

CURRENT AFFAIRS

WEEKLY



MAINS ARTICLE

GS-I

- ▣ TECTONIC TUG-OF-WAR BETWEEN INDIA AND CHINA

GS-II

- ▣ WHAT TRUMPONOMICS MEANS FOR INDIA
- ▣ ILLEGAL IMMIGRATION ISSUE
- ▣ THE DEBATE OVER 'QUOTA-WITHIN-QUOTA'
- ▣ SC'S VERDICT ON ARTICLE 39(B) AND PRIVATE PROPERTY
- ▣ SC RULING ON BASIC STRUCTURE AND MADRASA LAW

GS-III

- ▣ RURAL WAGE STAGNATION AMID ECONOMIC GROWTH
- ▣ MILLET REVOLUTION IN RURAL INDIA
- ▣ INDIA'S RAPID URBANISATION
- ▣ CSR & INDIAN AGRICULTURE
- ▣ KERALA'S NEW COASTAL ZONE PLAN
- ▣ COP-16 SUMMIT

PRELIMS ARTICLE

HISTORY

- ▣ First Asian Buddhist Summit

INTERNATIONAL RELATIONS

- ▣ Verification Patrolling in Despang
- ▣ OPEC+

POLITY & GOVERNANCE

- ▣ Waqf Board Land Grab
- ▣ Maritime Education Hub

ECONOMY

- ▣ Liquidation of Jet Airways

SCIENCE & TECHNOLOGY

- ▣ New Polio Cases in Pakistan
- ▣ Link Between Nickel Toxicity and Sterol Biosynthesis
- ▣ Sukhoi Su-30MKI Jets
- ▣ Aditya-L1 mission's Scientific Results
- ▣ Diffraction Limit
- ▣ B-52 Bombers

ENVIRONMENT

- ▣ Stock of the International Solar Alliance

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DISCLAIMER

The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

CONTENT

1st WEEK - NOVEMBER, 2024

SECTION - A

GEOGRAPHY (GS-I)

- Tectonic Tug-of-War Between India & China.... 01

INTERNATIONAL RELATIONS (GS-II)

- What Trumponomics means for India..... 03

POLITY & GOVERNANCE (GS-II)

- Illegal Immigration Issue04
- The Debate Over 'Quota-within-Quota' 05
- SC's Verdict on Article 39(b) 07
and Private Property
- SC Ruling on Basic Structure and08
Madrasa Law

ECONOMY (GS-III)

- Rural Wage Stagnation Amid09
Economic Growth
- Millet Revolution in Rural India 10
- India's Rapid Urbanisation..... 10
- CSR & Indian Agriculture11

ENVIRONMENT (GS-III)

- Kerala's New Coastal Zone Plan12
- COP-16 Summit13

SECTION - B

HISTORY

- First Asian Buddhist Summit15

INTERNATIONAL RELATIONS

- Verification Patrolling in Despang17
- OPEC+ 18

POLITY & GOVERNANCE

- Waqf Board Land Grab.....19
- Maritime Education Hub.....19

ECONOMY

- Liquidation of Jet Airways..... 20

SCIENCE & TECHNOLOGY

- New Polio Cases in Pakistan..... 20
- Link Between Nickel21
Toxicity and Sterol Biosynthesis
- Sukhoi Su-30MKI Jets21
- Aditya-L1 mission's Scientific Results22
- Diffraction Limit.....22
- B-52 Bombers.....23

ENVIRONMENT

- Stock of the International Solar Alliance.....23



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SECTION -A

MAINS ISSUES

TECTONIC TUG-OF-WAR BETWEEN INDIA AND CHINA

CONTEXT

The **ongoing tectonic interaction** between India and China is not a modern conflict but a natural, ancient process that has been occurring for millions of years. While geopolitical tensions between India and China along the **Line of Actual Control (LAC)** make headlines, a **much slower and continuous struggle is taking place below the Earth's surface**. This phenomenon is caused by the **movement**

of tectonic plates, which is leading to the shrinking of the Indian landmass as it slides under the **Eurasian or Tibetan plate**.

What are Tectonic Plates?

- The Earth's crust is divided into large sections known as **tectonic plates**.
- The Indian plate, which once formed part of the supercontinent **Gondwanaland**, began drifting northward about 60 to 70 million years ago.

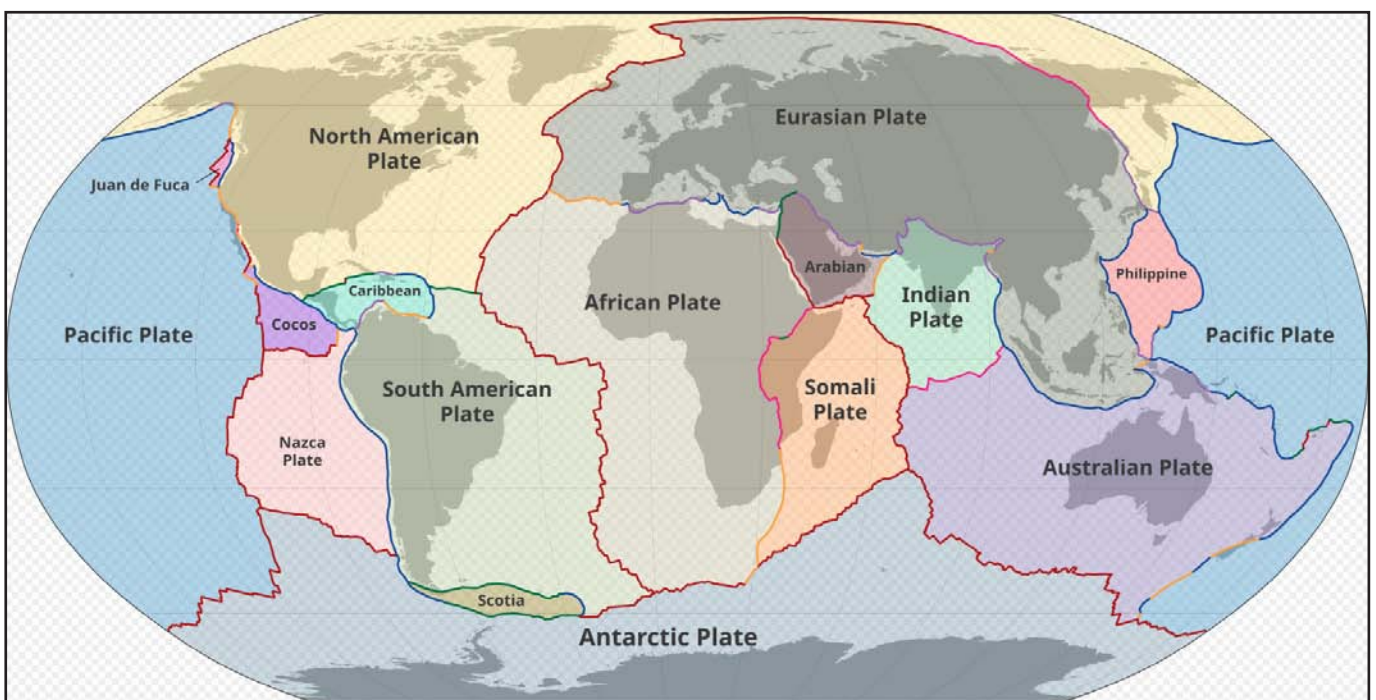


Figure No. 01

- Over millions of years, it moved towards the **Eurasian plate** (containing present-day China and the Tibetan Plateau).
- This collision resulted in the **uplift of the Himalayas** and the continuous process of subduction, where the Indian plate is slowly sliding under the Tibetan plate at a rate of 5 to 6 centimeters per year.
- This geological process is referred to as **continental drift**, which was responsible for the formation of the **Himalayan mountain range**. The Indian plate is still being squeezed under the Tibetan plate, causing the Himalayas to rise higher each year, including **Mount Everest**, which continues to grow in height due to this ongoing tectonic activity.

The Ongoing Tug-of-War

- The Indian plate's constant movement under the Tibetan plate causes significant geological stress, building up over time. This stress is released in the form of **earthquakes**.
 - The Himalayan region, being one of the **most tectonically active areas on Earth**, is prone to frequent seismic activity.
 - Some parts of this region have not experienced a major earthquake in over 500 years, and experts believe a large earthquake is overdue.
 - Recent studies show that regions like **Hanle in Ladakh** are rising slightly due to this **tectonic interaction**.
 - Over the last 25 years, Hanle has moved upwards by around **2.5 cm** and shifted northeastward by **85 cm**.
- Monitoring of these movements** is done through sophisticated technology such as **GPS and satellite tracking**, allowing scientists to track the movement of these tectonic plates with high precision.

(Figure No. 02 below)

Implications of the Tectonic Tug-of-War

- Earthquakes and Seismic Activity:** As the Indian plate slides under the Eurasian plate, it builds up tension that can cause earthquakes. The stress accumulated due to this interaction may eventually release, leading to large, potentially **catastrophic earthquakes**. Given the historical absence of major quakes in some regions, experts warn that the region may be due for a **"mega-earthquake."**
- Rising Himalayas:** The collision between these two plates also results in the **constant rising of the Himalayan mountain range**. The rate of uplift is approximately **5 mm per year**, making the Himalayas one of the **youngest and fastest-growing mountain ranges** in the world.
- To understand this process more accurately, Indian scientists from the **CSIR Fourth Paradigm Institute (CSIR-4PI)** have set up high-accuracy reference stations at key locations like Hanle in Ladakh and Bengaluru. Using advanced **Global Positioning System (GPS)** instruments, they can measure the subtle movements of the land, helping predict seismic risks and better understand the tectonic forces at play.

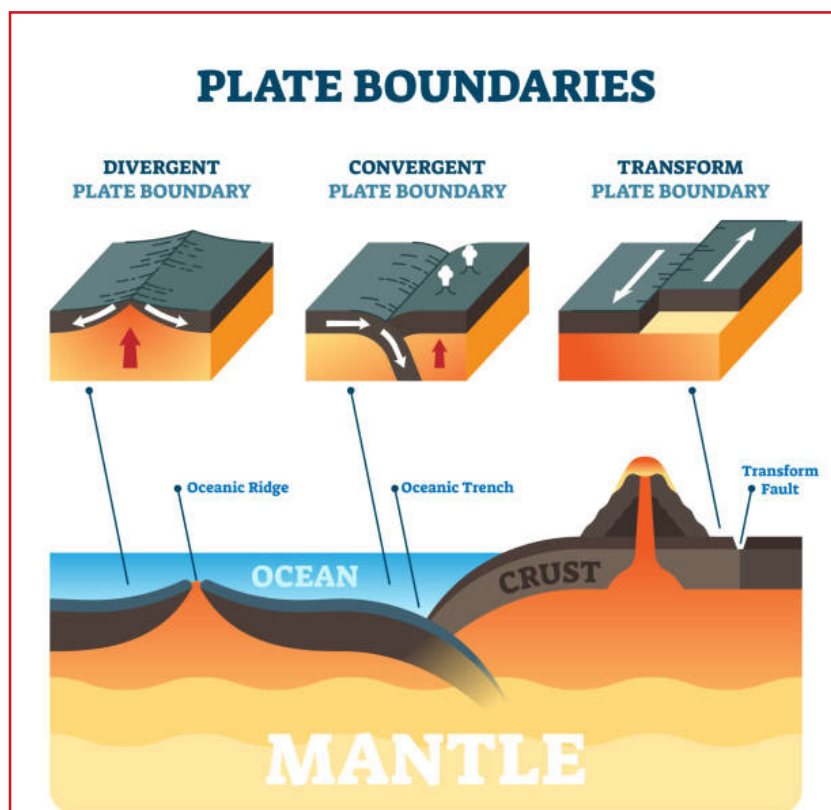


Figure No. 02

WHAT TRUMPONOMICS MEANS FOR INDIA

CONTEXT

Donald Trump's return to the **US Presidency in 2024** has sparked renewed attention on his economic policies, which could have significant ramifications for the US economy, global financial markets, and developing nations like India. From imposing high tariffs to tax cuts and changes in immigration policies, Trump's approach promises to reshape both the US and global economic landscapes.

