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To The Point

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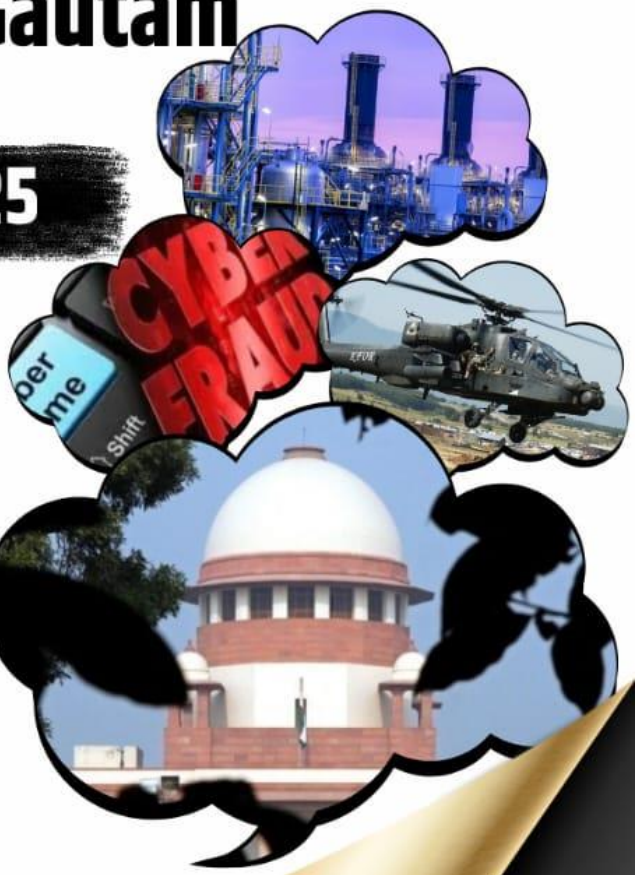

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05 July 2025

GS Paper 3 – Environment & Disaster Management

1 C-FLOOD Platform: A Game-Changer in Flood Forecasting and Management

Context: The **C-FLOOD Platform**, a **cutting-edge inundation forecasting system**, has been officially launched by the Union Minister of **Jal Shakti**, marking a significant milestone in India's flood preparedness and disaster management capabilities.

What is C-FLOOD?

The **C-FLOOD Platform** (Centralized Flood Forecasting System) is a **Unified Inundation Forecasting System** that integrates multiple data sources and models to deliver **advance flood forecasts** with high precision. It aims to **enhance early warning systems**, enabling timely response to minimize loss of life and property.

This robust platform has been **jointly developed** by the **Centre for Development of Advanced Computing (C-DAC), Pune** and the **Central Water Commission (CWC)**, under the **Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD & GR)**, **Ministry of Jal Shakti**.

The initiative is supported by the **National Supercomputing Mission (NSM)**, a collaborative effort between the **Ministry of Electronics and Information Technology (MeitY)** and the **Department of Science and Technology (DST)**.

Key Features of C-FLOOD Platform:

- **Web-Based Access**: User-friendly interface providing **real-time forecasts** and insights.
- **Advance Inundation Forecasts**: Offers **two-day prior warnings** of flooding events, down to the **village level**.
- **Flood Inundation Maps**: Provides **high-resolution maps** showing expected water spread and **water level predictions**.
- **Unified Platform**: Integrates flood modelling data from **national and regional agencies** to support coordinated disaster response.
- **High-Performance Computing (HPC)**: Utilizes **supercomputing power** at C-DAC Pune for large-scale hydrodynamic simulations.
- **Advanced 2-D Hydrodynamic Models**: Simulates realistic flood scenarios with **greater spatial accuracy**.

Current Coverage and Expansion Plans:

At present, the C-FLOOD system covers three major river basins:

- **Mahanadi River Basin**
- **Godavari River Basin**
- **Tapi River Basin**

The **Mahanadi Basin simulations** are run using **HPC infrastructure** under the NSM at C-DAC Pune. For **Godavari and Tapi basins**, flood models developed by the **National Remote Sensing Centre (NRSC)** under the **National Hydrology Project (NHP)** are integrated into the platform.

