
Today's Prelims Topics

Fentanyl

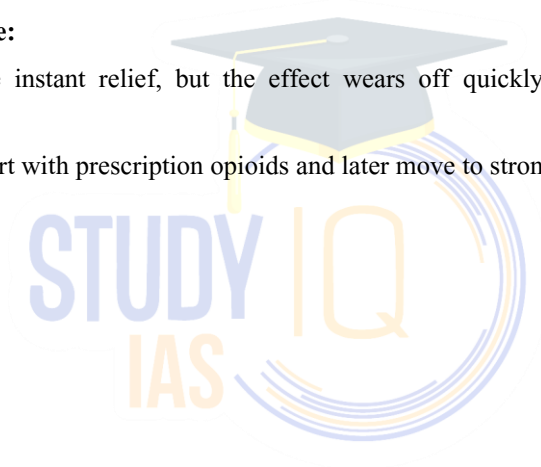
Context

In the latest version of the Major's List sent to the U.S. Congress, 23 countries includes India, Pakistan, China, and Afghanistan as being significant sources and/or sites of transit of illicit drugs, especially fentanyl.

About Fentanyl

- It is a potent **synthetic opioid** used as an analgesic (pain reliever) and anesthetic.
- It is **100 times stronger than morphine and 50 times more potent than heroin**.
- Health Risks:
 - Overdoses can cause: Pupil size changes, Cyanosis (blue skin due to lack of oxygen), Respiratory failure leading to death etc.
- **Other Opioids:** Oxycodone, morphine, codeine, heroin etc. They cause euphoria and pain relief but are **highly addictive**.
- **Highly Addictive Nature:**
 - Opioids provide instant relief, but the effect wears off quickly, leading to frequent use and addiction.
 - Many people start with prescription opioids and later move to stronger illicit drugs like fentanyl.

Source: [The Hindu](#)



Impact of Research and Innovation Scale (IRIS)

Context

The Indian Council of Medical Research (ICMR) recently proposed the Impact of Research and Innovation Scale (IRIS).

What is IRIS?

- It is a framework to measure the impactfulness of biomedical, public health, and allied research projects.
- **Unit of Measurement:** It uses **Publication-Equivalents (PEs)** as the unit.
 - Research paper in peer-reviewed journal → **1 PE**
 - Research paper cited in policy/guidelines → **10 PEs**
 - Patent → **5 PEs**
 - Commercial device in large-scale use → **20 PEs**

Advantages of IRIS

- **Standardisation of Impact:** Provides a common metric (PEs) to compare diverse research outputs across disciplines and scales.
- **Beyond Citations:** Recognises that impact is not just about academic citations but also about policy, patents, and products.
- **Encourages Research Diversification:** Could incentivise researchers to go beyond only academic publishing, fostering applied, translational, and community-focused work.
- **Policy and Funding Linkage:** If tied to funding allocation and project prioritisation, it ensures accountability and better use of public research funds.
- **Piloting & Institutional Uptake:** Already being piloted across ICMR institutions, indicating seriousness of implementation.

Limitations of IRIS

- **Lack of Theoretical Rationale:** No strong conceptual justification for assigning specific PE values (e.g., why 10 for policy, 20 for device).
- **Exclusion of Critical Work:** Commentaries, perspectives, and conceptual papers get **0 PE**.
 - Risks undervaluing path-breaking theoretical contributions (e.g., biopsychosocial model of medicine).
- **Bias Towards Commercialisation:** Skews impact evaluation in favour of commercial outputs (devices, patents) over basic science and community health interventions.
- **Distortion of Research Priorities:** May pressure researchers to chase PE-maximising outputs rather than pursue science as a **public good**.
- **Risk of Misuse in Poor Research Ethics Culture:** Indian biomedical research has faced ethical challenges; PEs could be gamed or manipulated.
- **Lack of Transparency & Consensus:** Needs rigorous validation (e.g., Delphi study with experts).
 - Absence of independent evaluation and open data may weaken credibility.

