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US PRESIDENT SIGNS ORDER WITHDRAWING US FROM 66 INTERNATIONAL ORGANISATIONS

In News

- The US has withdrawn from 66 international organizations, including 31 UN entities and 35 non-UN bodies.
  - The entities include climate/energy/science forums such as the UN Framework Convention on Climate Change (UNFCCC), the Intergovernmental Panel on Climate Change (IPCC), the International Renewable Energy Agency (IRENA), and the International Solar Alliance (ISA).
  - It also names development/governance and rights-related entities such as UN Women, UNFPA (UN Population Fund), UNCTAD, and UN-Habitat, along with multiple UN offices linked to peacebuilding and protection of children in conflict.

Why is the US Withdrawing?

- **Sovereignty Concerns:** Resistance to binding international rules perceived to constrain domestic policy autonomy.
- **Perceived Institutional Bias:** Allegations of politicisation, inefficiency, and bias against US or allied interests.
- **Domestic Political Pressures:** Multilateral commitments viewed as costly with limited direct electoral benefits.
- **Burden-Sharing Argument:** Claim that the US contributes disproportionately to global institutions.
- **Strategic Reorientation:** Preference for bilateral or minilateral arrangements over universal institutions.
- **Strategic Competition:** Desire to limit platforms where rival powers gain influence.

Potential Impacts

- **Climate Change Setback:** Weakens global efforts to curb greenhouse gas emissions and provides other countries an excuse to delay climate commitments and finance pledges.
- **Fragmentation of Multilateralism:** Further erodes international governance, intensifies power rivalries, and accelerates a shift towards protectionism and smaller ad-hoc regional blocs.
- **Development & Humanitarian Slowdown:** US funding cuts worsen already declining international development and humanitarian aid, affecting health, education, food security, and SDG progress.
- **Global Peace & Security Risks:** Reduced US support to bodies like the UN Peacebuilding Commission hampers peacebuilding and post-conflict recovery, especially in conflict-prone regions such as Africa and the Caribbean.
- **Weakening of Global Norms:** Encourages selective compliance with international law and treaty obligations by other states.
- **Leadership Vacuum:** Creates space for other major powers to shape global rules and institutions.

Way Ahead

- **For the UN and partners:** Diversify funding sources, redesign programs to be less donor-concentrated, and widen coalitions of "core contributors" to keep essential mandates functional despite U.S. exits.
- **For India:** Treat this as both a risk (less predictable finance/technology cooperation in bodies like ISA/IRENA) and an opening to expand diplomatic leadership by mobilizing alternative coalitions, increasing convening through ISA-like platforms, and pushing climate-development initiatives in forums where U.S. absence increases negotiating space.

Source: TH

DIGITALIZATION OF INDIAN JUDICIARY

In News

- Kalpetta district in Kerala's Wayanad has become India's first fully paperless district court system, with all judicial processes conducted digitally from case filing to final judgment.

Digitalization of Indian Judiciary

- Artificial Intelligence is bringing a major transformation to India's judiciary and law enforcement by improving efficiency, accessibility, and decision-making.
- It is aimed at reducing case backlogs, improving transparency, and enhancing access to justice.

Importance of Digitization

- **Access to Justice:** Digital platforms reduce geographical barriers, allowing citizens to track cases online.

- AI integration into judicial procedures, case management, legal research, and policing is helping streamline operations, reduce delays, and widen access to justice.

- **Transparency**: Real-time updates and digital records minimize scope for manipulation.
- **Efficiency**: Automation reduces paperwork, speeds up summons/warrants, and streamlines case management.
- **Language Inclusivity**: AI-driven translation tools help bridge India's linguistic diversity in legal proceedings.

Challenges

- **Limited internet penetration** and **lack of digital literacy** in rural areas hinder inclusivity.
- Many district courts **lack adequate hardware**, connectivity, and trained staff.
- Sensitive judicial data requires robust cybersecurity frameworks.
- Traditional legal practices and reluctance among stakeholders slow adoption.

