Today's Prelims Topics

Northern river Terrapin

Context

Researchers have developed an eDNA protocol to track and monitor the critically endangered northern river terrapin in the Sundarbans.

About Northern River Terrapin (Batagur baska)

- It is a Freshwater Turtle. It is **native to South East Asia.**
- **Features:**
  - The species has an **upturned snout.**
  - They have an **omnivorous diet,** they feed on waterside plants and small animals such as clams.
  - **Ecological Functions**: Maintains aquatic food chain & Seed dispersal and mineral cycling.
- **Habitat:** It is found in India and Bangladesh (Sundarbans), Myanmar, Malaysia (peninsular), Indonesia (Sumatra), Thailand, and Cambodia.
- **Conservation Status:**
  - **IUCN:** Critically Endangered
  - **WPA:** Schedule I
  - **CITES:** Appendix I
- **Major Threats:**
  - **Hunting and harvesting of eggs -** Harvesting of turtle eggs during the British era was a major factor behind the decline
  - **Habitat Loss** due to reduction in flow of freshwater also **Tropical cyclones** have eroded sandy beaches, potential nesting sites.
  - Destructive fishing practices, siltation and sedimentation due to watershed activities.

Source: Mongabay - Tracking an elusive turtle with genetic clues from nature

All-woman shift starts at Tata Steel's iron ore mine - First in India

Context

Tata Steel Ltd. has operationalised an **all-woman shift (India's first)** at its **Noamundi Iron Mine** reinforcing its commitment to women's empowerment.

About Noamundi Mine

- Noamundi is located in **West Singhbhum district** of **Jharkhand.** It is famous for the mining and **export of world-class haematite iron ore.**
- The Noamundi fields are owned by the **TATA Iron and Steel Industry.**
- **Top Iron Mines of India:**
    - Bailadila Mines - Chhattisgarh
    - Balda Mines - Odisha
    - Joda Mines - Odisha
    - Noamudi Mine - Jharkhand

Facts

- **Haematite and magnetite** are the most important iron ores in India.
- About **79% haematite ore deposits are found in the Eastern Sector** (Assam, Bihar, Chhattisgarh, Jharkhand, Odisha and Uttar Pradesh).
- About **93% magnetite ore deposits occur in the Southern Sector** (Karnataka, Andhra Pradesh, Goa, Kerala and Tamil Nadu).
    - Karnataka contributes around **70% of India's magnetite deposits.**
- **Top Iron Ore producing counties:** (1) Australia (2) Brazil (3) China **(4) India.**
- **Top 3 Iron-ore producing states of India:** (1) Odisha (2) Karnataka (3) Chhattisgarh.

Source:

- The Hindu - In a first, all-woman shift starts at Tata Steel's iron ore mine

Labour committee asks Centre to increase minimum PF pension

Context

The **Parliamentary Standing Committee on Labour** has urged the Centre to **revise the ₹1,000 minimum pension** provided by the Employees' Provident Fund Organisation (EPFO) under the Employees' Pension Scheme.

About Employees' Pension Scheme (EPS)

- EPS is a social security scheme of EPFO which provides pension benefits to employees in the organized sector. It was launched in **1995.**
- **Eligibility:** Employees who are members of the Employees' Provident Fund (EPF) are automatically enrolled in EPS.
- Under EPS, the **employer contributes 8.33% of the employee's salary** (subject to a wage ceiling - currently ₹15,000) towards the pension scheme.
- The Central Government contributes an additional **1.16%** of the employee's salary. Employees do not make direct contributions to EPS, their contributions are directed entirely to the **EPF.**

About EPFO

- It is a **statutory body** that came into existence under **the Employees' Provident Fund and Miscellaneous Provisions Act, of 1952.**
- The administration of this Act and its associated schemes falls under the purview of a **tripartite body** known as the **Central Board of Trustees,Employees' Provident Fund.**
    - The CBT comprises representatives from various sectors, including the government (both central and state), employers, and employees.
- It is one of the **World's largest Social Security Organisations** in terms of clientele and the volume of financial transactions undertaken.
- It is under the **administrative control of the Ministry of Labour and Employment, Government of India.**

UPSC PYQ

Q. With reference to casual workers employed in India, consider the following statements: **(2021)**

1. All casual workers are entitled for Employees Provident Fund coverage.
2. All casual workers are entitled for regular working hours and overtime payment.
3. The government can by a notification specify that an establishment or industry shall pay wages only through its bank account.

Which of the above statements are correct?

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: B

Source:

- The Hindu - Labour committee asks Centre to increase minimum PF pension

Idiopathic pulmonary fibrosis

Context

Recently Tabla maestro Zakir Hussain passed away due to idiopathic pulmonary fibrosis.

