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AIR 593
CITY COLLEGE KOLKATA



IRS TANMAY
AIR 346
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DAILY CURRENT AFFAIRS-

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1.Kuno Cheetah Death Highlights Challenges in Wildlife Tracking and Conservation

GS Paper III: Environment and Biodiversity |

Source: The Indian Express

Why in News?

The death of a 19-month-old male cheetah, KNG22, at the Kuno landscape in Madhya Pradesh has raised concerns over wildlife protection and monitoring under India's Project Cheetah. The cheetah, an offspring of Nirva, a South African female cheetah, was found critically injured on 25 October 2026 in the Sheopur Territorial Forest Division, near the Morena district border.

Medical investigations revealed multiple firearm injuries, and five pellets were recovered during emergency surgery. Despite treatment, the animal died on 27 October 2026. Six forest officials were suspended over alleged negligence, while the state government constituted a Special Task Force to investigate the incident. Reports also indicated the arrest of two suspects in connection with the shooting.

Project Cheetah: Background

- India's cheetah population was declared extinct in 1952.
- Project Cheetah was launched to reintroduce the species and restore ecological balance in suitable grassland and open-forest ecosystems.
- The first batch of eight cheetahs arrived from Namibia at Kuno National Park, Madhya Pradesh, in September 2022, followed by cheetahs from South Africa.
- The project aims to establish a viable free-ranging population, strengthen biodiversity conservation and restore ecological processes.

Limitations of Satellite-Based Wildlife Tracking

- Following the incident, Kuno National Park Director Uttam Kumar Sharma clarified that satellite collars do not provide continuous live tracking, contrary to popular perception.
- They transmit geographical location information at scheduled intervals rather than functioning like live surveillance systems.

- Kuno reportedly monitors around 15 cheetahs using satellite collars and Very High Frequency (VHF) radio receivers. Satellite collars provide location updates approximately every six hours.
- If a scheduled transmission is missed, the interval may increase to 12 or 18 hours. VHF equipment helps ground teams locate animals more precisely when they are within radio range.
- Satellite collars reportedly cost around ₹4–5 lakh each, with transmission frequency balanced against battery life and operational requirements.

Why Tracking Becomes Difficult?

- Signal interruptions can occur due to dense forest canopy, rocky terrain, caves, deep valleys, poor satellite visibility and temporary interference. A missed location update does not necessarily indicate collar malfunction or danger to the animal.
- Cheetahs are highly mobile and may travel 6–8 km daily, sometimes covering 12–15 km or more. They are particularly active during early morning and late evening.
- By the time field teams reach the last recorded location, the animal may have moved several kilometres away. Dense forests, difficult terrain, poor visibility and limited vehicle access further complicate ground surveillance.
- Monitoring becomes especially challenging when animals move beyond protected-area boundaries into adjoining territorial forests.

Government Response and Conservation Challenges

- The Madhya Pradesh Government has initiated an investigation through a Special Task Force involving forest and police officials.
- Six forest personnel have been suspended, while a central team involving officials associated with the National Tiger Conservation Authority (NTCA) and Wildlife Crime Control Bureau (WCCB) has been deputed to examine the incident and existing protection arrangements.
- The incident highlights broader concerns relating to inter-departmental coordination, wildlife crime prevention, human-wildlife conflict and the protection of animals moving beyond designated protected areas.
- It also demonstrates that technological monitoring alone cannot ensure wildlife safety.

Way Forward

Effective conservation requires an integrated monitoring system combining satellite collars, VHF receivers, camera traps, drones and regular ground patrols. Coordination between national park authorities, territorial forest divisions and police departments must be strengthened. Wildlife corridors, trained field personnel, timely information sharing and community participation are equally important. Tracking technology should complement, rather than replace, physical surveillance and local intelligence.

2.India's Renewable Energy Push: Strengthening Energy Security and Economic Resilience

Source: IE

Why in News?