In the coming phases, more **river basins across India** will be incorporated, making this platform a **nationwide decision-support system** for authorities involved in flood relief and disaster risk reduction.

Why C-FLOOD is a Transformational Initiative:

India is among the most flood-prone countries globally, with **recurring floods affecting millions** every year. The **C-FLOOD platform** is a **scientific leap forward**, ensuring that flood forecasting is no longer reactive, but **proactively managed through predictive modelling**.

By **bridging technology and water resource management**, C-FLOOD represents the future of disaster resilience in India. It also supports **climate adaptation efforts**, especially in the wake of increasing extreme weather events driven by **climate change**.

Did You Know?

- **Floods affect more people worldwide** than any other natural disaster.
- The **National Supercomputing Mission (NSM)** aims to build over **70 high-performance supercomputers** across India to boost indigenous research and development.
- The **NRSC** plays a key role in integrating **satellite remote sensing** with flood forecasting models, significantly enhancing **forecast accuracy**.

Conclusion:

The **C-FLOOD Platform** is more than just a technological innovation — it is a **lifesaving tool** empowering communities, governments, and responders with actionable insights. As India continues to battle the challenges of **urban flooding, river overflows**, and **climate variability**, platforms like C-FLOOD will be critical in building a **resilient and prepared nation**.

Stay tuned as the platform expands to cover more river basins and enhances India's capacity to predict, prepare, and prevent flood-related disasters.

GS Paper 3 – Economy

2 Financial Fraud Risk Indicator (FRI): A New Era in Fraud Prevention

Context: In a decisive move to strengthen digital security, the **Reserve Bank of India (RBI)** has directed all **Scheduled Commercial Banks, Small Finance Banks, Payments Banks, and Co-operative Banks** to integrate the **Financial Fraud Risk Indicator (FRI)** into their systems. This marks a significant step in the fight against growing incidents of **digital and financial fraud** in India.

What is Financial Fraud Risk Indicator (FRI)?

The **Financial Fraud Risk Indicator (FRI)** is a **risk-based evaluation system** developed by the **Digital Intelligence Unit (DIU)** under the **Department of Telecommunications (DoT)**. It assesses and classifies mobile numbers based on their association with **financial fraud activities**, tagging them with a **Medium, High, or Very High Risk** level.

This classification is derived using data from:

- The **National Cybercrime Reporting Portal (NCRP)** run by the **Indian Cyber Crime Coordination Centre (I4C)**
- The **DoT's Chakshu platform**
- **Banks and financial institutions**, including fraud intelligence reports

Key Features of FRI:

- **Real-Time Risk Assessment**: Banks and financial entities receive **instant alerts** about mobile numbers linked to fraud.
- **Mobile Number Classification**: Each number is tagged as **Medium, High, or Very High risk**, depending on its fraud association.
- **Actionable Intelligence**: Enables institutions to **flag, delay, or decline transactions** involving high-risk numbers.
- **Revocation List Sharing**: The **Mobile Number Revocation List (MNRL)**, shared by DIU, details numbers disconnected due to fraudulent activities, failed re-verification, or misuse.
- **Integrated Cybercrime Intelligence**: Aggregates inputs from government portals, financial watchdogs, and telecom networks for **holistic fraud detection**.

Institutions Already Using FRI:

Major financial and digital platforms have already embraced FRI, including:

- **HDFC Bank**
- **ICICI Bank**
- **Punjab National Bank**
- **India Post Payments Bank**
- **PhonePe**
- **Paytm**

These organizations have reported **improved fraud detection**, proactive prevention, and better **customer protection mechanisms** after FRI integration.

Why FRI is a Game-Changer:

India is witnessing a **surge in cyber-enabled financial crimes**, often involving **fraudulent mobile numbers** used for UPI scams, phishing, SIM cloning, and identity theft. The **FRI system** empowers stakeholders to take **real-time decisions**, ensuring that fraud is tackled **before** it impacts customers.

With **over 100 crore mobile subscribers** in India, and rising digital financial transactions, a tool like FRI brings **telecom and finance sectors together** for **coordinated action against cybercrime**.