Related Steps

- The **Supreme Court of India** has constituted an AI committee which is responsible for conceptualising, implementing, and monitoring the use of artificial intelligence in the Indian judiciary
- Under the third phase of the eCourts project, which was approved for four years from 2023-24, a sum of 53.57 crore has been allocated for future technological advancements, such as AI and blockchain
- An AI-based tool, the Supreme Court Portal Assistance in Court Efficiency (SUPACE), is in the experimental stage of development.
    - This tool aims to develop a module to understand the factual matrix of cases with an intelligent search of the precedents, apart from identifying the cases
- **Inter-operable Criminal Justice System (ICJS)** Integrates police, forensics, jails, and courts into a unified digital platform.
- **National Judicial Data Grid (NJDG)** provides real-time data on case pendency and disposal across courts.

Conclusion

- Artificial Intelligence is reshaping India's judiciary and law enforcement by improving efficiency, accessibility, and governance through advanced case management, legal research, and crime prevention tools.
- While its adoption requires strong data security, transparency, and legal safeguards to complement human judgment, sustained investment and regulation can make the justice system faster, more transparent, and accessible to all.

Source :BS

DRAFT PESTICIDES MANAGEMENT BILL, 2025

Context

- The Agriculture Ministry released the **draft Pesticides Management Bill, 2025**, seeking public comments on the legislation that aims to replace the **Insecticides Act, 1968, and the Insecticides Rules, 1971**.
    - It aims to combat the growing menace of spurious pesticides and strengthening farmer welfare through stricter regulation and the use of technology.

Major Features

- **Central Pesticides Board (CPB):** It shall be constituted within a period of six months from the date of commencement of this Act.
    - It is an apex regulatory body, providing scientific and technical guidance.
- **Registration Committee:** To be constituted within a period of six months from the date of commencement of this Act, it is a specialized panel to handle applications and decisions regarding pesticide registrations.
- **Reform-oriented measures:** It includes the use of technology and digital processes to streamline regulatory procedures.
- **Pesticide Registration:**
    - Mandatory digital registration for anyone intending to import or manufacture pesticides.
    - Registration decisions are based on safety, efficacy, and necessity.
- Licenses and Compliance:
    - Licensing required for manufacturing, selling, stocking, displaying, transporting, or undertaking pesticide-related commercial operations.
    - Licensing Officers empowered to grant, amend, suspend, or cancel licenses.

- Detailed obligations for licensees, including record-keeping and compliance with infrastructure and safety norms.
- Review, Suspension, and Cancellation:
  - Registration and licenses can be reviewed or revoked if pesticides pose unacceptable risks or if conditions of registration/licensing are violated.
  - Products may be banned following formal cancellation procedures.
- **Enforcement and Monitoring:**
  - Pesticide inspectors and licensing officers have powers to enforce compliance.
  - State Governments must provide periodic reports.
  - The Central Government can require data and take action to enforce law provisions.
- **Penalties:** The draft allows state-level authorities to impose higher penalties in cases of compounding offences, strengthening enforcement at the local level.

Significance

- The Bill modernizes pesticide governance by:
  - Introducing digital processes for registration and licensing.
  - Strengthening regulatory oversight and safety protocols.
  - Creating clear institutional structures for decision-making.
  - Focusing on environmental and human health protection.

Source: PIB

CENTRE CREATES THREE-YEAR PPP PROJECT PIPELINE

Context

- Recently, the **Department of Economic Affairs (DEA)** has unveiled a **three-year Public Private Partnership (PPP) project pipeline** aimed at streamlining infrastructure development across India.

Scale and Scope of the Pipeline

- According to the **Ministry of Finance**, the pipeline currently includes **852 projects** across **Central Infrastructure Ministries, States, and Union Territories**, representing a **total estimated cost exceeding ₹17 lakh crore**.
- These projects span critical sectors such as **transport, energy, water management, urban development, and social infrastructure**.

About Infrastructure Investment Models in India

- **Evolution of Infrastructure Financing:** Early infrastructure investment **relied predominantly on budgetary support**.
  - However, **post-liberalization reforms** opened the door to **private capital participation through PPP models.**
- Subsequent institutional innovations such as the **National Infrastructure Pipeline (NIP)**, **National Investment and Infrastructure Fund (NIIF)**, and the **National Bank for Financing Infrastructure and Development (NaBFID)** were designed to address persistent financing gaps.

