



### Indigenous Technology Cruise Missile (ITCM)

**Context:** Recent rules allow GNSS-equipped vehicle owners to travel 20 km daily on highways free of charge.

#### Overview:

- Under the National Highways Fee (Determination of Rates and Collection) Amendment Rules, 2024, fees apply for distances over 20 km.
- Nitin Gadkari announced GNSS fee pilot studies on NH-275 and NH-709, with global EOI from June 7 to July 22, 2024.

**Global Navigation Satellite System (GNSS)** uses satellites to provide global positioning by transmitting signals with time and orbital data, enabling receivers to determine location through trilateration.

#### Key Components

- Satellites:** GNSS satellites orbit the Earth and transmit signals that contain time and position data.
- Receivers:** These devices calculate positions based on the signals received from multiple satellites.
- Trilateration:** This method involves calculating the receiver's location by measuring distances from at least four satellites.

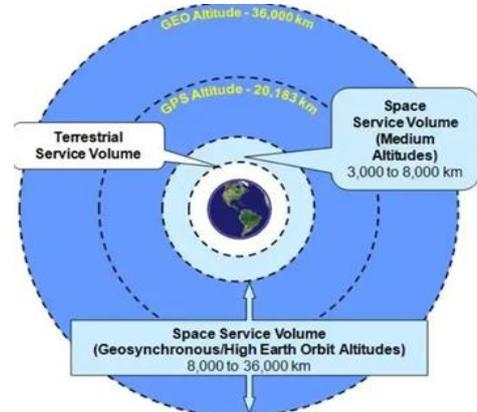
#### Global GNSS Networks

- GPS (Global Positioning System)**
  - Operator:** USA
  - Coverage:** GPS provides global coverage.
  - The GPS system was initiated in the 1970s and became fully operational with a constellation of 24 satellites by 1993.
  - GPS typically offers positioning accuracy of around 5 meters.
- Galileo**
  - Operator:** The European Union
  - Coverage:** Galileo offers global coverage.
  - Galileo aims to provide higher accuracy compared to GPS by using advanced algorithms and additional satellites.
- GLONASS (Global Navigation Satellite System)**
  - Operator:** Russia.
  - Coverage:** GLONASS provides global coverage.
  - GLONASS accuracy is comparable to GPS and improves with a greater number of satellites.
- BeiDou Navigation Satellite System**
  - Operator:** China
  - Coverage:** BeiDou offers global coverage.
  - BeiDou provides positioning accuracy comparable to or better than GPS and offers regional services with high precision.
- QZSS (Quasi-Zenith Satellite System)**
  - Operator:** Japan
  - Coverage:** QZSS primarily serves Japan and surrounding areas.

- QZSS enhances GPS accuracy specifically in Japan.

#### Indian GNSS Systems

- NavIC (Navigation with Indian Constellation)**
  - Operator:** NavIC is operated by India, specifically by the Indian Space Research Organisation (ISRO).
  - Coverage:** NavIC provides coverage over India and extends up to approximately 1,500 kilometers from its borders.
  - Satellites:** The NavIC system consists of 8 satellites.
  - Accuracy:** NavIC offers positioning accuracy of around 3 meters, which is more precise than GPS.
  - Applications:** Current applications of NavIC include vehicle tracking, emergency alerts for fishermen, and natural disaster monitoring.
  - Future Plans:** India has ambitions to expand NavIC from a regional system to a global system over time.
- IRNSS (Indian Regional Navigation Satellite System)**
  - Predecessor:** IRNSS is the predecessor to NavIC and forms part of the NavIC system.
- Operational Mechanism**



- Satellites' Orbits:** GNSS satellites are positioned in medium-Earth orbit, approximately 20,000 kilometers above the Earth.
- Satellite Constellations:** To ensure comprehensive global coverage, a minimum of 24 to 30 satellites are required. These satellites circle the globe twice daily.
- Trilateration Process:**
  - With a signal from one satellite, the receiver can determine its location on a spherical surface around the Earth.
  - With signals from two satellites, the receiver can narrow the location to one of two points where their spherical surfaces intersect.

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- With three satellites, the receiver can determine its position in two dimensions on the Earth's surface.
- Adding a fourth satellite allows the determination of the altitude, providing a three-dimensional position.

#### ➤ **Difference Between GPS and GNSS**

- **GPS:** GPS refers specifically to the Global Positioning System operated by the United States. It is a part of the broader GNSS framework.
- **GNSS:** GNSS is the overarching term that includes various global and regional satellite navigation systems, such as GPS, Galileo, GLONASS, BeiDou, and regional systems like NavIC. The use of multiple GNSS systems can enhance accuracy and availability compared to relying solely on GPS.