Source: [The Hindu](#)

Smog Eating Coating on Roads

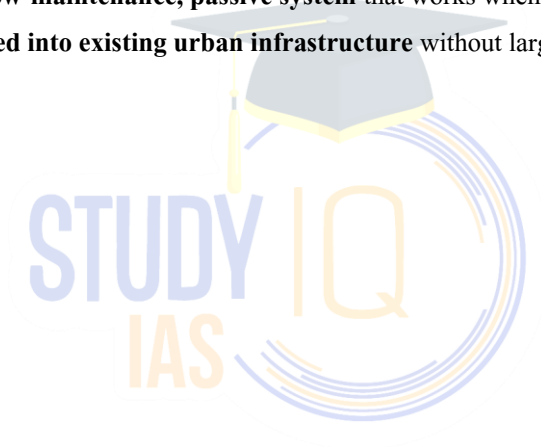
Context

The Delhi government will conduct a feasibility study to test smog eating photocatalytic coatings on roads, pavements, and public spaces.

What is Smog Eating Technology?

- It is a technology based on **photocatalysis using Titanium Dioxide (TiO₂)**.
 - Photocatalysis is a process where a substance (called a *photocatalyst*) speeds up a chemical reaction when exposed to **light**, usually sunlight or ultraviolet (UV) light, without being consumed in the process.
- Under sunlight, TiO₂ **breaks** down pollutants like **nitrogen dioxide (NO₂)** and **volatile organic compounds (VOCs)** into **less harmful substances** (e.g., nitrates, carbon dioxide, and water).
- **Benefits:**
 - Reduces harmful pollutants including NO₂ and hydrocarbons.
 - Contributes to better **public health** by lowering toxic air exposure.
 - Functions as a **low-maintenance, passive system** that works whenever sunlight is available.
 - Can be **integrated into existing urban infrastructure** without large-scale disruptions.

Source: [Indian Express](#)



Project Vijayak

Context

Project Vijayak of the Border Roads Organisation (BRO) celebrated its 15th Raising Day at Kargil, Ladakh.

About Project Vijayak

- **Establishment:** Launched in **2010** under the **Border Roads Organisation (BRO)**.
- **Location:** Ladakh region.
- **Mandate:** Develop and maintain **strategic roads and bridges** in Ladakh and adjoining frontier areas.
 - Ensure **logistic support** and mobility for the Armed Forces.
 - Promote **socio-economic development** by connecting remote valleys, villages, and border posts.
- **Achievements:**
 - Built and maintained over **1,400 km of roads** and **80 major bridges**.
 - Reopened the **Zojila Pass in just 31 days** (2025), a record in high-altitude road clearance.
 - On its 15th Raising Day (Sept 2025), announced **₹1,200 crore expansion plan** including tunnels and advanced technology for all-weather connectivity.

Border Roads Organisation (BRO)

- **Established:** 7 May 1960.
- **Parent Ministry:** Ministry of Defence, Government of India.
- **Functions:**
 - It plays a vital role in **India–China Border Roads (ICBRs)** for Ladakh, Arunachal Pradesh, Sikkim, Uttarakhand, and Himachal Pradesh.
 - Undertake **rescue and relief operations** by restoring connectivity after avalanches, landslides, earthquakes, and floods.
 - Executes road/infrastructure projects in friendly nations like **Bhutan, Myanmar, Afghanistan, and Sri Lanka** under India's strategic outreach.
- **Landmark projects:**
 - Atal Tunnel (Rohtang).
 - Col Chewang Rinchen Setu over Shyok River in Ladakh.

Source: [PIB](#)

One-in-One-out Scheme

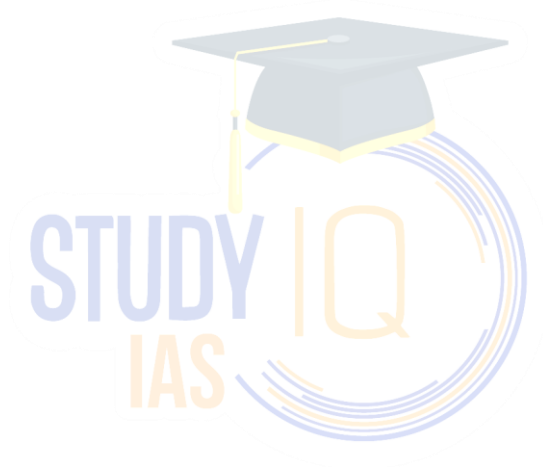
Context

An Indian national has been deported from the UK under the newly introduced 'one-in, one-out' scheme.