About Idiopathic pulmonary fibrosis (IPF)

- IPF is a chronic and progressive lung disease where the lung tissue becomes scarred and thickened (fibrosis) without a known cause.
- This scarring makes it increasingly difficult for the lungs to function properly, leading to breathing difficulties.
- IPF targets the **interstitium (**tissue surrounding **alveoli)**, making it harder for oxygen to move into the bloodstream.
- **Symptoms:**
    - Shortness of breath, especially during physical activity.
    - Chronic dry cough.
    - Fatigue and weakness.
    - Clubbing (widening and rounding) of fingers and toes in some cases.
- **Affected Population:** Generally occurs in individuals aged 50-70 years. Slightly more prevalent in men than women.
- **Treatment**
    - **Medications:** Antifibrotic drugs like **pirfenidone and nintedanib** to slow disease progression.
    - **Oxygen Therapy:** To improve oxygen levels in the blood.
    - **Pulmonary Rehabilitation:** Exercise, breathing techniques etc.
    - **Lung Transplantation:** Considered in advanced cases

Source:

- Indian Express - idiopathic pulmonary fibrosis

Credit Guarantee Scheme for e-NWR based pledge Financing

Context

The Union Minister of Consumer Affairs, Food and Public Distribution recently launched the Credit Guarantee Scheme for e-NWR based Pledge Financing (CGS-NPF).

About the Scheme

- **Aim:** Providing credit facilities to small farmers & preventing them from **distress selling.**
- It provides a corpus of Rs **1,000-crore** for post-harvest finance availed by farmers against **electronic negotiable warehouse receipts (e-NWRs)** after depositing commodities in **Warehousing Development and Regulatory Authority (WDRA)** accredited warehouses.
- **Coverage:** Loans up to Rs. 75 lakhs for agricultural purpose and Loans up to Rs. 200 Lakhs for nonagricultural purpose.
- **Eligible Institutions and Borrowers**
    - **Institutions:** All scheduled and cooperative banks.
    - **Borrowers:**
        - Small and marginal farmers, women, SC/ST/PwD farmers.
        - MSMEs, Farmer Producer Organizations (FPOs), and traders.
- **Risks Covered:**
    - **Credit risk:** Default on repayment.
    - **Warehouseman risk:** Failure of warehouses to deliver stored goods.

Electronic Negotiable Warehouse Receipt (e-NWR)

- It is a digital receipt that allows the transfer of ownership of a commodity stored in a warehouse **without having to physically deliver it.** e-NWRs can be used for trading, settlement, financing and can be used as **collateral for loans.**
    - Presently, e-NWR lending is only **Rs 4000 Cr** against the **potential of Rs 5.5 lakh crore.**

Warehousing Development and Regulatory Authority (WDRA)

- It is a **Statutory body** WDRA constituted in **2010** under the Warehousing (Development and Regulation) Act, of 2007.
- **Nodal Ministry:** Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution.
- **Functions:**
    - Developing and regulating warehouses
    - Negotiating warehouse receipts
    - Promoting the growth of the warehousing business

Source:

- PIB - Union Food and Consumer Affairs Minister launches Credit Guarantee Scheme for e-NWR based pledge Financing (CGS-NPF)

Hydroxymethanesulphonate

Context

According to a recent study, hydroxymethanesulphonate, a secondary aerosol forming in cold urban areas like Fairbanks, Alaska, is reshaping our understanding of aerosol chemistry in extreme conditions and its impact on air quality.

About Hydroxymethanesulphonate

- It is a **secondary aerosol,** formed when **formaldehyde reacts with sulphur dioxide in the presence of liquid water.**
    - Traditionally thought to occur only in clouds and fog, but found to occur in aerosol particles in Fairbanks winters.
- **Role of Temperature:** Extremely low temperatures (around -35ºC) cause supercooling of aerosol particles. Supercooled aerosols allow hydroxymethanesulphonate to form within them.
- **Aerosol acidity** depends on the relative concentration of:
    - **Sulphate ions (SO_4^{2-})** - Increase acidity.
    - **Ammonium ions (NH_4^+)** - Neutralize acidity.
- **Behaviour of Ammonium in low temperatures:** In low temperatures, ammonium ions are less likely to evaporate into ammonia gas. This buildup of ammonium ions further reduces acidity. This creates favourable conditions for hydroxymethanesulphonate formation.
- **Impact on environment:**
    - Contributes to **PM2.5 pollution**, worsening air quality.
    - Also influences cloud formation and radiative properties which further affect climate.

Related Concepts

- **Aerosols**: Tiny solid or liquid particles suspended in the air.
    - **E.g.** Dust, smoke, fog, chemical particles like sulphates and ammonium etc.
- **Particulate Matter (PM):** A mix of solid particles and liquid droplets suspended in air.
    - **PM 2.5**: Ultrafine particles (<2.5 micrometres), harmful due to their ability to enter lungs and cause health problems like asthma, reduced lung function, and premature death.
- **Supercooling:** It is a process where liquid water remains unfrozen even at temperatures below 0°C.

Source:

- The Hindu - New chemical pathway worsens quality of air in harsh winters

Algae-based solution for wastewater treatment

Context

Researchers have developed a **sustainable wastewater treatment method** using a **microalgae-bacterial consortium** to remove **toxic ammonium** from wastewater.

Proposed Microalgae-Bacterial Consortium Approach

- It uses a **photo-sequencing batch reactor (PSBR)**, integrating **bacteria and microalgae**.
    - **Algae** produce oxygen through photosynthesis, reducing the need for external aeration.
    - The system converts **ammonia** into **less toxic forms** like **nitrate** and eventually into **nitrogen**.
    - The algae-bacteria consortium facilitates **ammonia oxidation** and **nitrate reduction** through different stages of the process.
- This **bio-process** saves **50-90% of energy costs** compared to traditional systems.
- **Advantages:**
    - **Cost-effective**: Significantly reduces energy costs for oxygen supply and aeration.
        - Conventional ammonium removal relies on **aeration**, an **energy-intensive process**. Aeration accounts for up to **90% of a treatment plant's energy consumption**.
    - **Environmentally sustainable**: Avoids the use of energy-intensive mechanical processes and chemicals.