## Anusandhan National Research Foundation(ANRF)/(NRF)

**Context:** Recently, ANRF will coordinate R&D efforts across ministries to reduce duplication and enhance efficiency.

#### ➤ **Overview:**

- ANRF will coordinate resources and align R&D efforts across sectors, aiming to make India's R&D landscape more cohesive and impactful.
- Relying on non-governmental funding, ANRF will align research with market needs and address funding delays.

Anusandhan National Research Foundation(ANRF) directs and oversees scientific research in India, aiming to advance innovation and development across educational institutions and research centers.

The Department of Science and Technology (DST) will oversee NRF's operations.

#### ➤ **NRF Act, 2023:**

- The Act authorizes NRF's creation, replacing the Science and Engineering Research Board (SERB).
- NRF will guide scientific research, innovation, and entrepreneurship.
- Funded with 50,000 crore from 2023 to 2028.

#### ➤ **Origins and Evolution:**

- Concept proposed in 2005 by the Science Advisory Council to the Prime Minister.
- Endorsed by Prime Minister Manmohan Singh and evolved into SERB in 2008.
- NRF aims to offer high-level strategic guidance and investment in scientific research.

#### ➤ **Objectives:**

- To increase private sector investment in research.
- To allocate a larger share of government funding to state universities and colleges.

#### ➤ **Key Functions:**

- Developing strategic research and development roadmaps.
- Expanding research infrastructure across educational and research institutions.
- Funding competitive, peer-reviewed research grants.
- Facilitating the transition of research into capital-intensive technologies.
- Enhancing national and international research engagement.
- Encouraging investments from both public and private sectors.
- Conducting annual evaluations of scientific research and expenditure.

#### ➤ **Governing Board :**

- **President/Chairperson:** Prime Minister of India.
- **Vice Presidents:** Union Minister of Science and Technology and Union Minister of Education.
- **Member Secretary:** Principal Scientific Advisor.

#### ➤ **Additional Members:**

- Secretaries from relevant departments such as Science and Technology, Biotechnology, Scientific and Industrial Research, and others.
- Representatives from business sectors, social sciences, and humanities as appointed by the President.

#### ➤ **Rationale Behind Establishing the National Research Foundation**

- India's Gross Expenditure on Research and Development (GERD) is about 0.7% of GDP, below the global benchmark of 2%.
- A substantial increase in funding and a strategic approach are required to enhance India's leadership in science.
- Government funding constitutes 52% of GERD in India, significantly higher compared to the US, Germany, and China. NRF aims to boost private sector contributions.

#### ➤ **Significance and Potential of the National Research Foundation**

- NRF will prioritize funding for projects in underserved, rural, and semi-urban areas.
- NRF will support diverse research areas including social sciences, arts, and humanities.
- NRF will manage and implement missions such as supercomputing and quantum research effectively.
- NRF will foster partnerships among business, academia, government, and research institutions, leveraging private sector resources.

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## National Board for Wildlife (NBWL)

**Context:** the National Board for Wildlife's standing committee cleared 121 projects, including transmission lines and infrastructure in wildlife areas.

### ➤ Overview:

- Recent approvals for transmission lines in Gujarat include projects in Kutch Desert and Wild Ass sanctuaries, with mandated mitigation measures.
- Recent NBWL clearance conditions require guarding transmission pillars to prevent wildlife contact and studying the impact on biodiversity to preserve habitat integrity.

The National Board for Wildlife (NBWL) is India's apex body for wildlife-related matters, focusing on wildlife conservation and forest development.

It is a **statutory body** constituted under Section 5A of the Wildlife (Protection) Act, 1972 (WLPA).

It approves projects (including government projects) in and around the protected areas (national parks, wildlife sanctuaries, etc.).

It is an advisory board and advises the central government on policy matters concerned with wildlife conservation in the country.

- Established:** 2003
- Replaced:** Indian Board for Wildlife (1952)
- Chairperson:** Prime Minister of India
- Vice-Chairperson:** Minister of Environment, Forests, and Climate Change

- Composition:** 47 members, including the Prime Minister and key officials

### ➤ Functions:

- Promote and develop wildlife conservation.
- Advise the government on wildlife-related policy matters.
- Approve projects in and around protected areas.
- Ensure no alteration of protected area boundaries without NBWL's approval.

### ➤ Standing Committee:

- Comprises at least ten members nominated by the Environment Minister.
- Focuses on project clearances within protected areas and eco-sensitive zones.
- The Standing Committee handles project approvals but has faced criticism for prioritizing economic benefits over environmental impacts.

