FINDER
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FORTUNE IAS NEWS DAILY EXPLAINER
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Non-animal testing is key to next phase of pharma growth

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies -3
Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

1.What are Non-Animal Methods (NAMs)?

- NAMs are **human-relevant scientific methods used to assess the safety and efficacy of drugs without relying solely on animal testing.**
- They include **organoids, organ-on-chip platforms, advanced computational models** and Artificial Intelligence (AI)-based approaches.
- NAMs **improve the prediction of human biological responses.**
- They can **shorten drug development timelines and improve decision-making**.

2.Why are Non-Animal Methods (NAMs) gaining importance?

- Conventional animal testing **often fails to accurately predict how drugs will behave in humans.**
- **Only 10–14% of drug candidates entering Phase I** clinical trials ultimately receive regulatory approval.
- **Poor predictability contributes to high failure rates,** rising costs and delays in drug development.
- India, as a major supplier of affordable medicines to over 200 countries, can leverage NAMs to strengthen innovation.
- NAMs complement, rather than completely replace, conventional animal testing.

3. What is India's current status in adopting NAMs?

- India has **progressively adopted alternatives such as yeast-based models, ex-vivo tissues** and 3D organoids.
- India has **strong capabilities in generic medicines, biosimilars and contract research.**
- **Existing scientific infrastructure remains underutilised** due to limited regulatory integration.
- The **regulatory framework already permits NAMs for proof-of-concept studies, target identification, drug screening** and certain toxicology studies.
- A **lack of regulatory clarity and a unified national strategy continues to constrain wider adoption.**

4. What is the way forward for India?

- India **should establish a national framework for the adoption and validation** of NAMs.
- A **central coordinating mechanism** can align research institutions, regulators and industry.
- **Clear regulatory guidance on the acceptance of NAM-generated data** will encourage industry adoption.
- **Wider use of NAMs can strengthen drug discovery,** biologics, biosimilars and cosmetics safety testing.

> - **Biologics** are medicines derived from living organisms or their cells, such as proteins, antibodies, vaccines and gene therapies, used to treat diseases like cancer and autoimmune disorders.
> - **Biosimilars** are biological medicines highly similar to an approved reference biologic, with no clinically meaningful differences in quality, safety or efficacy, and are generally more affordable.

- While animal testing will continue where necessary, expanding NAMs can progressively reduce dependence on laboratory animals and position India as a global leader in biomedical innovation.

What are the gains from the India-U.K. trade deal?

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 2
Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

1. What trade benefits does India get?

- India-United Kingdom Comprehensive Economic and Trade Agreement (CETA), a **Free Trade Agreement (FTA)**, came into force on **July 15** and is seen as a "gold standard" due to its wide and deep coverage.
- The U.K. removes tariffs on **96.8% of tariff lines** , which means **almost all Indian goods exported to the U.K. will face zero import tax**, so they become cheaper and more competitive there.
- The agreement reduces **non-tariff barriers** like **Sanitary and Phytosanitary (SPS)** measures and **Technical Barriers to Trade (TBT)**, and covers areas such as digital trade, MSMEs, labour, environment, and gender.

Sanitary and Phytosanitary (SPS) measures - rules to ensure food safety and protect humans, animals, and plants from diseases, pests, and contaminants.

Technical Barriers to Trade (TBT) - standards, regulations, and certification requirements that products must meet to be sold in a country, including quality, safety, and labeling norms.

- India gains strongly in **services** as Indian firms get **commercial presence rights** to set up offices in the U.K. in sectors like IT, consultancy, and environmental services.

2. What is the DCC and how does it help Indian workers in the U.K.?

- The **India-U.K. Double Contribution Convention (DCC)** means Indian workers in the U.K. will **not have to pay social security in both countries at the same time**.
- Earlier, they had to pay in **both India and the U.K.**, but since most stayed **less than 10 years**, they could **not get U.K. benefits**, so their money was effectively lost.
- Now, for up to **5 years**, they will **pay only in India and be exempt from U.K. contributions**, which saves **around 23% of their salary**.
- This change will benefit about **75,000 Indian workers and 900 employers**, covering **nearly 90% of Indians working in the U.K.**.