Key Economic Proposals by Donald Trump

- **20% Tariff on Imports:** Trump has proposed imposing a **20% tariff on all imports** and **over 200% duty on cars**. These tariffs are likely to disrupt **global supply chains and escalate trade tensions**, particularly with China, the EU, and other major economies.
 - ▶ **Impact:** The immediate effect could be higher prices for consumers in the US, leading to inflationary pressures. This could also trigger retaliatory tariffs from other countries, potentially resulting in trade wars.
- **Tax Cuts Amid Record Deficits:** Trump has promised to extend his **tax cuts**, which were a significant part of his earlier presidency.
 - ▶ **Impact:** While tax cuts can stimulate the economy in the short term by increasing disposable income and boosting investment, they may exacerbate the US budget deficit, which is already at record highs. The government's increased borrowing needs could weaken confidence in US Treasury securities and raise concerns over fiscal profligacy.
- **Deporting Immigrants and Immigration Reforms:** Trump has proposed deporting millions of irregular immigrants, which could have long-term implications on the US labor market. At the same time, he has suggested making it easier for foreign students who graduate from US colleges to obtain green cards, potentially benefiting Indian students who form a significant portion of foreign students in the US.

Impacts on the US Economy

- **Inflation and Fiscal Deficits:** High tariffs, combined with proposed tax cuts, could lead to **higher inflation** in the US. The costs of goods, particularly imported ones, would increase. Furthermore, the US government's budget deficit would likely rise, as tax cuts reduce government revenues, while expenditures may increase due to higher defense or social security spending. This could put pressure on the US dollar and lead to increased borrowing costs.
- **Federal Reserve's Policy Shift:** In response to Trump's proposed economic policies, the **US Federal Reserve (Fed)** may have to change its **interest rate strategy**. If the US faces **inflationary pressures** due to higher tariffs and budget deficits, the Fed could halt or reverse

its **rate-cutting cycle**. This would have a global impact, as **US interest rates influence financial markets and monetary policy decisions** in other countries, including India. A shift in US rates could affect capital flows and global investments, especially in emerging markets.

- **Volatility in Global Financial Markets:** The combination of rising US inflation and potential changes in US interest rates could lead to volatility in global financial markets. Foreign investors might become wary of **US government bonds (Treasuries)** and shift their investments elsewhere. This could increase global uncertainty, particularly in emerging economies, which rely on foreign capital inflows for development.

Impact on India's Economy and Monetary Policy

- **Global Trade Disruptions and Supply Chains:** Higher tariffs and trade wars initiated by Trump could disrupt global supply chains, affecting manufacturing and trade. India, which has a growing trade relationship with the US, could see increased costs for both imports and exports. Additionally, if supply chains are restructured to avoid high US tariffs, it could lead to a decline in **foreign direct investment (FDI)** in India, as companies shift production to other low-cost regions.
- **Forex Volatility and US Dollar Impact:** A **possible weakening of the US dollar**—similar to Trump's earlier tenure—could affect India's foreign exchange markets. A weaker dollar could cause volatility in the **forex market**, making it more difficult for India to manage its external debt and forex reserves. It could also affect India's trade balance, as exports become relatively cheaper but imports more expensive. India may face pressure on its currency, the rupee, which could impact inflation and monetary policy.
- **Indian Monetary Policy Response:** India's central bank, the **Reserve Bank of India (RBI)**, might face challenges in its monetary policy. If the US Federal Reserve stops cutting interest rates, the RBI might delay its own rate cuts. This would impact borrowing costs for businesses and consumers in India, potentially slowing down economic growth. Additionally, RBI might need to address forex volatility and inflationary pressures that arise due to global economic uncertainties.

Other Global Implications

- **China's Response and Economic Stimulus:** Trump's proposed tariffs on Chinese goods could significantly affect China's growth, potentially reducing its GDP by 2-3 percentage points. In response, China may increase its economic stimulus package, which could involve government spending on infrastructure and recapitalizing banks.
 - ▶ While this might cushion the impact on China's economy, it could also make China's assets more attractive to foreign investors, potentially leading to a shift of capital away from India.
- **Bitcoin Surge and Global Investment Trends:** Trump has previously expressed his support for cryptocurrencies, and Bitcoin recently surged to a record high, partially

fueled by investors' optimism regarding Trump's pro-crypto stance. This could lead to increased investment in digital assets, potentially diverting capital away from traditional markets like stocks and bonds, which could have implications for emerging markets like India.

- **Tesla and Elon Musk's Influence:** With Elon Musk's potential involvement in Trump's administration, India could face pressure on several fronts. For instance, Musk has advocated for lower tariffs on electric vehicles (EVs), including Tesla's cars. This could affect India's EV market and lead to changes in India's policy towards electric vehicle imports and manufacturing.



FACT BOX

Tariffs

- A tariff is a tax placed on imported goods.
- Simply put, Tariffs are used to restrict imports by increasing the price of goods and services purchased from another country, making them less attractive to domestic consumers.

Advantages of Tariffs

- source of income for governments. By taxing imported goods, governments can reduce budget deficits and lower the tax burden on their citizens.
- **Facilitate Trade Negotiations:** Tariffs can be used as a tool to open discussions between countries. By adjusting tariffs, governments can leverage trade policies to influence bilateral or multilateral agreements on various issues.
- **Support Domestic Industries:** One of the most common uses of tariffs is to protect local businesses. By increasing the cost of imported goods, tariffs make domestic products more competitive in the market, encouraging local consumption and supporting the economy.
- **Market Stability and Predictability:** Tariffs can help stabilize the market by reducing competition from imports, ensuring that prices of certain goods remain predictable for both consumers and businesses.

Disadvantages of Tariffs

- **Generate Government Revenue:** Tariffs provide a
- **Strain International Relations:** Tariffs can cause tensions between countries, especially when they are used as a punitive measure or in retaliation. This can lead to diplomatic issues and harm relations between trade partners.
- **Trigger Trade Wars:** When one country imposes tariffs, the affected country may respond in kind, leading to a **trade war**. In such scenarios, both countries may suffer, as the higher prices of goods and reduced trade hinder economic growth for both parties.

ILLEGAL IMMIGRATION ISSUE

CONTEXT:

The Supreme Court of India agreed to examine a petition filed by the Jharkhand Government, challenging an interim order by the State High Court. The High Court had ordered the formation of a **fact-finding committee**, which includes central government officers, to look into allegations of illegal immigration into Jharkhand from Bangladesh. The issue of alleged infiltration has been contentious, and the matter is now being reviewed by the Supreme Court.

What is the issue?

- In September 2024, the Jharkhand High Court passed an order in response to a public interest litigation (PIL).
- The PIL claimed that illegal immigration from Bangladesh was happening in six districts of Jharkhand. This infiltration was altering the **demographic makeup of the region**, particularly in the **Santhal Pargana area**, where the **tribal population was allegedly decreasing and the Muslim population was increasing**.
- The High Court order was based on an affidavit submitted by the Union Government, which suggested that **"infiltration has been assessed to have taken place."**

Jharkhand Government's Points:

- However, the Jharkhand Government has contested this claim, arguing that the Union Government's assessment lacked proper data (based on outdated data from the 1961 and 2011 censuses) or evidence to substantiate it.
- The State Government has also raised concerns over the High Court's decision to intervene in what it claims is an issue that should be addressed through state mechanisms.
- Jharkhand is **not a border state**, and therefore, the issue of **illegal immigration** and infiltration should fall under the state's jurisdiction.

The High Court's Concerns

- The High Court had expressed concern that the demographic shift in Jharkhand—specifically the decline of the tribal population from 44.67% in 1951 to 28.11% in 2011, while the Muslim population rose from 9.44% in 1951 to 22.73% in 2011—was indicative of the adverse effects of illegal immigration.
- The Court had pointed to a **"lackadaisical approach"** by the State Government in tackling this issue and had called for a more proactive response.

Why this issue matters?

- This case highlights broader concerns about **illegal immigration**, particularly from neighboring countries like Bangladesh, and its impact on local demographics.
- Illegal immigration can cause significant social and political tensions, especially in states like Jharkhand, where tribal communities have historically been marginalized.

- The case also touches upon the autonomy of state governments to manage issues that impact their local populations versus the central government’s role in overseeing national security and migration-related concerns.
- While the Supreme Court has agreed to examine the case, the broader debate continues about how best to handle the issue of **illegal immigration**—whether through data-backed evidence or by giving more autonomy to states to manage their internal affairs.

How Migration is threat to internal security?

- **Threat to stability:** Migration, particularly illegal or unregulated, presents significant threats to internal security. These threats can manifest in various forms, affecting both social stability and national safety.
- **Exploitation of Vulnerable Migrants:** Terrorist organizations may target refugees, who are often vulnerable, for recruitment or manipulation. This fosters xenophobia and social division, creating security risks by labeling migrants as potential threats.
- **Radicalization Risk:** Migrants, especially in poor conditions, can be easily radicalized by extremist groups promising security, leading to direct threats to national stability.
- **Direct Threats:** Refugee movements can serve as cover for terrorists or extremists crossing borders, posing a direct risk to the state.
- **Indirect Threats:** Migrants can strain resources, lead to competition for jobs, and cause social unrest, which can be exploited by hostile groups to destabilize the region.
- **Demographic and Social Tensions:** Mass migration, especially in regions like North-East India, changes local demographics, overwhelming resources and leading to conflicts between indigenous and migrant populations.
- **Economic Vulnerability:** Migrants often face poverty and limited opportunities, which can lead to crime and increased susceptibility to radicalization by extremist groups offering solutions.
- **Illegal Activities:** Unregulated migration undermines the rule of law, with illegal migrants engaging in fraud, smuggling, and anti-national activities.
- **Weakened Sovereignty:** Inadequate regulation of migrants can erode national sovereignty, creating lawlessness and security risks.
- **Militant Groups:** In regions like Assam, perceptions of illegal migration can lead to the formation of radical groups, increasing the risk of violent extremism and internal conflict.

Policy on Illegal Migrants

- All foreign nationals, including those who enter into the country without valid travel documents or overstay beyond the validity of their visa period, are governed by the provisions contained in

- ▶ The Foreigners Act, 1946
- ▶ The Registration of Foreigners Act, 1939
- ▶ The Passport (Entry into India) Act, 1920
- ▶ The Citizenship Act, 1955
- Exemptions are given from the provisions of The Passport (Entry into India) Act, 1920 and the Foreigners Act, 1946 on a case-to-case basis.

THE DEBATE OVER ‘QUOTA-WITHIN-QUOTA’

CONTEXT

India’s reservation system has been a critical tool in promoting social and economic equality for historically marginalized communities, particularly the **Scheduled Castes (SCs) and Scheduled Tribes (STs)**. This affirmative action was introduced to undo centuries of discrimination faced by these communities. However, after more than **75 years since independence**, questions are being raised about whether the system still meets its intended goals and whether some groups within the SC category are benefiting more than others.

What is the objective of Reservations?

- The reservation system was designed by Dr. B.R. Ambedkar, the architect of the Indian Constitution, to address the deep-rooted social and economic inequality that existed due to the caste system.
- The main aim of reservations was to provide equal opportunities for SCs and STs in education, government jobs, and public offices.
- This was a step toward achieving substantive equality — ensuring that marginalized groups had the means to improve their socio-economic status.

What is the ‘Quota-within-Quota’ System?

- The **‘Quota-within-Quota’** system is an approach to subdivide a larger reservation category into smaller, more targeted sub-categories.
- This system is aimed at ensuring that the most disadvantaged groups within a broader category, such as the **Scheduled Castes (SCs), Scheduled Tribes (STs), or Other Backward Classes (OBCs)**, get a more focused share of the benefits from affirmative action policies.
- The concept is based on the idea that within a larger group, some sections may be more marginalized or face greater socio-economic challenges than others, and thus, need more specific support.
- **How Does the System Work?** In a typical reservation system, a percentage of seats or positions in educational institutions, government jobs, and public offices are reserved for SCs, STs, and OBCs.

