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School of Research Based Learning & Competition

Current Affairs - 12 July 2026

INDIA'S FIRST HYDROGEN TRAIN: A GREEN LEAP FOR INDIAN RAILWAYS

PM Modi will flag off India's first hydrogen-powered train in Jind, Haryana, on July 17, 2026.

With this, India joins an elite group of countries, including Japan, South Korea, the US, and Canada, that operate hydrogen trains ("H-trains"), marking a major milestone in green transportation technology.

Key Features of the Train

- India's hydrogen train is among the world's longest and most powerful hydrogen trainsets, with the following specifications:
 - **Configuration:** Eight passenger cars and two driving power cars (10 coaches total)
 - **Power:** 2400 kilowatts (3200 hp)
 - **Capacity:** 682 seats, with a total passenger capacity of 2,600
 - **Route:** 89-km Jind-Sonipat section via 12 stations, with a 2-hour travel time
 - **Speed:** Operational speed of 75 km/h, maximum speed of 120 km/h
 - **Operations:** Two round trips daily, covering 356 km and consuming about 300 kg of hydrogen
 - **Emissions:** Zero CO2 emissions; the only by-product is harmless water vapour

Global Context: Hydrogen Trains Elsewhere

- French rolling stock giant **Alstom** first presented hydrogen train technology at a 2016 exhibition in Berlin.
- Its Coradia iLint train-set was launched in **Germany** in 2018, becoming the **world's first hydrogen-powered** passenger train.
- Japan, China, and the US subsequently launched their own hydrogen trains.
- However, the technology remains in an evolving stage for mass transportation of passengers and freight, which is why few countries operate such trains, and mostly for short-haul routes.

How Do Hydrogen Trains Work?

Unlike conventional electric locomotives that draw alternating current from overhead wires, hydrogen trains **generate their own electricity** by combining hydrogen with oxygen.

- In India's hydrogen train, each of the two power cars houses four integrated power packs, comprising hydrogen fuel cells and lithium ferro phosphate batteries.
- The fuel cell draws hydrogen stored on board (440 kg, at high pressure) and combines it with oxygen from the outside air to generate electrical energy.
- **Power distribution**
 - Each power pack generates 300 kW (115 kW from the fuel cell, 185 kW from the battery).
 - Four power packs together provide 1200 kW per power car, and with two power cars, total power reaches 2400 kW, comparable to conventional electrical or diesel-electric multiple unit trains on similar routes.

The Storage Challenge

- Storing and transporting hydrogen safely is the biggest technical hurdle.
- While normal atmospheric pressure is one "bar," hydrogen must be stored at 200-500 bar, making it highly flammable and difficult to handle.
- Additionally, hydrogen production levels remain low globally, and transportation is logistically challenging.
- To address this, Indian Railways has set up a 3,000-kg-capacity fuelling facility at Jind, along with a chiller plant that cools hydrogen to minus 15°C during dispensing, converting it into a liquid state for safer and easier handling.

Conclusion

India's first hydrogen train marks a significant stride toward clean, zero-emission rail transport, placing the country among a handful of global pioneers.

However, challenges around hydrogen storage, production, and cost mean its long-term expansion will depend heavily on pilot project's real-world performance on Jind-Sonipat route.

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INDIA-NEW ZEALAND RELATIONS - ELEVATING TO STRATEGIC PARTNERSHIP AND ROADMAP TO 2030

- The Indian PM's visit to New Zealand—the **first** by an Indian Prime Minister in 40 years—marked a major milestone in bilateral relations.
- India and New Zealand **formally elevated** bilateral relations to a Strategic Partnership and endorsed a Roadmap to 2030 for comprehensive cooperation.
- The partnership is anchored in democratic values and rule of law, economic collaboration, security and defence cooperation, and **people-to-people** and cultural ties.
- The visit symbolised a renewed phase in bilateral engagement after four decades.

Economic Cooperation and Free Trade Agreement (FTA):

- **Trade expansion:**
 - Both countries committed to **doubling** bilateral trade to NZ\$7 billion (around ₹35,000 crore) by **2030**.
- **Investment commitments:**
 - New Zealand announced its intention to invest **USD 20 billion in India** over the next 15 years.

Defence, Maritime Security and Indo-Pacific Cooperation:

- **Maritime security and counter-terrorism:**
 - To strengthen regional security, both sides agreed to establish a Maritime Security Dialogue, create a Joint Working Group (JWG) on Counter-Terrorism, and enhance information sharing.
- **Shared Indo-Pacific vision:**
 - The two leaders reaffirmed commitment to:
 - A free, open, inclusive, stable and prosperous Indo-Pacific.
 - Freedom of navigation and overflight, in accordance with the 1982 United Nations Convention on the Law of the Sea (UNCLOS).
 - Respect for international law and peaceful resolution of disputes.