Extra Insight:

- The **Digital Intelligence Unit (DIU)** was formed to act as a **nodal agency for telecom-related digital intelligence**, with special focus on **fraudulent communications and cybercrime prevention**.
- **Mobile number-based fraud** is one of the fastest-growing vectors in India, contributing to a large share of cybercrime complaints in recent years.
- The **FRI model** could become a global benchmark, inspiring other countries to develop similar cross-sectoral fraud intelligence tools.

Conclusion:

The **Financial Fraud Risk Indicator (FRI)** is more than just a security measure—it's a **proactive intelligence framework** that can transform the way financial institutions handle fraud risk. As **cyber threats evolve**, India's innovative approach through **FRI integration** signals a robust and united front in securing digital payments and restoring public trust in online financial systems.

By making **real-time, data-driven decisions**, banks and service providers can now **protect customers better, respond faster, and act smarter** in the war against financial fraud.

GS Paper 1 – Geography

3 Grand Ethiopian Renaissance Dam (GERD): Africa's Largest Hydropower Marvel Nears Completion

Context: In a historic announcement, **Ethiopian Prime Minister Abiy Ahmed** declared that the long-anticipated **Grand Ethiopian Renaissance Dam (GERD)** is now **fully complete** and will be **officially inaugurated in September**. The dam, which has been under construction for over a decade, stands as a **symbol of national pride and energy self-sufficiency** for Ethiopia, while continuing to spark diplomatic tensions with downstream nations **Egypt and Sudan**.

What is the GERD?

The **Grand Ethiopian Renaissance Dam**, formerly known as the **Millennium Dam**, is a **colossal hydroelectric project** located in the **Benishangul-Gumuz region** of western Ethiopia, near the **Sudanese border**. Built across the **Blue Nile River**—a major tributary of the Nile—the GERD is poised to **transform the energy landscape** of the African continent.

Key Highlights of GERD:

- **Installed Capacity**: **6.45 Gigawatts (GW)** — making it the **largest hydroelectric power plant in Africa** and among the largest in the world.
- **Construction Commencement**: April **2011**
- **Project Cost**: Estimated at **$4.2 billion**
- **Ownership**: Fully owned by the **Ethiopian Electric Power Corporation (EEPCO)**

Structural Features of the GERD:

- **Main Dam Type**: **Roller-Compacted Concrete (RCC) gravity dam**
- **Height and Length**: **145 meters** tall and **1,780 meters** long
- **Reservoir Capacity**: Holds up to **74 billion cubic meters** of water
- **Reservoir Area**: **1,875 square kilometers** — situated in a deep gorge, which results in a **high water volume with relatively low surface spread**
- **Saddle Dam**: **4,800 meters long** and **45 meters high**, with an **emergency side spillway** for controlled water discharge
- **Spillways**: 3 in total to regulate overflow
- **Power Generation Units**: 16 turbines, each with a **capacity of 375 MW**

Geopolitical Tensions:

The GERD has been at the **center of a trilateral dispute** involving **Ethiopia, Egypt, and Sudan**. Both Egypt and Sudan are heavily dependent on the **Nile River** for freshwater, and they **fear that the GERD's massive reservoir** will limit their share of Nile waters, particularly during the filling and operation phases. Despite repeated appeals from Egypt and Sudan to pause the filling until a comprehensive agreement is reached, Ethiopia has continued to **unilaterally fill the reservoir in multiple stages**.

Why GERD Matters:

- **Energy Security**: Once fully operational, GERD is expected to **double Ethiopia's electricity production**, providing power to over **65 million Ethiopians** and enabling **energy exports** to neighboring countries.

- **Regional Integration**: Ethiopia plans to sell surplus power to **Sudan, Kenya, Djibouti, and beyond**, positioning itself as a **regional energy hub**.
- **Climate-Resilient Infrastructure**: Hydropower is a **renewable and low-emission source**, aligning with **Africa's climate goals** under the **Paris Agreement**.
- **National Sovereignty**: The GERD is **100% domestically funded**, a point of immense national pride for Ethiopians.

Did You Know?

- The **Nile River**, stretching over **6,650 kilometers**, is the **longest river in the world** and supports over **300 million people** across 11 countries.
- Despite its vast size, **Ethiopia contributes more than 85% of the Nile's water**, yet historically benefited the least from it.
- The GERD could **help reduce seasonal flooding** in Sudan and provide a more regulated flow of water downstream—if operated cooperatively.