Prime Minister Narendra Modi, addressing the inaugural session of the Bharat Renewable Energy Summit & Expo 2026 at Bharat Mandapam, New Delhi, announced an ambitious expansion of India's non-fossil fuel energy capacity. He highlighted that renewable energy investments have strengthened India's energy security and helped the economy withstand external shocks arising from the ongoing West Asia (Iran) crisis. He also reiterated the government's commitment to expanding clean energy capacity and attracting large-scale investments.

India's Renewable Energy Progress

- India has made significant progress in its clean energy transition under the principle of "Promises, Passion and Performance".
- Under its Paris Agreement commitment, India aimed to achieve 50% of its cumulative installed electricity capacity from non-fossil fuel sources by 2030, a target achieved in 2025, five years ahead of schedule.
- According to Central Electricity Authority (CEA) data cited in the report, India has approximately **308 GW of installed non-fossil fuel capacity**, accounting for 55.1% of its total installed capacity of 558.89 GW.
- The government aims to achieve **500 GW of non-fossil fuel capacity by 2030**, with further expansion planned over the next decade.

Renewable Energy and Economic Security

- The ongoing West Asia crisis has highlighted the vulnerability of economies dependent on imported fossil fuels.
- India's dependence on imported crude oil and natural gas exposes it to international price fluctuations, geopolitical tensions and supply disruptions.
- Investments in domestic renewable energy have helped diversify the energy mix and reduce exposure to external shocks.
- Unlike fossil fuels, which are concentrated in particular geographical regions, renewable resources such as solar and wind are widely available. Thus, energy security has increasingly become an essential component of India's economic security and strategic independence.

Investment Opportunities in the Renewable Energy Sector

- India has attracted more than **$164 billion (approximately ₹15 lakh crore)** in renewable energy investments over the past decade.

- Since the RE-INVEST Summit in 2024, investments of approximately $63 billion have reportedly entered the sector. The government estimates investment opportunities exceeding **₹20 lakh crore (around $220 billion)** by the end of this decade.
- These investments are expected across renewable power generation, transmission infrastructure, domestic manufacturing, battery storage and associated technologies. Policy stability, rising electricity demand and supportive government initiatives are expected to strengthen India's position as a global clean energy investment destination.

Beyond Solar and Wind: Green Hydrogen and Clean Mobility

- India's clean energy transition extends beyond solar, wind and hydropower to emerging technologies such as green hydrogen, energy storage and electric mobility.
- Under the **National Green Hydrogen Mission**, India aims to achieve green hydrogen production capacity of at least 5 million metric tonnes annually by 2030.
- Green hydrogen can help decarbonise hard-to-abate sectors such as steel, fertilisers, refining and heavy transport.
- The launch of India's first green hydrogen-powered train reflects efforts to integrate clean energy into transportation.
- The government is also encouraging rooftop solar-based cooking solutions and wider electric vehicle adoption to reduce dependence on imported fossil fuels.

Empowering Farmers: From Annadata to Urjadata

- The government is promoting decentralised renewable energy through initiatives such as **PM Surya Ghar: Muft Bijli Yojana**, which encourages rooftop solar installations in residential households, and **PM-KUSUM**, which supports solar-powered agricultural pumps and decentralised solar power generation.
- The Prime Minister emphasised that farmers should move beyond being food producers (*Annadata*) and become energy producers (*Urjadata*) by installing solar panels on vacant agricultural land and field boundaries.
- This can provide additional income to farmers, reduce dependence on conventional electricity and promote sustainable agricultural practices.

Challenges and Way Forward

- Despite considerable progress, India's renewable energy transition faces challenges such as intermittent solar and wind generation, inadequate energy storage, transmission infrastructure gaps, land acquisition difficulties, financing requirements and dependence on imported components.
- Addressing these challenges requires strengthening domestic solar and battery manufacturing, modernising electricity grids, expanding pumped-storage projects, improving transmission infrastructure and encouraging private investment.

- Greater research and development, technological innovation and community participation are also essential to ensure an affordable, reliable and inclusive energy transition.