About the Scheme

- A **bilateral migration and deportation arrangement** between the **United Kingdom (UK)** and **France**.
- Introduced in **August 2025**, it allows the UK to send back migrants who enter illegally across the **English Channel**.
- For every illegal migrant France accepts, the UK agrees to take in **one genuine asylum seeker** legally from France — hence the name **“One-In, One-Out.”**

Source: [Live Mint](#)



3 West African Countries Quit ICC

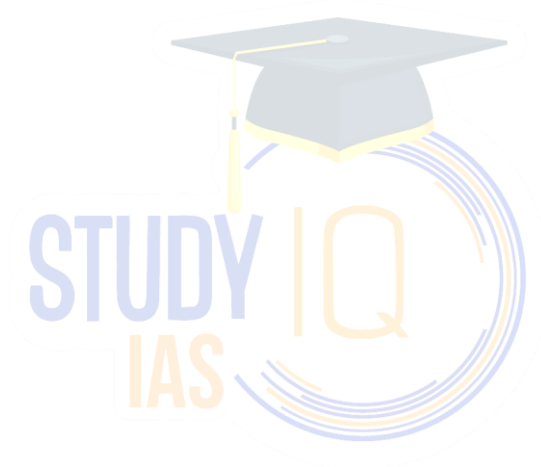
Context

Burkina Faso, Mali and Niger withdrew from International Criminal Court (ICC).

About International Criminal Court (ICC)

- It is a permanent judicial institution founded in 2002 under the **Rome Statute in 1998**.
- **Headquarter:** Hague, Netherlands
- **Mandate:** to investigate, prosecute, and adjudicate individuals accused of committing genocide, war crimes, crimes against humanity, and the crime of aggression.
- **Members:** 120 member nations (Earlier were 123)
 - Also, US, China, Russia, and India are not members.
- **Composition:** The Court has eighteen judges, each from a different member country, elected to nonrenewable nine-year terms
- Unlike the International Court of Justice (ICJ) it is **not an organ of the United Nations**.

Source: [The Hindu](#)



Tamil Nadu Coastal Restoration Mission (TN-SHORE)

Context

World Bank to fund T.N. village councils for mangrove plantation as part of the Tamil Nadu Coastal Restoration Mission (TN-SHORE).

About TN SHORE Mission

- **Approved:** September 2025.
- **Funding:** ₹1,675 crore total — about ₹1,000 crore from the World Bank and the rest from the Tamil Nadu government.
- **Aim:** Strengthen **coastal resilience, biodiversity, and local economy** by restoring marine and coastal ecosystems.

Status of Mangrove

- Tamil Nadu has **41.9 sq. km** of mangrove cover, including 1.19 sq. km of very dense patches, 25.07 sq. km of moderately dense areas, and 15.65 sq. km of open mangroves.
- As per the Indian State of Forest Report (ISFR) 2023, **India's mangrove cover** is around **4,992 sq. km**, constituting **0.15%** of the country's total geographical area.

Source: [The Hindu](#)

Cold Start - Mega Drone Drill

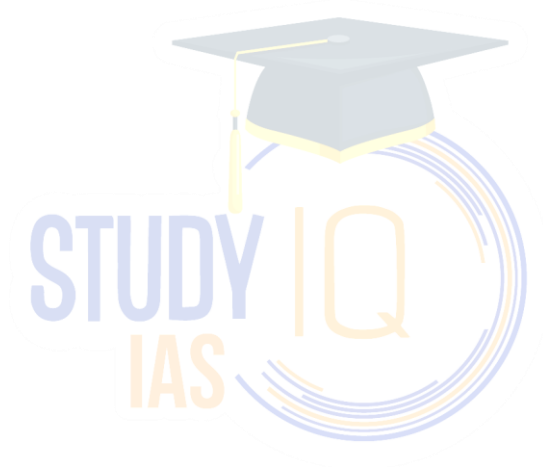
Context

Cold Start exercise will be conducted from October 1 to 6 2025.