- ▶ Under the 'quota-within-quota' system, the overall reservation for a broad category (like SCs) is further subdivided into smaller quotas based on sub-castes or communities.
- Recently, the Supreme Court has raised concerns about the **effectiveness of the reservation system**. The primary issue is whether all SC subgroups benefit equally from reservations.
- Some SC communities appear to have advanced more than others, leading to the suggestion of a 'quota-within-quota' system. This would subdivide the SC reservation into smaller categories to better target the most disadvantaged groups within the SCs.
- **Political Influence:** The design of reservation policies, including the subdivision of quotas, is often influenced by political motives rather than data-driven evidence. In states like Bihar, political pressures have led to the inclusion of broader categories in the reservation system, which undermines its effectiveness.
- **Need for Updated Data:** One of the major challenges in reforming the reservation system is the lack of comprehensive, updated data on caste-based disparities. The national Census, which can provide detailed caste data, has been delayed for years. Without reliable data, it is difficult to assess the real impact of reservations or to design policies that effectively target those who need them most.

Data from Various States

Different states in India show varying outcomes regarding the impact of reservations on SC communities:

- **Andhra Pradesh & Tamil Nadu:** In these states, two major SC groups — Malas and Madigas (Andhra Pradesh) and Adi Dravida and Pallans (Tamil Nadu) — show similar socio-economic outcomes. Both groups have benefited relatively equally from reservations in education and employment. The data suggests that there is no significant need for further subdivision of the SC quota in these states.
- **Punjab:** Punjab has had a 'quota-within-quota' system since 1975, dividing the SC quota into subcategories like Mazhabi Sikhs and Balmikis (more disadvantaged) and Ad Dharmis and Ravidasis (relatively better-off). This approach has helped the more marginalized groups catch up to others in terms of education, employment, and social mobility.
- **Bihar:** In Bihar, the government introduced a 'Mahadalit' category in 2007 to target the most disadvantaged SC groups. However, the policy lost effectiveness due to political pressures, which led to the inclusion of a broader range of SC groups. This diluted the original purpose of targeting the most marginalized groups.

Key Issues with the Reservation System

- **Access to Reservations:** A major problem with the current reservation system is the limited access to the benefits it provides. In states like Uttar Pradesh and Bihar, less than half of SC households have the necessary caste certificates to access reserved seats in education and government jobs. This indicates that many SC individuals are excluded from the benefits of affirmative action.
 - ▶ In contrast, states like Tamil Nadu and Andhra Pradesh report higher percentages of SC households with caste certificates (over 60-70%), but these states are exceptions rather than the rule.
- **The 'Creamy Layer' Debate:** One idea being discussed is the introduction of a 'creamy layer' exclusion for SCs, similar to what exists for Other Backward Classes (OBCs). The idea is to exclude wealthier or more educated individuals from the reserved categories. However, there is little evidence to support that wealthier SC individuals are no longer discriminated against or that they no longer face caste-based stigma in society.

Should There Be a 'Quota-within-Quota'?

- The idea of a 'quota-within-quota' has both merits and challenges. In states like Punjab, where disparities between SC subgroups are significant, subdividing the SC quota has led to more equitable outcomes. However, in many other states, the need for further subdivisions is not clear, as the benefits of reservations appear to be fairly distributed across SC groups.
- Instead of focusing solely on subdividing quotas, the government should first address the more fundamental issue: **improving access to reservations for all SCs**. A large number of SC households do not have caste certificates, which restricts their ability to access the benefits of affirmative action.
- Moreover, any changes to the reservation system should be backed by updated, accurate data to ensure that policies are based on real needs and not political calculations. Only with better access, updated data, and a focus on genuine social and economic upliftment can the reservation system continue to serve its purpose of promoting equality in India.



FACT BOX

Provisions of Reservation in Constitution of India for SC's/ ST's/ OBC's/EWS

- **Article 15(4) and 16(4)** of the Constitution enabled the Central and State Governments to reserve seats in government services for the members of the SC's and ST's.
- **Constitution (77th Amendment) Act, 1995** and a new **clause (4A)** was inserted in **Article 16** to enable the government to provide reservation in promotion.
 - ▶ Later on, **clause (4A)** was modified by the **Constitution (85th Amendment) Act, 2001** to provide consequential seniority to SC's and ST's candidates promoted by giving reservation.
- **Constitutional 81st Amendment Act, 2000** inserted Article 16 (4 B) which enables the state to fill the unfilled vacancies of a year which are reserved for SCs/STs in the succeeding year, thereby nullifying the ceiling of fifty percent reservation on total number of vacancies of that year.

- **Article 330 and 332** provides for specific representation through reservation of seats for SCs and STs in the Parliament and in the State Legislative Assemblies respectively.
- **Article 243D** provides reservation of seats for SCs and STs in Panchayat.
- **Article 233T** provides reservation of seats for SCs and STs in every Municipality.
- **Article 335 of the constitution** says that the claims of SCs and STs shall be taken into consideration without compromising the maintenance of efficacy of the administration.
- **Part XVI of the constitution of India** deals with reservation for SC's and ST's in Central and State legislatures.
- **103rd Constitutional amendment** provides 10% reservation for Economically Weaker Section (EWS) in the general category under **Articles 15(6) and 16(6)**.

- **Article 31C**, introduced in **1971**, aimed to protect laws made in furtherance of **Articles 39(b) and 39(c)** (related to wealth distribution and preventing concentration of wealth) from being struck down by courts on the grounds of violation of **Articles 14 (equality) and 19 (freedom of speech)**.
- This was challenged in the **Kesavananda Bharati case (1973)**, where the Supreme Court upheld judicial review but allowed laws promoting **Articles 39(b) and 39(c)** to be immune from challenges based on Articles 14 and 19.
- In the **Minerva Mills case (1980)**, the Supreme Court emphasized the primacy of **fundamental rights** over DPSPs, clarifying that no law could override **Articles 14, 19, and 21**.

Key-takeaways from the SC's Judgment

- **Not All Private Property Falls Under Article 39(b):** The majority opinion stated that **not all private property** can be considered "material resources of the community" under Article 39(b) for government acquisition. The **Chief Justice** noted that this approach prevents a rigid economic dogma favoring **state control** over private resources.
- **Case-by-Case Basis:** The judgment emphasized that determining whether a private resource should be acquired for the **common good** should depend on **case-by-case assessment**. The factors for consideration include the resource's **scarcity, public impact**, and the consequences of its concentration in private hands.
- **Rejection of Earlier Interpretations:** The bench rejected the **interpretation** in previous judgments (like **State of Karnataka v. Shri Ranganatha Reddy, 1977**) that extended Article 39(b) to cover all private resources, including those owned by individuals. This earlier view was seen as being shaped by a **particular economic ideology** promoting state acquisition of private property.
- **Immunity for Laws under Article 39(b):** The Court reaffirmed that **laws made to implement Article 39(b)** are shielded from challenges under **Article 31C**. However, the Court emphasized that such acquisitions must still comply with **constitutional guarantees**, such as **Articles 14** (equality) and **300A** (right to property).
- **Dissenting Opinion:**
 - **Private property** should not be **automatically excluded** from the scope of Article 39(b), especially in a country with **widening economic inequality**. **Equitable distribution** of private resources could benefit the public and help in achieving the **DPSP goals**, like reducing inequality.

SC'S VERDICT ON ARTICLE 39(B) AND PRIVATE PROPERTY

CONTEXT

In a significant **8:1 majority ruling**, the Supreme Court's **nine-judge Constitution Bench** has clarified the scope of **Article 39(b)** of the Indian Constitution, which deals with the **acquisition and redistribution of resources** for the common good. The court ruled that **not all private property** can be classified as "material resources of the community" for the purposes of government acquisition.

What is Article 39(b)?

- **Article 39(b)** is part of **Part IV of the Constitution** (Directive Principles of State Policy or **DPSP**).
- It mandates that the State should **distribute the ownership and control** of the "material resources of the community" to ensure they serve the **common good**.
- This provision aims to prevent the **concentration of wealth** in a few hands and ensures that resources are used for the collective welfare of society.
- However, the court was asked to interpret the term "**material resources**" under this article and to determine whether private property can fall under this category for government acquisition.

Judicial Conflict Between Fundamental Rights and DPSPs

- The tension between **fundamental rights** (such as the right to equality and freedom of speech) and the **Directive Principles of State Policy** (which guide the State in policy-making but are **not legally enforceable**) has long been a judicial challenge.

Impact of the Verdict

- **Evolution of Economic Policy:** The ruling marks a shift in India's **economic policy**. While acknowledging the **role of the state** in promoting public welfare, it also respects **individual property rights**. This decision aligns with the country's transition towards a more **liberalized economy** where both public and private investments coexist.

- **Case-by-Case Evaluation:** The Court's ruling establishes that any government action to acquire private property for the public good must be evaluated based on specific circumstances, **balancing public needs with private rights**.
- **Political Implications:** This judgment comes at a time when discussions around wealth redistribution, especially in the context of the 2024 Lok Sabha elections, have gained political attention. The ruling could impact how economic policies are framed, particularly those aimed at addressing inequality or redistributing wealth.

SC RULING ON BASIC STRUCTURE AND MADRASA LAW

CONTEXT

In a **landmark ruling**, a **three-judge bench** of the Supreme Court, headed by **Chief Justice D.Y. Chandrachud**, has held that **the Basic Structure doctrine cannot be applied to challenge the validity of an ordinary law**. This judgment arose from a challenge to the **Uttar Pradesh Madrasa Education Board Act, 2004**, which was questioned on the grounds of violating the **principle of secularism**—one of the key components of the **Basic Structure** of the Indian Constitution.

What is the Basic Structure Doctrine?

- The **Basic Structure doctrine** was first established in the **Kesavananda Bharati case (1973)**.
- It holds that certain fundamental features of the **Indian Constitution**, such as **democracy, secularism, federalism, and judicial review**, cannot be altered by Parliament through constitutional amendments.
- This doctrine is seen as a safeguard to ensure that the Constitution's foundational values are protected.

Key Aspects of the Ruling

- **Basic Structure Doctrine Cannot Apply to Ordinary Legislation:** The **Basic Structure doctrine** is meant to apply to **constitutional amendments**, not to **ordinary laws** passed by the legislature. Applying the **Basic Structure** test to challenge ordinary legislation, according to the court, would lead to **uncertainty** in legal adjudication, as the doctrine is based on **broad and undefined concepts** such as **secularism** and **democracy**, which can vary in interpretation.
- **Secularism and Constitutional Provisions:** The Supreme Court rejected the claim that the **Uttar Pradesh Madrasa Education Board Act** violated the **principle of secularism** as part of the **Basic Structure**. For a law to be challenged on the grounds of violating **secularism**, the challenger must demonstrate that the statute explicitly contravenes the specific **constitutional provisions** related to secularism. The mere allegation of violating secularism was not sufficient.
- **Distinction Between Constitutional Amendments and Ordinary Law:** The ruling reiterated an earlier

observation made in the **Raj Narain case (1975)**, which involved the use of the Basic Structure doctrine for the first time.

- ▶ In that case, the **Supreme Court** had drawn a distinction between **constitutional amendments** and **ordinary statutes**. The court held that constitutional amendments, being part of the Constitution, are subject to a higher standard of review, whereas ordinary laws passed by the legislature are not susceptible to being tested against the Basic Structure.
- **Judicial Precedents in the Raj Narain Case:** In his judgment, Chief Justice Chandrachud referenced the **Raj Narain case**, which was pivotal in the evolution of the Basic Structure doctrine. The bench in that case had ruled that applying the Basic Structure doctrine to ordinary laws would amount to **"rewriting the Constitution"**. This opinion was critical in shaping the court's view on why the doctrine should not be used to assess the validity of regular statutes.

The Uttar Pradesh Madrasa Education Board Act, 2004

- The law in question, **Uttar Pradesh Madrasa Education Board Act, 2004**, regulates the administration and functioning of madrasas (Islamic religious schools) in the state. The law was challenged on the grounds that it violated the **principle of secularism**, one of the foundational principles of the Indian Constitution, by allegedly interfering with the secular nature of education.
- The **Allahabad High Court** had ruled that the law violated secularism, which led to the matter being brought before the Supreme Court. The Court, however, held that the law did not violate the **Basic Structure** and that **secularism**, as an element of the Basic Structure, could not be invoked to invalidate an ordinary law without specific constitutional violations.