### ➤ Recent Criticisms:

- The NBWL has not met for six years, leading to concerns about its role in policy advice and conservation.
- Criticized for allowing projects that may harm wildlife and ecosystems, with insufficient consideration of long-term environmental effects.
- Lack of independent environmentalists on the committee has raised concerns about the effectiveness of project approvals.

## NEWS IN BETWEEN THE LINES

### Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana



Union Minister for Fisheries, Animal Husbandry and Dairying, Rajiv Ranjan Singh will launch Pradhan Mantri Matsya Kisan Samridhi Sah-Yojna in an event in New Delhi today on 11<sup>th</sup> of September.

#### About Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana:

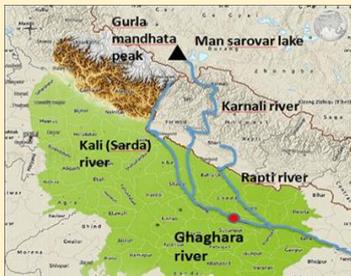
- The Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY) is a **sub-scheme of the Pradhan Mantri Matsya Sampada Yojana (PMMSY)**.
- It **aims to gradually formalize** the unorganized fisheries sector by allowing **fishers, fish farmers** and supportive workers to self-register on a digital platform.
- It also aims to provide access to institutional **financing for micro and small enterprises in the fisheries sector**.
- It provides a **one-time incentive** to beneficiaries for purchasing aquaculture insurance.
- It is expected to generate significant employment opportunities, **including 1.7 lakh new jobs**.
- The scheme also prioritizes the employment of **75,000 women**.

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## Ghaghara River



Recently, the Uttar Pradesh Forest Department captured its fifth wolf under 'Operation Bhediya' in Bahraich district near the Ghaghara river.

### About the Ghaghara River:

- The Ghaghara River, is a **major tributary of the Ganges River**.
- It also known as the **Karnali River in Nepal, Mapcha Tsangpo in Tibet** and the lower Ghaghara in **Awadh is known as the Sarayu River**,
- It is a **perennial trans-boundary river** that originates from the **Mapchachungo glaciers in Tibet**.
- This river flows through **Tibet, Nepal and India**.
- It joins the **Sarda River** on the plains before meeting the Ganges at **Chhapra, Bihar**.
- Its major tributaries include the **Tila, Seti, Beri, Rapti, Budhi Ganga** and **Chhoti Gandhaki**.
- Some districts of Uttar Pradesh like **Barabanki, Basti, Ayodhya** and **Mau** are located on the bank of the Ghaghara river.

## National Human Rights Commission



Recently, the National Human Rights Commission (NHRC) issued a notice to the Jharkhand government after a pregnant woman in labour pain was left unattended for about 27 hours at M.G.M. Hospital, Jamshedpur in Jharkhand.

### About National Human Rights Commission:

- The National Human Rights Commission is a **statutory body**.
- It was established on **October 12, 1993**, in accordance with the **Paris Principles**.
- It is responsible for reviewing and addressing human rights **violations** and making recommendations for their protection and promotion.
- It is mandated to protect human rights as "**rights related to life, liberty and dignity** of an individual guaranteed by the **constitution and courts** of our country".
- It is a multi-member body including a **chairman, four members** and **four ex-officio members**.
- The **chairman and members serve for a five-year term** or until they reach the **age of 70**, whichever comes first.

## Keratin



### About Keratin:

- Keratin is a **structural protein found in epithelial cells**, essential for strengthening **hair, nails** and the **outer layer of the skin**.
- It is found in the **epidermal layers** of the skin and the cells of hair and nails.
- It is a **fibrous protein** that is insoluble in water, making it durable and protective.
- Keratin provides strength and rigidity to hair, skin and nails, while forming a **protective barrier against heat, chemicals and pathogens**.
- There are two types of keratin including **Alpha-keratin**, found in humans and **mammals** (hair, skin, nails) and **Beta-keratin**, present in birds and **reptiles** (feathers, scales).
- Keratin can be **extracted from animal horns, feathers and wool for use in hair cosmetics** and also serves as a **tumor marker in cancer treatment**.
- **Keratinization** is the process in which cells fill with keratin, die and form the tough, protective outer layer of hair, nails, and skin.
- As hair cells move away from the root, they die and become **keratinized**, giving hair its structure and strength.

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## POINTS TO PONDER

- Where is the headquarters of the International Solar Alliance located? – **Gurugram**
- What organization provides political risk insurance and credit enhancement for investments in developing countries? – **MIGA**
- What is the scientific name of the Elongated Tortoise? – **Indotestudo elongata**
- Which country was severely affected by Typhoon Yagi, Asia's most powerful storm this year? – **Vietnam**
- Where did the 20th edition of Exercise Yudh Abhyas-2024 commence? – **Rajasthan**

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