About Exercise Cold Start

- A **tri-services exercise** (Army, Navy, Air Force).
- **Venue:** Madhya Pradesh.
- **Aim:** Test **drones and counter-drone systems**, and assess **air defence readiness**.
- **Participants:** Armed forces, **industry partners, R&D agencies, academia**.
- **Focus:** Develop **integrated defence systems** to counter drones, UAVs, and hypersonic threats.

Source: [The Hindu](#)



Tropical Forests Forever Facility (TFFF)

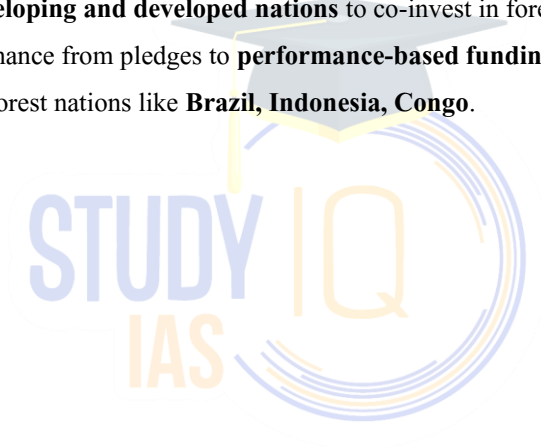
Context

Brazil will be the **first country** to announce an investment in the **Tropical Forests Forever Facility (TFFF)**

About TFFF

- A proposed **\$125 billion multilateral endowment fund** to support conservation of tropical forests worldwide.
- **Proposed by: Brazil**, to be showcased as its major deliverable at **COP30 (2025, Belém, Amazon)**.
- **Working Model:** Countries with tropical forests receive **annual stipends** based on how much forest they preserve.
 - Incentivises conservation over deforestation.
- **Funding Plan:** **\$25 billion** initial contributions from governments and philanthropies.
 - Expected to leverage **\$100 billion** more from private investors.
- **Supporters:** Interest shown by **China, UK, France, Germany, Norway, Singapore, UAE**, among others.
- **Significance:**
 - Encourages **developing and developed nations** to co-invest in forest protection.
 - Shifts climate finance from pledges to **performance-based funding**.
 - Benefits major forest nations like **Brazil, Indonesia, Congo**.

Source: [DD News](#)



Barren Island

Context

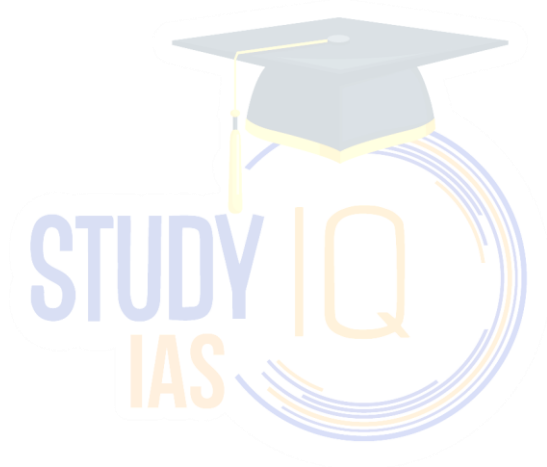
Minor volcanic eruptions were noticed twice at Barren Island in Andaman and Nicobar Islands.

Barren Island

- Located in the **Andaman Sea**, part of **Andaman & Nicobar Islands**.
- **India's only active volcano**; first eruption recorded in **1787**, with recent activity in **2025**.
- Uninhabited island, ~8.3 sq km area, 353 m high.
- Declared **Wildlife Sanctuary**; supports limited fauna like bats, rodents, and feral goats.
- Surrounding waters are popular for **scuba diving**, but landing is restricted.