Conclusion:

The completion of the **Grand Ethiopian Renaissance Dam** marks a monumental achievement for Ethiopia and a defining moment for the region. As the country prepares for its grand inauguration in **September**, the focus now shifts to the urgent need for **diplomatic dialogue and cooperation** among Nile Basin nations.

GS Paper 3 – Science & Technology

4 Apache AH-64E Attack Helicopter: The Ultimate Combat Force Multiplier for Indian Army

Context: The **Indian Army** is preparing to welcome the first delivery of the **Apache AH-64E attack helicopters** from the **United States**, marking a significant upgrade in its offensive air capabilities. Already proven in global battlefields, the Apache's induction into the Army's aviation wing is a **game-changing move for India's combat readiness**.

Overview: What Makes the Apache AH-64E So Formidable?

The **Apache AH-64E**, also known as the **Apache Guardian**, is widely regarded as the **most advanced multi-role attack helicopter** in the world. Designed for **precision strike missions**, **advanced reconnaissance**, and **close air support**, it brings a combination of **lethal firepower**, **survivability**, and **network-centric warfare capabilities**.

- **Country of Origin**: **United States**
- **Manufacturer**: **Boeing Defense, Space & Security**
- **Latest Variant**: **AH-64E**, extensively used by the **U.S. Army**
- **Global Operators**: Includes **India**, **Israel**, **Japan**, **UK**, **UAE**, **Egypt**, **Greece**, **Indonesia**, **South Korea**, **Netherlands**, **Qatar**, **Kuwait**, and **Saudi Arabia**

Apache in Indian Defense:

- The **Indian Air Force** currently operates **22 AH-64E Apaches**, inducted between 2019 and 2020.
- In **2020**, the **Government of India** signed a deal with **Boeing** to acquire **6 additional AH-64Es** specifically for the **Indian Army**, tailored for **high-altitude warfare** and joint operations in forward areas.

Technical Specifications:

- **Length**: **17.8 meters** (*58.7 feet*)
- **Maximum Take-Off Weight**: **10,433 kg** (*23,000 pounds*)
- **Maximum Speed**: **300 km/h** (*186 mph*)
- **Operational Range**: **500 km** (*310 miles*)

Advanced Features and Combat Capabilities:

The **AH-64E Apache** comes equipped with state-of-the-art **open systems architecture**, allowing for seamless integration of **next-generation communication, navigation, sensor**, and **weapon systems**.

Key enhancements include:

- **Greater thrust and lift** for extreme performance in high-altitude terrains
- **Joint digital operability**, enabling networked warfare and real-time battlefield coordination
- **Improved survivability** through advanced defensive systems and radar-evading design
- **Cognitive decision aiding** that assists pilots with threat detection and mission planning
- A **dual infrared and night vision sensor system**, along with an **integrated infrared laser**, offers unparalleled **target tracking and designation**

Powerful Weapons Arsenal:

- **30 mm M230 Chain Gun**: A rapid-fire, highly accurate cannon for both ground and aerial targets

- **AGM-114 Hellfire Missiles**: Can carry up to **16 units**, designed to obliterate **armored vehicles**, **bunkers**, and **fortified targets**
- **Hydra 70 Rockets**: Unguided but highly effective for wide-area impact
- **Stinger Missiles**: Offers **air-to-air combat capabilities**, defending against aerial threats including drones and low-flying aircraft

Strategic Importance for India:

The **AH-64E Apaches** will significantly enhance India's **tactical airpower** and **interoperability with ground forces**, especially in areas like **Ladakh**, **Rajasthan**, and **North-East India**. Their capability to perform in **rugged terrain**, carry out **rapid offensive strikes**, and provide **real-time intelligence** makes them a vital asset in both conventional and asymmetric warfare scenarios.

Did You Know?

- The Apache AH-64 was **originally developed in the 1970s** by Hughes Helicopters and has undergone **continuous upgrades** to remain at the forefront of global combat aviation.
- The **AH-64E variant** includes a **man-unmanned teaming (MUM-T)** capability, allowing the pilot to **control drones** and **access real-time UAV feed** from the cockpit.
- With over **2,500 Apaches delivered worldwide**, it is the **most widely used attack helicopter** on the planet.