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- **Combined Task Force-150 (CTF-150):**
 - The leaders highlighted cooperation under CTF-150 in 2025, in which New Zealand served as Commander, while India served as Deputy Commander.
 - The force works to combat narcotics trafficking, maritime terrorism, and illicit maritime activities in the Middle East and Western Indian Ocean.

Sectoral Cooperation:

- **Agriculture and animal husbandry:**
 - Both sides signed agreements on animal husbandry and dairying, technical collaboration and exchange of best practices.
 - **Launch of the Kiwifruit Action Plan.** Establishment of Centres of Excellence for Kiwifruit in Nagaland and Uttarakhand.
- **Joint Action Plan on Sport:** It will promote cooperation in high-performance sports, sports science, sports medicine, and athlete development.
- **Scientific collaboration:** The countries also agreed to enhance cooperation in Antarctic research, and scientific knowledge exchange.
- **Cultural similarities:** Linking **Matariki**, the Māori New Year - marked by the appearance of the Pleiades star cluster. Kritika, the ancient Indian name for the same constellation.

India-New Zealand Relations:

- **Diplomatic ties:** Both established diplomatic relations in 1952, with their missions later being upgraded to High Commissions. The relationship is founded on shared democratic values, **Commonwealth membership**, etc.
- **People-to-people connect:** The Indian diaspora numbers around 250,000, making it the **3rd**-largest ethnic community in New Zealand. India is the **2nd**-largest source (~8,000) of international students in New Zealand.
- **Strategic engagement:** New Zealand's "**Opening Doors to India**" (2011) policy and "**India–New Zealand 2025: Investing in the Relationship**" (2020) strategy reflect its long-term commitment to deepening engagement with India.

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VAR UNDER THE SCANNER: UNDERSTANDING FOOTBALL'S VIDEO ASSISTANT REFEREE CONTROVERSY

The Video Assistant Referee (VAR) system came under intense scrutiny during the FIFA World Cup clash between Egypt and Argentina in Atlanta. A well-crafted Egyptian goal was disallowed after VAR intervention flagged a foul in the build-up, sparking outrage from the Egyptian camp.

What is VAR and How Does It Work?

- VAR refers to both the **video review system** and the **chief referee** who monitors play, typically from a central hub.
- The system was proposed in the early 2010s and approved by the International Football Association Board (IFAB) in 2016, with the primary objective of avoiding "clear and obvious errors" during key match incidents.
- The setup includes **multiple high-quality cameras** positioned around the venue and a pitch-side monitor near the dugouts.
- The VAR official recommends that the on-field referee review certain incidents, but the final call rests with the on-field referee, who can accept or reject the recommendation even after review.

When Can VAR Intervene?

- VAR is primarily used to review **four categories of decisions**: goal or no goal, penalty or no penalty, direct red cards (including reversals), and cases of mistaken identity.
- At this World Cup, its third consecutive edition since introduction in 2018, VAR has taken on **additional responsibilities**, including reviewing wrongly awarded corner kicks and correcting incorrectly issued second yellow cards.

The Egypt-Argentina Controversy

- Egyptian player Mostafa Zico scored following an impressive attacking move, but the goal was disallowed after VAR official Jerome Brisard flagged a possible foul by Egypt's Marwan Attia on Argentina's Lisandro Martinez elsewhere on the pitch.

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- On-field referee Francois Letexier reviewed the footage and ruled that Attia had unfairly won the ball in the build-up, disallowing the goal.
- Egypt contested this decision on two grounds:
 - that the **foul occurred away** from where the goal-scoring move began, and
 - that **no similar review was granted** for alleged fouls on Egyptian players inside Argentina's box just before Argentina's winning goal.
- FIFA's chief refereeing officer clarified that there is no defined limit on distance or time between a foul and a goal for VAR to intervene in the build-up.
- **FIFA's Response**
 - Following the backlash, FIFA introduced a significant operational change: two in-house VAR officials will now be appointed for every match from the quarterfinals through the final.
 - This is aimed at improving oversight and consistency in decision-making.

Key Criticisms of VAR

- **Inconsistency:** Similar incidents are often judged differently by different referees, creating confusion over what constitutes a penalty or red card.
- **Over-officiating:** Critics argue VAR is making football "soft" by flagging fouls barely visible to on-field officials, as seen in Germany's disallowed goal against Paraguay in the round-of-32.
- **Lack of transparency:** Fans, players, and coaching staff are frequently left uninformed about the reasoning behind VAR's recommendations to the on-field referee.

Conclusion

The Egypt-Argentina episode has exposed persistent flaws in VAR's application, particularly around consistency and communication. While FIFA's move to add a second VAR official signals responsiveness, the deeper challenge remains balancing technological precision with football's fast-paced, human character.

