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WEEKLY



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- INDIA-CHINA TIES AT "NEW STARTING POINT"
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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.

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SECTION -A

MAINS ISSUES

JANJATIYA GAURAV DIVAS

CONTEXT

Every year on **November 15th**, **Janjatiya Gaurav Divas** is celebrated to honor the contributions of India's tribal communities, especially in the country's freedom struggle. The day marks the birth anniversary of **Bhagwan Birsa Munda**, a tribal leader and freedom fighter, whose legacy continues to inspire.

Who Was Birsa Munda?

- Birsa Munda was born in 1875 in the **Chota Nagpur Plateau** and belonged to the **Munda tribe**.
- Initially, he joined a **German Mission school** and converted to Christianity, but later renounced it and dropped out of school.
- Birsa Munda created a new faith called **Birsait**, which worshipped only one god.
 - This religion quickly gained popularity among the **Munda and Oraon tribes**. Due to his influence, he came to be known as the '**Father of the Earth**'.
- During the 1880s, Birsa witnessed the **Sardari Larai movement**, which advocated for the restoration of tribal rights through non-violent methods. However, the British colonial government ignored these demands, leading Birsa to take more direct action.

Munda Rebellion (Ulgulan)

- The Munda Rebellion, also known as *Ulgulan* or "the Great Tumult," was led by Birsa Munda against the British colonial authorities and exploitative outsiders, known as *dikus*.
- The movement aimed at establishing Munda rule in the region.

About the Munda Tribe

- The Munda tribe is one of the **aboriginal groups from the Chota Nagpur region** of eastern India.
- The **Munda language** belongs to the **Austro-Asiatic language family**, and the tribe is often referred to as part of the larger Kolarian group.
- The tribe's own name for itself is **Hor-on, not Munda**, which was assigned by outsiders.

- **Reasons for the Revolt:** In 1874, the British replaced the Munda tribe's traditional *Khuntkari* system with the *Zamindari* system, creating new classes of landlords (*zamindars*) and tenants (*ryots*). This change intensified forced labor (*vethbigari*) and left the tribals reliant on moneylenders, deepening their exploitation.
- **Impact:** The Munda revolt led to the **Chhota Nagpur Tenancy Act of 1908**, which restricted the transfer of tribal land to non-tribals and provided relief to the Adivasis. This act became landmark legislation in protecting tribal rights and securing their land.

Tribal Contributions to India's Independence

- Tribal movements against British rule, like the **Ulgulan (Revolution)** led by **Birsa Munda**, were not only pivotal in challenging British oppression but also inspired a national awakening.
- Birsa Munda, revered as Bhagwan by tribal communities, led a fierce resistance against the exploitative colonial system, making his birth anniversary on 15th November a fitting occasion to honor tribal heroes.

- Across various regions, tribes such as the **Santhals, Munda, Ho, Pahadia, Oraon**, and others led sustained resistance movements.
- Tribal movements like the **Khasi-Garo movement, Mizo movement, Kol movement**, etc. are integral chapters in India's history.

▣ Tribal Movements Across India:

- *East India:* Santhals, Munda, Oraon, Ho, and others.
- *Northeast India:* Khasi, Naga, Mizo, and others.
- *South India:* Gonds, Kurichya, and others.
- *Central India:* Halba, Muriya, Koi.
- *West India:* Bhil, Koli, Mina, and others.
- Many of these tribes launched significant rebellions against British rule, with leaders such as **Tilka Majhi, Veer Surendra Sai, Sidhu and Kanu Murmu, Rani Gaidinliu**, and others becoming iconic figures in the freedom struggle.



FACT BOX

Government Initiatives and Financial Support for Tribal Development

India is home to a diverse range of tribal communities, with the **Scheduled Tribe (ST)** population recorded at **10.45 crore, or 8.6% of the total population**, according to the **2011 Census**. These communities, comprising over **705 distinct groups**, are spread across the country.

- **Dharti Aaba Janjatiya Gram Utkarsh Abhiyan:** Launched in 2024, this ambitious program aims to address critical gaps in social infrastructure, health, education, and livelihood development across approximately 63,843 tribal villages.
- **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN):** Launched in 2023, this initiative aims to uplift Particularly Vulnerable Tribal Groups (PVTGs). It focuses on improving the quality of life for PVTG communities through targeted support, including Aadhar enrolment, community certificates, PM-Jandhan Yojana, and Ayushman cards.
- **Pradhan Mantri Adi Adarsh Gram Yojana (PMAAGY):** It aims to provide basic infrastructure in villages with a significant tribal population.
- **Eklavya Model Residential Schools (EMRS)** were launched in 2018-19 as part of a Central Sector Scheme to provide quality education to Scheduled Tribe (ST) children in remote areas, offering them opportunities for higher education and employment.
- **Pre-Matric and Post-Matric Scholarship Schemes:** These scholarships aim to reduce dropout rates and support tribal students' education

▣ Other Scholarship Schemes

- **National Overseas Scholarship for ST Students**
- **National Fellowship for ST Students**

- **Sickle Cell Anaemia Elimination Mission:** Launched in 2023, the mission targets the elimination of Sickle Cell Disease (SCD), a genetic blood disorder prevalent among tribal populations.
- **Mission Indradhanush:** Immunization Campaign focuses on ensuring full immunization for children up to two years of age and pregnant women, with a special emphasis on tribal communities.
- **Nikhay Mitra Initiative** targets tuberculosis (TB), offering diagnostic, nutritional, and vocational support to TB patients, particularly those from tribal communities.
- **National Health Mission (NHM) and Haemoglobinopathy Guidelines**
- The National Health Mission under the Ministry of Health and Family Welfare developed comprehensive guidelines for the prevention and control of haemoglobinopathies, including Sickle Cell Disease (SCD), which are common among tribal population.
- **Pradhan Mantri Matru Vandana Yojana:** It supports maternal and child health, offering financial assistance to tribal women for prenatal and postnatal care.

GLOBAL SOUTH NEEDS FOCUS: PM MODI

Context

The countries of the **Global South** are most adversely impacted by the **food, fuel and fertiliser crisis** caused by **global conflicts** and G20 must give primacy to their concerns and priorities, Prime Minister Narendra Modi said in an address on the first day of the 19th G20 summit in Rio de Janeiro, Brazil.

Key-highlights of the Summit

- The 2024 Summit's theme is 'Building a Just World and a Sustainable Planet'.
- PM Modi attended the 19th G20 Summit as a member of the Troika. India is part of the G20 Troika along with Brazil and South Africa.
- On the sidelines of the summit, PM Modi engaged in bilateral discussions with various national leaders, including those from the United Kingdom, France, Italy, Indonesia, Norway and Portugal.
- **India's G20 Presidency:** Last year, India's successful presidency elevated the G-20 to people's G-20 and mainstreamed the priorities of the Global South into its agenda.
 - Induction of the 55-nation African Union as a permanent member of the G20 and managing to produce a leaders' declaration overcoming deep divisions over the Ukraine conflict were seen as major milestones of India's G20 presidency last year.

Major Points made by PM Modi

- PM Modi highlighted how nations in the **Global South** face severe challenges from food, fuel and fertiliser shortages resulting from ongoing conflicts. During the session '**Social Inclusion and the Fight Against Hunger and Poverty**', he highlighted the importance of reforming international institutions, stating that the G20 would strive towards this goal.
- **India's initiatives to deal with hunger and poverty**
 - ▶ India had pulled 250 million people out of poverty in the last 10 years and was distributing free foodgrains to 800 million people in the country.
 - ▶ Around 550 million people are benefiting from the world's biggest health insurance scheme.
 - ▶ Under the **world's largest crop insurance scheme**, over 40 million farmers have received benefits worth 20 billion US dollars. Under the farmers scheme, assistance worth over 40 billion dollars has been given to 110 million farmers.
 - ▶ **Institutional credit** worth 300 billion US dollars is being given to farmers.
 - ▶ India is not only ensuring food security but also **focusing on nutrition**.
 - ▶ India believes in the approaches of '**Back to Basics**' and '**March to Future**.' That is why the country is emphasising on organic farming, popularising millets (known as **Shree Anna** in India) and encouraging climate-resilient crop varieties.

What is Global South?