Major Infrastructure Investment Models

- **Public–Private Partnership (PPP) Model:** Both public and private sectors share responsibilities in financing, building, and maintaining infrastructure projects.
  - It has been instrumental in road, airport, and urban water sectors.
- Key PPP sub-models include:
  - **Build-Operate-Transfer (BOT):** Private partner builds and operates a facility for a specified period, then transfers it back to the government.
    - It is used widely in road toll projects and certain transport assets.
  - **BOT-Annuity:** Government pays the private developer periodic annuity payments after commercial operations begin, reducing upfront revenue risk.
  - **Hybrid Annuity Model (HAM):** A blend of government funding and private financing: typically 40% paid by government during construction and the balance raised by the developer.
- **Engineering, Procurement, and Construction (EPC) Model:** It has been adopted where the government bears funding responsibility but execution is outsourced to private entities.
  - It minimizes delays and improves efficiency.
- **Infrastructure Investment Trusts (InvITs) and Real Estate Investment Trusts (REITs):** These aim to deepen capital markets and channel institutional investments into infrastructure and real estate assets.
  - These pooled investment vehicles allow both domestic and foreign investors to participate in long-term infrastructure financing.

- **Asset Monetisation and Hybrid Models:** India is diversifying its investment models through the **National Monetisation Pipeline (monetisation of brownfield assets)** to unlock value from existing public assets.
  - It is a strategy where operational infrastructure is leased to private investors for a defined period, generating upfront revenue for reinvestment.

Supporting Mechanisms for PPPs

- **Viability Gap Funding (VGF) Scheme:** It provides financial support to make economically justified but financially unviable projects attractive for private investors. It is **implemented by the *Department of Economic Affairs.***
- **Model Concession Agreements**: Standardized legal frameworks developed by NITI Aayog for sectors like transport or logistics to improve investment certainty.
- **National PPP Policy Frameworks**: Policy units such as the Private Investment Unit in the Department of Economic Affairs help formulate and manage PPP strategies.

Related Concerns & Issues

- **Financial and Funding Challenges:**
  - **High Capital Intensity:** Infrastructure projects (highways, railways, airports) require **large upfront investments** with returns spread over decades. This discourages private investors seeking quicker returns.
  - **Stressed Banking Sector:** Indian banks, especially Public Sector Banks (PSBs), have faced high **Non-Performing Assets (NPAs)** due to stalled infrastructure projects.
  - **Limited Long-Term Finance:** India lacks sufficient **long-term debt instruments** (like pension and insurance fund participation), leading to over-reliance on banks for infrastructure finance.
- **Issues in PPP Models:** According to **NITI Aayog**, several PPP projects failed due to flawed project structuring and weak dispute resolution.
  - **Risk Allocation Problems:** In many PPP projects, **risks are poorly allocated**, with private players bearing risks related to land acquisition, regulatory approvals, and traffic demand.
  - **Over-Optimistic Projections:** Traffic and revenue projections are often inflated to make projects financially viable on paper, leading to post-construction distress.
  - **Contractual Disputes:** Ambiguous concession agreements cause frequent disputes between government authorities and private concessionaires.
- **Land Acquisition and Environmental Issues:**
  - **Delays in Land Acquisition:** Land acquisition remains one of the **biggest bottlenecks**, due to legal disputes, rehabilitation and resettlement challenges, and local resistance.
  - **Environmental Clearances:** Projects often face delays due to lengthy environmental impact assessments and litigation, especially in mining, roads, and power sectors.
- **Regulatory and Policy Uncertainty:**
  - **Fragmented Institutional Framework:** Multiple ministries, state governments, and local bodies are involved, leading to **coordination failures**.
  - **Frequent Policy Changes:** Retrospective taxation, tariff renegotiations, and changes in concession terms create **policy uncertainty**.
  - **Weak Regulatory Bodies:** In sectors like power and urban infrastructure, regulators often lack autonomy and enforcement capacity.
- **Governance and Institutional Weaknesses:**
  - **Weak Project Preparation:** Poor feasibility studies and inadequate technical assessments lead to cost overruns and time overruns.
  - **Corruption and Lack of Transparency:** Perceived corruption in bidding, contract awards, and regulatory approvals undermines investor confidence.
- **Operation & Maintenance (O&M) Issues:**
  - Focus is often on **asset creation**, not lifecycle maintenance;
  - Poor O&M reduces asset quality and long-term returns;
  - Urban infrastructure (water supply, sewage) is especially affected.