3.Exostoma nasibarbatum: New Catfish Species Discovered in Manipur

Source: The Hindu

Why in News?

A new species of rare glyptosternine catfish, named *Exostoma nasibarbatum*, has been identified in Manipur, highlighting the rich freshwater biodiversity of Northeast India. The species was discovered during a scientific survey of the Bupal stream, a tributary of the Dujang River in the Chindwin river system, near the Myanmar border.

About Exostoma nasibarbatum

- *Exostoma nasibarbatum* is a freshwater catfish belonging to the genus *Exostoma*.
- It inhabits fast-flowing and turbulent streams characterised by large boulders and rocky substrates.
- The species possesses specialised morphological adaptations that help it survive in strong water currents and remain attached to rocky surfaces.
- Its major adaptations include a strongly flattened head and body, enlarged paired fins with adhesive striae and flattened maxillary barbels that assist in attachment to rocky substrates.
- Its most distinctive feature is a prominent nasal barbel extending beyond the posterior margin of the eye (orbit). The species name combines the Latin words *nasus* (nose) and *barba* (beard), referring to this elongated sensory organ.

Taxonomic Classification and Distribution

- The newly identified species belongs to the genus *Exostoma*, a group of Asian freshwater catfishes
- It belongs to the family **Sisoridae** under the order **Siluriformes**. Sisorid catfishes are commonly associated with fast-flowing mountain streams and river systems.
- According to the reported classification, 23 valid species are recognised within the genus *Exostoma*, distributed across major river systems of the Indian subcontinent and Southeast Asia. Of these, seven species are recognised in the Chindwin–Irrawaddy drainage system.

Ecological Significance

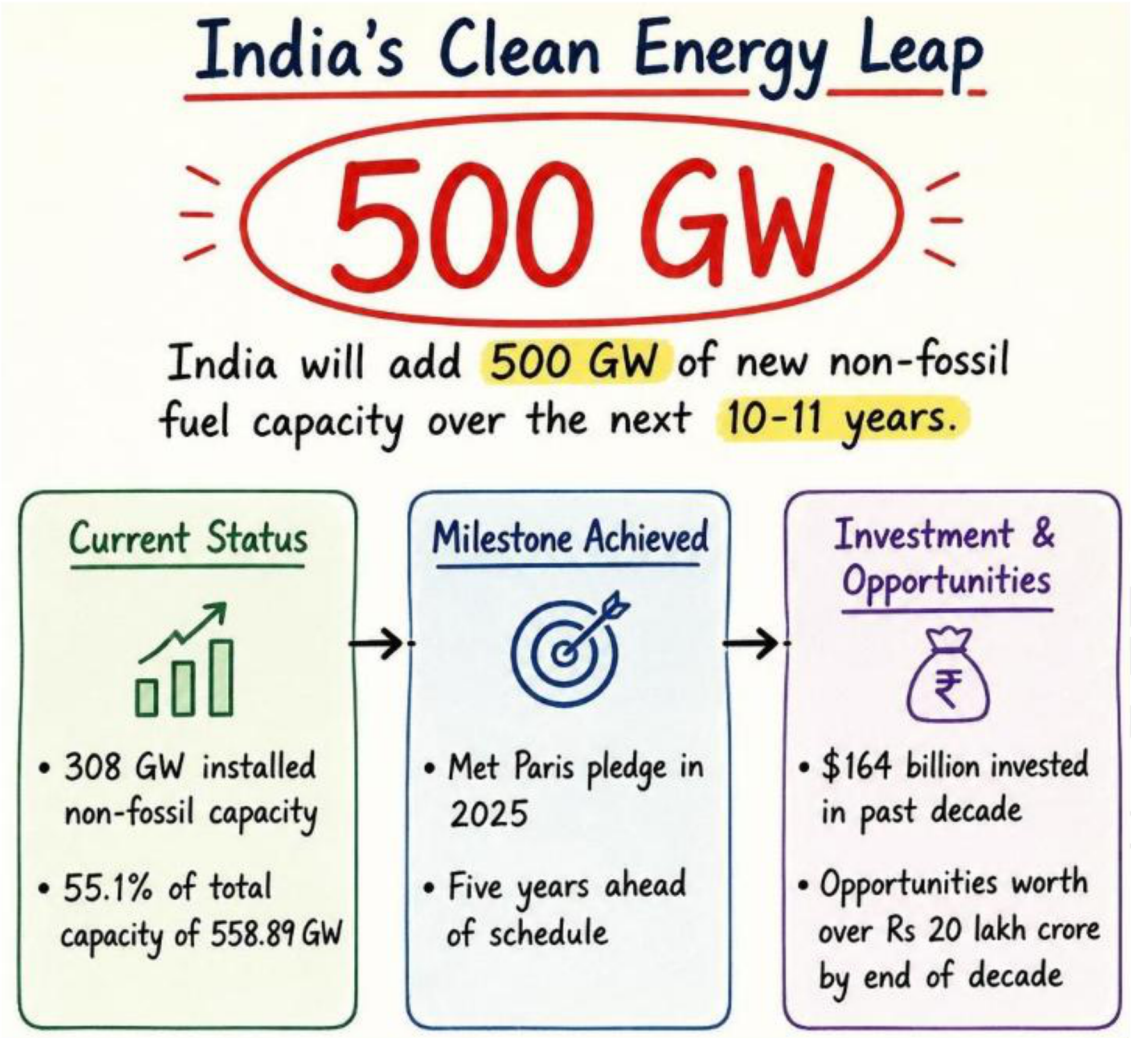
- The discovery highlights the importance of Northeast India's freshwater ecosystems, particularly the river systems connected to the Indo-Myanmar biodiversity region.
- Such habitats support specialised aquatic species with unique ecological adaptations.
- The identification of previously undocumented species also indicates the need for systematic freshwater biodiversity surveys, habitat protection and conservation of river ecosystems.

