SRM Techniques

- **Marine cloud brightening (MCB):** Adds aerosol to the lower atmosphere over **ocean regions** increasing reflectivity of low-lying marine clouds.
- **Cirrus cloud thinning (CCT):** Modifies the properties of **high altitude ice clouds** increasing transmission of outgoing terrestrial radiations.
- **Surface albedo enhancement:** Increasing the **reflectivity of surfaces,** e.g., white roofs.
- **Space-based methods:** Proposes **large "mirrors"** in space to **reflect sunlight.**

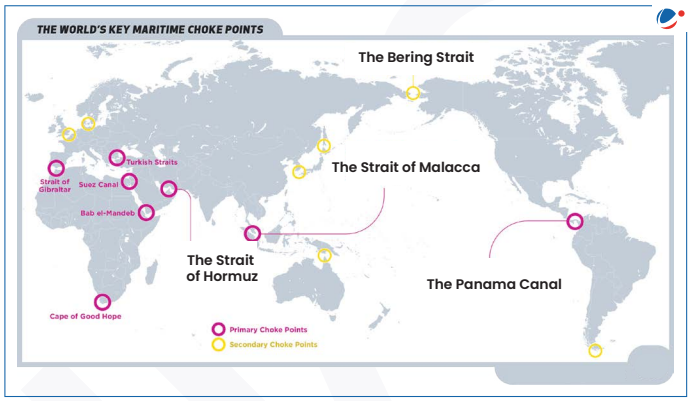
In a Shifting Global Order India-Middle East-Europe Economic Corridor (IMEC) is India's Strategic Imperative

Secretary (Economic Relations), Ministry of External Affairs (MEA) citing IMEC's importance proposed creation of an **IMEC Fund** to ensure project execution & **establishment of IMEC Secretariat** to oversee coordination and timelines.

- **About IMEC:**
  - **It is a multimodal economic corridor,** launched at G20 Leaders' Summit (New Delhi) in 2023 through an MoU between India, European Union, France, Germany, Italy, Saudi Arabia, UAE, and the US.
  - **IMEC consists of:** The East Corridor connecting India to the Arabian Gulf & Northern Corridor connecting the Arabian Gulf to Europe.

India-Middle East-Europe Economic Corridor (IMEC): A Strategic Imperative for India

- **Historical Maritime choke points: E.g.,** Gibraltar and Malacca Strait, Panama Canal, and Red Sea highlight the need for IMEC as a **strategic alternative.**
  - **Global crises, e.g.,** Russia-Ukraine war had revealed vulnerabilities to these supply chains.
- **Improved multimodal connectivity:** IMEC bridges Europe, the Arabic Gulf, and ASEAN, integrating the India-Myanmar-Thailand (IMT) Trilateral Highway, enhancing trade and regional connectivity.
  - India's economic aspirations, a projected **$30 trillion GDP by 2047,** require robust external connectivity.
- **Trade efficiency:** Aims at reducing the time and cost of transporting goods from India to Europe **by 40% and 30% respectively.**
- **IMEC is not just a trade route:** it's envisioned as a multimodal economic corridor integrating energy grids, transport systems, and digital solutions.



What are Maritime Choke points?

- **Definition:** They are **strategic, narrow passages** connecting 2 larger areas and serve as **critical waterways** facilitating **international trade.**
- They are typically **straits or canals where high volumes of traffic converge,** creating **vulnerabilities** due to **structural risks, geopolitical tensions, and piracy.**
- **There are two choke points in the Indian Ocean:**
  - **Malacca Strait** which lies between Malaysia, Singapore and the Indonesian island of Sumatra. It links Southeast Asia and the western Pacific to the Indian Ocean.
  - **Hormuz Strait,** which is the only sea passage linking the Persian Gulf to the Indian Ocean.

Majority of India's Population Faces High to Very High Risk from Extreme Heat, Finds Study