The Court's Reasoning

- ▶ **Vagueness of Basic Structure:** Chief Justice Chandrachud emphasized that the **concepts underlying the Basic Structure doctrine**—such as **democracy, secularism, and federalism**—are broad and **undefined**. Allowing these concepts to be used as a standard for striking down ordinary legislation could create **legal uncertainty**.
- ▶ **Statutory Review:** He stated that if a statute allegedly violates secularism, the challenge should be based on a **direct constitutional provision** related to secularism, rather than invoking the broader Basic Structure doctrine.
- ▶ **Judicial Precedents:** By quoting key judgments in the **Raj Narain case**, the Chief Justice reinforced the idea that there is a clear distinction between **constitutional amendments** and **ordinary laws**. **Constitutional amendments** can be scrutinized for violating the **Basic Structure**, but this is not the case with ordinary laws passed by the legislature.

Implications of the Ruling

- **Clarification of Basic Structure's Application:** The ruling clarifies that **ordinary laws** cannot be invalidated merely by invoking the **Basic Structure**. This provides clarity on the role of the **Basic Structure doctrine** in **constitutional adjudication** and ensures that the focus remains on the Constitution's **amendments**, rather than legislation passed by the government.
- **Impact on Secularism Challenges:** The decision also sets a precedent for **secularism challenges** in the future. The **Supreme Court** has made it clear that laws cannot be struck down simply on the allegation of violating secularism unless there is a **specific constitutional breach**.
- **Strengthening of Legislative Authority:** By upholding the **Uttar Pradesh Madrasa Education Board Act**, the Court affirmed the **state's power** to regulate **educational institutions**, including **madrasas**, and to enact laws for **administrative purposes** without the threat of judicial intervention based on the Basic Structure.

RURAL WAGE STAGNATION AMID ECONOMIC GROWTH

CONTEXT

India's economy has grown at a healthy rate of 4.6% annually from 2019-20 to 2023-24, with even stronger growth of 7.8% in the last three fiscal years. The agricultural sector, which is crucial for rural livelihoods, has also grown steadily at an average rate of 4.2%. However, despite this economic progress, rural wages have not kept pace with inflation.

Rural Wage Growth vs. Economic Growth

- **Nominal Wages:** From 2019 to 2024, rural wages grew by 5.2% on average annually in nominal (current value) terms. For agriculture, this figure was slightly higher at 5.8%.
- **Real Wages:** When adjusted for inflation, the situation looks different. In **real (inflation-adjusted) terms**, **rural wages** grew at only **-0.4%** per year on average, indicating **stagnation**. For agricultural wages, the growth was slightly better at **+0.2%**.

In simpler terms, while wages have increased in name, the rise has not been enough to **outpace inflation**, meaning that the purchasing power of rural workers has not improved significantly.

Why Are Rural Wages Stagnant?

There are two main reasons why rural wages are stagnating despite the economy's growth:

▫ Rising Labour Force Participation Among Women

- The **Labour Force Participation Rate (LFPR)** measures the percentage of the working-age population (15 years and above) that is either

employed or actively seeking work. Over the past few years, there has been a significant increase in the number of women joining the workforce, particularly in rural areas.

- ◆ **Female LFPR in Rural Areas:** In 2018-19, the female LFPR in rural India was **26.4%**. By 2023-24, this had risen to **47.6%**. This is a major shift, showing that more women are willing to work.

- The **reason for this increase** is largely attributed to government programs like **Ujjwala**, **Saubhagya**, **Swachh Bharat**, and **Har Ghar Jal**. These initiatives have improved access to clean cooking fuel, electricity, water, and sanitation. This has reduced the time women spend on household chores, like collecting water or firewood, allowing them to take up more productive work outside the home.
- However, **the downside** of this increase in the workforce is that more people are now available for work. **More workers, especially women, are willing to work at the same or even lower wages**, which has led to a downward pressure on real wages in rural areas.

▫ Shift Towards Agriculture

- Another key factor is where the new workforce is getting jobs. As more women enter the rural labour market, a significant portion of them is finding employment in **agriculture**. From 2018-19 to 2023-24, the share of agriculture in rural employment rose from **71.1% to 76.9%**.
- ◆ The problem with this is that **agriculture is a labour-intensive sector** with low productivity. In other words, each additional worker in agriculture adds less value to the output, leading to **lower wages** in agriculture.
- ◆ As rural India has not seen a proportional increase in jobs in **non-farm sectors** (e.g., manufacturing or services), the majority of new entrants into the workforce are stuck in agriculture, which has limited capacity for high-wage growth.

Capital-Intensive Growth

- Economic growth in India in recent years has been increasingly **capital-intensive**. This means that industries like infrastructure, steel, and cement require more machinery and less human labor.
- The growth in such sectors generates wealth, but not enough employment for a large number of workers.
- As a result, the benefits of economic growth are accruing to **capital owners** (firms and industrialists) rather than **labourers**.

The Mitigating Factor: Income Transfer Schemes

While wage growth has been slow, the government has introduced **income transfer schemes** to provide additional support, especially to women and rural families. These schemes include:

- **Direct Income Transfers:** The government has provided annual income support of **Rs 6,000 per year** to 11 crore farmers through the **PM-KISAN scheme**. Additionally, **free grain distribution** has benefited over 80 crore people.
- **State-Specific Schemes:** Many states have implemented or announced schemes that provide direct financial support to women in rural areas. For example:
 - ▶ **Maharashtra's Ladki Bahin Yojana:** Transfers **Rs 1,500 per month** to women from families with an annual income below Rs 2.5 lakh. This amount can be crucial for rural women, whose average daily wage in August 2024 was Rs 311.5.

MILLET REVOLUTION IN RURAL INDIA

CONTEXT

The growing recognition of **millets** as nutritious and sustainable food sources has sparked a renewed interest in their cultivation and consumption across India, particularly in rural areas.

Current Consumption Trends

- Despite perceptions of **declining millet consumption** due to the **green revolution's focus on wheat and rice**, rural consumers have maintained a strong connection to traditional grains.
- Rural areas are consuming millets on par with urban counterparts. Research indicates that states like **Rajasthan, Uttar Pradesh, Maharashtra, and Karnataka** continue to incorporate millets into their diets, using them for food, fodder, and industrial applications.
- **Rural vs. Urban Consumption:** While overall millet consumption has decreased over the decades, rural consumption remains significantly higher than in urban settings. This enduring tradition highlights the need for companies and startups to recalibrate their strategies to better engage with rural markets.

Government Initiatives and Support:

- ▶ Public Distribution System (PDS)
- ▶ Pradhan Mantri Poshan Shakti Nirman
- ▶ Saksham Anganwadi
- ▶ Poshan 2.0

What is Millet?

- Millet is a collective term referring to a number of small-seeded annual grasses that are cultivated as grain crops, primarily on marginal lands in dry areas in temperate, subtropical, and tropical regions.
- **Examples:** jowar (sorghum), ragi (finger millet), Kodo (Kodo millet), kutki (little millet), kakun (foxtail millet), Sanwa (barnyard millet), cheena (proso millet), kuttu (buckwheat) and chaulai (amaranth).

Positives of millets:

- ▶ **Nutritionally superior traits:** Millet's score over rice and wheat in terms of minerals, vitamins, and dietary fibre content, as well as amino acid profile.
 - ◆ **For example,** Bajra (pearl millet), has iron, zinc, and protein levels comparable to that of wheat, but it's gluten-free and has more fibre.
- ▶ It can address the problem of "hidden hunger" arising from the consumption of energy-dense but micronutrients-deficient foods
 - ◆ The rotis from bajra make one feel fuller for longer, as they take more time to digest and do not raise blood sugar levels too fast.

Advantages as a crop:

- Millets are hardy and drought-resistant crops.
- This has to do with their short duration (70-100 days, against 115-150 days for rice and wheat)
 - ▶ lower water requirement (350-500 mm versus 600-1,250 mm)
 - ▶ ability to grow even on poor soils and in hilly terrain

Where do millets lag?

- **Eating Habits:** For the poor, both in urban and rural areas, rice and wheat were once aspirational foods
- **Dominance of traditional grains:** Two-thirds of India's population receives up to 5 kg of wheat or rice per person per month at Rs 2 and Rs 3/kg respectively.
 - ▶ The recent move to place two fine cereals free of cost from January 2023, further tilts the scales against millets.
- **Cooking:** Rolling Rotis is easier with wheat than millet flour.
- **Low per-Hectare yields:** The national average is roughly 1 tonne for jowar, 1.5 tonnes for bajra and 1.7 tonnes for ragi. Whereas it is 3.5 tonnes for wheat and 4 tonnes for paddy — are a disincentive.
- **Presence of Infrastructure for traditional grains:** With access to assured irrigation, they would tend to switch to rice, wheat, sugarcane, or cotton.
- **Absence of government procurement at minimum support price (MSP):** It makes farmers hesitant to grow even this high-yielding and naturally bio-fortified bajra, suitable for both post-monsoon Kharif and summer cultivation.

INDIA'S RAPID URBANISATION

CONTEXT

October 31 is observed every year as **World Cities Day**. The world's urban population has reached an estimated 4.7 billion, or 57.5% of the world's total population, with projections to double by 2050. The theme for this year's World Cities Day is '**Youth Climate Changemakers: Catalysing Local Action for Urban Sustainability**'.

Challenges faced by cities

- Cities are confronting unprecedented challenges, particularly due to climate change.
- Despite progress towards Sustainable Development Goals (SDGs), issues such as poverty, inequality, and environmental degradation persist.
- In the Global South, challenges are compounded by rapid urbanization, inadequate infrastructure, and limited resources. Common issues include:
 - ▶ Housing shortages
 - ▶ Poor access to clean water and sanitation
 - ▶ Increased vulnerability to climate-related events

Urbanization in India

- India's urbanization trajectory is distinct from that of Western nations, which historically benefited from industrialization and colonial economic transfers.
- India experiences "poverty-driven urbanization," with significant rural-to-urban and urban-to-urban migration driven by economic distress.
- The COVID-19 pandemic revealed gaps in urban infrastructure, leading to reverse migration and highlighting vulnerabilities.

Key Urban Challenges in India

- ▶ **Lack of Current Data:** The absence of a 2021 Census hampers accurate assessments of urban population and planning.
- ▶ **Inadequate Spatial Planning:** Urban planning is often outdated, failing to accommodate population growth and changes in demographics.
- ▶ **Economic Changes:** Deindustrialization since the 1980s has resulted in job losses in major cities, with 40% of the urban population now residing in slums.
- ▶ **Climate Change Impact:** Cities face severe pollution, flooding, and heat island effects. Eight out of the ten most polluted cities in India are in the National Capital Region (NCR) around Delhi.
- ▶ **Social Segregation:** Urban areas are increasingly divided along social and religious lines, with a widening gap between affluent developments and those lacking basic housing.
- ▶ **Informal Sector Vulnerability:** Approximately 90% of city jobs are in the informal sector, characterized by poor working conditions and lack of job security.
- ▶ **Governance and Planning Issues:** Despite the 74th Constitutional Amendment aimed at decentralizing urban governance, many Indian cities remain under the control of undemocratic bodies.
 - ◆ Elected representatives often lack control over urban planning, which is frequently outsourced to private entities and parastatals.
 - ◆ Cities receive only 0.5% of GDP in intergovernmental transfers, limiting their financial capacity for development.

CSR & INDIAN AGRICULTURE

CONTEXT

India's **Corporate Social Responsibility (CSR)** framework has evolved significantly since its legal introduction under **Section 135 of the Companies Act 2013**, making it the first country to mandate CSR spending. With **Rs 1.84 lakh crore** of CSR funds disbursed between 2014 and 2023, the contributions from the corporate sector have shown a marked increase, particularly in the areas of **healthcare, sanitation, education, and environmental sustainability**. However, one sector that could greatly benefit from this funding is **agriculture**, especially as the country strives to make its farming practices more **economically viable** and **ecologically sustainable**.