4.India to Add 500 GW Non-Fossil Fuel Capacity in the Next 10–11 Years

Source: The Hindu

Why in News?

Prime Minister Narendra Modi announced that India will add 500 GW of new non-fossil fuel-based power generation capacity over the next 10–11 years. He made this announcement while addressing the inaugural session of the Bharat Renewable Energy Summit and Expo 2026 in New Delhi.



Key Highlights

- India currently has 308 GW of installed non-fossil fuel capacity, accounting for approximately 55.1% of its total installed power generation capacity of 558.89 GW, according to the Central Electricity Authority (CEA).
- India achieved its target of generating 50% of its installed electricity capacity from non-fossil fuel sources in 2025, five years ahead of the 2030 deadline under its Paris Agreement commitment.
- The Prime Minister stated that India has attracted more than $164 billion in investment in the renewable energy sector over the past decade.
- Around $63 billion has been invested in the sector since the RE-INVEST Summit 2024.
- India has investment opportunities worth more than ₹20 lakh crore (approximately $220 billion) in the renewable energy sector by the end of this decade.

India's Non-Fossil Fuel Energy Target

- The newly announced target of adding 500 GW of non-fossil fuel capacity over the next 10–11 years is separate from India's existing target of achieving 500 GW of non-fossil fuel capacity by 2030.
- India has already achieved nearly 300 GW of installed non-fossil fuel capacity towards its 2030 target, as mentioned in the report.
- The expansion of non-fossil fuel capacity is part of India's broader strategy to strengthen energy security and reduce dependence on fossil fuels.
- Non-fossil fuel energy sources include solar, wind, hydropower, nuclear energy and bioenergy.

India's International Climate Commitments

Paris Agreement and Nationally Determined Contributions (NDCs)

- India submitted its updated Nationally Determined Contribution (NDC) under the Paris Agreement in 2022.
- India committed to achieving 50% of its cumulative installed electric power capacity from non-fossil fuel-based energy resources by 2030.
- India achieved this target in 2025, five years ahead of schedule.