Source: News On AIR

'NATGRID': THE SEARCH ENGINE OF DIGITAL AUTHORITARIANISM

In News

- Authorities started using the National Intelligence Grid (NATGRID) to trace and track suspects and criminals, though several practical challenges remain on the ground.

Background

- The 2008 Mumbai terror attacks ("26/11") exposed intelligence lapses, particularly the failure to connect disparate data about the attackers, including David Coleman Headley.
- In response, institutional and technological reforms were initiated, with NATGRID (National Intelligence Grid) emerging as the "crown jewel" of India's post-26/11 intelligence apparatus.

NATGRID

- NATGRID is a database compiled by the Ministry of Home Affairs that contains over 24 sets of data, such as immigration records, banking details, travel history, and phone data, among others, to help agencies identify and monitor suspects.
  - It was conceived in 2008 after the 26/11 attacks in Mumbai.
- It was first announced in 2009 but operationalized in 2012 via executive order

Recent Developments

- NATGRID reportedly receives ~45,000 queries per month and access is now extended to police officers down to the rank of Superintendent of Police.
- Integration with the National Population Register (NPR, covering 1.19 billion residents) has raised concerns about mapping entire populations, moving beyond targeted intelligence to mass surveillance.
- **Technological Capabilities:** Analytical engine "Gandiva" enables entity resolution, linking fragmented records to individuals.
  - Facial recognition and KYC databases can now be cross-referenced, allowing inferences at scale about individuals' intentions.

Concerns

- Algorithms may reproduce or amplify societal biases (caste, religion, geography), falsely labeling individuals as threats.
- Tens of thousands of queries processed monthly may render logging ineffective; independent scrutiny is minimal.
- NATGRID risks shifting from counter-terrorism to everyday policing without statutory safeguards.
- Courts have not fully adjudicated the legality of intelligence programs lacking clear statutory backing; Puttaswamy (2017) privacy protections remain underutilized.
- Intelligence failures stem from weak institutions and poor accountability; without independent oversight, NATGRID risks enabling digital authoritarianism rather than preventing threats.

Conclusion

- NATGRID, while designed to prevent terror, has evolved into a mass surveillance architecture. Its expansion without statutory, judicial, or parliamentary oversight risks normalizing suspicion and encroaching on civil liberties.
- True prevention requires accountability, transparency, and legally grounded intelligence practices.

Source :TH

HYDROGEN MOLECULE AS A PRECISION TEST FOR FUNDAMENTAL PHYSICS

Context

- Recent advances in theoretical physics and experimental spectroscopy have enabled scientists to test the foundations of quantum mechanics and quantum electrodynamics (QED) using the hydrogen molecule (H_2).

Background

- The hydrogen molecule (H_2), has long been used to test the accuracy of fundamental physical laws.
- With advances in experimental techniques, **scientists can now measure the energy gaps** between different molecular states with an **accuracy of one part in 100 billion.**
- At this level, even very small theoretical inaccuracies become detectable, making it necessary to refine existing models.

What is hydrogen?

- Hydrogen is the chemical element with the **symbol H** and **atomic number 1.**
- Hydrogen is the **lightest element** and the most abundant chemical substance in the universe, **constituting roughly 75%** of all normal matter.
- It is colorless, odorless, tasteless, non-toxic, and highly combustible gas.

Significance of hydrogen molecule in testing

- **Stable molecule:** H_2 consists of two protons and two electrons, making it the simplest system where molecular bonding occurs.

- **It allows testing** whether fundamental theories developed for atoms extend accurately to molecules.
- **Benchmark system:** Because of its simplicity, any deviation between theory and experiment in H can signal gaps in fundamental physics.