Source: [The Print](#)



Oju Hydel Project

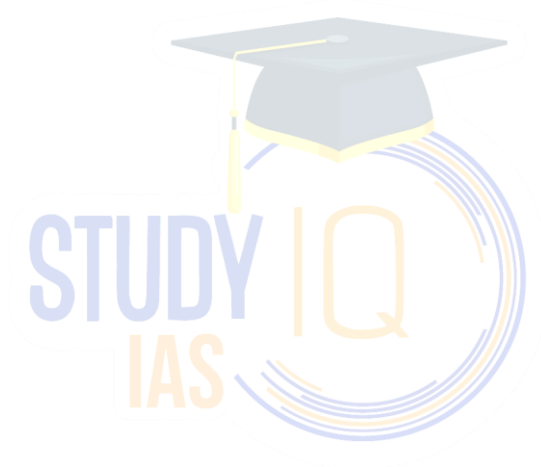
Context

An expert panel of the Union Environment Ministry has recommended environmental clearance for the 2,200 MW Oju Hydroelectric Project.

About Oju Hydel Project

- **Location:** Subansiri District, Arunachal Pradesh.
- **On River:** Subansiri River.
- **Capacity:**
 - Installed capacity: **2,200 MW**.
 - Plant will have a **captive power plant of 120 MW**.
- **Strategic Importance:** Close to the **India-China border** → boosts India's **infrastructure and energy presence in sensitive frontier areas**.
 - Supports **energy security** by harnessing hydro potential in the Northeast.

Source: [Indian Express](#)



AI Enabled Centre at Betla National Park

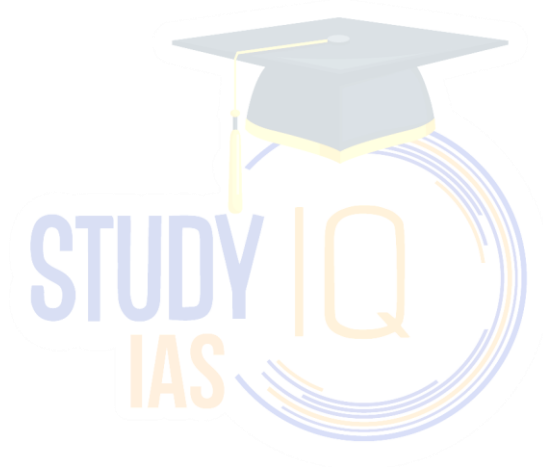
Context

A first of its kind AI-enabled nature experience centre is set to come up at Betla National Park.

About Betla National Park

- **Location:** Latehar district of Jharkhand.
- **Facts:**
 - It is part of core area of Palamau Tiger Reserve.
 - North Koel River passes through the northern part of Betla National Park.
 - Betla Fort is a 16th-century fort built by the Chero kings inside the park.

Source: [New Indian Express](#)



Places in news

Morocco

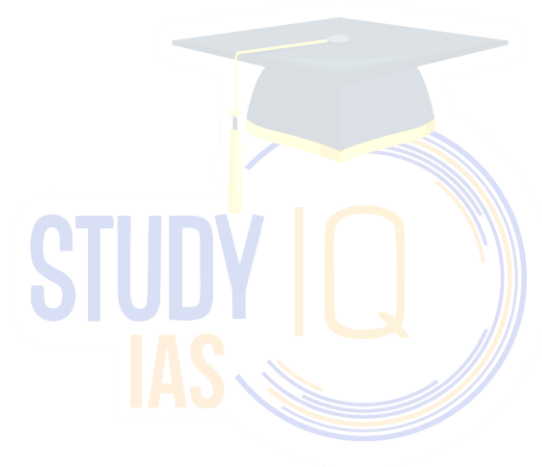


News? India's Defence Minister opens Tata Group's combat vehicle plant in Morocco

About Morocco

- **Location:** North Africa, bordered by the **Atlantic Ocean**, **Mediterranean Sea**, **Algeria**, and **Western Sahara**.
- **Capital:** Rabat | Largest city: Casablanca.
- **Global Membership:** Member of **African Union**, **Arab League**, **UN**, **WTO**.

Source: [Indian Express](#)



Mains Topics

Reimagining Transgender Rights in India

Context

Despite progressive legal reforms, transgender persons in India continue to face systemic exclusion in education, employment, housing, and healthcare, highlighting the urgent need for inclusive policies and meaningful political representation.