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GLOBAL LIVEABILITY INDEX



- It is published by the Economist **Intelligence Unit (EIU)**.
- Its purpose is to **evaluate how suitable cities** are for living by measuring everyday living conditions rather than economic size or tourist popularity.
- **Coverage:** It assesses **173 cities across the world across 30 indicators**.
- **Parameters:** It is grouped into five categories namely
 - Stability (25%)
 - Healthcare (20%)
 - Culture & Environment (25%)
 - Education (10%)
 - Infrastructure (20%)
- **Score:** It uses a **1–100 scale**.

Key Highlights of Global Liveability Index

- The report finds that although the **global average liveability score** remained unchanged at **1 out of 100**.
- Among the five categories, **healthcare registered the strongest year-on-year improvement**, increasing by an average of 0.74 points.
- **Global Top Cities:** **Copenhagen (Denmark)** remains the world's **most liveable city**, edging out Vienna (Austria) and Melbourne (Australia).
- **India:** **New Delhi ranked 120**, followed by Mumbai (121), Chennai (123), and Bengaluru (127).

CHANDRAPRABHA WILDLIFE SANCTUARY



- It is located in the Chandauli district of **Uttar Pradesh**.
- It is named after the **Chandraprabha River**, meaning ‘The Luminescence of Moon’.
- In the early 18th century, this area became a **hunting ground for the rulers of Varanasi**, but eventually, in 1957, the sanctuary was established here.

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- **Asiatic lions** were **introduced** at Chandra Prabha in **1958**.
- The exercise was **successful in the beginning**, with the number of lions increasing from three to eleven by 1969. However, the **following year the lions were found missing**.
- **Flora:**
 - **Tendu, Blue Berries**, Mahua, Goose-berry, Palash, Sal, Neem, Semal, and many other varieties of plantation are found in abundance.
 - Unique and rare **medicinal plants** used in the formulation of Ayurvedic medicines like **Musli, Chitawar, Ashwagandha**, Chirata, Sarpgandha, etc. are also found.
- **Fauna:**
 - Wild animals that dot this sanctuary include **Leopard, Sloth bear**, Chinkara/Cheetal, Hyena, Fox, Jackal, etc.
 - Many colourful and different species of **birds**, like **Peacock, Red Jungle Fowl, Quail, Partridge, Eagle, Vulture, Wild Mynah**, Parakeet, Cuckoo, Barn Owl and the Bulbul are natural inhabitants of this sanctuary.

MANAS TIGER RESERVE



- **Location:** It is located in the **state of Assam**.
- **Borders:**
 - To the **north**, it is separated from the **Royal Manas National Park** of Bhutan by the **River Manas** and its tributaries-Beki and Hakua;
 - To the **west**, it is separated from the **Buxa Tiger Reserve** of West Bengal by the **River Sankosh**.
- It has a unique distinction of being a **Natural World Heritage Site**, an **Elephant Reserve**, a **Biosphere Reserve** and an **Important Bird Area**.
- **Vegetation:** It consists of **scrub forests, semi-evergreen and mixed deciduous forests**, interspersed with grasslands and riparian vegetation (in core area).

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- **Flora:** Sal (*Shorea robusta*), alluvial savannah woodlands, Riparian fringing forest and Khair-Sisoo forests.
- **Fauna:** It serves as a crucial habitat for several rare and endangered species, including the tiger, **greater one-horned rhino**, **swamp deer**, **pygmy hog**, and **Bengal florican**.

ONE-HORNED RHINOCEROS



- The greater one-horned rhino, also known as **Indian rhinoceros**, is the largest of the three Asian rhinos.
- **Habitat:** It is found in **semi-aquatic** and often take up residence in **swamps, forests, riversides**, and anywhere that is near nutritious mineral licks.
- **Distribution:**
 - It can be found in **India and Nepal**, particularly in the **foothills of the Himalayas**.
 - In the past, Greater one-horned rhinos roamed freely in the floodplains and forests alongside the **Brahmaputra, Ganges, and Indus River valley**.
 - **Kaziranga National Park** in Assam, India, **contains the largest population**.
- **Features:**
 - It is **identified by a single black horn** and a grey-brown hide with skin folds, which gives it an **armor-plated appearance**.
 - The **species is solitary**, except for females with small calves. Males maintain loosely defended territories.
 - **Diet:** Indian rhinos are **herbivores** (graminivores, folivores, frugivores, lignivores). They eat grass, leaves, fruit, branches, aquatic plants, as well as cultivated crops.
- **Threats:** Hunting is largely responsible for the Indian rhino decline.
- **Conservation Status:**
 - **IUCN:** Vulnerable