Physical effects incorporated in experiment

- **Electron–electron correlation:** The calculation accurately captured how the two electrons influence each other's motion. Ignoring this interaction leads to incorrect energy predictions.
- **Electron–nucleus coupled motion:** The nuclei (protons) were allowed to move slightly in response to electron motion. This **"recoil effect,"** becomes significant when measurements are made with very high accuracy.
- **Relativistic corrections:** Since electrons move at very high speeds, effects predicted by Einstein's theory of special relativity were included to refine energy calculations.
- **Quantum Electrodynamics (QED) effects:** Tiny corrections arising from the interaction of charged particles with electromagnetic fields were accounted for in the experiment. These effects are usually negligible but are now experimentally measurable.

Key principles associated with the experiment

- **Spectroscopy:** It is a technique used to measure energy level differences in atoms and molecules by analysing absorbed or emitted light.
- **Quantum Electrodynamics (QED):** A part of quantum field theory describing how charged particles interact with electromagnetic fields.
  - It predicts tiny corrections to energy levels beyond basic quantum mechanics.

Source: TH

NEWS IN SHOT

DOOMSDAY GLACIER

Context

- A new study published in the Journal of Geophysical Research: Earth Surface explains **recent structural changes in the Thwaites Glacier region** and shows how other Antarctic ice shelves may collapse in the future.

Doomsday Glacier (Thwaites Glacier)

- It is an outflow glacier of the **West Antarctic Ice Sheet (WAIS),** flowing into the **Amundsen Sea.**
  - The West Antarctic Ice Sheet is **one of the 16 climate tipping elements on the planet.**
- It is nicknamed **'Doomsday Glacier'** due to its **potential to cause major sea-level rise.**
- According to the authors of the study, about two-thirds of the detected earthquakes, 245 out of 362, occurred near the marine end of the **Thwaites Glacier.**
  - The complete destruction of the Doomsday Glacier **could lead to a global sea level rise of 3 meters.**

Source: DTE

KARNATAKA–KERALA TENSIONS OVER MALAYALAM LANGUAGE BILL, 2025

Context

- The Karnataka government has urged the Kerala Governor to reject the Malayalam Bhasha Bill, 2025, passed by the Kerala Legislative Assembly.

About

- The Bill **mandates Malayalam as the compulsory first language** in all governments and aided schools across Kerala up to Class 10.
- Karnataka has termed the Bill unconstitutional and detrimental to the rights of the Kannada-speaking linguistic minority, particularly in Kerala's Kasaragod district.

Constitutional Provisions

- **Article 29 & 30:** Protection of minority interests and right of minorities to establish and administer educational institutions.
- **Article 347:** Special provision for recognition of a language spoken by a section of the population of a State.
- **Article 350A:** Obligation of States to provide facilities for instruction in the mother tongue at the primary stage for linguistic minorities.
- **Article 350B:** Special Officer for Linguistic Minorities to investigate safeguards.

Source: TH

BUREAU OF INDIAN STANDARDS

In News

- On its 79th Foundation Day, the Bureau of Indian Standards (BIS) was praised by the government for strengthening India's quality standards and supporting growth across key sectors.

Bureau of Indian Standards

- BIS is the national standard body of India established under the BIS Act 2016 .
- BIS has its headquarters at New Delhi.
- It oversees standardization, marking, and quality certification of goods, benefiting the economy by ensuring safe, reliable products, minimizing health hazards, protecting the environment, promoting exports, and controlling product variety.
- Its standards and certification also support public policies in areas like consumer protection, product safety, food safety, environment, and construction.

Achievements

- BIS has worked towards specifically addressing various national priorities and other government initiatives like Swacch Bharat Abhiyan, Digital India, Make in India and ease of doing business through its activities of standardization and certification.
- The government launched **several new initiatives**, including the BIS Standard Portal, Standard Help Inform and Nature Empowerment Women, comic books in print and 2D animation formats, and SAKSHAM, an annual excellence recognition scheme.

Source :Air

TURKMAN GATE

In News

- The Turkman Gate area in Old Delhi saw violent clashes following a demolition drive by the Municipal Corporation of Delhi (MCD).