- The concept of the Global South emerged to designate developing, emerging or lower-income countries, mostly in the southern hemisphere, and replace the term "**Third World**" after the **1945-90 Cold War**.
- Global South includes a group of developing countries with diverse values, cultural traditions, development levels, and interests, mainly covering regions such as Asia, Africa, and Latin America.
- In recent years, these countries have made significant progress in economic growth, technological innovation, environmental protection, and international cooperation, gradually becoming an important part of the global trend toward multipolarity, representing the collective rise of developing countries.
- However, the Global South is facing issues like energy and food crises and the impact of the recession on the global economy.

India's approach to Global South

- India, over the years played a catalytic role in reshaping the vision of the Global South.
- India provides a voice to the **Global South Movement**.
- Whether on the question of climate change, energy transition, taking a stand on normative issues or protecting the **Global South's interest**, India played a proactive role in international forums over the years.

- At various climate Summits, India resisted the onslaught from the Global North and protected the interest of the **Global South** be it on the question of climate financing, limiting the emission norms, or highlighting the **Global North's** responsibility as the historical polluter.



FACT BOX

G20

- The G20 was launched after the **2007-08 financial crisis** to include important emerging economies in talks that had been confined to the **Group of Seven industrialized nations**, and has become a key venue for economic and financial cooperation.
- It represents around **85% of global GDP**, over **75% of global trade** and about two-thirds of the world population.

INDIA-CHINA TIES AT "NEW STARTING POINT"

Context

In a big step forward in India-China ties, the two countries have discussed resuming direct flights between the countries as well restarting the Kailash Mansarovar yatra.

Key-highlights

- A high-level engagement between India and China has been held recently on the sidelines of the G20 Summit, between India's External Affairs Minister S Jaishankar and his Chinese counterpart Wang Yi.
- The meeting was the first high-level engagement between the two countries since the completion of the disengagement process in the two contentious areas of Depsang and Demchok in eastern Ladakh.
- The disengagement process has contributed to the maintenance of peace and tranquility.

What are the key-issues under discussion?

- **Direct flights between India and China** were suspended because of the Covid pandemic in 2020 and have not resumed since then despite the restrictions being lifted.
 - ▶ The stand-off in Ladakh began in May that year and a clash took place in Ladakh's Galwan the next month in which 20 Indian soldiers were killed in action and the Chinese side also suffered losses, with the exact number remaining unconfirmed.
 - ▶ A troop buildup followed on both sides and military-level talks began taking place to resolve the stand-off.
- **The Kailash Mansarovar pilgrimage** to Mount Kailash, believed to be the abode of Lord Shiva, in China was also suspended during the pandemic in 2020 and is yet to resume.

What would have prompted this closeness?

- **For improved trade:** In New Delhi's case, the economy guided a **political reset with Beijing**. After the Galwan clash, India placed significant restrictions on Chinese investment and visas which had affected the Indian business community.
- **To eradicate pressure:** The West's stance on the diplomatic trouble in **India-Canada relations** alongside the charges in the United States against an Indian spy over an alleged plot to kill American Sikh separatist Gurbhagat Singh Pannun may have given some impetus to New Delhi's decision to improve ties with Beijing.
- **China's behaviour has shifted.** As part of efforts to maintain its international ambitions, Beijing is seeking to present itself as a more responsible and cooperative international player with less emphasis on so-called "**wolf warrior**" diplomacy.

How does the possibility of closer India-China ties impact global power?

- India and China, the two most populous countries in the world, are experiencing a shift in their bilateral relations that could have far-reaching consequences for global geopolitics.
- This evolving partnership, driven by **economic complementarities and strategic cooperation**, has the potential to **reshape the global order**, moving away from the **US-centric model** that has prevailed since the end of the **Cold War**.
- **Economic Complementarities:** China, a global manufacturing hub, and India, with its strong services sector and growing digital economy, can benefit greatly from enhanced economic ties. The two nations can collaborate on various fronts such as:
 - ▶ **Trade and Investment:** With China as a major exporter and India as an emerging market, both countries can benefit from increased trade, investments, and technology exchange.
 - ▶ **Infrastructure Development:** India's need for infrastructure development can align with China's Belt and Road Initiative (BRI), offering opportunities for collaboration in sectors like energy, transport, and manufacturing.
- **Asia's Growing Influence:** A closer relationship between India and China could mark a **strategic shift** in global geopolitics. For decades, the world has been dominated by a US-centric global order, with the United States playing the role of the primary power broker. However, as India and China find common ground, they could shift the focus to **Asia** as the new center of influence in world affairs.
- **Regional Stability:** A partnership between the two Asian giants could bring greater **stability** to the region, reducing tensions that have long existed over issues such as the border dispute.

- **Balance of Power:** A strong India-China relationship could challenge US dominance, especially in the Indo-Pacific region, and lead to a **multipolar world order**, where global decisions are driven by multiple powers, not just the US.
- **Recalibration of Alliances:** Traditional alliances, including those centered around the US, may be reevaluated as countries adjust their foreign policies based on shared interests with Asian powers.
- **Strategic Pragmatism:** Countries may prioritize **strategic pragmatism** over historical rivalries, opting for partnerships that offer economic benefits and regional stability.

The Role of the United States in Sino-Indian Relations

- The United States' actions toward India in recent years have contributed to the **Sino-Indian rapprochement**. Despite historically being a close ally to the US, India has faced increasing pressure on various fronts, including its defense ties with Russia, trade relations, and stance on global security issues.
- This pressure has, ironically, pushed India and China closer, as both countries see **shared interests** in resisting Western pressure.

INDIA-NIGERIA RELATIONS

Context

India and Nigeria reaffirmed their strategic partnership during Prime Minister Narendra Modi's historic visit to Abuja. The high-level talks between PM Modi and Nigerian President Bola Ahmed Tinubu focused on strengthening cooperation in critical areas such as defence, trade, energy, and agriculture. This visit marks the first by an Indian prime minister to Nigeria in 17 years.

More on News

- Nigeria also conferred its national award - the "**Grand Commander of the Order of Niger**" (GCON), on Modi for his statesmanship and stellar contribution to fostering bilateral ties, making him the second foreign dignitary to receive the distinction.
- Queen Elizabeth is the only foreign dignitary who was awarded GCON in 1969.
- The award adds to a growing list of international honors for PM Modi, with Nigeria becoming the 17th country to recognise him for his contributions on the global stage.
- **MoU:** Three Memoranda of Understanding (MoUs) were signed following the talks, covering cultural exchange, customs cooperation, and survey collaboration. PM Modi also highlighted the contribution of the Indian diaspora in Nigeria, describing the **60,000-strong community** as a "key pillar" of bilateral relations.
 - ▶ A significant theme of the discussions was the shared vision of India and Nigeria to champion the interests of the Global South.

India-Nigeria Relations

- India and Nigeria have been strategic partners since 2007 with growing economic, energy and defence collaboration.
- India established its diplomatic mission in Lagos in 1958, two years before Nigeria gained independence.
- Today, more than 200 Indian companies operate in Nigeria, investing approximately \$27 billion across various sectors, making them the second-largest employers after the Nigerian federal government.
- **Trade:** India is a **major trading partner for Nigeria**, with Indian products accounting for over 70% of the pharmaceutical market in Nigeria. Bilateral trade reached USD 7.89 billion in 2023-24, despite fluctuations in recent years.
 - ▶ Nigeria is the 2nd largest trading partner of India in the African region, with a bilateral trade worth \$11.8 billion in 2022-23.
 - ▶ In the year 2023-24, the bilateral trade stood at \$7.89 billion. Over 200 Indian companies are currently operating in Nigeria, with investments totalling around \$27 billion across various sectors, including pharmaceuticals, power, and construction.
- **Defence Cooperation:** India's growing relationship with **Africa**, especially **Nigeria**, has a strong defence component. India is involved in four main areas of military cooperation with African nations:
 - ▶ **UN Peacekeeping:** India sends soldiers for peacekeeping missions under the United Nations (UN).
 - ▶ **Training African Officers:** India trains military personnel from African countries, including Nigeria.
 - ▶ **Indian Navy in the Indian Ocean:** India's naval forces play an active role in maintaining security in the Indian Ocean region, which is crucial for global maritime trade.
 - ▶ **Defence Industry:** India's defence industry is actively engaging in Africa, supplying military hardware like helicopters and fighter jets.
- Moreover, India's Technical and Economic Cooperation (ITEC) program offers Nigerian defence personnel 150 training slots every year. This cooperation also extends to military hardware procurement, with Nigeria exploring the purchase of helicopters and fighter jets from Indian manufacturers like Hindustan Aeronautics Limited (HAL).
- **Space and Cybersecurity Cooperation:**
 - ▶ **Space Cooperation:** An MoU (Memorandum of Understanding) has been signed to boost space collaboration, with training programs for Nigeria's National Space Agency starting in January 2025. The focus is on remote sensing, mapping, and satellite development.
 - ▶ **Cybersecurity:** India's Computer Emergency Response Team (CERT-IN) has partnered with Nigeria's CERT-NG to strengthen cybersecurity cooperation, ensuring better protection from cyber threats.