Conclusion:

The induction of the **Apache AH-64E attack helicopter** into the Indian Army's arsenal marks a **significant leap in battlefield mobility and strike precision**. As threats evolve, so must India's defense capabilities—and with the Apache, India is taking a **decisive step toward modernizing its air combat forces**, reinforcing its position as a **dominant regional power** in both deterrence and rapid deployment.

GS Paper 2 – Polity, Governance

5 Supreme Court Upholds Legislative Autonomy in Chhattisgarh Auxiliary Police Case

Context: In a significant judgment, the **Supreme Court of India** has clarified that the **passing of a new law by a State Legislature**, even on matters previously adjudicated, **does not amount to contempt of court** unless it violates **constitutional provisions**. This decision was delivered in the long-pending case of ***Nandini Sundar & Others vs State of Chhattisgarh***, concluding both **writ and contempt petitions** filed in relation to anti-Maoist operations in the State.

The Case:

Back in **July 2011**, the Supreme Court had issued a powerful order against the Chhattisgarh government's deployment of **Special Police Officers (SPOs)** for **counter-insurgency operations**, primarily against Maoist groups. The Court held this practice to be **unconstitutional**, stating that it **violated Article 14 (Right to Equality)** and **Article 21 (Right to Life)** of the Constitution.

The judgment ordered:

- **Immediate disarmament** of SPOs
- **Cessation of recruitment and funding** for these forces
- **Compliance reporting** by the Union and State governments

Chhattisgarh's Legislative Response:

In response, the Chhattisgarh government enacted the **Chhattisgarh Auxiliary Armed Police Forces Act, 2011**, to **legally authorize an auxiliary police force**. This force was intended to assist regular security units but with specific safeguards to avoid repeating past violations.

Key provisions included:

- **Section 4(1)**: Restricted the auxiliary force to **non-frontline support roles**
- **Section 5(2)**: Explicitly barred deployment in **direct combat operations**
- **Mandatory six-month training** and **rigorous eligibility screening** to ensure professionalism

However, petitioners challenged this law, claiming it **defied the Supreme Court's 2011 ruling**, leading to contempt proceedings.

Supreme Court's Verdict on Contempt Allegation:

The Court **dismissed the contempt plea**, upholding that the **State had complied** with the original order and that the **new law was within its legislative powers**.

Key observations:

- **Full Compliance Noted**: The Court acknowledged that the State had followed all directives from the 2011 ruling and submitted **status reports** to confirm this.
- **Legislative Authority Upheld**: The Court reaffirmed that **State Legislatures** have the **plenary power to make laws**, provided they remain **within constitutional and legislative competence**.
- **No Automatic Contempt**: Merely passing a new law related to a previously adjudicated issue **does not constitute contempt** unless the legislation **blatantly contradicts constitutional mandates**.

Reaffirming the Separation of Powers:

Citing landmark rulings such as ***Indian Aluminium Co. vs State of Kerala (1996)***, the Supreme Court reiterated that:

- **Judiciary**, **Legislature**, and **Executive** must operate **within their respective domains**
- Courts are empowered to review the **constitutionality** of laws, but **not to monitor or block** the **legislative process**
- **Judicial review** must be **limited to checking legality**, not **legislative intent or action**

Key Takeaways and Broader Implications:

- **Clarity on Legislative Rights:** This ruling offers much-needed clarity: **States can legislate** on sensitive issues **even after a Supreme Court judgment**, so long as the law addresses earlier judicial concerns and **respects constitutional boundaries**.
- **Reinforcement of Federal Structure:** The judgment respects the autonomy of **State governments** in India's **quasi-federal setup**, and affirms that the judiciary should not act as an **overseer of legislative discretion**.
- **Guidance for Future Lawmakers:** By setting a clear precedent, the verdict provides **confidence and direction** for legislatures seeking to draft laws on **complex, evolving issues** such as internal security, police reforms, and counter-insurgency.
- **Balance of Power in Democracy:** It upholds the delicate **democratic balance**—the judiciary guards constitutional principles, while legislatures hold the **legitimate power to enact** laws in the public interest.

Did You Know?