Turkman Gate

- It is one of the gates of **Shahjahanabad**, the city established by Mughal emperor Shah Jahan in 1683 when he moved his capital from Agra to Delhi.
- The gate is named after **Shah Turkman**, a Mughal-era saint whose tomb is nearby, and a fair is held annually in the area to mark his death anniversary.
- **Architecture**: It is rectangular, two bays deep with a flat roof on the first bay and a domed roof on the second.
  - It has three arched openings, double arches at the outer ends, and semi-octagonal double-storey bastions on either side of the southernmost opening.

Source :IE

DUST EXPERIMENT

Context

- **The Indian Space Research Organisation (ISRO)** used the **first homegrown cosmic dust detector,** the **Dust EXperiment (DEX),** to confirm that a **cosmic dust particle** hits Earth's atmosphere approximately every thousand seconds (around 16 minutes).

Dust EXperiment (DEX)

- ISRO developed the **Dust EXperiment (DEX),** a 3 kg instrument that was launched into space onboard the XPoSat mission.
- It is the first-of-its-kind instrument designed to detect **Interplanetary Dust Particles (IDPs).**
- **Interplanetary Dust Particles (IDPs):** IDPs are **microscopic shrapnel from comets and asteroids** that form the atmosphere's "meteor layer", and show up as "shooting stars" at night.

Significance

- The findings are significant as understanding **cosmic dust particles** helps **protect satellites and spacecraf**t from high-speed micro-impacts.
- Data on cosmic dust particles will also aid in **planning and executing India's first manned space mission - Gaganyaan mission.**
- DEX-like instruments are crucial in **planetary exploration** as they can help study the atmospheres of Venus, Mars and other celestial bodies.

Source: IE

STELLAR TWINS

Context

- A study of a type of stellar twin called **W Ursae Majoris**–type contact binaries that orbit each other closely gives new insights into how binary stars evolve and their eventual fate.

What Are W Ursae Majoris (W UMa) Stars?

- W Ursae Majoris (W UMa) stars are **short-period, dumbbell-shaped binaries** in which the two stars are in contact.
- These stars are so close that they share a **single outer atmosphere** and they orbit around each other.
- **Significance:** These stars act as "natural laboratories" as they assist in precise determinations of fundamental stellar parameters such as **masses, radii, and temperatures,** crucial for testing theories about how stars evolve over time.

What Are Stellar Twins?

- Stellar twins are **stars that are very similar in their fundamental physical properties**, such as mass, radius, temperature, chemical composition, and age.
- Because of these similarities, they are extremely valuable for studying stellar evolution and testing astrophysical theories.
- **Types of Stellar Twins:**
  - Binary Stellar Twins
  - Solar Twins
  - Spectroscopic Twins

Source: PIB

MADHAV GADGIL

Context

- Noted ecologist **Madhav Gadgil,** known for his work on the **conservation of Western Ghats, has passed away.**

Major Contributions

- In 2010, the Ministry of Environment and Forests appointed Madhav Gadgil to chair the **Western Ghats Ecology Expert Panel (WGEEP),** known as the **Gadgil Commission.**
  - **His 2011 report recommended** classifying 64% of the 1,40,000 sq km Ghats, spanning six states, as Ecologically Sensitive Areas (ESAs) in three tiers: ESZ-1 (no mining, dams or large projects), ESZ-2 (restricted activities) and ESZ-3 (regulated development).
  - It led to **debate and discussion on the significance of the Western Ghats** as an ecological hotspot and the **efforts to conserve them.**
- He played a key role in declaring the **Nilgiris as India's first biosphere reserve in 1986**.
- He later helped shape the **Biological Diversity Act, 2002,** and **Forest Rights Act 2006,** introducing the concept of People's Biodiversity Registers to document and protect local ecological knowledge.
- He served on the **Prime Minister's Scientific Advisory Council** and the **National Tiger Authority**, successfully bridging academic research with grassroots environmental activism.
- His contributions were widely recognised with major honours, including the Padma Shri (1992), Padma Bhushan (2006), the Tyler Prize for Environmental Achievement (2015) and the UNEP Champions of the Earth award (2024).
  - The **annual Champions of the Earth award** is the U.N.'s highest environmental honour awarded for his seminal work in the Western Ghats.

Source: TH

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