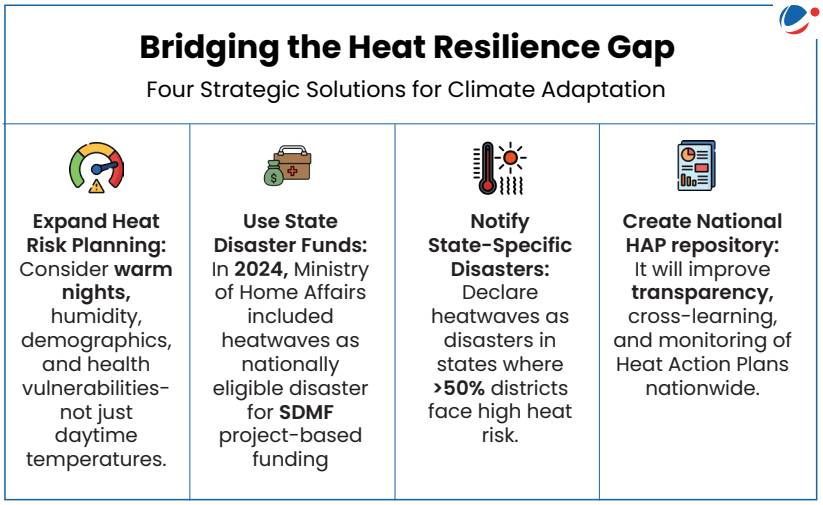
The study, **'How Extreme Heat is Impacting India: Assessing District-level Heat Risk',** carried out by Council on Energy, Environment (CEEW), assessed **heat risk across 734 districts in India.**

Understanding Heat Risk vs. Heatwaves and Heat Stress

- **Heatwaves:** These refer to **prolonged periods** of abnormally high temperatures in **a specific region** (**e.g.,** plains, coastal areas, hills).
- **Heat Stress:** Occurs when the body temperature rises **beyond 37°C,** leading to discomfort, cramps, and potentially fatal heat strokes.
- **Heat Risk:** Refers to the probability of **experiencing heat-related illnesses** or **death** due to **exposure to extreme temperatures. It depends on:**
  - **Intensity of Heat** (compounded by humidity).
  - **Degree of Exposure.**
  - **Vulnerabilities** of affected communities.

Factors Driving Heat Risk

- **Increase in Warm Nights (2012-22):** Frequency of very warm nights increased faster than that of warm days.
  - **It's concerning** as higher temperatures during night make **it difficult for body to cool** down after intense daytime heat, **leading to a rise in heat strokes.**
- **Increase in Humidity in North India:** North India's humidity rose from **30-40% (1982-2011)** to **40-50% (2012-22)** limiting the body's cooling through sweat and worsening heat stress.
- **High population density and rapid urbanization:** In cities like Mumbai, Delhi, Pune, and Gurugram have led to the **'urban heat island effect'**
  - **Urban heat island effect:** Phenomenon where concrete infrastructure absorbs and retains heat.



Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) Completes Nine Years

PMSMA is based on the premise: If every pregnant woman is examined by a physician once during the PMSMA, the process can result in reduction in the number of maternal and neonatal deaths in our country.

- Neonatal death refers to the death of a baby in the first 28 days of life.

About Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)

- **Launched:** 2016 by the Ministry of Health & Family Welfare (MoHFW).
- **Aim:** Provide assured, comprehensive & quality antenatal care (ANC), free of cost, universally to all pregnant women.
- **Guarantee:** A minimum package of ANC to women in **their 2nd / 3rd trimesters of pregnancy.**

Key Features of PMSMA

- **Services Provided by:** OBGY (Obstetrics & Gynecology) specialists, radiologists, and physicians (including private doctors).
- **Free ANC services, tests** (including 1 ultrasound), and medicines {(Iron and Folic Acid (IFA), calcium} offered on the 9th of each month at public health facilities.
- **Special focus on:** Unregistered or missed ANC women, Dropouts, High-risk pregnancies.
- **High-risk pregnancy identification: Green sticker:** no risk; **Red sticker:** high risk.
- **PMSMA complements other existing programs of the government like:** Janani Suraksha Yojana (JSY), Pradhan Mantri Matru Vandana Yojana (PMMVY), POSHAN Abhiyaan etc.

Key-Achievements of PMSMA

- **Significant improvement in India's Maternal Mortality Ratio (MMR),** which declined from 130 per lakh live births in 2014-16 to 80 per lakh live births in 2021-23.
- Over **6 crore pregnant** women have been examined under PMSMA.

Extended PMSMA (E-PMSMA)

- **Launched:** In 2022
- **Aim:** To ensure tracing and tracking of High-Risk Pregnant (HRP) women till a safe delivery
- **Key Features:**
  - Provision of additional PMSMA Session (Max 4 times in a month).
  - Individual tracking of HRP up to healthy outcome (till 45th day after delivery).
  - SMS alert to beneficiary as well as to the ASHA for registration of HRP & follow-up visits.