Wastewater Generation in India

- According to the **2022 NITI Aayog report**, India generates:
    - **39,604 Million Litres per Day (MLD)** of wastewater in rural regions.
    - **72,368 MLD** of wastewater in urban centers (2020-21).
- Wastewater in India mainly arises from:
    - **Agricultural runoff**.
    - **Industrial effluents**.
    - **Sewage**, all of which contain various toxic chemicals, including **ammonium**.

Source:

- Mongabay - Researchers propose algae-based solution for wastewater treatment

News in Shorts

SRI LANKA–INDIA EXERCISE - 24 (SLINEX-24)

- It is a **Bilateral Naval Exercise between India & Sri Lanka.**
- It was established in **2005.** This year it will be held in **Vishakhapatnam** under the aegis of the **Eastern Naval Command.**
- **Joint Military exercise between both countries: Mitra Shakti**

Source:

- **PIB - SRI LANKA–INDIA EXERCISE - 24 (SLINEX-24)**

Rann Utsav

- It is the **annual white desert carnival** held by Gujarat Tourism Department at **India's largest salt desert 'Great Rann of Kutch'.**
- It celebrates the cultural and artistic heritage of Kutch.

About Art forms of Kutch

- **Textiles and Embroidery:**
  - **Bandhani (Tie and Dye):** Threads are tied tightly around the fabric to create patterns, followed by dyeing.
  - **Kutchi Embroidery:** Intricate designs with mirrors (abhla bharat), beads, and threads. Includes styles like **Suf, Kharek, and Rabari embroidery.**
  - **Ajrakh Printing:** Block printing with natural dyes, primarily in indigo and red hues.
  - **Rogan Art:** Hand-painted designs using castor oil-based colors.
- **Mud and Mirror Work (Lippan Kaam):** Decorating walls of houses with clay and mirror work. Common in **Bhungas** (traditional circular mud houses).
- **Bell Making:** Copper and brass bells crafted by Lohar artisans. They are not made with a mould or fire, but by beating strips of metal to the desired shape and then interlocking the pieces.

Source:

- **Indian Express - Rann Utsav**

Editorial Summary

Levy a higher GST rate on tobacco, sugared beverages

Context

A Group of Ministers (GoM) proposed to increase the highest GST tier on tobacco and sugar-sweetened beverages from **28% to 35%**.

Background

- Over the past seven years since GST's introduction, no significant increases in GST rates have been made on harmful products like tobacco and sugar-sweetened beverages.
- Only two minor hikes in National Calamity Contingent Duties (NCCD) on tobacco occurred.
- This lack of taxation increases has made these harmful products more affordable, undermining efforts to reduce their consumption.

Impact of Proposed GST Rate Hike

- The proposed 35% GST rate hike is a positive step in revenue generation (**₹43 billion annually** with the proposed 35% GST rate.)
    - A potential 40% GST Rate could generate an additional **₹72 billion annually**.
- It will also lead to reducing tobacco consumption and lower treatment costs for tobacco-related diseases.

Status of Tobacco Product Consumption in India

- **Second-largest consumer of tobacco** globally after China.
- **28.6%** of adults above 15 years and **8.5%** of students aged 13-15 use tobacco.
- Tobacco use has declined in all groups, except for **women** where use **increased by 2.1%** between 2015 and 2021.
- India accounts for the **largest (66%) of the world's smokeless tobacco users**.

Impact of Tobacco Usage

- **Human Health:** It is a leading cause of **non-communicable diseases (NCDs)** such as cancer, cardiovascular diseases, and respiratory issues and over **3,500 deaths per day** in India.
- **Economic Loss:** In 2017, the annual economic burden of tobacco was **₹2,340 billion (1.4% of GDP)**.
- **Geographical Impact**: It depletes **soil nutrients** and is a major **contributor to deforestation** (5.4 kg of wood is required to process 1 kg of tobacco).
- **Environmental Impact:** The production and consumption of tobacco generates **~1.7 lakh tonnes of waste** every year in India.

Steps Taken By Government

- **Cigarettes Act, 1975:** Mandates statutory warnings such as "Cigarette Smoking is Injurious to Health" on cigarette packs and advertisements.
- **Cigarettes and Other Tobacco Products Act (COTPA), 2003:** Regulates the production, advertisement, distribution, and consumption of tobacco through 33 sections.
- **WHO Framework Convention on Tobacco Control (FCTC), 2005:** India is a signatory to this global treaty aimed at reducing tobacco use.
    - This treaty helps countries develop strategies to reduce demand and supply of tobacco.
- **Food Safety and Standards Act, 2006:** Prohibits the use of tobacco or nicotine as ingredients in food products.
- **Cable Television Networks Amendment Act, 2000:** Bans advertisements promoting tobacco

and liquor on television.