- **Pharmaceutical and Healthcare Cooperation:** India's pharmaceutical industry plays a major role in Nigeria's healthcare sector. Indian medicines account for over 70% of Nigeria's pharmaceutical market. India is referred to as the "Pharmacy of the World" in Nigeria due to its affordable and high-quality medicines. Key developments include:
 - ▶ **Healthcare Schemes:** India is also assisting Nigeria in implementing its healthcare programs, such as the COWIN vaccine platform and the Ayushman Bharat health scheme.
- **Agriculture and Food Security:** Agriculture employs about 70% of Nigeria's population, but only 44% of Nigeria's arable land is currently cultivated. Indian companies are already involved in edible oil plantations and are interested in grain farming in Nigeria.
- **Oil, Gas, and Economic Cooperation:** Nigeria is a major oil producer, and India depends on it for a large portion of its oil imports. Nigeria's oil and gas reserves are crucial for India's energy security.
 - ▶ **India imports about 4.6 million barrels of oil per day**, and disruptions in oil supply from the Middle East could hurt India's economy.
- Modi's visit to Nigeria marks a new chapter in bilateral ties, which were elevated to a strategic partnership in 2007.



FACT BOX

Nigeria

- Nigeria is located in **West Africa**, sharing a border with **Benin, Niger, Chad and Cameroon**.
- Nigeria became independent from Britain on October 1, 1960.
- Nigeria is the most populous and economically developed country in Africa. It is **Africa's largest oil producer** and among the **top ten producers worldwide**.
- Abuja (Nigeria's capital) is home to the headquarters of **ECOWAS** - the key West African economic integration organization, peace and security.
- **Important export products:** Rubber and cacao (for chocolate and cocoa)
- **Natural environments:** Semi-deserts in the north; tropical rainforest in the south.

RUSSIA'S UPDATED NUCLEAR DOCTRINE

Context

Russian President **Vladimir Putin** approved an updated version of Russia's **nuclear doctrine**, which outlines when Russia **may use its vast nuclear arsenal**. This update comes amid rising tensions with the West, particularly because of

US military aid to Ukraine. The new doctrine suggests that **long-range missiles** provided by the US to Ukraine could trigger a **nuclear response** from Russia.

Key Changes in the Nuclear Doctrine

- The new policy document declares that Russia “takes all necessary efforts to reduce the nuclear threat and prevent aggravation of interstate relations that could trigger military conflicts, including nuclear ones”.
- Nuclear deterrence is aimed to ensure that any potential adversary realises the inevitability of retribution in case of an aggression against Russia and its allies.
- Russia views nuclear weapons as a **last resort** to protect its sovereignty and territory.
- The doctrine articulates Moscow could use nuclear weapons “in response to the use of nuclear and other types of weapons of mass destruction” against Russia or its allies.
- **Conditions for Nuclear Use:** The new doctrine makes it easier for Russia to use nuclear weapons.
- Main situations where Russia might consider using them:
 - ▶ **Nuclear or Mass Destruction Weapons Attacks:** If Russia or its allies are attacked with nuclear or other weapons of mass destruction.
 - ▶ **Conventional Attack on Russia or Allies:** If there is an aggression using conventional (non-nuclear) weapons that threatens Russia’s sovereignty or territorial integrity.
 - ▶ **Attack on Key Military or Government Targets:** If an enemy attacks critical Russian military or government facilities, weakening Russia’s ability to retaliate.
 - ▶ **Imminent Threats:** If Russia detects an incoming missile or aircraft that poses a significant threat to its territory or allies.
 - ▶ **Support from Nuclear Powers:** If a non-nuclear country attacks Russia, but is supported by a nuclear-armed country (like the US), Russia will treat it as an **attack by the entire military bloc**.
- **Focus on Nuclear-backed Attacks:** One important change is that the new doctrine treats attacks by **non-nuclear countries** supported by nuclear powers (e.g., US-supplied weapons to Ukraine) as a **joint attack**, meaning Russia could target not just the attacker but also the nuclear power backing them.
- **Goal of Deterrence:** The core purpose remains the **deterrence of aggression**. The doctrine aims to ensure that potential adversaries understand the **inevitable retaliation** they would face if they attack Russia or its allies.

Why Did Russia Update Its Nuclear Doctrine?

- The new version of the nuclear doctrine was approved shortly after **Ukraine** used **ATACMS missiles**, supplied by the US, to strike Russian territory.
- Such missile strikes, especially from **NATO-backed** Ukraine, could trigger a nuclear response according to the new doctrine.

Global Security Concerns and Policy Implications:

- **Dangerous Precedent:** Russia’s actions may embolden other nations like Iran and North Korea to consider or flaunt nuclear capabilities as a deterrent in conventional conflicts. This could lead to an increase in nuclear arsenals globally and undermine efforts toward nuclear non-proliferation and disarmament.
- **Erosion of Non-Proliferation Efforts:** The war has highlighted the vulnerabilities of non-nuclear states, potentially motivating them to seek nuclear capabilities. The Budapest Memorandum, where Ukraine gave up its nuclear arsenal for security assurances, now appears ineffective, potentially discouraging future disarmament agreements.
- **Shift in Nuclear Deterrence:** The traditional clear distinction between nuclear and conventional warfare is being blurred. Russia’s signaling suggests that nuclear weapons might be considered for coercion in lower-stakes conflicts, thereby altering the global nuclear deterrence landscape.

Challenges and Future Implications:

- **Increased Proliferation Risk:** Smaller states in conflict-prone regions may pursue nuclear capabilities to secure asymmetric advantages in conventional warfare, increasing regional and global proliferation anxieties.
- **Undermining Global Stability:** The potential for tactical nuclear weapon use in conventional conflicts poses severe risks to global stability, threatening to replace the deterrent effect with an escalatory spiral.
- **Need for Revised International Policies:** The international community must reassess and strengthen nuclear non-proliferation treaties and mechanisms to address the emerging threats posed by such nuclear posturing and to ensure global security.

ITALY-INDIA JOINT STRATEGIC ACTION PLAN 2025-2029

Context

On the sidelines of the G20 Summit, India and Italy have launched a landmark four-year (2025-29) joint strategic action plan to boost partnership in 10 sectors.

Key-highlights

- The action plan 2025-29 identified 10 specific pillars for advancing bilateral engagement that included economic cooperation and investments, energy transition, space, defence, security, migration and mobility, people-to-people exchanges.
- The outcome was a set of initiatives designed to enhance collaboration over the next five years.
- India and Italy also agreed to cooperate on the India-Middle East-Europe Economic Corridor (IMEEC), a strategic initiative aimed at enhancing connectivity and trade between India, the Middle East, and Europe.

- ▶ This corridor has the potential to significantly improve regional trade links and boost economic activity.
- The two sides will focus on sustainable transport and maritime infrastructure, with plans to finalize agreements related to port cooperation. Strengthening these trade routes will benefit not only India and Italy but also the broader region.