Indian PM outlines Global Priorities for Disaster-Resilient Infrastructure at ICDRI 2025

India's 5 Key Global Priorities

- **Integrating Disaster Resilience in Education.**
- **Formulating a Global Digital Repository for Disaster Resilience.**
- **Promoting Innovative Financing** to ensure access to funding for the **developing** countries.
- Reaffirming India's recognition of **SIDS** as **Large Ocean Countries,** emphasising need for special **attention** to their **vulnerabilities.**
- **Strengthening Early Warning Systems.**

Key Highlights of the Conference

- **Launched Call to Action for Coastal Resilience in SIDS:** Provides **recommendations** to enhance **resilience in coastal infrastructure,** prioritizing vulnerable regions like **Small Island Developing States (SIDS) by 2034.**
  - It highlighted **10 concrete actions to unlock finance and build resilient infrastructure (2025-2034)** like:
    - Launch the **SIDS Global Data Hub 2.0,**
    - Ensure **100% multi-hazard early-warning coverage in SIDS by 2030,**
    - Create a **one-stop accreditation process** for SIDS,
    - Establish **resilience units** within **ministries of finance** to consolidate climate finance etc.
- **Optimizing investment frameworks:** Ensure timely, effective, and scalable funding for resilient coastal infrastructure by unifying **policy, finance, and technical standards.**
- **First-ever hosting in Europe:** It was hosted in **Nice, France,** broadening its impact and fostering inclusive dialogue and partnerships.

About International Conference on Disaster Resilient Infrastructure (ICDRI) 2025

- It is a **platform** under **Coalition of Disaster Resilient Infrastructure (CDRI)** to drive discussions and actions on **climate adaptation, coastal resilience, and sustainable development.**
  - **CDRI** is a global coalition launched by **India** to strengthen **infrastructure resilience** against **climate and disaster risks.** It aims to drive US$10 trillion worth investment into disaster-resilient infrastructure **by 2050.**
- **Aim:** To forge a safer, **resilient future for vulnerable coastal communities** worldwide by bridging science, policy, and finance.
- **Theme:** 'Shaping a Resilient Future for Coastal Regions'.

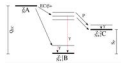
Also In News

Vibe Coding

Recently, **Vibe Coding** has emerged as an important tool for coding among the **businesses.**

About Vibe Coding

- **Meaning:** It involves **AI transforming the user thinking** (expressed using plain speech) into **executable code.**
  - In 2024, Around **30% of code** at Google and Microsoft was AI-generated, indicating a major shift towards them.
- **Significance:** Makes **real time suggestion, automates tedious** processes, and **producing standard codebase structures.**
- **Challenges: Technical complexity** (requires novel or complex frameworks); **code quality and performance issue; debugging** challenges; **maintenance and updates, security concerns, etc.**



Proton Emission

Recently, researchers have detected and measured the **half-life** (190 microseconds) of the **heaviest proton emitter ^{188}At (Astatine) isotope,** which decayed by emitting a proton.

- Proton is a **subatomic particle** with a **positive electrical charge.**

About Proton Emission

- It is the **radioactive decay** mode that determines the **limit of observable proton-rich nuclei** for most elements.
  - Hence, for a nucleus **with given proton and neutron numbers,** if more protons are added, a limit is reached where the last-added proton would simply drip away.
- It was detected for the **first time from ^{53}Co (Cobalt) in the 1970s.**

Indravati National Park (INP)

Recently, security forces encountered Moist in anti-Naxal operations in **INP.**

About Indravati National Park

- **Location:** Bijapur district, Chhattisgarh.
- **Landscape:** Constitutes the Indravati Landscape with **Bhairamgarh** and **Pamed** Wildlife Sanctuaries.
- **Indravati River (Origin: Dandakaranya range, Odisha):** It derives its name from the **Indravati River** (tributary of **Godavari**).
  - Forms the **boundary** of the reserve on Northern and Western side, coinciding with the **inter-state boundary** between **Chhattisgarh and Maharashtra.**
- **Status:** Received the status of a National Park in **1981** and Tiger Reserve in **1983.**
- **Flora:** Trees, Climbers, Shrubs, bamboo, ferns, bryophytes, algae, etc.
- **Fauna:** Home to one of the last populations of **rare wild buffalo.**

Inga 3 Hydropower Project and Congo River

The **World Bank** approved $250 million in **financing** for the **Inga 3 Hydropower project** in the **Democratic Republic of Congo (DRC).**

About Inga 3

- It is a proposed **11050 MW hydropower project** on the **Congo River** in **DRC.**
- It forms part of the **Grand Inga Project** (aims for total installed capacity of over **42,000 MW of electricity**).