- **Prevention and Control of Pollution Act, 1981:** Recognizes smoking as a source of air pollution.
- **Motor Vehicles Act, 1988:** Prohibits smoking in public vehicles.
- **National Tobacco Control Programme (NTCP), 2008:** Aims to reduce tobacco consumption and related deaths.
    - **Key activities**: training, capacity building, information dissemination, surveys, surveillance, and cessation support.
- **Tobacco Cessation Programme:** Provides support to individuals trying to quit tobacco use.
    - Establishes cessation clinics across the country to aid in quitting efforts.

Hike of Taxes on Tobacco and Sugar-Sweetened Beverages (Argument and Counterpoint)

Concern	Argument	Counterpoint
Potential Increase in Illicit Trade	Higher taxes may drive consumers to purchase cheaper, unregulated products.	Evidence shows tax hikes have minimal impact on illicit trade; governance and regulation matter more.
Impact on Low-Income Consumers	Higher taxes disproportionately burden low-income groups consuming beedis/tobacco.	Reducing consumption improves long-term health and lowers medical expenses.
Industry Over-Shift of Tax Burden	Industry may pass on higher-than-required price hikes to increase profits.	• Effective monitoring and regulation can prevent excess profit-making. • **E.g.,** India should consider raising excise taxes alongside the GST revision for a stronger and more comprehensive taxation framework.
Impact on Farmers and Small-Scale Producers	Tobacco farmers and beedi producers may suffer due to lower demand.	Diversification programs and alternative livelihoods can mitigate this impact.
Revenue Stability	Declining consumption may reduce overall tax revenues in the long run.	Initial revenue increases can be reinvested in health and development programs.
Economic Impact on Beverage Industry	Declining sales may affect jobs and investments in the beverage industry.	Health benefits outweigh short-term economic concerns; industry can offer healthier alternatives.
Administrative Challenges	Enforcing higher taxes may be difficult, especially in rural areas.	Strengthening enforcement and regulation can address these challenges effectively.
Consumer Resistance and Public Backlash	Consumers may resist sudden price hikes, viewing them as punitive.	Public awareness campaigns can build support by highlighting health benefits.

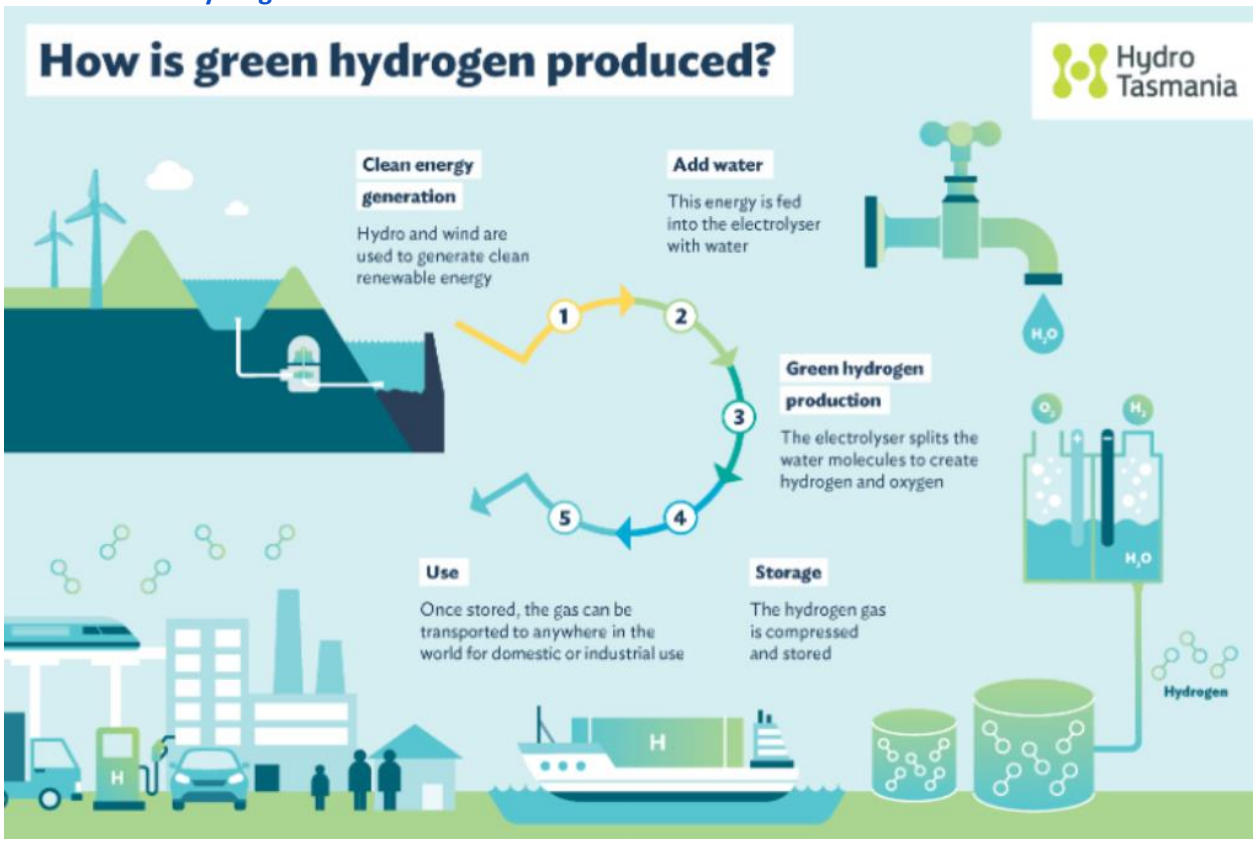
Source: [The Hindu: Levy a higher GST rate on tobacco, sugared beverages]

Green Hydrogen and Financial Challenge

Context

- India's ambition to achieve net-zero emissions by 2070 hinges significantly on the development of a robust green hydrogen sector.
- The country aims to produce 5 million metric tonnes (MMT) of green hydrogen annually by 2030, positioning itself as a leader in this emerging industry.
- However, various economic and infrastructural challenges threaten to impede this progress.