- The case originated from **widespread concerns** over the use of **tribal youth as poorly trained SPOs** in Maoist-hit regions of Chhattisgarh.
- The 2011 judgment was hailed globally as a **human rights victory**, emphasizing **State accountability in counter-insurgency**.
- India's Constitution allows both Parliament and State Legislatures to enact laws, but only **within defined subjects and limits** laid out in the **Seventh Schedule**.

Conclusion:

The Supreme Court's ruling in the **Chhattisgarh Auxiliary Police case** stands as a **powerful reaffirmation of democratic values**—where courts safeguard rights, but **do not hinder lawful legislative action**. As India navigates complex security and governance challenges, this judgment offers a **model of constitutional harmony**, ensuring that the **rule of law**, **civil liberties**, and **State authority** can co-exist through responsible and responsive governance.

GS Paper 3 – Infrastructure, and Industry

6 Strengthening India's Chemical Industry: A Roadmap to Global Leadership

Context: In a visionary move, **NITI Aayog** has unveiled a comprehensive report titled **"Chemical Industry: Powering India's Participation in Global Value Chains"**, outlining a bold strategy to make India a global hub in the **chemical manufacturing and export landscape**. The report emphasizes the urgent need for **targeted reforms and strategic investments** to boost India's chemical sector to **USD 1 trillion** and expand its **global value chain (GVC) share from 3.5% to 12% by 2040**.

Current Position of India's Chemical Industry:

- **India ranks 6th globally** in terms of chemical production, yet its **GVC integration** remains limited.
- The sector contributes **7% to India's GDP** and is expected to be a key driver of economic growth.
- In 2023, the industry faced a **USD 31 billion trade deficit**, largely due to dependence on **imported feedstock** and raw materials.

Key Challenges Holding Back the Sector:

Despite its vast potential, India's chemical sector grapples with multiple structural challenges:

- **High Import Dependence**: A lack of **domestic feedstock production** and backward integration has led to excessive reliance on imports.
- **Weak R&D Investment**: India invests just **0.7% in research and development**, far below the **global average of 2.3%**, limiting innovation in **high-value and specialty chemicals**.
- **Skill Gap**: There is a **30% shortage of trained professionals**, creating a mismatch in industry demands and workforce readiness.
- **Other Bottlenecks**:
  - Inadequate **infrastructure and industrial clusters**
  - **Inefficient logistics and high transportation costs**
  - **Complex and overlapping regulatory frameworks**
  - Delays in **environmental clearances**

Strategic Recommendations for the Future:

To unlock the full potential of this high-impact sector, the report proposes a multi-pronged approach:

- **Viability Gap Funding (VGF)**: Introduce targeted funding to **attract private investments** in capital-intensive segments.
- **Operational Expenditure (Opex) Subsidy**: Offer subsidies for **import-dependent** but **export-potential-rich chemicals**, especially those critical to national industries like pharma, defense, and electronics.
- **Establishment of World-Class Chemical Hubs**: Develop **integrated mega chemical clusters** with plug-and-play infrastructure and simplified regulatory processes.
- **Fast-Track Environmental Approvals**: Implement **single-window clearance** and standardize compliance norms to reduce project delays.
- **Boosting Research and Skill Development**:

- Set up **centers of excellence** in chemical engineering and green chemistry.
- Launch **public-private innovation funds** to promote indigenous R&D.
- Collaborate with academia and industry for **upskilling programs**.

- **Securing Free Trade Agreements (FTAs)**: Strategically negotiate **FTAs with key markets** like the EU, ASEAN, and Gulf countries to improve **market access and global competitiveness**.

Did You Know?

- The global chemical market is projected to reach **USD 6 trillion by 2040**, and India is uniquely positioned to become a **leading manufacturing alternative to China**.
- With increasing focus on **green chemicals and sustainability**, India has a chance to lead in **bio-based and circular chemical technologies**.

Conclusion:

India's chemical sector stands at a **transformational inflection point**. With **robust policy support**, **regulatory reforms**, and **infrastructure development**, it can emerge as a **global powerhouse in chemical manufacturing and innovation**.

By addressing critical gaps and unlocking strategic investments, India can not only achieve self-reliance in key chemicals but also **position itself as a vital node in global supply chains**, contributing significantly to economic growth, exports, and job creation in the coming decades.