About Congo River

- **Countries Covered (6):** Cameroon, Central African Republic, DRC, Republic of Congo, Equatorial Guinea, and Gabon.
  - It is home to the **world's largest tropical peatlands.**
- **Key Features: World's 2nd largest in terms of flow** after the Amazon, and the **2nd longest river in Africa** after the Nile, and **crosses equator twice.**

Cryo-electron microscopy (Cryo- EM)

Researchers created Magnetic Isolation and Concentration cryo-electron microscopy (MagIC), which is an enhanced version of Cryo-EM.

About Cryo -EM

- **2017 Nobel Prize** in Chemistry was awarded to Jacques Dubochet, Joachim Frank, and Richard Henderson for developing Cryo-EM
- To study **3D shapes of biological molecules** requiring **high concentration** of the molecule in the sample for imaging.
- **Resolution:** Cryo-EM achieves resolutions in the 1.5~3.5 angstrom (Å) range.
- **Limitation:** Difficult to use low-abundance molecules.

About MagIC

- Allows study of samples that are **100 times more dilute.**
- **Advantage:** Enable imaging of rare biological molecules with greater efficiency and less sample volume.

Parasitic Wasp

Recently, a new species (Losgna Occidentalis) of **Parasitic Wasp** was discovered in Chandigarh.

About Parasitic Wasp (Parasitoids)

- **Appearance: Small, flying insects** with many species being **smaller than a millimeter.**
  - Found in multiple families within the insect order **Hymenoptera,** including the sawflies, bees, and wasps.
- **Key Characteristics:** Adults primarily **feed on the pollen** and **nectar of flowers; solitary** (do **not build hive** or report to a queen).
  - They **lay their eggs inside other insects** to complete their lifecycle, altering its behaviour and eventually killing them.
- **Significance:** Control pests, prevent invasive species, etc.

Civil Registration System (CRS)

CRS data shows lower death registrations in 2022 after 2021 Covid peak.

About CRS:

- CRS is a **birth** and **death registration system.**
- **Significance of CRS:**
  - It provides **data** for **evidence-based policymaking** across sectors like health, population, and education.
  - Enhances **governance** and **delivery of welfare services.**
- **Legal Framework:**
  - Governed by **Registration of Births and Deaths (RBD) Act, 1969** (amended in 2023) to promote uniformity and comparability in the registration across the country.
  - **CRS falls under Concurrent List** (Entry 30)
- **Institutional Structure: Registrar General of India (RGI) at Central level:** Coordinates CRS across India.

Marine Spatial Planning (MSP)

India and **Norway** jointly hosted a high-level event on **Marine Spatial Planning (MSP)** at the **Monaco Marine Conference.** India highlighted its initiatives for MSP like-

- **Digital Public Good SAHAV portal**-a GIS-based decision support system providing real-time spatial data, enabling smart planning and marine resilience.
- **Pilot** projects at **Puducherry and Lakshadweep** demonstrating use of **MSP in tackling coastal erosion, managing biodiversity** under **India-Norway MSP collaboration.**

About Marine Spatial Planning

- MSP is a **public process** of analyzing and allocating the **spatial and temporal distribution of human activities** in marine areas to achieve ecological, economic and social objectives specified through a political process.
- It is a key tool for **sustainable ocean governance,** offering a **science-based framework** for optimising ocean resources, protecting biodiversity, and ensuring coastal livelihoods.

Place in News

Rwanda (Capital: Kigali)

Rwanda withdrew itself from the **Economic Community of Central African States (ECCAS).**

- **ECCAS** is an organisation for promotion and of regional economic co-operation in Central Africa.

Political Features:

- It is a **landlocked country** lying south of the Equator in **east-central Africa.**
- **Land Boundaries:** Uganda (North), Tanzania (East), Burundi (South), and to Democratic Republic of the Congo (West).

Geographical Features:

- **Lake Kivu,** one of the Great Lakes of East Africa, lies between Rwanda and the Democratic Republic of the Congo.
- **Primary mineral resources:** tin (cassiterite) and tungsten (wolfram).
- **Major ethnic groups in Rwanda** are Hutu and Tutsi.
- **Rift Valley: The eastern region of Rwanda** is part of the **Great Rift Valley,** which is a tectonic feature stretching across eastern Africa.