3. What does the U.K. gain?

- India provides tariff concessions covering **89.5% tariff lines**, with **30.3% immediate removal**, **47% phased reduction**, and **12.1% under quotas**(Goods get low or zero tariff only up to a fixed limit, after which normal tariffs are charged).
- This makes **U.K. whiskey, cars, and engineering goods cheaper** in India.
- U.K. firms **gain access to Indian service sectors** like finance, telecom, accounting, and environmental services without needing a local presence.
- India also agrees to recognise **U.K. professional qualifications, improving mobility of professionals.**

4. Unusual aspects and what is left out

- India will **reduce import duties on cars for the first time**, but only for a **limited number (quota)**, starting with **30-50% duty and gradually lowering to 10% in five years**.
- In **government procurement**, U.K. companies can now **participate in Indian Central government tenders (as Class-II suppliers-**firms whose products have 20-50% made in India content -partly local, partly imported**)**, while India gets access to a **large £90 billion U.K. public procurement market**.
- The agreement **does not include an investment deal**.
- India also **did not get relief from the U.K.'s Carbon Border Adjustment Mechanism (CBAM-**A tax on imports based on the carbon emissions involved in producing them**)**, so **some trade concerns, especially related to carbon taxes, still remain unresolved**.
- India should **leverage the agreement to boost export competitiveness and services expansion** while strengthening domestic industries, negotiating future **investment protection provisions**, and proactively addressing challenges like **CBAM** to ensure **long-term, balanced gains**.

What goals does Semicon 2.0 aim to achieve?

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 3
Achievements of Indians in science & technology; indigenization of technology and developing new technology.

1. Why has the Government launched ISM 2.0 and MPMS?

- On 15 July, **the Union Cabinet approved India Semiconductor Mission (ISM) 2.0 with an outlay of ₹1.27 lakh crore and the Mobile Phone Manufacturing Scheme (MPMS) with ₹62,500 crore.**
- The schemes **aim to strengthen semiconductor fabrication, assembly, packaging and mobile phone manufacturing** in India.
- The **government expects to attract ₹4 lakh crore in investments, ₹2 lakh crore in production, and ₹1 lakh crore in exports over five years**.
- The initiatives seek to **deepen India's integration into the global electronics value chain.**

MPMS (Mobile Phone Manufacturing Scheme): A Central scheme launched in 2026 to promote domestic mobile phone manufacturing, component production, design and research, with incentives linked to localisation and value addition

2. How is ISM 2.0 different from Phase I?

ISM (India Semiconductor Mission): Launched in 2021, it is India's flagship programme to develop a complete semiconductor and display manufacturing ecosystem.

- ISM Phase I **was launched in December 2021 with an outlay of ₹76,000 crore**.
- ISM 2.0 **expands support to chip design, semiconductor equipment, specialty chemicals, gases and R&D.**
- **Capital subsidy has been reduced** from up to 50% to about 30–40%.
- The Centre is **expected to provide less land support as States are increasingly offering land and incentives.**
- The scheme aims to build a complete semiconductor ecosystem, rather than only fabrication and packaging facilities.

3. What has India achieved under ISM Phase I?

- **12 semiconductor manufacturing and packaging projects have been approved** with a committed investment of ₹1.64 lakh crore.
- **Most approved units are semiconductor packaging facilities**, along with one silicon fabrication unit and one gallium nitride (GaN) Micro-LED fabrication unit.
- **24 chip design projects have been approved** under the Design Linked Incentive (DLI) Scheme.

Design Linked Incentive Scheme: Launched in December 2021 under the India Semiconductor Mission (ISM) by the Ministry of Electronics and Information Technology (MeitY), it provides financial and infrastructure support to startups, MSMEs and companies for semiconductor chip design in India.

- Semiconductor design software has been provided free to universities and startups.
- The **Semiconductor Laboratory (SCL), Mohali,** is being upgraded to support indigenous chip design and fabrication.

4. Why is India focusing on semiconductor and mobile phone manufacturing?

- **Supply chain disruptions and geopolitical tensions** underscore the need for domestic semiconductor capacity.
- **India is initially focusing on 28 nm** (chips used in automobiles and consumer electronics.
- ISM 2.0 aims to **gradually develop frontier-node semiconductor technologies.**

Frontier-node semiconductors are advanced chips manufactured using the latest process nodes (7 nm and below), offering higher performance and lower power consumption for applications such as AI and high-performance computing.

- MPMS **promotes localisation of mobile phone components, design and R&D.**
- MPMS provides 2.25%–5% incentives linked to indigenous design and value addition.

How does India's newly launched train powered by hydrogen work?