Importance of Agriculture to India's Economy

- Agriculture plays a pivotal role in **India's socio-economic fabric**. Nearly **47%** of the population is dependent on agriculture for employment, and the sector contributes about **16.73%** to India's GDP.
- The vast majority of Indian families are directly or indirectly associated with agriculture, and the sector shapes the livelihoods of millions.
- Despite its importance, agriculture in India faces significant challenges, including **climate change, stagnant farmer incomes, and degradation of natural resources**.
- **Agriculture's Transition to Sustainability**
 - ▶ Following the **Green Revolution**, which prioritized increasing **agricultural productivity**, India has now reached a stage where food production is relatively stable. The focus has shifted toward **sustainability**—ensuring that agriculture is not only productive but also **resilient** to climate shocks and **environmentally sustainable**. Recent initiatives such as the **Parampragat Krishi Vikas Yojana (PKVY)** and the **Mission for Integrated Development of Horticulture (MIDH)** have sought to address these concerns.
 - ▶ The **2024-2025 agriculture budget** of **Rs 1.52 lakh crore** explicitly mentions the **productivity and resilience** of agriculture as key priorities.
 - ▶ However, despite these efforts, government funding often falls short of meeting the sector's vast needs, particularly in terms of **infrastructure development** and **capital investments**.

CSR's Role in Supporting Agricultural Sustainability

- Given these challenges, the private sector's involvement through **CSR** has become increasingly important. As of the most recent reports, **23%** of companies surveyed identified "**environment and sustainability**" as their CSR priority, signaling a willingness to contribute to sustainable agricultural development. CSR funding has already been channeled into various projects, such as:

- ▶ **Establishing grain banks** to prevent food waste and ensure food security.
- ▶ **Farmer schools** for improving agricultural knowledge and skills.
- ▶ **Water conservation projects** to mitigate water scarcity in agricultural areas.
- ▶ **Energy-efficient irrigation** systems to promote sustainable farming.

Challenges in Tracking CSR Funds for Agriculture

- Despite the growing interest in sustainable agricultural practices, one of the key challenges is **tracking CSR contributions** specifically related to agriculture. Currently, there is no comprehensive way to **distinctly categorize and monitor CSR spending** on agricultural sustainability initiatives. While sectors like **healthcare** and **education** have clear guidelines for tracking funds, the agricultural-related activities under CSR are scattered across multiple categories, such as:
 - ▶ Agroforestry
 - ▶ Poverty alleviation and hunger
 - ▶ Technology incubators
 - ▶ Environmental sustainability
 - ▶ Livelihood enhancement projects
 - ▶ Rural development
- These broad categories, while encompassing some agriculture-related initiatives, also cover a wide range of activities that may not directly pertain to agricultural sustainability, making it difficult to determine how much is actually being spent on farming-related projects.
- From **2014 to 2023**, sectors related to agriculture disbursed **Rs 53,046.75 crore** under CSR. However, because these funds are spread across a variety of sectors, the precise allocation for **agriculture** remains unclear. This lack of clarity makes it difficult to **assess the impact** of CSR investments on India's agricultural landscape, which is critical given the sector's importance.

Significance

- **Increased Transparency:** Clear reporting mechanisms would allow for better tracking of CSR funds allocated to agricultural initiatives. This would help ensure that the funds are being spent effectively and efficiently, with greater **accountability** to both stakeholders and the public.
- **Targeted Funding:** With a distinct focus on agriculture, CSR funds could be **targeted** to address specific **sustainability issues** such as **soil health**, **water conservation**, **climate resilience**, and **modernization of farming practices**. This would make the funds more impactful and aligned with India's larger agricultural policies.
- **Alignment with Policy Priorities:** Specifying agriculture as a CSR sector would also align with India's **rural development goals**, **climate action plans**, and **poverty alleviation initiatives**, making it easier for companies to contribute to these **national priorities**.

- **Boosting Capacity Building:** In addition to capital expenditure for infrastructure, CSR initiatives could also focus on **capacity building**, improving the skills and knowledge of farmers, and promoting **sustainable agricultural practices**.
- **Tracking Impact:** A clear focus on agriculture would allow for better **impact assessments** of CSR projects in the sector. These assessments could inform future policies and ensure that investments lead to **tangible improvements** in agricultural productivity and sustainability.

KERALA'S NEW COASTAL ZONE PLAN

CONTEXT:

The **Union Ministry of Environment, Forest and Climate Change** has approved **Coastal Zone Management Plans (CZMPs)** for ten coastal districts in Kerala. This approval allows these districts to **relax certain Coastal Regulation Zone (CRZ) rules** and start new development activities, including building construction closer to the sea.

Importance for Kerala:

- Kerala has about 590 km of coastline, with a high population density in coastal areas.
- The CZMP approval is expected to benefit around 10 lakh people by easing restrictions on building new homes and repairing existing ones.
- The new rules reduce the No Development Zone (NDZ) from 100 meters to 50 meters in certain areas, allowing for more construction.

Key Changes:

- ▶ The NDZ around tidal waters will now be 50 meters instead of 100 meters.
- ▶ This change categorizes 37 village panchayats as CRZ-III A, allowing more development in densely populated rural areas.
- ▶ In total, the NDZ area in Kerala will be reduced significantly.

Concerns for Mangroves:

- ▶ Mangrove areas, crucial for coastal ecosystems and fish breeding, will face reduced legal protection.
- ▶ The buffer zone for government-held mangroves is decreased from 4,300 hectares to 2,500 hectares.
- ▶ Private landowners can now exploit mangroves on their properties, which poses a risk to these vital ecosystems.



FACT BOX

Coastal Regulation Zone (CRZ)

- Under the **Environment Protection Act, 1986 Ministry of Environment and Forests (MoEF)** issued notification in 1991, for regulation of activities in the coastal area.
- **Coastal Regulation Zone (CRZ)** is the area up to 500m from the high-tide line and a stage of 100m along banks of creeks, estuaries, backwater and rivers subject to tidal fluctuations.
- CRZ Rules govern human and industrial activity close to the coastline, in order to protect the fragile ecosystems near the sea.
- The **Union Ministry of Environment, Forest and Climate Change** has notified the 2019 Coastal Regulation Zone (CRZ) norms, replacing the existing CRZ norms of 2011.
- The new CRZ norms aim to promote sustainable development based on scientific principles.
- Coastal Regulation Zones (CRZ) 1991 notification gave four fold classifications of coastal areas.
 - ▶ **CRZ-1:** These are ecologically sensitive areas as they help in maintaining the ecosystem of the coast. They lie between low and high tide line. Exploration of natural gas and extraction of salt are permitted
 - ▶ **CRZ-2:** These areas are urban areas located in the coastal areas. Now under new coastal zone regulations 2018, the floor space index norms have been de-frozen.
 - ▶ **CRZ-3:** Rural and urban localities which fall outside the 1 and 2. Only certain activities related to agriculture even some public facilities are allowed in this zone
 - ▶ **CRZ-4:** This lies in the aquatic area up to territorial limits. Fishing and allied activities are permitted in this zone. Solid waste should be let off in this zone. This zone has been changed from 1991 notification, which covered coastal stretches in islands of Andaman & Nicobar and Lakshdweep

COP-16 SUMMIT

CONTEXT

The **16th edition of the Convention of Biological Diversity (CBD)** in Cali, Colombia, saw representatives of countries trying to iron out a conclusive deal well past the deadline.



Background of the Convention

- The CBD follows previous meetings, including the 2022 summit in Montreal, Canada.
- **Key outcome from the Montreal meeting:** the **30-by-30 agreement** aimed to protect 30% of land and water by 2030, addressing the current protection levels of 17% for land and 10% for marine areas.
- The **Kunming-Montreal Global Biodiversity Framework (KMGBF)** established 23 action-oriented global targets for urgent biodiversity action by 2030, including:
 - ▶ Reducing invasive alien species by 50%
 - ▶ Minimizing pollution risks to tolerable levels
 - ▶ Creating a mechanism for benefit-sharing from digital sequence information and integrating biodiversity into various policies

Current Developments at COP-16

- Although a final text is pending, negotiators have agreed to establish a subsidiary body that includes indigenous groups in discussions on conservation and biodiversity.
- A contentious issue at COP-16 was the **Digital Sequence Information (DSI)** agreement, focusing on the sharing of benefits from commercial products derived from DNA analysis of living organisms.
- Key agreements adopted include commitments to address biodiversity and climate change, mainstream biodiversity in various sectors, and manage invasive species.

India's Contribution to COP-16

- India presented an updated biodiversity plan.
- **Financial Commitment:** India expects to spend approximately **₹81,664 crore** on biodiversity and conservation from 2025-2030. Between 2018-2022, it spent **₹32,207 crore** on these efforts.
- India emphasized the need for international finance to meet its biodiversity goals, aligning with **Target 19** of the KMGBF, which seeks to mobilize **\$200 billion annually** for biodiversity, including **\$30 billion** from international sources.

Significant initiatives by India include:

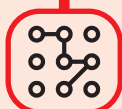
- ▶ Establishing the **International Big Cat Alliance** to protect seven major big cat species, signifying a commitment to ecosystem health.
- ▶ Increasing its **Ramsar sites** (wetlands of ecological importance) from 26 to 85 since 2014, with projections to reach 100 soon.

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SECTION - B

QUICK BYTES

FIRST ASIAN BUDDHIST SUMMIT

CONTEXT

Ministry of Culture in collaboration with the International Buddhist Confederation, is organizing the First Asian Buddhist Summit (ABS) on 5th and 6th November in New Delhi.

Key-highlights

- The theme of this summit is '*Role of Buddha Dhamma in Strengthening Asia*'.
- The Summit will bring together Sangha leaders, scholars, experts and practitioners from various Buddhist traditions across Asia to foster dialogue, promote understanding and address contemporary challenges faced by the Buddhist community.
- Buddhism holds a unique position in the spiritual and cultural history of India and pan-Asia. The Summit marks a unique opportunity to bring together diverse voices of **Buddha's Dhamma across Asia**.
- The summit is also a manifestation of India's '**Act East**' policy, which is principled on collective, inclusive and spiritual development of Asia with **Dhamma** as the guiding light.



FACT BOX

Buddhism in India:

- Siddhartha Gautam, born in 563 BC, was part of the **Sakya** royal family that ruled from **Kapilvastu, Lumbini**. At the age of 29, Gautama left home and led a life of self-denial.

- After 49 days of meditation, Gautama received enlightenment under a pipal tree at Bodhgaya in Bihar.
- Buddha made his first sermon in the village of **Sarnath**, near the town of Benares in the UP. The event is known as the **Dharma-Chakra-Pravartana** (legal wheel revolution).
- He died at the age of 80 in **Kushinagara**, a city in the UP. The event is known as **Mahaparinibban**.

The rules of Buddhism:

- **Middle Path:** Avoid both extremes of worldly pleasure and the practice of extreme self-The Buddha instead called the 'Madhyam Marg' or the intermediate method to be followed.
- **Four good truths:**
 - ▶ Suffering exists (**Dukkha**)
 - ▶ Suffering has a cause (**Samudāya**)
 - ▶ Suffering has an end (**Nirodha**)
 - ▶ There is a path that leads to the end of suffering(**Magga**)
- **Eight-Way Ways:** Positive Views, Proper Objective, Proper Speech, Proper Action, Proper Health, Positive Thinking, Positive Effort, Positive Concentration
- **Five Principles or Pancasil-** Violence, theft, sexual misconduct, lying or gossip, drunkenness

Major Buddhist texts:

- The Buddhist scriptures are known as the **Tipitaka** which means 'three baskets'. Tripitaka is made up of three main sections:

The Three Baskets (Tipiṭaka)