What is Green Hydrogen?



- Green hydrogen is produced by **renewable energy** through **electrolysis of water.** Electrolyser technology is central to the green hydrogen production process.
- Electrolysis involves the **splitting of water (H2O)** into its constituent elements, **hydrogen (H2)** and **oxygen (O2),** using an electric current.
- **Commercially available technologies for green hydrogen production:**
    - **Alkaline Electrolyzers:** Alkaline electrolyzers operate via transport of hydroxide ions (OH-) through the electrolyte from the cathode to the anode with hydrogen being generated on the cathode side.
    - **Polymer Electrolyte Membrane Electrolysers:** In a polymer electrolyte membrane (PEM) electrolyser, the electrolyte is a solid specialty plastic material.
    - **Solid Oxide Electrolysers:** It uses a solid ceramic material as the electrolyte that selectively conducts negatively charged oxygen ions (O2-) at elevated temperatures (700°–800°C) to generate hydrogen.
- **Applications:** Green hydrogen can be consumed through either **direct combustion,** electricity generation through **fuel cells** and industrial processes like **ammonia, steel** manufacturing and **petroleum refinery** to be used as chemical feedstock.

Advantages of green hydrogen as a fuel

- **High Calorific Value:** Hydrogen has almost 2.5 times the energy per tonne compared to natural gas, shifting to Hydrogen thereby reduces natural gas imports.
- **Energy efficiency:** A hydrogen fuel cell is two to three times more efficient than an internal combustion engine fueled by gas.
- **Climate change mitigation:** The method of producing green hydrogen does not emit any greenhouse gases, helping in our fight against climate change.
- Also, Green hydrogen can potentially replace coal **and coke** in **iron and steel production, decarbonizing** this sector will also have a significant impact on India's climate goals.
- Hydrogen can be effectively used as a **fuel for heavy duty vehicles,** helping in the **decarbonization of the transportation sector** too.
- **Storage:** Hydrogen has the highest energy per mass of any fuel, which means that the higher the energy density of a system, the greater the amount of energy you can store.
- **Cost effective:** India's distinct advantage in low-cost renewable electricity means that green hydrogen will emerge as the most cost-effective form.
- **Grid stability:** The intermittent nature of renewable energy, especially wind, leads to grid instability. But green hydrogen can be stored for long periods of time which can be used to produce electricity using fuel cells.
- **Monetary benefits:** Experts say the oxygen produced as a by-product can also be monetized by using it for industrial and medical applications or for enriching the environment.
- **Demand:** It is expected that Hydrogen demand in India could grow more than **fourfold by 2050,** representing almost **10% of global demand** of which majority of this demand could be met with green hydrogen.

What are the Challenges Associated with Green Hydrogen Production in India

- **Economic Viability**: High production and electrolyzer costs make green hydrogen less competitive than traditional hydrogen.
    - **E.g., Green Hydrogen**: Costs between **$5.30 - $6.70 per kg**.
        - **Grey/Blue Hydrogen**: Much lower at **$1.9 - $2.4 per kg**.
        - The significant price gap makes green hydrogen uncompetitive.
- **Financing**: High weighted average cost of capital (WACC) and the lack of innovative financing models increase investment risks.
    - **E.g.**, An increase in WACC from 10% to 20% could lead to a 73% increase in the levelized cost of hydrogen, even if all other production factors remain constant.
- **Infrastructure**: Absence of the production, storage, and distribution of green hydrogen, including pipelines and refueling stations.
- **Policy Gaps**: Limited focus on comprehensive policies and regulatory support.
- **Demand Certainty**: Industries lack confidence in future demand for green hydrogen.
    - **E.g.,** Only **27.6%** of global clean hydrogen projects have reached final investment decisions.
        - This indicates structural barriers to investment beyond technological readiness.

- **WACC** represents the average rate of return a company is expected to pay to all its shareholders, including both debt holders and equity investors, to finance its assets.

Way Forward

- Establishing **localized industrial clusters** connected to renewable energy sources can create **self-sustaining hydrogen corridors**.

Global Policy Models for Green Hydrogen Development

- **United Kingdom**: **Low Carbon Hydrogen Standard Certification** to build market confidence.
- **United States, Japan, Australia**: Development of **strategic hydrogen hubs** where infrastructure, production, innovation, and consumption co-evolve.
    - Infrastructure is proactively developed rather than following demand.