Challenges Faced by Trans People

- **Social Exclusion and Stigma:** Families often abandon trans children. They face ridicule in schools, markets, workplaces, and public transport.
- **Education Barriers:** Bullying and discrimination push many out of schools, reducing access to higher education. Inclusive curricula and safe environments remain scarce.
- **Employment and Economic Insecurity:** Quotas exist on paper, but real benefits are minimal due to bureaucratic hurdles and corruption. Many are forced into begging or sex work for survival.
- **Housing Discrimination:** Finding rental accommodation is extremely difficult. Landlords hesitate, neighbours oppose, and societies ostracise them.
- **Healthcare Access:** Gender transition is expensive and rarely covered under public healthcare. Mental health services are inadequate. Lack of trained medical professionals in gender-affirmative care.
- **Safety in Public Spaces:** Harassment in buses, trains, and public places is common, making daily life unsafe.
- **Political Underrepresentation:** Very few trans persons hold public office. Policies are often made for them but rarely with them.

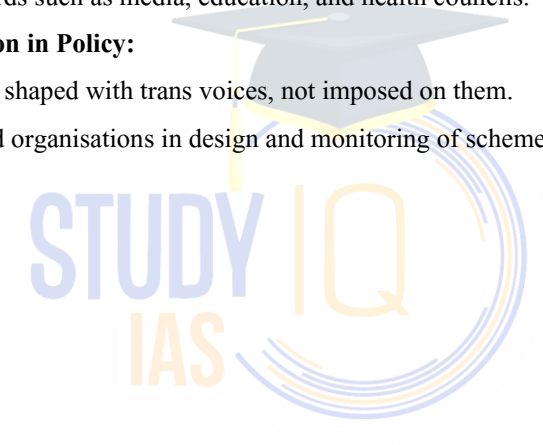
Steps Taken by the Government

- **Legal Framework:**
 - **NALSA Judgment (2014):** Affirmed right to self-identification.
 - **Transgender Act, 2019:** Prohibits discrimination in education, healthcare, employment, and housing.
- **Schemes and Policies:**
 - **Garima Greh Scheme:** Shelter homes for trans persons.
 - **SMILE Scheme (2022):** Focus on rehabilitation, skill-building, and economic empowerment.
 - **Scholarships for transgender students.**
- **Awareness and Sensitisation:**
 - Awareness campaigns for police, teachers, and government staff.
 - National Portal for online ID certification to reduce bureaucratic harassment.
- **Healthcare Initiatives:**
 - National Health Mission has proposed including gender-affirmative care.
 - Some states (Kerala, Tamil Nadu) have progressive policies offering free sex reassignment surgeries in government hospitals.

Way Forward

- **Education Reform:** Inclusive curricula, anti-bullying protocols, and targeted scholarships.
 - Safe learning environments with trained teachers.
- **Healthcare Access:** Publicly funded gender-affirmative healthcare (surgeries, hormone therapy, mental health).
 - Training doctors and counsellors in transgender health needs.
- **Economic Empowerment:**
 - Strict enforcement of anti-discrimination laws in workplaces.
 - Reservation in public employment and targeted skill-development programmes.
 - Incentivise private sector hiring.
- **Housing and Public Safety:**
 - Anti-discrimination protections in rental housing.
 - Safe public spaces through awareness campaigns and stricter enforcement.
- **Political Representation:**
 - Seats for trans persons in local bodies, Assemblies, and Parliament.
 - Inclusion in boards such as media, education, and health councils.
- **Community Participation in Policy:**
 - Policies must be shaped with trans voices, not imposed on them.
 - Involve trans-led organisations in design and monitoring of schemes.

Source: [The Hindu](#)



The Need for Digital Sovereignty in India

Context

Growing dependence on foreign digital infrastructure and recent shocks like the U.S. H-1B visa fee hike and the Nayara Energy case highlight the urgent need for India to pursue **digital sovereignty** to safeguard its economy, security, and strategic autonomy.

Digital Dependence: India as a “Digital Colony”

- India’s **digital backbone is controlled by U.S. companies**:
 - Smartphones → Android, iOS.
 - Laptops → Windows.
 - Cloud → AWS, Azure, Google.
 - Emails → Outlook, Gmail.
- **Critical infrastructure** (banks, airports, grids, cyber security) runs on U.S. software.