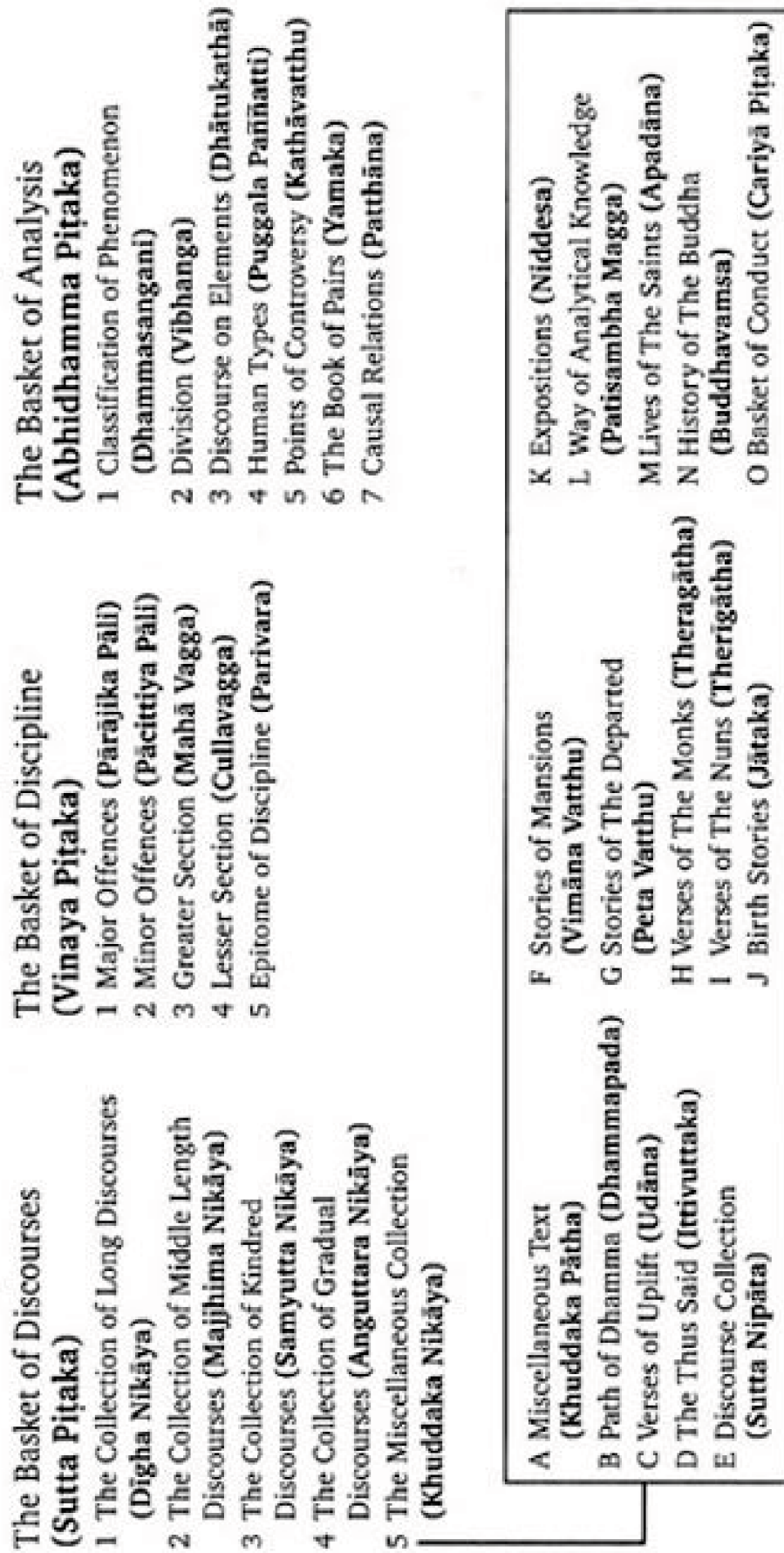


Figure No. 03

- ▶ Vinaya Pitaka (moral code)
- ▶ Sutta Pitaka (Dhamma Buddha): Divided into five **Nicayas: Digha, Majjhima, Samyutta, Anguttara, Anguttara Khuddaka**
- ▶ Abhidhamma Pitaka (philosophical analysis)
- Other important Buddhist texts include **Divyavadana, Dipavamsa, Mahavamsa, Milind Panha** etc.

(see Figure No. 03 on previous page)

Buddhist Schools:

- **Mahayana** believes in the heaven of the Buddha and the idolatrous worship of the Buddha and the Bodhisattvas including the Buddha Nature.
- **Hinayana** believes in the original teachings of the Buddha or the Doctrine of the Elders. He does not believe in idolatry and seeks to gain personal salvation through self-discipline and meditation.
- **Theravada** is a Hinayana sect, founded in Sri Lanka and later spread throughout Southeast Asia.
- **Vajrayan** means “Car of Thunder”, also known as tantric Buddhism.
- **Zen** is a school of Mahayana Buddhism founded in China.

Patrolling Points

- Depsang and Demchok were the last two friction points during the four and half years long tense stand-off between Indian and Chinese troops in eastern Ladakh.
- Since the LAC flare-up, the PLA troops blocked India’s access to five patrolling points in Depsang– **PP 10, 11, 11A, 12 and 13** – that are close to the LAC.
- The area including **Dault Beg Oldie** **airbase** is a part of what is known as **Sub Sector North** in the India military parlance.
- East of the Depsang plain lies **Aksai Chin**, an area illegally occupied by China since the 1950s. The region is strategically important not only due to its proximity to **Siachen glacier** and **Karakoram range**, but also because of the flat nature of the terrain.
- The five patrolling points are located in an area called bottleneck which opens on a flat area that gives India a vantage point to keep an eye on two crucial Chinese roads connecting **Tibet with Xinjiang**.

VERIFICATION PATROLLING IN DESPANG

CONTEXT

The Indian Army has conducted the first round of patrolling in the **Depsang area** along the **Line of Actual Control (LAC)**, after conducting similar patrols in **Demchok**, following the consensus reached between the Indian and Chinese sides for disengagement and resumption of patrolling in the region. The Army now has “unrestricted access” to the five PPs in Depsang and two in Demchok.

FACT BOX

Depsang Plains

- The Depsang Plains are located close to the strategically important **Daulat Beg Oldie**.
- The crucial **Sub-Sector North (SSN)** consists of the **Depsang plains and Daulat Beg Oldie (DBO)**. Currently, the airfield at DBO is accessible by the 255 km-long Darbuk-Shyok-DBO (DSDBO) road.
- In Depsang Plains, Chinese troops have been blocking Indian Army patrols from going up to the **PPs 10, 11, 11A, 12 and 13**, beyond the **Y junction**.
- Chinese build-up in this area threatens Indian positions at DBO and also brings Chinese troops closer to the DSDBO road.

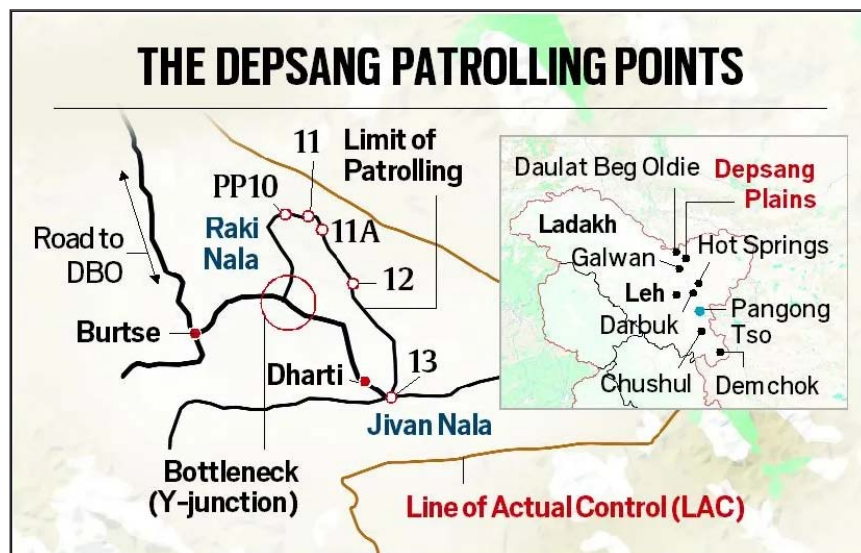


Figure No. 04

- Depsang is also close to the **Karakoram pass** overlooking the strategic **Saltoro ridge and Siachen glacier**, the **world's highest battlefield**.
- The Depsang Plains issue began in 2013 when China carried out an 18-km incursion in the area.

Demchok

- Demchok is in the southern part of eastern Ladakh. In Demchok, the problem is mainly at the **Charding Ninglung Nullah (CNN) junction**.

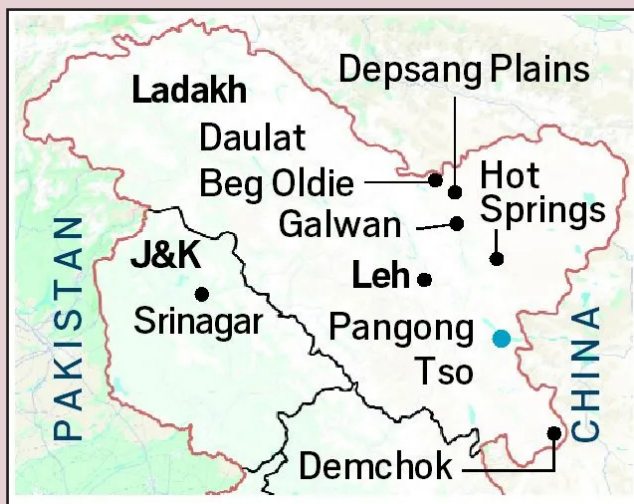


Figure No. 05

OPEC+

CONTEXT

OPEC+ has agreed to delay a planned December oil output increase by one month, as weak demand notably from China and rising supply outside the group maintain downward pressure on the oil market.

What is OPEC+?

- The **Organization of the Petroleum Exporting Countries (OPEC)** was established in **1960** by five founding countries: **Iraq, Iran, Kuwait, Saudi Arabia, and Venezuela**. Since its inception, OPEC has grown to include **13 member countries** that together control a significant portion of the world's oil reserves and production capacity.
- However, in **2016**, in response to **falling oil prices** caused by rising **U.S. shale oil production**, OPEC expanded its reach by partnering with additional oil-producing nations that were not part of the original OPEC group. This broader coalition is known as **OPEC+**, which includes key non-OPEC oil producers like **Russia, Mexico, Kazakhstan, and Oman**.

■ OPEC+ Members

- ▶ **OPEC Members:** Saudi Arabia, United Arab Emirates (UAE), Kuwait, Iraq, Iran, Algeria, Libya, Nigeria, Congo, Equatorial Guinea, Gabon, and Venezuela.

- ▶ **Non-OPEC Members in OPEC+:** Russia, Azerbaijan, Kazakhstan, Bahrain, Brunei, Malaysia, Mexico, Oman, South Sudan, and Sudan.
- OPEC+ collectively accounts for a significant portion of global oil production and plays a crucial role in determining **oil prices** worldwide through **production cuts or increases**.

OPEC+ Production and Spare Capacity

- OPEC+ has substantial **spare capacity** in terms of oil production. **Spare capacity** refers to the ability of oil producers to increase output quickly if necessary, in response to rising demand or disruptions in supply.
- **For example:**
 - ▶ **Saudi Arabia** has the potential to increase its production by up to **3 million barrels per day (bpd)**.
 - ▶ The **United Arab Emirates (UAE)** can potentially raise production by **1.4 million bpd**.
- This spare capacity gives OPEC+ a significant role in managing global oil supply and stabilizing prices, especially when there are disruptions in major oil-producing countries, such as **Iran**.
- **OPEC+ and Global Oil Prices:** OPEC+ has significant influence over global oil prices. By adjusting production quotas, OPEC+ can influence supply, which in turn affects prices. For instance:
 - ▶ **Production Cuts:** OPEC+ often cuts production to **raise oil prices** when global demand is sluggish. For example, the group has cut production by **5.86 million bpd** in recent years.
 - ▶ **Geopolitical Tensions:** Conflicts, such as those involving Iran or other major oil producers, can lead to **oil price volatility**. OPEC+'s spare capacity can help stabilize prices in such situations, but the ability to do so depends on the geopolitical situation.

Global Oil Consumption and India's Role

- India is the **third-largest oil importer and consumer** in the world, importing over **80% of its oil needs**. India plays an increasingly important role in global oil markets:
- In **July 2022**, India became the **top buyer of Russian oil**, surpassing **China**.
- India is expected to become the largest source of global oil demand growth between now and 2030.
- This growing demand from India has significant implications for global oil prices and trade patterns, especially as the country continues to rely on imports to meet its energy needs.

■ India's Measures to Reduce Oil Imports

- ▶ **FDI in Oil and Gas PSUs:** In **2021**, the government allowed **100% Foreign Direct Investment (FDI)** in oil and gas **Public Sector Undertakings (PSUs)** under the **automatic route**, encouraging private and foreign investment in India's energy sector.