Prelims: General Studies Paper - 1
Indian Polity and Governance-Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues, etc.

Mains: General Studies - 3
Achievements of Indians in science & technology; indigenization of technology and developing new technology.

1. What is India's hydrogen-powered train?

- India's **first hydrogen-powered train** was flagged off on **July 17** and operates on the **89-km Jind–Sonipat route in Haryana**.
- It is a **10-coach train** with a capacity of around **2,600 passengers** and a design speed of **110 km/h**.

2. How does a hydrogen-powered train work?

- Unlike conventional electric trains, it **generates its own electricity onboard** using **hydrogen fuel cells**.
- In the fuel cell, stored **hydrogen combines with oxygen** from the air to generate electricity that powers the train.
- The only direct by-products are **water vapour and heat**, with **no combustion, smoke, or direct tailpipe carbon emissions**.

3. How is hydrogen produced and supplied?

- A dedicated **green hydrogen plant at Jind** produces hydrogen through **electrolysis**, in which water is split into **hydrogen and oxygen using electricity**.
- The hydrogen is then **compressed, stored, and supplied to the train** for refuelling. The facility can store nearly **3,000 kg of hydrogen**.
- Its hydrogen storage and supply system has been approved by the **Petroleum and Explosives Safety Organisation (PESO)**.

4. What safety measures are used?

- Hydrogen is **colourless, odourless, tasteless, and non-toxic**, but it is **inflammable** and requires careful handling.
- The train and hydrogen plant use **leak and flame detectors, continuous ventilation, fire alarms, and automatic shutdown systems** to detect risks and prevent accidents.
- If any unusual activity is detected, the system can **automatically stop the hydrogen supply**.

5. What is the global status and future in India?

- **Germany** was the first country to introduce commercial hydrogen passenger trains, while countries such as **France, Italy, China, and Japan** are also exploring the technology.
- Indian Railways is considering hydrogen trains for **heritage railway routes**, including the **Kalka-Shimla route**.
- Wider adoption of hydrogen-powered trains could support India's **National Green Hydrogen Mission** and its long-term **Net Zero goal**.

KEYWORDS

Investment Friendliness Index (IFI)

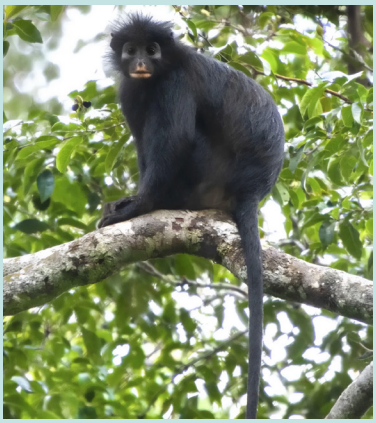
- The **Investment Friendliness Index (IFI) was released by NITI Aayog on 17 July 2026** to assess how effectively States and Union Territories create and sustain a conducive investment environment.
- The **IFI evaluates all 36 jurisdictions (28 states & 8 UTs) across eight pillars**, including Infrastructure, Business Climate, Regulatory Ease, Financial Health and Environmental Resilience.
- States and UTs are **assessed within three peer groups:** Large States, Hilly and North-Eastern States, City States and UTs to enable contextually fair **comparisons**
- **Gujarat, Maharashtra, Tamil Nadu, Goa and Odisha were the only jurisdictions classified as Overall Top Performers,** each scoring above 50.
- Among the Hilly and North-Eastern States, **Uttarakhand secured the first rank, followed by Assam and Himachal Pradesh.**
- The IFI is intended only as a ranking exercise and does not identify state-specific policy gaps or reform priorities.

Petroleum and Explosives Safety Organisation (PESO)

- The **Petroleum and Explosives Safety Organisation (PESO)** is India's **national technical regulator** for the safety of **petroleum, explosives, and compressed gases**.
- It was established in **1898** and was formerly known as the **Department of Explosives**.
- PESO functions under the **Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry**.
- It administers safety responsibilities under the **Explosives Act, 1884** and the **Petroleum Act, 1934**, along with related rules.
- PESO **licenses and regulates facilities** such as **refineries, petroleum depots, pipelines, road tankers, jetties, and other facilities handling hazardous substances**.