India-Italy Relations

- India and Italy are ancient civilizations with rich cultural heritage. Diplomatic relations between India and Italy were established in 1947.
- In 2023, both countries celebrated the 75th anniversary of establishment of diplomatic relations.
- **Trade relations:** Italy, a key member of the European Union (EU) is a major trade partner of India. Italy is India's fourth-largest trading partner in the EU.
 - ▶ Indian exports to Italy include organic products, clothing, pharmaceuticals, and automotive parts.
 - ▶ Indian companies in Italy operate in IT, electronics, and engineering sectors, while over 600 Italian companies are active in India, spanning diverse industries.
- **International forums:** Italy collaborates with India in various international forums, including the:
 - ▶ International Court of Justice
 - ▶ UNESCO
 - ▶ International Maritime Organization.
- **Alignment on key global initiatives:** Additionally, Italy has joined several India-led global initiatives, such as the:
 - ▶ International Solar Alliance (ISA)
 - ▶ Coalition for Disaster Resilient Infrastructure (CDRI)
 - ▶ Indo-Pacific Ocean Initiative (IPOI)
 - ▶ Global Bio-Fuels Alliance (GBA)
 - ▶ India Middle East Europe Economic Corridor (IMEEC)

Key Disagreements:

- ▶ **Debt and Spending:** The core disagreement between the SPD/Greens and the FDP was over government spending. The SPD and Greens **wanted to increase state spending**, particularly in areas like **climate initiatives and defense**, which would require borrowing. In contrast, the FDP insisted on strict adherence to Germany's **"debt brake" rule**, which limits borrowing.
- ▶ **Debt Brake Rule:** Germany's **debt brake** rule, enshrined in its Constitution, restricts government borrowing to just **0.35% of GDP**. This rule was introduced after the **2008 financial crisis** to prevent excessive borrowing. The FDP, supporting fiscal discipline, resisted proposals for more borrowing, while the SPD and Greens pushed for higher spending.
- ▶ **Tax Cuts and Austerity:** The FDP also advocated for tax cuts for the wealthy and austerity measures, which were opposed by the SPD and Greens.

Constitutional Crisis and Budget Issues:

- To work around the debt brake, Germany uses special off-budget funds for urgent financial needs, such as the **climate transformation fund** and the **defense fund**. However, the coalition's use of these funds faced legal challenges.
- In November 2023, Germany's **constitutional court** ruled that transferring unused pandemic-era debt into these funds was unconstitutional. This ruling further complicated the government's budget and deepened the conflict within the coalition.

Snap Elections and Political Instability:

- As the coalition became increasingly dysfunctional, the Chancellor agreed to hold **snap elections** on **February 23, 2025**, well ahead of the original elections scheduled for September 2025.
- A **no-confidence motion** is set to be introduced on **December 16, 2023**, which the government is likely to lose due to the lack of support from the FDP.

Key Issues Facing Germany:

- The immediate future of Germany's political landscape is uncertain, with the rise of far-right politics and a fractured ruling coalition.
- The country faces significant challenges, including **dealing with an energy crisis** exacerbated by the **war in Ukraine** and **managing rising public dissatisfaction** with **political instability**.
- Germany's economy was expected to shrink by 0.2% this year. This is a downgrade from the 0.3% growth that was expected in April 2024, making Germany the only G-7 country to contract in 2024. This follows the predictions from major economic institutions in Germany.

POLITICAL CRISIS IN GERMANY

Context

In November 2023, the ruling coalition government in Germany collapsed. The coalition, formed in 2021, included three parties: **the Social Democrats (SPD), the Greens, and the Free Democrats (FDP)**.

Reasons for Collapse

- The immediate cause of the collapse was the firing of the Finance Minister from the FDP by the Chancellor, who is from the SPD. This led to a breakdown in cooperation between the coalition partners, as disagreements over key policy issues intensified.

SC DIRECTS CENTRE ON REHABILITATION FRAMEWORK FOR SEX TRAFFICKING VICTIMS

Context

The Supreme Court has asked the Union government to take urgent and prompt measures to address "highly sensitive and important" issue of establishment of a comprehensive rehabilitation framework for victims of sex trafficking, in view of legislative vacuum.

What is Human Trafficking?

- Human trafficking is the recruitment, transportation, transfer, harboring, or receipt of people through **force, fraud, or deception** to exploit them for **profit**. The exploitation can take various forms, including:
 - **Sexual exploitation**
 - **Forced labor**
 - **Slavery**
 - **Servitude**
 - **Removal of organs**
- According to the **United Nations Office on Drugs and Crime (UNODC)**, human trafficking is a serious global issue with wide-ranging consequences.

Global Severity of Human Trafficking

- **Prevalence of Trafficking:** According to the **UNODC 2019 report**, **60% of trafficking** occurs within a single country.
- **Victims of Sexual Exploitation**
 - **90% of sexual trafficking victims** are **women and girls**.
 - **Forced Labor in South Asia**
 - In **South Asia**, **85% of trafficking victims** are exploited for **forced labor**.
- Human trafficking is the **third most challenging crime** globally, following **drug trafficking** and **weapons trade** in terms of turnover and human misery.

Causes of Human Trafficking

- **Poverty:** **Poverty** creates vulnerability, with traffickers exploiting the desperate circumstances of people, especially in impoverished areas.
- **Social and Cultural Factors:** Social devaluation, especially of young women, makes them easy targets for traffickers.
- **Migration:** **Migration** due to economic opportunities, disasters, or conflict increases vulnerability, with traffickers using false promises to exploit individuals.
- **Climate Change:** Natural disasters and displacement due to **climate change** (both sudden and slow onset) exacerbate vulnerabilities to trafficking.
- **Low Conviction Rate:** Despite these legal provisions, the **conviction rate** in human trafficking cases remained

19.4% in 2022, indicating the challenges in effectively prosecuting traffickers.

- **Other Contributing Factors:** **Corrupt officials, permeable borders, and international criminal groups** further enable trafficking activities.

India's Vulnerability to Human Trafficking

- **Porous Borders:** India, especially **West Bengal**, has a porous 2,216.7 km border with **Bangladesh**, facilitating both **domestic** and **international human trafficking**.
- **Geographical Location:** India's geographical proximity to **opium-growing regions**, such as the **Golden Crescent** (Afghanistan) and the **Golden Triangle** (Myanmar), contributes to trafficking networks in the region.

Legal and Constitutional Frameworks in India to Counter Human Trafficking

- **Article 23 of the Indian Constitution:** It prohibits **human trafficking** and **forced labor** (begar).
- **Article 24:** It forbids the **employment of children below 14 years** in **hazardous jobs** like factories and mines.
- **Immoral Traffic Prevention Act (ITPA), 1986:** The Act implements the **Trafficking Convention** and establishes authorities to combat trafficking, though its roles and functions need clarification.
- **Criminal Law (Amendment) Act, 2013:** The Act replaces **Section 370 of the IPC** with **Sections 370 and 370A**, providing comprehensive measures against human trafficking.
- **Bharatiya Nyaya Sanhita (BNS):**
 - **Section 143 of the Bharatiya Nyaya Sanhita (BNS), 2023** provides penal provisions for strict punishment for any offence of human trafficking.
 - **Section 144(1) of the BNS** provides for strict punishment for the offence of sexual exploitation of trafficked children. The punishment for such offences range between five years to life imprisonment.
 - **Sections 95 to 99 of the BNS** deal with offences against children and provide for strict punishment to the offenders. These sections have provisions for dealing with the offence of hiring, employing or engaging a child to commit an offence; procurement of child; and selling/buying of a child for purposes of prostitution, etc. The punishment for these offences range between three years to fourteen years.
 - **Section 139 of the BNS** provides punishment against kidnapping or maiming of a child for the purposes of begging.

- ▶ **Section 141 of the BNS** provides punishment for importation of a girl or boy from foreign country for illicit sexual exploitation etc. The punishment for these offences range between ten years to life imprisonment.

URBAN TRANSFORMATION IN INDIA

Context

The **Roadmap for India's City Systems Reforms** released recently discusses the current state of urban governance and provides recommendations for urban transformation in India. Here's what it covers:

Current state of urban governance (Key findings)

India's rapid economic growth has accelerated urbanisation with nearly half the population expected to reside in urban areas by 2035.

Women Councillors in Urban Local Bodies

- Around **46%** of the councillors in India are women.
- In **19 out of 21 capital cities** (like **Patna, Shimla, Ranchi,** and **Bhubaneswar**), the number of women councillors is more than **60%**.
- **Tamil Nadu** has the highest number of women councillors, followed by **Rajasthan, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Uttar Pradesh, Kerala, Bihar,** and **Chhattisgarh**.
- **17 States** have passed laws reserving **50%** of local council seats for women, which is higher than the constitutional requirement of **33%**.
- **Urban Transformation Pathways:** The report presents **three pathways** for improving urban governance in India:
 - ▶ **Place-Based Governance:** Focusing on governance that is centered around specific regions or cities, rather than just national schemes and funding.
 - ▶ **Decentralised Participatory Governance:** Encouraging more involvement of local people in governance decisions by strengthening local governments and ensuring they are more responsive to citizens.
 - ▶ **Building State Capacities:** Strengthening the capabilities of State governments to manage urbanization effectively.
- **Rural-Urban Transition:** The report emphasizes the need for a **Rural-Urban Transition Policy** to manage the growing number of villages turning into towns and cities. Since **2011**, around **1,000 villages** have already transitioned into urban areas. The policy would help plan this transition properly.