- ▶ **Coal Bed Methane (CBM):** India is exploring **Coal Bed Methane** as an alternative energy source to reduce its dependence on crude oil. CBM is a natural gas extracted from coal beds, which is seen as a cleaner alternative.
- ▶ **Underground Coal Gasification (UCG):** The government is using **UCG** to convert coal into synthetic gas, which can be used for electricity generation and industrial processes. This helps in reducing dependence on imported oil and gas.
- ▶ **National Gas Hydrate Programme (NGHP):** India is also exploring **gas hydrates** (frozen methane deposits found under the ocean floor) as a potential energy source. The **National Gas Hydrate Programme (NGHP)** aims to map these resources and explore their commercial viability.
- ▶ **Open Acreage Licensing Policy (OALP):** Under the **OALP**, India has opened up oil and gas exploration to private and foreign companies, allowing them to bid for exploration blocks in unlicensed areas. This aims to boost domestic oil and gas production.

- redrafted to exclude them, made applicable to Hindus only and renamed the **Madras Hindu Religious and Endowments Act, 1927**.
- The Waqf Act was first passed by Parliament in 1954. Subsequently, it was repealed and a new Waqf Act was passed in 1995 which gave more powers to Waqf Boards.
- **Amendments in 2013** - Some provisions of the Act were amended in the year 2013 to make waqf management more efficient and transparent. However, during the course of implementation of the Act, it was felt that the Act did not prove effective in improving administration of Waqf.
 - ▶ The Waqf Board has unlimited powers to claim properties in the name of Muslim charity — a power that no other religious body in India enjoys.
 - ▶ **Section 3 of the Waqf Act, 1995**, states that if the Waqf “thinks” that the land belongs to a Muslim, then it is the property of the Waqf. The board does not have to furnish any evidence on why they think the land falls under their ownership.
- **Waqf Repeal Bill, 2022:** For the purpose of achieving a more equitable arrangement and treatment of bodies such as waqf and other recognized religious entities established under similar intent, the aforesaid Waqf Act, 1995 as amended was tabled in Rajya Sabha.
- **Mussalman Wakf (Repeal) Bill, 2024:** The objective of the Waqf (Amendment) Bill, 2024, is to amend the Waqf Act, 1995, to redress the issues and challenges in regulating and managing Waqf properties. The Amendment Bill seeks to improve the administration and management of waqf properties in India.
 - ▶ It aims to overcome the shortcomings of the previous act and enhance the efficiency of Waqf boards by introducing changes such as renaming the Act, updating the definitions of waqf, improving the registration process, and increasing the role of technology in managing waqf records

WAQF BOARD LAND GRAB

CONTEXT

Amidst the ongoing debate over the **Waqf Amendment Bill**, shocking revelations have emerged regarding the Waqf Board’s claims over ancient Hindu temple lands in various states.

What is ‘Waqf’?

- Waqf refers to **properties dedicated exclusively for religious or charitable purposes** under Islamic law, and any other use or sale of the property is prohibited.
- Waqf means that the ownership of the property is now taken away from the person making Waqf and transferred and detained by Allah.
- **‘Waqif’** is a person who creates a waqf for the beneficiary.
- **Irrevocable:** Since the ownership of the property is transferred to Allah from the waqif in the case of Waqf, and property cannot be taken back from Allah, once a property becomes Waqf, it will always stay Waqf, making it irrevocable.
- **Spread:** Wakf Boards currently control 8.7 lakh properties spanning 9.4 lakh acres across India with an estimated value of 1.2 lakh crores.
 - ▶ India has the largest waqf holding in the World. Further, Waqf Board is the largest landowner in India after the Armed Forces and the Indian Railways.

What is the Waqf Act?

- The **Mussulman Waqf Act, 1923**, was introduced by the British who first introduced **The Madras Religious and Charitable Endowments Act, 1925**, which drew large protests from Muslims and Christians. It was then

MARITIME EDUCATION HUB

CONTEXT

The **Kerala Maritime Board** has issued a call for expressions of interest to develop a cutting-edge maritime education hub in **Neendakara, Kollam**, through a public-private partnership.

About the Maritime Education Hub

- The proposed maritime education hub will be developed through a public-private partnership and aims to offer a wide range of courses, including:
 - ▶ **Marine Engineering**
 - ▶ **Maritime Law**
 - ▶ **Marine Technology**
 - ▶ **Nautical Science**
 - ▶ **Naval Architecture**
 - ▶ **Offshore Engineering**

- In addition to academic offerings, the hub will focus on providing placement and career development opportunities, ensuring that graduates are well-equipped to meet the industry's needs.
- **Strategic Location and Collaborations:** Kerala's strategic position along the **Arabian Sea**, with direct access to international shipping routes, enhances its role as a key hub for trade and maritime activities in the **Indian Ocean region**. The state's vibrant maritime ecosystem will facilitate partnerships between industry and academia, promoting internships, research, knowledge exchange, and skill development programs.
- **Alignment with National Vision:** The establishment of the maritime education hub is part of the **Shipping Ministry's Amrit Kaal Vision 2047**, which outlines **39 initiatives** aimed at creating a robust innovation ecosystem within the maritime sector.
 - ▶ This vision focuses on elevating education, research, and training to meet global standards, reinforcing India's position in the international maritime landscape.
- **Need:** This initiative responds to the **rising demand for skilled professionals in the maritime sector**, driven by India's projected ship management sector growth of **6% annually**. With the increasing shipping volumes and the expansion of coastal and cruise tourism, the need for comprehensive maritime training has become imperative.
 - ▶ With India's share of the **global seafaring workforce** expected to increase from 10-12% to 20% over the next decade, addressing the anticipated talent gap is crucial.



FACT BOX

India's Maritime Sector

- India has a remarkable marine position with a 7,500 km long coastline and 1,382 offshore islands.
- India has 14,500 kilometers of **potentially navigable waterways**, apart from a **strategic location on important maritime trade routes**.
- The country's maritime sector plays a vital role in its trade and economic growth, as 95 percent of the country's trade by volume and 65 percent of the trade by value is undertaken through maritime transport.
- The coastal economy sustains over 4 million fishermen and India is the second largest fish-producing nation in the world with a fleet of about 2,50,000 fishing boats.
- **Important Initiatives:** Maritime India Vision 2030, Sagar Mala Program, Indian Maritime Centre (IMC), Indian International Maritime Dispute Resolution Centre (IIMDRC), 100% FDI Policy

LIQUIDATION OF JET AIRWAYS

CONTEXT

The Supreme Court ordered the **liquidation** of Jet Airways under the **Insolvency and Bankruptcy Code (IBC)**, marking an end to the five-year saga of attempts to revive the airline through the corporate insolvency resolution route.

What is Liquidation of a Company?

- The liquidation of a company happens when company assets are sold when it can no longer meet its financial obligations. Sometimes, the company ceases operations entirely and is deregistered.
- The **Companies Act of 2013** regulates the liquidation process.
- When a company is liquidated, the shareholders' interest in the company is extinguished, and the company ceases to exist.
- The company's assets are sold off to repay its debts and to distribute the remaining funds among its shareholders.

Reasons for Liquidating a Company

- ▶ Insufficient funds
- ▶ Lack of business activity
- ▶ Fraud or mismanagement
- ▶ High debt levels
- ▶ Mergers and acquisitions
- ▶ Changes in the law

Insolvency and Bankruptcy Code, 2016 (IBC)

- The Insolvency and Bankruptcy Code, 2016 (IBC) is the **bankruptcy law of India** which seeks to consolidate the existing framework by creating a **single law for insolvency and bankruptcy**.
- When insolvency is triggered under the IBC, there can be two outcomes:
 - ▶ Resolution
 - ▶ Liquidation

NEW POLIO CASES IN PAKISTAN

CONTEXT

The number of polio cases in Pakistan this year has risen to 45 after two fresh cases were detected in the country's Khyber Pakhtunkhwa province. Pakistan and Afghanistan are the only countries where the debilitating virus remains endemic.

About Poliomyelitis (Polio)

- Poliomyelitis (polio) is a highly infectious disease caused by a virus.
- It invades the **nervous system** and can cause **total paralysis** in a matter of hours.
- **Transmission:** The virus is transmitted by person-to-person spread mainly through the faecal-oral route or, less frequently, by a common vehicle (for example, contaminated water or food) and multiplies in the intestine.
- **Initial symptoms:** Fever, fatigue, headache, vomiting, stiffness of the neck and pain in the limbs.
 - ▶ Polio mainly affects children under 5 years of age. However, anyone of any age who is unvaccinated can contract the disease.
- **Treatment:** There is no cure for polio, it can only be prevented. Polio vaccine, given multiple times, can protect a child for life. There are two vaccines available (Both are effective and safe):
 - ▶ Oral Polio Vaccine

Inactivated Polio Vaccine

- **Global Polio Eradication Initiative:** In 1988, the **World Health Assembly** adopted a resolution for the worldwide eradication of polio, marking the launch of the Global Polio Eradication Initiative, spearheaded by national governments, WHO, Rotary International, the US Centers for Disease Control and Prevention (CDC), UNICEF, and later joined by the Bill & Melinda Gates Foundation and Gavi, the Vaccine Alliance.
- **Progress so far:** Wild poliovirus cases have decreased by over 99% since 1988, from an estimated 350 000 cases in more than 125 endemic countries to 12 reported cases in 2023.
 - ▶ Of the 3 strains of wild poliovirus (type 1, type 2 and type 3), wild poliovirus type 2 was eradicated in 1999 and wild poliovirus type 3 was eradicated in 2020.
 - ▶ As at 2024, endemic wild poliovirus type 1 remains in two countries: Pakistan and Afghanistan.

LINK BETWEEN NICKEL TOXICITY AND STEROL BIOSYNTHESIS

CONTEXT

Researchers at the **University of Georgia** recently made an interesting discovery about how nickel, a toxic metal, affects cells. Their findings, published in the journal **PLoS Genetics**, reveal that exposure to nickel can lead to a **sterol deficiency** in both mammalian (animals) and fungal cells.

Key-Findings

The research team discovered an unexpected connection between **nickel exposure** and **sterol biosynthesis** (the process of creating sterols) in fungal and mammalian cells. Here's a summary of their findings:

- **Nickel Exposure Reduces Sterol Levels:** When exposed to nickel, cells in both fungi and mammals had reduced amounts of sterols. Specifically, in fungi, the sterol **ergosterol** was significantly decreased.
- **The Role of SRE1/SREBP:** The researchers found that a specific protein called **SRE1** (Sterol Response Element 1) in fungi is important for regulating sterol production. In mammals, a similar protein is called **SREBP** (Sterol Regulatory Element Binding Protein). When cells are exposed to nickel, this protein is activated and triggers the genes responsible for sterol biosynthesis.
- **The Gene ERG25 and Nickel Tolerance:** One crucial finding of the study was that a gene called **ERG25**, which is involved in sterol biosynthesis, plays a role in **nickel tolerance**. When the ERG25 gene was over-expressed (increased activity), fungal cells were better able to tolerate high levels of nickel. This suggested that the ERG25 protein helps the cell deal with nickel exposure by maintaining sterol production.
- **Sterol Deficiency and Nickel Sensitivity:** The study also found that **fungal cells with a mutation** in the **Sre1 gene** (which controls sterol biosynthesis) became very sensitive to nickel. Without proper sterol production, these cells couldn't handle the stress caused by nickel, highlighting the link between sterol biosynthesis and nickel tolerance.

How does it connect to cell biology and potential medical applications?

- **Nickel and Its Role:** Nickel is a heavy metal often found in industrial environments, and it's also a known **allergen** and **carcinogen** for humans. However, certain organisms, such as **plants, bacteria, and fungi**, actually **need nickel** for normal biological processes. For example, the fungus **Cryptococcus neoformans** uses nickel for the function of an important enzyme called **urease**.
- **Sterols and Their Importance:** Sterols are **lipid molecules** (fats) that are a critical component of cell membranes in **plants, animals, and fungi**. They provide structural rigidity to these membranes, making them more stable. In **humans and animals**, the most important sterol is **cholesterol**, while in **fungi**, it is **ergosterol**.
 - ▶ **Cholesterol:** In humans, cholesterol is essential for many bodily functions, but if present in excess, it can build up in blood vessels and cause **heart disease**.
 - ▶ **Ergosterol:** In fungi, ergosterol plays a similar role to cholesterol but is the target of many **antifungal drugs**, like fluconazole, which **inhibit ergosterol production** to kill the fungus.