Case Study: Nayara Energy

- Microsoft abruptly blocked Outlook and Teams for the Russia-linked Nayara Energy refinery in Gujarat.
- Services were restored only after court intervention.
- The incident demonstrated how foreign control over software could paralyse Indian industries overnight.

Need for Digital Sovereignty

- **National Security**: Critical infrastructure (defence, energy grids, airports) runs on foreign operating systems and cloud services, creating risks of external disruption.
- **Economic Dependence**:
 - Over 60% of India’s IT exports depend on the U.S.; over 85% on Western markets.
 - Dependence on H-1B visas and U.S. software companies gives other nations leverage over India’s economy.
- **Data Control and Privacy**:
 - Massive volumes of Indian citizens’ and companies’ data are stored in foreign-owned servers.
 - Raises risks of surveillance, misuse, and data exploitation.
- **Technological Colonialism**:
 - India’s digital backbone is controlled by U.S. firms-Android/iOS for phones, Windows for PCs, AWS/Azure for cloud, Gmail/Outlook for email.
 - This over-reliance undermines India’s **strategic autonomy**.
- **Loss of Domestic Innovation**:
 - Indian IT firms focused on export-oriented coding services but neglected to create indigenous platforms, operating systems, or productivity suites.

Challenges to Achieving Digital Sovereignty

- **Overdependence on Foreign Tech**: Smartphones, PCs, cloud services, cybersecurity, and industrial software are dominated by foreign providers.

- **Lack of Indigenous Platforms:** Absence of strong Indian alternatives for OS, search engines, productivity suites, or social media.
- **Funding vs. Vision Gap:** India has the talent but lacks long-term **vision-driven missions** for digital independence.
- **Weak Cybersecurity Ecosystem:** Heavy reliance on imported security tools leaves gaps in protecting networks.
- **Resistance from Industry:** Indian IT giants prefer export billing models instead of investing in indigenous product ecosystems.
- **Global Supply Chain Interdependence:** Hardware components (chips, semiconductors) remain globally integrated, making full autonomy difficult.

Steps Taken by the Government

- **Policy Frameworks:**
 - **Digital India (2015):** Promotes digital infrastructure, e-governance, and services.
 - **National Cyber Security Strategy (draft, 2020):** Framework for securing networks and infrastructure.
 - **Digital Personal Data Protection Act (2023):** Introduces data protection and localisation provisions.
- **Indigenous Initiatives:**
 - **Aadhaar, UPI, CoWIN, ONDC:** Examples of strong domestic digital public infrastructure.
 - Indigenous OS efforts (BharOS) launched to reduce reliance on Android/iOS.
- **Capacity Building:** Support for startups and domestic tech R&D under schemes like **Startup India** and **Atmanirbhar Bharat**.
- **Data Localisation Push:** RBI mandated that payments data of Indian users be stored within India.
- **Cybersecurity Collaboration:** Creation of CERT-In for monitoring cyber incidents and promoting security awareness.

Way Forward

- **Launch a Digital Swaraj Mission:** Time-bound, mission-mode programme to build indigenous OS, cloud, cybersecurity, and industrial software.
- **Sovereign Cloud Infrastructure:** Establish national cloud systems for government, defence, and critical sectors with strict data-localisation rules.
- **Promote Indigenous OS and Tools:** Mandate gradual adoption of BharOS or other Indian OS in government systems. Create demand by reforming procurement policies.
- **Incentivise Local Innovation:** Tie incentives and subsidies to IP creation and indigenous tech development.
- **Public-Private Partnerships:** Collaborate with Indian IT firms, startups, and academia to create homegrown solutions.
- **Learn from China:** Systematically build domestic platforms for OS, cloud, cybersecurity, and apps.

China's Example

- Built **Kylin OS** for government use and **HarmonyOS** for smartphones.

- Created homegrown cloud giants (Alibaba, Tencent).
 - Enforced **cybersecurity, industrial software, and data localisation**.
 - Ensured foreign powers cannot paralyse its economy.
- **Global Strategy:** While building autonomy, also **diversify digital partnerships** with Europe, Japan, and other neutral nations to reduce U.S. monopoly.

Source: [The Hindu Business Line](#)