- **Comprehensive Policy Framework**: Beyond production incentives, India needs policies addressing financing barriers.
    - **Strategies:**
        - **Long-Term Hydrogen Purchase Agreements**
        - **Partial Loan Guarantees** to reduce uncertainty for investors.
        - **Regulatory Sandboxes** for experimentation with new business models, similar to fintech innovation in India.
- **Innovative Financing Models**: Move beyond traditional project finance to cater to hydrogen's unique challenges.
    - **Financing Approaches**:
        - **Modular Project Financing**: Facilities scale in phases, reducing upfront capital needs.
        - **Anchor-Plus Financing**: Base capacity underwritten by a creditworthy anchor customer, with flexible financing for additional capacity.
        - **Equipment Leasing**: Transform electrolyzer costs into manageable operational expenses, following models used in solar and wind sectors.
- **International Collaboration**: Move beyond aspirational agreements to practical market-making initiatives.
    - **Standardized Certification**: For carbon intensity and hydrogen origin to facilitate exports.
    - **E.g.,** The **Hydrogen Energy Supply Chain Project** between Australia and Japan demonstrates how cross-border partnerships can secure demand certainty for large-scale investments.
- **Early projects in industrial hubs** such as Odisha, Maharashtra, and Gujarat will be crucial in demonstrating viable business models for green hydrogen production.

Source: [The Hindu: Green hydrogen and the financing challenge]

Reservation and Religion

Context

- Recently, the Supreme Court of India stated that "reservation cannot be on the basis of religion."
- This remark came during the hearing of appeals challenging the Calcutta High Court's decision to **invalidate reservations granted to 77 communities**, primarily from the **Muslim community, under the Other Backward Classes (OBC) category.**

Calcutta High Court Decision (2024)

- On **May 22, 2024**, the **Calcutta High Court** struck down OBC reservations for **77 classes**, of which **75 were Muslim**.
- The court ruled that the reservations were granted **without objective criteria** to establish backwardness.
- It observed that **religion** appeared to be the **sole basis** for identifying these communities as OBCs, violating the principles set forth in the **Indra Sawhney case**.

Religion as a Criterion for OBC Reservations

Constitutional Framework for Religious Groups in Reservations

- The Constitution **does not explicitly prohibit** identifying **religious groups** as **beneficiaries of reservations**.
- However, such inclusions have primarily occurred within the **OBC category**.
- **Article 16(4)** of the Constitution empowers states to provide reservations for “any backward class of citizens” that is inadequately represented in state services.
- **Instances of Inclusion:**
    - **Kerala** included Muslims within the OBC quota in **1956**.
    - **Karnataka** followed in **1995**.
    - **Tamil Nadu** extended similar provisions in **2007**.

Karnataka and the Role of Backward Classes Commissions

- In Karnataka, OBC reservations for Muslims were introduced based on the **Third Backward Classes Commission** report (1990), chaired by **Justice O. Chinnappa Reddy**.
    - The report identified **Muslims** “as a whole” as **socially and economically backward**.
- The **Justice Rajender Sachar Committee** report (2006) also highlighted the **low representation** of Muslim OBCs in **Central Government departments**.
    - It emphasized that the benefits of backward class entitlements had yet to **reach Muslim communities**.

Indra Sawhney Judgment and Its Significance

- In the landmark case of **Indra Sawhney v. Union of India (1992)**, the **Supreme Court** clarified the purpose of OBC reservations as addressing **historical discrimination**.
- **Key observations:**
    - While factors like **religion, race, caste**, and other group identities could be considered, they **cannot be the sole criterion** for granting reservations.
    - The determination of **backwardness** must be **objective** and evidence-based.

Religious Restriction in SC Status

Constitutional Basis for Scheduled Caste (SC) Reservations

- **Article 341(1)** of the Constitution empowers the **President** to specify castes, races, or tribes that are to be recognized as **Scheduled Castes (SCs)**.
- Based on this, **The Constitution (Scheduled Castes) Order, 1950** was issued, listing SC communities on a **state-wise basis**.

Religion as a Barrier in SC Reservations

- **Clause 3** of the 1950 order restricts SC status to individuals **professing Hinduism, Sikhism, or Buddhism**.
- Timeline of inclusions:
    - Initially, SC benefits were limited to **Hindus**.
    - In **1956**, the order was expanded to include **Sikh converts**.
    - In **1990**, it was further extended to include **Buddhist converts**.

Judicial Position: Soosai v. Union of India (1985)

- In the **Soosai case**, a cobbler from the **Adi-Dravida SC community** was denied SC benefits after **converting to Christianity**.
- The Supreme Court observed:
    - It did not definitively answer whether a **religious convert** could retain their caste status post-conversion.
    - The Court ruled that proving **continued caste-based social handicaps** with "**oppressive severity**" in the **new religion** was essential to access SC benefits.

Ranganath Mishra Commission Recommendations (2007)

- The **Ranganath Mishra Commission** (constituted in 2004) found that the **caste system** transcends religious boundaries and affects **all Indian communities**, regardless of religion.
- **Key Recommendation**: A **change of religion** should **not disqualify** a person from retaining SC status if they were previously included in the SC list.
- **Response**: However, the **Central Government** has **rejected these findings** in recent years, resulting in periodic halts to efforts aimed at including converts from **Christianity** and **Islam** under SC reservations.