Net-Zero Target

- India has announced its goal of achieving net-zero greenhouse gas emissions by 2070.
- This commitment was announced by Prime Minister Narendra Modi at the COP26 Climate Change Conference held in Glasgow, United Kingdom, in 2021.

Significance of Renewable Energy Expansion

- Renewable energy expansion will help India reduce its dependence on imported fossil fuels and strengthen national energy security.
- Greater investment in clean energy will support the development of domestic manufacturing, infrastructure and employment opportunities.
- Diversification of energy sources will help India become more resilient to international energy supply disruptions and fluctuations in fossil fuel prices.
- The expansion will also support India's efforts to address climate change and reduce greenhouse gas emissions.

5.How Smoking Sets the Stage for Lung Cancer: New Study

Source: The Hindu

Why in News?

A study published in the journal Proceedings of the National Academy of Sciences (PNAS) on 5 October 2026 revealed how chronic cigarette smoke exposure can reprogramme lung stem cells into a precancerous state. The study explains how smoking makes lung cells more vulnerable to cancer-causing genetic mutations.

Key Highlights

- The study was conducted by researchers from Johns Hopkins University School of Medicine and the Van Andel Research Institute.
- Researchers used laboratory-grown lung organoids, which are three-dimensional mini-lung models, to understand the effects of chronic cigarette smoke exposure.
- The study found that prolonged exposure to cigarette smoke causes epigenetic changes in lung stem cells, altering their normal functioning without changing their underlying DNA sequence.
- These changes create a precancerous environment in which damaged cells can survive, multiply and become more vulnerable to cancer-causing mutations.
- The research identified two major types of lung cancer associated with this process: adenocarcinoma and squamous cell carcinoma.
- The findings are relevant for India, where lung cancer is a major public health concern. Apart from smoking, exposure to air pollution and biomass smoke also contributes to lung cancer risk.

Detailed Findings of the Study

Epigenetic Changes in Lung Stem Cells

- Chronic cigarette smoke exposure causes epigenetic reprogramming of lung stem cells.
- Epigenetic changes affect how genes are switched on or off without changing the actual DNA sequence.
- Researchers observed that certain lung stem cells started growing faster and developed an abnormal injury-like identity within one to three months of smoke exposure.

- This condition resulted in metaplasia, a process in which one type of normal cell is replaced by another type of cell.

Role of the Zbp1 Gene

- The study found that cigarette smoke silences regulatory regions of genes involved in protecting cells, including the Zbp1 gene.
- Zbp1 plays an important role in cellular defence mechanisms and programmed cell death.
- When this protective mechanism is suppressed, damaged and abnormal cells may survive instead of undergoing self-destruction.
- This allows potentially harmful cells to persist and increases their vulnerability to cancer-causing mutations.

Role of the Immune System

- Chronic smoke exposure also changes the functioning of macrophages, which are immune cells responsible for detecting and removing harmful substances and abnormal cells.
- These changes weaken local immune defence mechanisms and may allow abnormal cells to escape immune surveillance.
- As a result, the lung tissue becomes more favourable for the development and growth of cancer cells.

Role of Genetic Mutations in Lung Cancer

The researchers found that smoke exposure alone did not produce tumours in the experimental models. Cancer developed when specific genetic mutations were introduced into lung organoids that had already been exposed to chronic smoke.

Two important genetic changes were identified:

- KRAS mutation: When introduced into deeper lung stem cells, it led to the development of lung adenocarcinoma.
- TP53 loss: When introduced into airway lining stem cells, it resulted in squamous cell carcinoma.

Major Types of Lung Cancer

Lung Adenocarcinoma

- It is a type of non-small cell lung cancer (NSCLC).
- It generally develops in the peripheral or outer regions of the lungs.
- It is one of the most common types of lung cancer.

- It can occur in both smokers and non-smokers.

Squamous Cell Carcinoma

- It is another major type of non-small cell lung cancer.
- It usually develops in the lining of the airways.
- It is strongly associated with cigarette smoking.