- **Reimagining Urban Governance:** The report recommends rethinking the role of the **Ministry of Housing and Urban Affairs** and State urban departments. These should be seen as **regional economic and local government bodies** rather than just focusing on sectors, schemes, and funding.
 - ▶ The goal is to focus on **strengthening local self-government** rather than just implementing national schemes in cities.

Challenges

- **Delayed Elections:** Many Urban Local Bodies (ULGs) have delayed elections, with **61% of ULGs in 15 States** having issues with timely elections.
- **Disempowered Mayors:** Mayors in many cities have limited powers. They only have control over **4 out of 18 functions** they are supposed to manage.
- **Citizen Participation:** There is a lack of formal platforms for citizens to engage with local governments. The **74th Constitutional Amendment** (which aimed to empower urban local bodies) needs better implementation.

Suggestions

The roadmap makes suggestions to improve the skills of **urban local body (ULB)** staff:

- **Certification-Based Skilling Programs:** These programs would help local government staff acquire skills and knowledge to manage urban issues effectively.
- **Municipal Shared Service Centres:** These centres would help smaller cities by sharing resources and services, ensuring that even smaller cities benefit from economies of scale.
- **Digital Public Finance Management System:** This system would track how funds are spent and whether physical progress of projects matches the financial outlay.
- **Shelf of Projects:** Every city should have a ready list of development projects to facilitate municipal borrowings and make sure cities are prepared for future growth.

ECONOMIC SLOWDOWN

Context:

Union Finance Minister Nirmala Sitharaman addressed concerns about a potential slowdown in the Indian economy, seeking to reassure both domestic and global audiences that there was no cause for undue worry. Her remarks were made in the **CONTEXT** of growing apprehension about weakening economic indicators, such as faltering urban demand and weak corporate results, which some analysts have linked to a "cyclical slowdown."

What is economic slowdown?

- An **economic slowdown** refers to a period when the growth rate of a country's economy slows down significantly.
- It is characterized by:

Cyclical Slowdown	Structural Slowdown
<ul style="list-style-type: none"> ◦ A cyclical slowdown occurs as part of the natural business cycle, driven by fluctuations in economic activity. ◦ It happens when the economy slows after a period of rapid growth, often triggered by factors such as reduced consumer spending, lower business investment, or high inflation. • Characteristics: <ul style="list-style-type: none"> ▶ Typically short-term. ▶ Linked to economic cycles like recessions and expansions. ▶ Often resolved when the cycle moves into a recovery phase. ◦ Example: A slowdown during a recession, where demand falls, corporate profits decline, and unemployment rises, but the economy recovers as it moves out of the recession. 	<ul style="list-style-type: none"> ◦ A structural slowdown is a more prolonged, deep-rooted slowdown that results from fundamental changes in the economy. ◦ These changes can be due to shifts in industries, demographics, technological advancements, or global competition. ◦ Characteristics: <ul style="list-style-type: none"> ▶ Long-term or permanent in nature. ▶ Caused by structural factors such as technological disruption, deindustrialization, or changes in the workforce. ▶ Difficult to reverse without significant policy intervention or restructuring. ◦ Example: An economy facing slow growth due to a decline in traditional industries (e.g., manufacturing) and the rise of automation or digital technologies that disrupt labor markets.

Table No. 01

- ▶ a reduction in economic activity, typically measured by **lower GDP growth**
- ▶ weakening industrial output
- ▶ faltering consumer demand
- ▶ reduced business investment
- In India's case, a slowdown is marked by weak urban demand, poor corporate earnings, and a dip in high-frequency economic indicators, such as production and consumption, which some economists attribute to **cyclical factors**, rather than structural changes.
- A slowdown may be temporary, or it could be part of a larger economic transition.
- The central bank takes the contrary position in the event of a fall in inflationary pressures. Repo and reverse repo rates form a part of the liquidity adjustment facility.

(See Table No. 01 above)

RBI'S INTEREST RATES AND IMPACT ON INFLATION

Context

India's Commerce Minister has called for the **Reserve Bank of India (RBI)** to **reduce interest rates** to boost economic growth.

What is an RBI's Interest Rate?

- Repo rate is the rate at which the central bank of a country (Reserve Bank of India in case of India) lends money to commercial banks in the event of any shortfall of funds.
 - ▶ Repo rate is used by monetary authorities to control inflation.
- In the event of inflation, central banks increase repo rate as this acts as a disincentive for banks to borrow from the central bank. This ultimately reduces the money supply in the economy and thus helps in arresting inflation.
- **RBI can reduce interest rates in the following ways:**
 - ▶ **By lowering the Repo Rate:** The **repo rate** is the rate at which commercial banks borrow money from the RBI. When the RBI lowers the repo rate, it becomes cheaper for commercial banks to borrow money. As a result, the banks lower their lending rates (like the home loan interest rates) to borrowers. This helps stimulate investment and consumption in the economy.
 - ▶ **By lowering the Reverse Repo Rate:** The **reverse repo rate** is the rate at which commercial banks deposit excess funds with the RBI. When the RBI lowers this rate, it discourages banks from keeping money with the RBI and encourages them to lend more to businesses and individuals.
 - ▶ **By changing the Cash Reserve Ratio (CRR):** The **CRR** is the percentage of a bank's total deposits that it must keep with the RBI in reserve. When the RBI reduces the CRR, it allows commercial banks to keep more funds for lending, which can reduce interest rates.
 - ▶ **Open Market Operations (OMO):** The RBI also buys and sells government securities in the open market to control liquidity (the amount of money in the economy). When the RBI buys government bonds, it injects money into the economy, which can help reduce interest rates.

What is Monetary Policy?

- **Monetary Policy** refers to the actions taken by a country's central bank (in India, the RBI) to control the money supply, manage inflation, and stabilize the economy.
- It influences economic activity by adjusting interest rates and regulating the supply of money.
- There are two main types of monetary policy:
 - **Expansionary Monetary Policy (Loose Policy):**
 - ◆ It is aimed at **stimulating the economy**.
 - ◆ It is used when the economy is slowing down or facing a recession.
 - ◆ The central bank **lowers interest rates** to make borrowing cheaper, which encourages businesses to invest and consumers to spend.
 - ◆ It **increases the money supply**, making it easier for people to borrow money and spend it.
 - ◆ **Example:** If the RBI lowers the repo rate, it makes loans cheaper and encourages investment and spending, boosting the economy.
 - **Contractionary Monetary Policy (Tight Policy):**
 - ◆ It is aimed at **controlling inflation** or an overheating economy.
 - ◆ It is used when the economy is growing too quickly, and prices are rising too fast (inflation).
 - ◆ The central bank **raises interest rates** to make borrowing more expensive and to reduce the money supply in the economy.
 - ◆ It aims to **reduce inflation** by discouraging excessive borrowing and spending.
 - ◆ **Example:** If the RBI raises the repo rate, loans become more expensive, and people borrow less, which helps slow down inflation.

Key-terms in the monetary policy review

Repo rate	<ul style="list-style-type: none"> ◦ Repo rate is an interest rate at which the RBI provides liquidity under the liquidity adjustment facility (LAF) to banks against the collateral of government and other approved securities. ◦ Currently, the repo rate is at 6.50 percent.
Standing Deposit Facility (SDF) Rate	<ul style="list-style-type: none"> ◦ SDF rate is a rate at which the RBI accepts uncollateralised deposits, on an overnight basis, from banks. ◦ The SDF is also a financial stability tool in addition to its role in liquidity management. The SDF rate is placed at 25 basis points below the policy repo rate. ◦ Currently, SDF rate is at 6.25 percent.