Key Constitutional Issues Pending Supreme Court Review

Challenge to the 1950 Scheduled Castes Order

- The **constitutional validity** of the **1950 Scheduled Castes Order**, specifically **Clause 3**, is under scrutiny in the case of **Ghazi Saaduddin v. State of Maharashtra** (pending since 2004).
- In **2011**, the Supreme Court agreed to examine the constitutionality of Clause 3.
- However, in **April 2024**, the Court deferred hearings, citing the Centre's formation of a new commission to review whether religious converts should retain SC status.

The K G Balakrishnan Commission

- The Centre rejected the **Ranganath Mishra Commission's 2007 recommendations**, which supported extending SC benefits to religious converts.
- Instead, the government established a new commission, chaired by former Chief Justice of India **K G Balakrishnan**, to **assess the issue**.
- The commission has conducted **public hearings** across states and, in **November 2024**, received an extension to submit its report by **October 2025**.

Debate on OBC Reservations for Religious Groups

- The Supreme Court is also addressing whether **OBC reservations** can be extended to **religious groups as a whole**.
- **Background:**
    - In **2005**, the **Andhra Pradesh government** introduced a law granting **5% OBC reservations** to Muslims.
    - The **Andhra Pradesh High Court** struck down the law the same year, stating the government had failed to apply **objective criteria** to classify Muslims as a backward class.

- **Current Status**:
    - The Supreme Court indicated it would hear this matter **after resolving the challenge to reservations for Economically Weaker Sections (EWS)**.
    - While the EWS decision was delivered on **November 7, 2022**, there has been **no further progress** on the OBC reservations for religious groups case.

Source: **Indian Express: How Supreme Court, govt have attempted to define importance of religion in SC & OBC reservations**

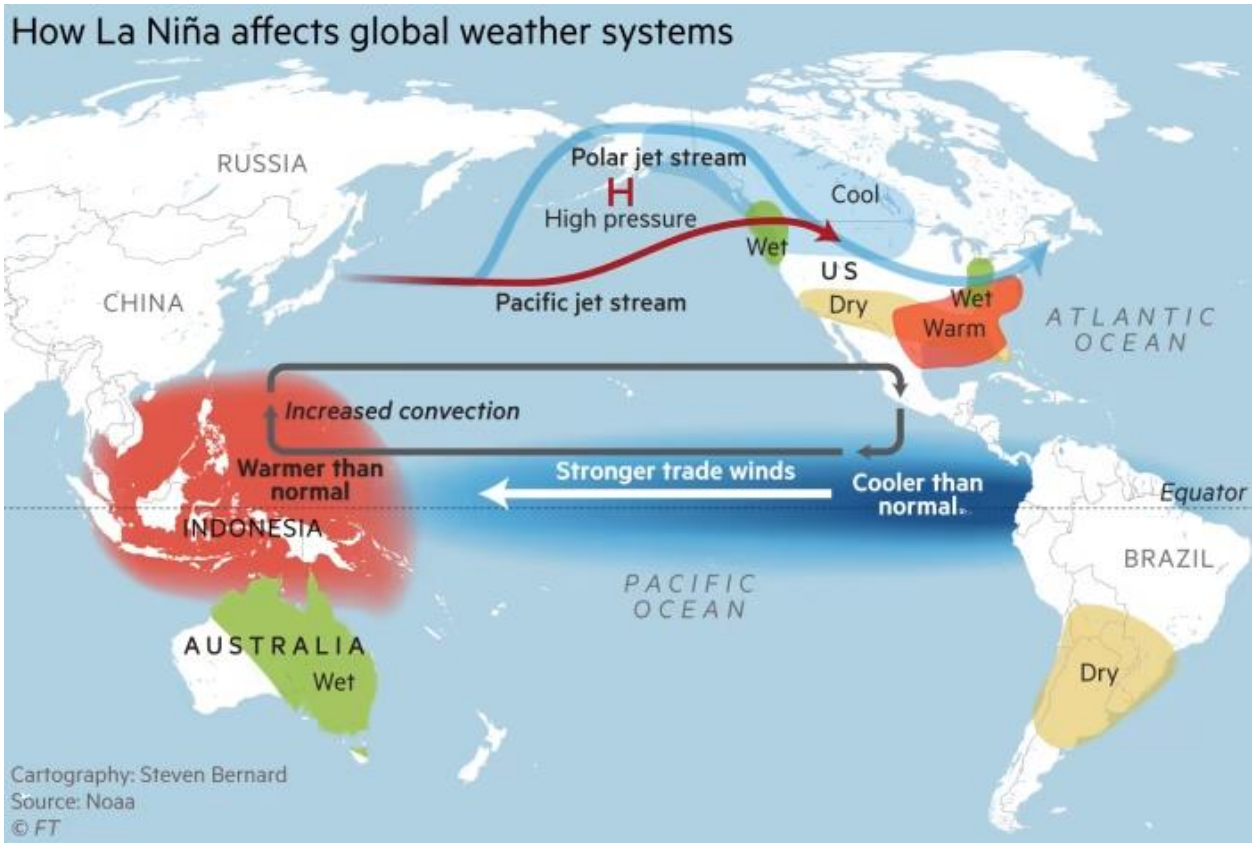
Detailed Coverage

How does La Niña affect India's climate?