SUKHOI SU-30MKI JETS

CONTEXT

The Indian Air Force (IAF) is preparing for a comprehensive upgrade of its first batch of **84 Sukhoi Su-30MKI** jets, with financial arrangements currently being finalized.

About

- The **Sukhoi Su-30MKI** is a multirole combat fighter aircraft developed jointly by the **Sukhoi Design Bureau** and **Hindustan Aeronautics Limited (HAL)** for the **Indian Air Force (IAF)**. Based on the Su-30 design, the Su-30MKI features **thrust vectoring control** and **canards**, enhancing its maneuverability.
- **Development:** Development began in **1995** with prototypes built by Sukhoi between **1995 and 1998**. By **January 2020**, the IAF had **260 Su-30MKIs**, with additional deliveries expected.
- **Design and Avionics:** The Su-30MKI features an **aerodynamic airframe** made of titanium and aluminum alloys, with a length of **21.9 m**, wingspan of **14.7 m**, and maximum take-off weight of **38,800 kg**.
 - ▶ It has a **tandem glass cockpit** for two pilots, integrating advanced avionics like the **Elbit Su 967 HUD**, multifunction displays, and a **fly-by-wire** control system.
 - ▶ The aircraft is equipped with a **N011M passive electronically scanned array radar**, soon to be upgraded to the **Zhuk AESA radar**.
- **Weapon Systems and Countermeasures:** The Su-30MKI carries a **30mm Gsh-30-1 cannon** and features **12 hardpoints** for external stores, with a capacity of up to **8 tons**.
 - ▶ It can launch various air-to-surface missiles, including the **BrahMos** supersonic cruise missile, and is compatible with air-to-air missiles such as **R-27R**, **R-73**, and **R-77**.
 - ▶ The aircraft integrates a **tarang radar warning receiver** and employs countermeasures like chaff and flare dispensers.
- **Engine and Performance:** Powered by **two AI-31FP turbojet engines**, each producing a thrust of **12,500 kgf**, the Su-30MKI can reach speeds of **Mach 1.9**. Its unrefueled flight range is **3,000 km**, extending to **8,000 km** with in-flight refueling capabilities.

ADITYA-L1 MISSION'S SCIENTIFIC RESULTS

CONTEXT:

The **Aditya-L1 mission**, India's first scientific endeavor dedicated to studying the Sun, has released its first significant scientific results.

What Has Been Found?

- Scientists using the **Visible Emission Line Coronagraph (VELC)**, the primary payload of **Aditya-L1**, successfully estimated the onset time of a **coronal mass ejection (CME)** that erupted from the Sun in July.
 - ▶ CMEs are powerful explosions that can release vast amounts of plasma into space, potentially disrupting satellites and communication systems on Earth.

- This precise estimation, based on unique data collected by VELC, marks a significant step in understanding these energetic eruptions and their characteristics.

About Aditya-L1

- Launched in: 2023
- Aditya is India's first space-based mission to study the solar system's biggest object. It is named after Surya - the Hindu god of the Sun (**Aditya**).
- Aditya-L1 is designed to monitor the Sun continuously, with a particular focus on CMEs, as the Sun approaches the maximum phase of its **current solar cycle** (Cycle No. 25).
- Positioned in a halo orbit around the **L1 Lagrange point**, the spacecraft enables uninterrupted observation of solar activities.
 - ▶ **Lagrange point 1 (L1)** is the exact place between the Sun and Earth where the spacecraft has now reached. L1 is located 1.5 million km (932,000 miles) from the Earth, which is 1% of the Earth-Sun distance.
- The **Visible Emission Line Coronagraph (VELC)** payload, developed by the **Indian Institute of Astrophysics (IIAP)**, allows scientists to study CMEs close to the solar surface for the first time.
- The mission has a planned lifespan of five years, aiming to provide valuable data that could enhance our understanding of solar dynamics and their implications for life on Earth.

DIFFRACTION LIMIT

CONTEXT

Recent advancements in **super-resolution microscopy** have revolutionized **imaging techniques**, allowing scientists to observe cellular structures with unprecedented clarity, beyond the limits of traditional light microscopy. This breakthrough enhances research capabilities in biology and medicine, enabling detailed study of processes such as protein interactions and cellular functions.

What is the Diffraction Limit?

- When we use light-based instruments like **telescopes or microscopes**, there's a limit to how clearly we can see small details. This limit is known as the **diffraction limit**.
- Essentially, it defines how well these instruments can distinguish between two close objects.
 - ▶ The resolution of a telescope, **for example**, tells us how well it can separate two distant objects. The better the resolution, the closer together the objects can be while still being seen as separate.
- **Science Behind Resolution:** In the late 19th century, a **German engineer** named **Ernst Karl Abbe** discovered a formula that explains the maximum resolution based on two factors: the wavelength of light and the numerical aperture of the instrument. The formula is:

$$d = \frac{\lambda}{2NA} = \frac{\lambda}{2N \sin \theta}$$

- ▶ d = maximum resolvable distance (the smallest detail you can see)
- ▶ w = wavelength of light (the distance between light waves)
- ▶ N = numerical aperture (a measure of how much light the lens can gather)
- Due to the diffraction limit, traditional light microscopes could see cells but not the smaller structures inside them, like proteins or viruses.
- **Microscopy:** Starting in the 1980s, scientists developed a new technique called **super-resolution microscopy**. This advancement allows us to see much smaller details than what was previously possible, going beyond the diffraction limit.
- **How Super-Resolution Works:** Instead of simply shining light through the microscope, super-resolution microscopy uses special molecules called fluorophores. When these molecules are exposed to radiation, they glow. The microscope can then analyze this glow to understand the surrounding structures, allowing scientists to visualize much smaller objects, including parts of cells and even atoms.
- **Recognition for Innovation:** In 2014, the developers of super-resolution microscopy were awarded the Nobel Prize in Chemistry for their groundbreaking work, marking a significant advancement in our ability to observe the microscopic world.

B-52 BOMBERS

CONTEXT

The United States has announced deployment of **B-52 bombers**, fighter jets, refueling aircraft and Navy destroyers to the **Middle East**, in a readjustment of military assets as the **Abraham Lincoln** carrier strike group prepares to leave the region.

About B-52 Bombers

- The aircraft has high mission-capable rate, large payload, long range, persistence and ability to employ both nuclear and conventional precision standoff weapons.
- B-52s are powered by eight jet engines (an unusually high number).
- They can carry 32,000 kg of ordnance including bombs, rockets, missiles and precision guided weapons as well as air-launched cruise missiles and miniature air launched decoys.
- Though **sub-sonic** with a maximum speed of Mach 0.86, these can fly up to 50,000 feet and have a range of **14,200 km without aerial refueling**.
- Its massive **185-foot wingspan**, two feet more than the Leaning Tower of Pisa in Italy, is too wide to allow traditional take-off or landing procedures and a special landing gear had to be developed by Boeing.
- The B-52 primarily provides the United States with immediate nuclear and conventional global strike capability.
- First flown in 1952, the aircraft began entering USAF service in 1955, with a total of 744 aircraft of different

variants being produced. The last airframe was rolled out in 1962. The B-52 continues to be a critical contributor to the US national security strategy.

- At present, about 75 such aircraft are said to be in service, primarily based at Minot in **North Dakota** and **Barksdale Air Force Base** in Louisiana with the **2nd Bomb Wing** and **307th Bomb Wing** as part of the **Air Force Global Strike Command**.

STOCK OF THE INTERNATIONAL SOLAR ALLIANCE

CONTEXT:

The **International Solar Alliance (ISA)**, launched in 2015 by **India** to accelerate solar energy adoption across developing countries, has seen limited success. Despite its ambitious goals, it has made only modest progress, particularly in the **Global South**, where energy access remains a significant issue. As the ISA marks its ninth year, experts are questioning its impact and why its promise hasn't materialized as expected.

What Is the ISA?

- **Launched in 2015** by **India** with support from **France**, the ISA was designed to **boost solar energy deployment in developing countries**.
- The ISA aims to overcome **financial, technological, and regulatory barriers** to solar energy deployment, especially in **Africa, Latin America**, and other parts of the **Global South**.
- It functions as a **facilitator** rather than a project developer, aiming to create an enabling environment for solar energy adoption.
- The ISA is seen as a key component of **India's diplomatic outreach** to the **Global South**, particularly in **Africa**.

Slow Progress: ISA's Impact Remains Modest

- ▶ Despite **110+ member countries**, the ISA has failed to deliver substantial solar projects.
- ▶ The **first ISA-facilitated project** is a **60 MW solar plant in Cuba**, but it is still in the early stages and not yet operational.
- ▶ Other countries, especially in **Africa**, have completed **preparatory work**, but **large-scale solar deployment** remains limited.

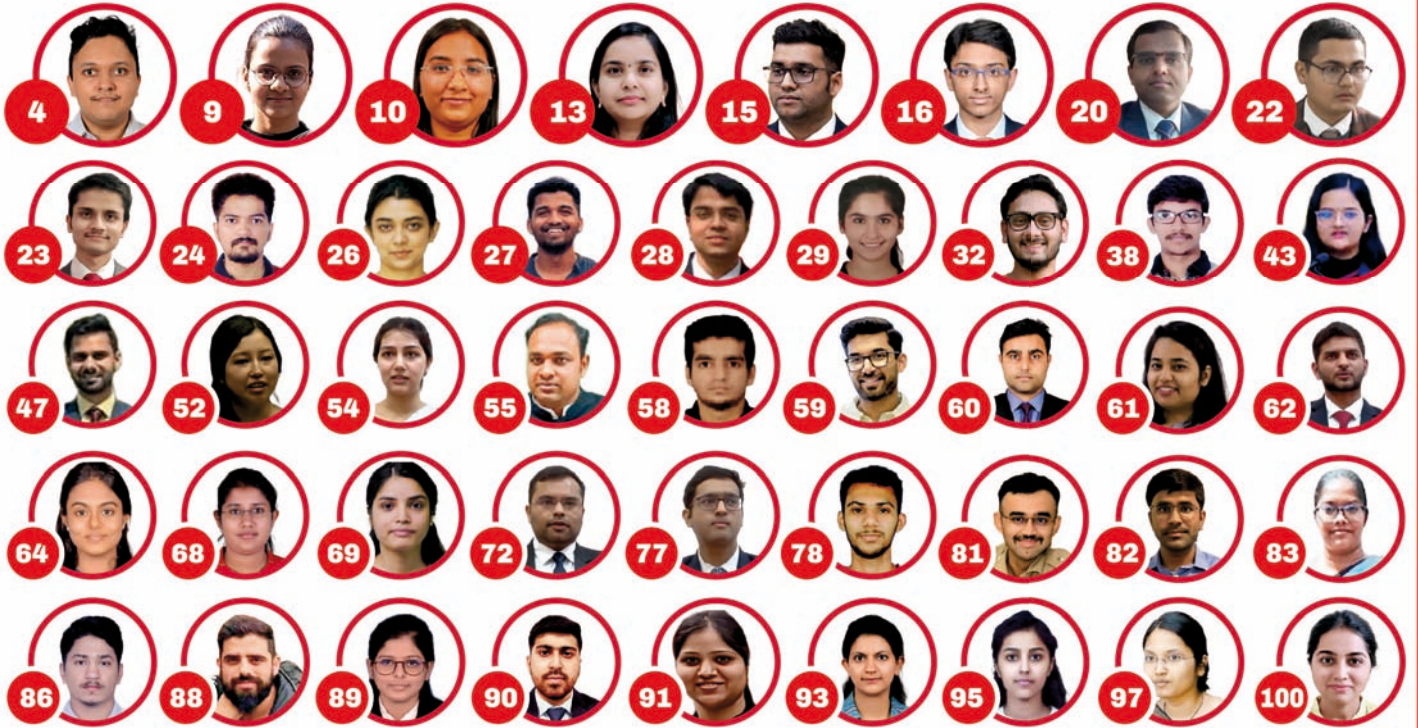
Global Solar Growth:

- While global solar capacity grew at **20% annually**, most installations occurred in countries like **China** and **India**, which accounted for **over 80%** of solar investments.
- **Africa**—where energy access is a major concern—has seen less than **2%** of new solar installations, highlighting a major gap in ISA's outreach.



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