Significance of the Study

- The study explains that smoking does not simply damage lung cells; it can also create a precancerous environment that makes cells more vulnerable to cancer.
- It provides a better understanding of how environmental exposure and genetic mutations work together in cancer development.
- The findings may help researchers identify early biological changes associated with lung cancer and develop better prevention and treatment strategies.
- The research is particularly relevant for India because exposure to tobacco smoke, air pollution and biomass smoke remains an important public health concern.

6.Grey Market and IPO Booms: What Retail Investors Need to Watch Out For

Source: The Hindu

Why in News?

The unofficial grey market trading of shares of companies awaiting their stock market listing has been gaining popularity in India. The Small Investors Welfare Association (SIREN) wrote to the Securities and Exchange Board of India (SEBI) on 21 October, seeking immediate intervention against unregulated trading in IPO shares and the publication of unofficial Grey Market Premium (GMP) rates.

What is the Grey Market?

- The grey market is an unofficial and unregulated market where investors buy and sell IPO shares before they are officially listed on stock exchanges.
- These transactions take place outside recognised stock exchanges and are not supervised by SEBI.
- Trading generally happens through informal networks, brokers and online platforms such as WhatsApp and Telegram.

- Since these transactions are not conducted through recognised exchanges, investors do not receive the same regulatory protection available in the formal securities market.

What is Grey Market Premium (GMP)?

- Grey Market Premium (GMP) refers to the additional amount at which an IPO share is traded in the unofficial market above its issue price before listing.
- It is often used by investors as an unofficial indicator of the expected listing performance of an IPO.
- For example, if a company issues shares at ₹100 and its grey market premium is ₹40, the unofficial market price is ₹140.
- However, GMP is not an official indicator of a company's value or guaranteed listing gains because it is based on unofficial transactions and market expectations.

Key Concerns Associated with the Grey Market

- Lack of Regulation: Grey market transactions take place outside the regulatory framework of SEBI, leaving investors with limited protection against fraud and disputes.
- Price Manipulation: Unofficial GMP figures can be manipulated to create artificial demand and influence retail investors.
- Misleading Investment Decisions: High GMP may encourage investors to subscribe to an IPO without properly examining the company's financial performance, valuation and business risks.
- Lack of Transparency: Most transactions are based on verbal agreements without formal documentation.
- Financial Losses: Investors may suffer significant losses when actual listing prices differ from unofficial market expectations.

Role of SIREN

- The Small Investors Welfare Association (SIREN) approached SEBI on 21 October, seeking action against the growing grey market.
- It highlighted that unofficial premiums are openly circulated through WhatsApp, Telegram and online tracking portals.
- SIREN compared such activities to illegal betting because investors speculate on the expected listing prices without participating in a regulated trading system.

- It urged SEBI either to take strict action against operators and platforms publishing unofficial rates or to examine the possibility of a regulated mechanism for legitimate pre-listing transactions.

Example: Reliance Power IPO

- SIREN cited the Reliance Power IPO as an example of the risks associated with grey market speculation.
- Before listing, its shares were reportedly trading at very high unofficial premiums.
- However, after listing, the share price fell sharply and traded nearly ₹100 below its issue price of ₹450.
- This example highlights that a high grey market premium does not guarantee listing gains.

Regulatory Framework in India

- The Securities and Exchange Board of India (SEBI) is the primary regulator of India's securities market.
- SEBI was established in 1988 and received statutory status under the SEBI Act, 1992.
- SEBI regulates stock exchanges, securities intermediaries and the securities market to protect investors and promote fair trading practices.
- Stock exchange trading platforms must be operated by recognised stock exchanges under the applicable regulatory framework.
- Grey market transactions operate outside this recognised exchange mechanism.

What Should Retail Investors Keep in Mind?

- Investors should not make IPO investment decisions solely on the basis of Grey Market Premium.
- They should carefully examine the company's financial statements, business model, valuation and future growth prospects.
- Investors should read the Red Herring Prospectus (RHP) before subscribing to an IPO.
- IPO applications and share trading should be conducted through authorised and regulated channels.