Marginal Standing Facility (MSF) Rate	<ul style="list-style-type: none"> ◦ The penal rate at which banks can borrow, on an overnight basis, from the central bank by dipping into their Statutory Liquidity Ratio (SLR) portfolio up to a predefined limit (2 per cent). ◦ MSF rate currently stands at 6.75 percent.
Monetary policy stance	<ul style="list-style-type: none"> ◦ There are various stances: ◦ Accommodative Stance, which means the central bank is prepared to expand the money supply to boost economic growth. ◦ Neutral stance suggests that the central bank can either cut rate or increase rate. This stance is typically adopted when the policy priority is equal on both inflation and growth. ◦ Hawkish stance indicates that the central bank's top priority is to keep the inflation low. During such a phase, the central bank is willing to hike interest rates to curb money supply and thus reduce the demand. ◦ Calibrated tightening means during the current rate cycle, a cut in the repo rate is off the table.
CPI Inflation	<ul style="list-style-type: none"> ◦ Consumer Price Index (CPI) based Inflation is a measure of changes in the price levels of goods and services purchased by households.

How Does RBI's Monetary Policy Affect the Economy?

- **Controlling Inflation:** If prices rise too quickly (high inflation), the RBI may raise interest rates to slow down borrowing and spending, reducing inflation.
- **Encouraging Economic Growth:** During a slowdown or recession, the RBI might lower interest rates to make borrowing cheaper. This encourages businesses to invest and consumers to spend, boosting economic activity.
- **Managing the Exchange Rate:** Changes in interest rates can influence the value of a country's currency. For example, higher interest rates attract foreign investors, which can increase demand for the local currency, making it stronger.
- **Balancing Growth and Inflation:** The RBI needs to balance promoting economic growth with controlling inflation. If it cuts interest rates too much, inflation may rise; if it raises rates too much, economic growth may slow down.

IMPACT OF TARIFFS ON U.S.-CHINA TRADE

Context:

Donald Trump, the President-elect of the U.S., has proposed imposing **tariffs** of up to **60% on Chinese imports**. This decision is aimed at reducing the **U.S. trade deficit** with China, which means the U.S. imports more from China than it exports to China. The goal is also to punish China for its subsidies to domestic producers, which make Chinese goods cheaper in the U.S. compared to locally produced goods. In addition to China, Trump has also threatened to impose **10% tariffs** on imports from the **European Union**.

Immediate Impact of the Tariffs:

- **Higher Prices for Consumers:** **Tariffs** are taxes on imports, and when the U.S. imposes these, the **prices** of affected goods (like clothes, electronics, etc.) will rise in the U.S. market.
 - ▶ For example, if the U.S. places a tariff on Chinese-made goods, those goods will become more expensive in the U.S. because importers will have to pay the tariff, which they will likely pass on to consumers.
- **Domestic Inflation:** If **many products** are taxed through tariffs, the overall price level in the U.S. will increase, leading to **inflation** (a general rise in prices).
 - ▶ However, if tariffs help **reduce the trade deficit** (U.S. imports less and exports more), it might improve the **U.S. dollar's value** and reduce inflation to some extent. It could also boost **domestic production** if U.S. manufacturers take over from Chinese suppliers.
- **Global Impact:** Other countries (like China and the EU) might respond with their own **tariffs** on U.S. goods. This could lead to a **trade war**, where tariffs escalate, harming both sides.
 - ▶ A trade war could lead to **higher global commodity prices** and worsened inflation worldwide.

Example to Illustrate:

Imagine a shirt:

- **In China:** The shirt costs **724 yuan**.
- **In the U.S. market:** It's sold for **USD 100**, based on the exchange rate **USD 1 = 7.24 yuan**.
- **Cost of producing in the U.S.:** A U.S. manufacturer would sell it for **USD 105** (about **760.2 yuan**).

So, the Chinese shirt is **cheaper** than the U.S. shirt, so American consumers prefer buying it.

What Happens if the U.S. Imposes a Tariff?

If the U.S. imposes a **10% tariff** on Chinese shirts:

- The price of a Chinese shirt in the U.S. market would go up by **10%**.

- **New price of the Chinese shirt in the U.S. = \$110** (or **796.4 yuan**).
- **Why?** The tariff adds \$10 to the cost of the Chinese shirt, making it **less attractive** to American consumers.

Now, the U.S. manufacturers can sell their shirts at **\$105** (still cheaper than the new price of Chinese shirts), which could make U.S. manufacturers more competitive, since the **domestic price** is only **\$105**.

Impact on China:

- The Chinese producers now face a **10% tariff**, which translates to an extra **72.4 yuan** per shirt.
- To counter this, China's government might intervene by:
 - ▶ **Subsidizing** its textile producers (give them 72.4 yuan per shirt).
 - ▶ **Devaluing the yuan** (making it weaker against the dollar) by **10%**.
 - ▶ **Stimulating the economy** by lowering interest rates, leading to a weaker yuan.
- If the yuan is devalued by **10%** to **\$1 = 7.96 yuan**, Chinese exporters will still get **796.4 yuan** for the shirt (same as before the tariff), but they will pay the tariff in yuan (72.4 yuan), effectively making the impact of the tariff **neutral** for them.
- However, **devaluing the yuan** might lead to **higher inflation** in China because the value of the currency drops, making imports more expensive. But if it helps boost **Chinese exports** and **economic growth**, the inflation risk could be managed.

INDIA'S MARITIME SECTOR AND SAGARMANTHAN

Context

India's maritime sector is growing rapidly and playing an important role in the country's economic rise. In 2023, India contributed 16% to global economic growth and is expected to become the third-largest economy soon. As India's global influence increases, its maritime sector (shipping, ports, etc.) is becoming a key part of its economic and strategic plans.

More on News

- The importance of India's maritime sector was highlighted during the **first edition of 'Sagarmathan: The Great Oceans Dialogue'** held in New Delhi.
- The 'Sagarmathan' event was organised by the **Ministry of Ports, Shipping & Waterways (MoPSW)** and the **Observer Research Foundation**.
- It was aimed to encourage dialogue on sustainable development and the future of the maritime sector.

About India's Maritime Sector

- India has a **7,500-kilometer coastline**, with **12 major ports** and over **200 minor ports**, making it a key player in global shipping. About **95% of India's trade** by volume is handled through its ports, and **70% by value**.

- **Global Position:** India ranks as the **16th-largest maritime nation** in the world and is located along the world's busiest shipping routes. Many ships traveling between East Asia, America, Europe, and Africa pass through Indian waters.
- **Growing Fleet:** India has a fleet of **1,530 ships** (as of 2023), making it a major player in global shipping. It is also the third-largest in the world for **ship recycling**, contributing to **sustainable maritime practices**.
- **Port Infrastructure:** The cargo-handling capacity of Indian ports has grown by **87%** from 2014 to 2023. This is essential for supporting the nation's expanding trade and economy.
- **Government Role:** The Indian government has supported growth in the maritime sector through initiatives like:
 - **100% Foreign Direct Investment (FDI)** for port projects.
 - **Tax holidays** for port enterprises to encourage private investment.

Key Developments and Initiatives

- **Port Efficiency:** Indian ports have improved their efficiency. For example, in **2023-24**, major ports reduced their **container turnaround time** to **22.57 hours**, beating global benchmarks.
- **New Shipping Fleet:** India plans to create a **new shipping company** to expand its fleet by at least **1,000 ships** in the next decade, which will help reduce foreign freight costs and increase trade.
- **Paradip Port:** This port became India's largest by **cargo volume** in FY24, handling **145.38 million tonnes** of cargo.
- **Future Investments:** The government plans to invest **\$82 billion** in port infrastructure by **2035**. A **new port at Vadhavan**, Maharashtra, with an estimated cost of **\$9.14 billion**, is a key project.
- **Green Shipping:** The government is pushing for **eco-friendly shipping practices**. For example, the **Green Tug Transition Program** aims to replace traditional fuel-powered tugs at major ports with cleaner, sustainable options.

Major Government Schemes in Maritime Sector

- **Sagarmala Programme:** A key initiative to improve ports, enhance connectivity, and develop coastal areas. It focuses on port modernization, better roads and railways to ports, and increasing coastal trade.
- **Maritime India Vision (MIV) 2030:** A plan to make India a global maritime leader. It covers over **150 initiatives** across 10 areas, including ports, shipyards, and inland waterways, to boost growth in the next decade.
- **Inland Waterways:** The government is working to develop **26 new national waterways** to ease transportation and reduce congestion on roads and railways.

INDIA & ITS NET-ZERO EMISSION TARGET

Context

India's commitment to achieving **net-zero emissions by 2070** faces significant challenges, including balancing **economic growth with climate action**, managing **resource constraints**, and addressing **global inequities** in climate responsibility. The outcome of the **2024 U.S. presidential election** could also influence global climate efforts and financing, particularly for developing countries like India.