Context

The India Meteorological Department predicts that La Niña will begin between late 2024 and early 2025, leading to a milder winter.

What is La Niña?



- **La Niña** (a cooling phase) is a natural climate phenomenon that occurs as part of the **El Niño-Southern Oscillation (ENSO)** cycle.
- ENSO involves periodic changes in the sea surface temperatures and atmospheric conditions in the Pacific Ocean.
- During La Niña, the **sea surface temperatures** in the **central and eastern equatorial Pacific Ocean** become **unusually cold**.
- This is caused by stronger-than-normal **trade winds**, which blow from east to west across the Pacific.
- These winds push warm surface water toward the **western Pacific** (near Asia and Australia), allowing colder water from the ocean depths to **upwell** (rise) to the surface in the eastern Pacific near South America.
- La Niña events typically last **9–12 months**, though they can persist for up to **2 years** in some cases.

Fact

- This decade began with three consecutive La Niña events (2020-2022), **a rare occurrence** known as **Triple Dip La Niña** (the first since 1998-2001), followed by an El Niño in 2023.

Impacts of La Niña on Global Climate

The effects of La Niña vary globally but typically include:

- **Weather Patterns**:
  - **Asia and Australia**: Higher-than-average rainfall, risk of flooding, and stronger monsoon seasons.
  - **South America (Pacific Coast)**: Drier weather, drought conditions.
  - **North America**:
    - Cooler and wetter winters in the **northern U.S. and Canada**.
    - Warmer and drier conditions in the **southern U.S.**
  - **Africa**: Wetter conditions in eastern Africa but drought in southern Africa.
- **Hurricanes and Cyclones**: La Niña typically increases the **frequency and intensity of hurricanes** in the **Atlantic Ocean** due to reduced vertical wind shear.
- **Global Climate Impact**: It can lead to **temporary global cooling**, as the colder Pacific waters influence global temperatures.

Climate Change and La Nina

- Climate scientists highlight that **global warming** is altering natural phenomena like ENSO.
- La Niña events, once relatively predictable, are now occurring with **greater frequency and intensity**.
- Despite La Niña's cooling influence, its effects are increasingly **overshadowed** by long-term global warming trends.
- The interaction between La Niña and global warming remains under study, but early research suggests increasing **erratic behavior**.
- This could lead to **unexpected droughts, floods, and heatwaves** in regions previously unaffected by such extremes.

India and La Niña (2025): Localized Impacts

- **Colder and Wetter Winters:** Northern and northwestern states like **Punjab, Haryana, and Rajasthan** may experience prolonged cold spells and dense fog.
  - Disruptions to **daily life and transportation** are likely.
  - Cooler temperatures can benefit crops like **wheat**, but extreme cold may negatively impact **human health and productivity**.
- **Enhanced Monsoon Activity: Above-average monsoon rains** are expected, extending into **late September or October**.
  - Benefits include improved **water reservoirs** and **hydroelectric projects**.
  - However, the risk of **flooding** increases in vulnerable regions such as **Assam, Bihar, and parts of Maharashtra**.
- **Impact on Agriculture:** Heavier rains can **boost rabi (winter) crop production** by improving **soil moisture**.
  - Excess rainfall may cause **waterlogging** in key rice and wheat-growing areas, potentially **damaging crops** and **delaying harvests**.
- **Water Resource Management:** La Niña could help **replenish groundwater levels** and **reservoirs**.
  - However, unplanned water discharge during heavy rains may trigger **flooding in urban areas**.
  - Coastal cities like **Mumbai** and **Chennai** need **robust disaster management systems** to prevent waterlogging and disruptions.

- **Public Health Challenges:** Extended rains and cooler temperatures may increase **waterborne diseases** like **cholera** and **dengue**, especially in densely populated urban areas.
    - **Healthcare preparedness** and **public awareness campaigns** will be essential to manage these health risks.

Impact of La Niña on Air Quality

- **Delayed Onset Exacerbates Pollution:** due to late arrival of La Niña, there is a prolonged period of stagnant surface winds, particularly in autumn and early winter.
    - This leads to a buildup of pollutants, such as PM2.5 and PM10, near the surface, worsening air quality.
- **Extended Severe Winters**: There may be stronger winds, fewer clouds, and a reduction in pollutant accumulation and slightly improve air quality in late winter.
    - However, a longer and more severe winter could lower the inversion layer, limiting vertical air mixing and keeping pollutants trapped.
- **Delayed Monsoon Withdrawal**: La Niña's influence on monsoons can also cause a delayed monsoon retreat, leading to extended high humidity and calm winds.
    - This combination reduces atmospheric mixing, trapping pollutants near the surface and increasing levels of particulate matter (PM2.5 and PM10) in the air.
    - These factors, coupled with local emissions and pollution from neighbouring regions (such as stubble burning from Punjab and Haryana) worsen air quality during the pre-winter period.
- **Impacts on Different Regions**: While La Niña improves air quality in northern India by dispersing pollutants, it can worsen conditions in other regions, particularly peninsular India, by increasing PM2.5 levels by up to 20%.
    - Early or late arrival of La Niña can have differing impacts depending on geographic location.

Sources:

- The Hindu: How does La Niña affect India's climate?
- Indian Express: The La Nina Shadow
- Your Story