Species in News

Colobus congoensis



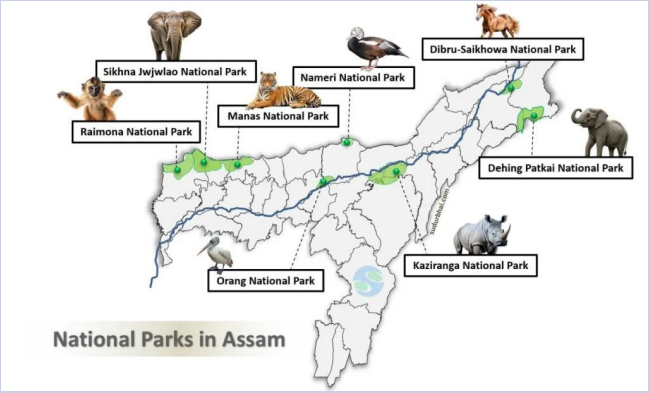
- Colobus congoensis, **commonly called Likweli, is a newly described species of African colobus monkey** discovered in the Democratic Republic of the Congo (DRC).
- It is **found in the remote rainforests between the Lomami and Congo (Lualaba) rivers, including Lomami National Park** in east-central DRC.
- Likweli is **mainly black, with a distinctive orange-cream patch around the mouth and nose,** a white rump patch, and loud roaring–snorting calls.
- Genetic studies indicate that its closest living relative is the Black Colobus (Colobus satanas), despite being separated by over 1,200 km.
- It is **only the fifth new African monkey species discovered in the last 75 years,** making it a significant discovery.
- Due to its restricted range, small population, and threats from habitat loss and hunting, **researchers have recommended that Likweli be classified as Endangered.**

Places in News

Siliguri Corridor

- The **Siliguri Corridor, also known as the "Chicken's Neck", is a narrow stretch of land in northern West Bengal** that connects India's northeastern states with the rest of the country.
- At its narrowest point, the Siliguri Corridor is **about 22 km wide and is bordered by Nepal to the west, Bhutan to the north, and Bangladesh to the south.**
- The **corridor serves as the principal land route for civilian movement, trade, and military logistics** between mainland India and the eight northeastern states.
- The strategic significance of the **Siliguri Corridor is enhanced by its proximity to China's Chumbi Valley, located near the India–Bhutan–China tri-junction.**
- Any disruption or blockade of the Siliguri Corridor could severely affect India's connectivity, security, and supply lines to the northeastern region.

Raimona National Park



- **Raimona National Park** is in the news because a recent study revealed that **invasive exotic plant species**, such as **Lantana camara** and **Chromolaena odorata**, surprisingly serve as **major nectar sources and larval host plants**, helping sustain **butterfly populations** in the park.
- Located in the **Bodoland Territorial Region of Assam**, it forms a **contiguous transboundary conservation landscape** with **Bhutan's Phibsoo Wildlife Sanctuary** and **Jigme Singye Wangchuck National Park**.
- The park is defined by **natural water boundaries**, flanked by the **Sonkosh River (west)**, the **Saralbhanga River (east) (both tributaries of the Brahmaputra)**, and the **Pekua River (south)**.
- It is **critically important for conservation** of the **endemic Golden Langur**, an **endangered primate species**, which also serves as the **official mascot of the Bodoland region**.
- The landscape exhibits **exceptional ecological diversity**, supporting **11–12 distinct forest types**, including **moist sal forests**, **Sub-Himalayan semi-evergreen forests**, and **riverine grasslands**.

Lomami National Park

- **Lomami National Park** is currently in the news because researchers have confirmed the discovery of a **new monkey species**, the **Likweli (Colobus congoensis)**, which is **small, black**, and distinguished by a **striking orange-cream patch around its mouth** and a **white patch under its tail**.
- Located in the **central-east region of the Democratic Republic of the Congo (DRC)** within the **Congo Basin**, the park lies in the **interfluve region** between the **Lomami River (west)** and the **Lualaba (Upper Congo) River (east)**.
- It was **officially established in 2016** following the **2012 discovery** of another **endemic primate**, the **Lesula monkey (Cercopithecus lomamiensis)**, which spurred the creation of the protected area.
- Spanning approximately **8,879 sq km**, the park consists mainly of **lowland equatorial rainforests** and **hydromorphic savannas**, which remain **highly intact** due to **extreme isolation** and the **absence of logging or major agricultural activity**.
- The region is a **vital conservation sanctuary**, hosting several **endemic and threatened species**, including the **Bonobo**, **Lomami red colobus**, **Dryas monkey**, **Congo peafowl**, and the **Okapi**.