What is India's Target?

- **India** has committed to achieving **net-zero emissions by 2070**, but this target is seen as **long-term** and difficult due to challenges like **financial constraints** and **resource limitations** (land, water, etc.).
- India's per capita emissions are among the lowest globally, but the richest 10% in India have emissions 20 times higher than the poorest 10%. Climate change disproportionately impacts the **poor**, worsening inequality.
- **Global Carbon Budget:**
 - To limit global temperature rise to **1.5°C** above pre-industrial levels (the goal set by the Paris Agreement), the world has a **limited carbon budget** of about **400-500 billion tonnes of CO₂**.
 - Current global emissions are around **40 Gt (gigatonnes) of CO₂** per year, which means emissions must drop significantly to stay within the carbon budget.
- This means net global emissions must drop drastically to stay within the carbon budget. Several countries have announced net-zero targets, but we also really need a sharp decline in total emissions.

Progress Made So Far (2021 to Mid-2024)

- India, the third-largest emitter of greenhouse gases, has seen its annual emissions reach approximately **3 billion tonnes**, with an **8% year-on-year increase** from pandemic levels. However, significant efforts have been made to decarbonize various sectors, primarily under the **Panchamrit Action Plan**, which includes key initiatives to reduce emissions across critical sectors through subsidies, frameworks, and mandates.
- **Energy Sector Decarbonization:** India aims to increase its **non-fossil fuel capacity** to **500 GW** by 2030 and meet **50% of consumer demand** through renewables.
- **Key Initiatives:**
 - The government prioritizes the **domestic production of photovoltaic modules** under the **PLI scheme**.
 - Building **resilient transmission infrastructure** for renewable energy via the **Green Energy Corridor Initiative**.
 - Offering **heavy subsidies** for solarizing irrigation pumps through the **PM-KUSUM scheme**.

- ▶ To address **grid stability** challenges arising from intermittent renewable energy, the **Ministry of Power** is promoting the development of **pumped storage** and **small hydel projects**.
- **Green Hydrogen Development:** India has doubled efforts to produce green hydrogen to decarbonize energy-intensive industries and transportation. Under the **National Green Hydrogen Mission**, India aims to become a global hub for the production, usage, and export of green hydrogen.
- **Electric Vehicles (EVs) and Battery Storage:** To make **EVs financially viable**, the GOI has introduced a **Battery Swapping Policy** and the **PLI Scheme for Advanced Chemistry Cells (ACC)**, focusing on reducing battery costs (which account for about 40% of vehicle costs).
 - ▶ As of recent data, EVs account for nearly 5% of total vehicle sales, with the 3-wheeler segment seeing 50% penetration, driven by strong demand from last-mile EV operators and ride-hailing providers.
- **Carbon Sequestration and Urban Green Spaces:** The **Ministry of Environment** has also planned to enhance carbon sequestration through natural carbon sinks, aiming to create up to 1,000 **Nagar Vans (urban forests) across India**. 380 Nagar Vans are already sanctioned.
- **Renewable Energy and Carbon Markets:** India is fourth globally in total renewable capacity, demonstrating an **impressive 400% growth over the last decade**. The government has also made strides in carbon credit markets, allowing non-obligated companies to voluntarily participate and reduce their carbon footprints.

What challenges are faced by India?

- **Equity in Climate Action:** The **developed world**, which caused the majority of historical emissions, is expected to **lead in cutting emissions** and provide **financial support** to developing countries. However, this hasn't happened at the required scale. Developing countries like India face the dilemma of balancing **development goals** (poverty alleviation, economic growth) with the need for **climate action**.
- **India's Growing Power Demand:** India's power demand is expected to rise dramatically in the coming decades, potentially 9-10 times by 2070, due to economic growth, urbanization, and electrification of sectors.
 - ▶ Meeting this demand solely with renewable energy (solar, wind) will be difficult, requiring massive expansion in solar (5,500 GW) and wind (1,500 GW) power capacity, far beyond current levels.
- **Land and Resource Constraints:** Meeting renewable energy targets will lead to land-use trade-offs. For instance, to achieve over 3,500 GW of solar and 900 GW of wind would require large amounts of land that could affect food security, biodiversity, and other natural resources.
 - ▶ India needs to carefully manage its land for renewable energy, agriculture, and forests to avoid unsustainable trade-offs.
- **Balancing Development and Sustainability:** India faces a tough balancing act: improving the quality of

life for its population while achieving climate goals. The goal should not be to replicate the high consumption lifestyles of developed countries, but instead to focus on "sufficiency consumption", where growth is balanced with sustainability.

What measures should be adopted?

- **Demand-Side Measures for Sustainability:** To meet climate goals, India must focus on both **supply-side** (renewable energy, nuclear power) and **demand-side** measures:
 - ▶ **Energy-efficient buildings, better construction materials, and passive designs** to reduce the need for air-conditioning.
 - ▶ **Public transport, non-motorized transport** (walking, cycling), and **mindful consumption patterns** (e.g., local food, reducing long-haul freight).
 - ▶ Use of **alternative fuels** in industries and **electrification** of sectors like transportation and agriculture.
- **Energy Diversification and Nuclear Power:** India also needs to diversify its energy mix, including further investment in **nuclear power** to provide a **low-carbon baseload** and complement intermittent renewable sources like solar and wind. **Nuclear energy** can help reduce dependence on fossil fuels while meeting growing electricity demands.
- **Global Climate Targets Are Tightening:** As the world moves towards **net-zero emissions**, the window for delaying climate action is closing. Every year of delay will make it harder to meet climate targets. While global politics (like U.S. presidential elections) may affect progress, India and other countries must continue to take action where they can.

HIGH-PERFORMANCE BUILDINGS (HPBS)

Context

High-Performance Buildings (HPBs) are gaining attention as a **sustainable solution** to address rising energy consumption, resource scarcity, and climate resilience, with examples like Infosys campuses showcasing their potential to reduce energy use, water consumption, and environmental impact. As urbanization increases and climate change intensifies, HPBs are becoming central to achieving sustainable development and meeting global climate goals.

What Are High-Performance Buildings (HPBs)?

- High-Performance Buildings (HPBs) and green buildings are terms often used interchangeably, but they have distinct objectives:
 - ▶ **Green Buildings:** Green buildings focus on reducing environmental impacts and energy consumption, often certified through established programs that assess sustainability across various categories, such as energy efficiency and water conservation.

- ▶ **High-Performance Buildings:** HPBs aim for exceptional efficiency in all aspects, from energy and water use to occupant health and comfort. They utilize advanced technologies and smart design strategies to achieve results beyond local regulations, continuously tracking performance metrics.

Key Features of HPBs:

- **Integrative Design:** HPBs are created using an **integrative design process**, where architects, engineers, and other experts collaborate early to set specific performance goals. These might include maximizing natural light or optimizing cooling efficiency.
 - ▶ **Digital modeling** is used to simulate the building’s performance before construction, helping to refine strategies for energy savings and comfort.
 - ▶ **Passive design strategies** like using natural sunlight and materials that store heat (thermal mass) help reduce the need for artificial heating and cooling.
- **Sustainable Materials:** HPBs use **materials with low embodied carbon** (the emissions produced during manufacturing) and high recycled content. This reduces their environmental impact.
 - ▶ **Life-cycle assessments** are done to evaluate materials’ environmental impact over time, helping to select the most sustainable options.
 - ▶ **Low-emission interior materials** improve indoor air quality by reducing harmful substances that can evaporate into the air.
- **Energy Efficiency:** Buildings consume around **40% of global energy**. HPBs reduce this demand through both **passive** and **active strategies**.
 - ▶ **Passive strategies:** Use natural light, optimize building orientation, and leverage thermal mass to reduce reliance on artificial lighting, heating, and cooling.
 - ▶ **Active strategies:** Use **energy-efficient systems** like HVAC (heating, ventilation, and air conditioning), smart lighting controls, and **automated sensors** to optimize energy use.
 - ▶ HPBs aim for **net-zero energy**, meaning they generate as much energy (e.g., via solar panels) as they consume, reducing reliance on fossil fuels.
 - ▶ The **Infosys Hyderabad campus** is an example of an HPB that uses radiant cooling and daylighting controls to minimize energy use.
- **Water Conservation:** With water scarcity becoming a major issue, HPBs focus on **water conservation** and **reuse**.
 - ▶ **Efficient fixtures** like low-flow faucets and dual-flush toilets reduce water consumption.
 - ▶ **Rainwater harvesting** systems collect rainwater for non-drinking purposes like irrigation.
 - ▶ **On-site wastewater treatment** systems recycle water, with some buildings like Infosys campuses in India recycling 100% of their wastewater.

Performance Monitoring:

- ▶ To ensure HPBs are operating efficiently, **performance monitoring** systems track **energy usage, water consumption, and indoor air quality** in real time. This data helps identify inefficiencies and make corrections.
- ▶ The **IISHS campus in Bengaluru** uses **smart devices** and AI to optimize energy and thermal performance.

Climate Resilience:

- ▶ HPBs are designed to withstand extreme weather, such as **floods** and **heatwaves**. This is done through:
 - ◆ **Careful site selection** to avoid flood-prone areas.
 - ◆ **Durable materials** and backup **renewable energy** systems to ensure the building remains functional even during power outages.
- ▶ An example is the **Infosys Crescent building** in Bengaluru, which uses advanced cooling systems to drastically reduce energy use compared to typical office buildings.

Overall Impact:

- HPBs are setting the **standard for sustainable and resilient buildings** in the 21st century. They reduce **energy costs**, enhance **climate resilience**, and **improve indoor comfort**, while contributing to sustainability goals.
- As more buildings adopt HPB principles, the goal is for **all buildings to eventually follow these standards**, improving **environmental impact, operational costs, and real estate value**.
- Science & Technology (GS-III)

INDIA ANNOUNCES SUCCESSFUL HYPERSONIC MISSILE TEST

Context

India has successfully tested a domestically developed **long-range hypersonic missile**, attaining a key milestone in military development that puts it in a small group of nations possessing the advanced technology.

About the Indian missile:

- **Developed by:** The Indian missile is developed by the state-run **Defence Research and Development Organisation** and industry partners.
- It is designed to carry payloads for ranges exceeding 1,500 km (930 miles) for the armed forces.
- Generally, the hypersonic missiles, capable of carrying conventional explosives or nuclear warheads, can fly in the range of five times the speed of sound (Mach 5 which is roughly 6,174 km) per hour at sea level.
- However, some advanced versions of hypersonic missiles can even fly at the speed of over 15 mach.

- **Global race:**
 - ▶ At present, Russia and China are way ahead in developing hypersonic missiles while the US is in the process of developing a range of such weapons under an ambitious programme.
 - ▶ Several other countries, including **France, Germany, Australia, Japan, Iran, and Israel**, are also pursuing projects to develop hypersonic missile systems.

What are Hypersonic Missiles?

- **Hypersonic missiles** are a class of advanced weapon systems that travel at speeds greater than **Mach 5**, which is **five times the speed of sound** (around **6,200 km/h or 3,853 mph**).
- These missiles are designed to fly much faster and with more agility than traditional **ballistic missiles**, which makes them a highly effective and difficult-to-intercept weapon in modern defense systems.

Key Features of Hypersonic Missiles

- ▶ **Speed:** Hypersonic missiles travel at speeds **greater than Mach 5** (5 times the speed of sound), allowing them to reach their targets in a fraction of the time it would take traditional missiles. This speed gives them a significant advantage in evading interception by current missile defense systems.
- ▶ **Maneuverability:** Unlike traditional **ballistic missiles**, which follow a **predictable, parabolic trajectory**, hypersonic missiles use **aerodynamic lift** to maneuver within the atmosphere. This means they can change course mid-flight, making them much harder to track or intercept. Ballistic missiles, once launched, follow a fixed path and can only change course after re-entry. Hypersonic weapons, on the other hand, can perform **evasive maneuvers** throughout their flight.
- ▶ **Boost-Glide Technology:** Most hypersonic missiles utilize **boost-glide** technology. These missiles are initially launched by a rocket booster, which carries them into the atmosphere at hypersonic speeds. After reaching a certain altitude, the missile uses aerodynamic lift to glide toward its target. This glide phase allows the missile to alter its course during flight, further complicating interception efforts.
- ▶ **Long Range:** Hypersonic missiles can travel distances of **thousands of kilometers**, which is similar to the range of **intercontinental ballistic missiles (ICBMs)**. This makes them capable of striking distant targets with high precision and speed.
- **Missile Types:** There are two main types of hypersonic weapons:
 - ▶ **Hypersonic glide vehicles (HGV)** are launched using a rocket. After separating from the rocket, the glide vehicle travels at speeds of Mach 5 or more towards its target.

Significance of Hypersonic Missiles

- **Evasion of Defense Systems:** Traditional missile defense systems are designed to track and intercept ballistic missiles, which follow predictable high-altitude trajectories. However, the **maneuverability and speed** of hypersonic missiles make them **difficult to track** and intercept. The ability of these weapons to change course in mid-flight makes them a serious challenge for existing missile defense technologies.
- **Enhanced Offensive Capabilities:** For countries with **nuclear arsenals**, hypersonic missiles are seen as an effective way to ensure the credibility of their **nuclear deterrent**. By enabling missiles to evade interception, these systems make it much harder for an adversary to neutralize a nuclear strike.
- **Strategic Advantage:** The ability to **travel at hypersonic speeds** and maneuver mid-flight makes hypersonic missiles a strategic asset, capable of **overwhelming or bypassing defense systems**. They add a layer of security for nations, ensuring that even the most advanced defense systems cannot guarantee complete protection.

Challenges in Development

- **Heat Resistance:** Hypersonic missiles generate extreme heat due to friction with the atmosphere as they travel at such high speeds. This requires advanced materials that can withstand temperatures of over **2,000°C (3,632°F)**. Materials like **carbon-carbon composites** and **heat-resistant alloys** are used to protect the missile.
- **Precision Guidance:** To maintain their high speed and maneuverability, hypersonic missiles require **advanced guidance systems**. These systems need to be extremely precise, often relying on **inertial navigation** and **artificial intelligence** to adjust the missile's course in real time.
- **Propulsion Systems:** The **scramjet engines** used in some hypersonic missiles operate by **scooping in air** at hypersonic speeds and compressing it for combustion. This allows the missile to maintain its speed without relying on rocket boosters throughout its flight. However, designing efficient scramjet engines that can operate at these speeds presents a major engineering challenge.

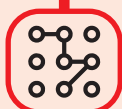


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SECTION - B

QUICK BYTES

SALIL CHOWDHURY

CONTEXT

2024 marks Salil Chowdhury's (a legendary musician) 100th birth anniversary. His contributions to Indian film music, especially in Malayalam cinema, continue to be celebrated.

About Salil Chowdhury

- Salil Chowdhury was born on November 19, 1925, in West Bengal, India. He was a versatile musician and composer, known for his work in **Bengali, Hindi, and Malayalam cinema**.
- Musical Training and Influences:** Chowdhury was trained in **Hindustani classical music** and was deeply influenced by Bengali folk traditions. He was also well-versed in **Western classical music**, which he blended with other musical styles in his compositions.
- Career:** Chowdhury's career began in the 1940s, and he became a leading figure in Indian film music, especially in Bengali and Hindi cinema. He was also a member of the **Indian People's Theatre Association (IPTA)**, where he composed revolutionary songs.
- His Work**
 - Impact on Malayalam Cinema:** Salil Chowdhury's work in Malayalam cinema began when he composed the soundtrack for *Chemmeen* (1965). His music for this film was a turning point, not just in the film but in Malayalam cinema as a whole.
 - Revolutionizing Music Composition:** Before Chowdhury, the common practice in Malayalam films was for lyricists to write lyrics first, and composers would then create tunes based on those lyrics. Chowdhury changed this process by composing the music first and fitting the lyrics into the melody later. This approach is

now more common in modern Malayalam music composition.

- ◆ **Chemmeen's Musical Influence:** The music of *Chemmeen* became iconic, with songs capturing the essence of Kerala's coastal life. Chowdhury blended Bengali folk music with Western orchestration, creating a distinct sound that resonated deeply with Malayalam audiences.
- ▶ **Notable Collaborations:** Chowdhury's most significant collaboration in Malayalam cinema was with lyricist O.N.V. Kurup, with whom he composed 45 songs. He also worked with other famous lyricists like Vayalar Rama Varma and Sreekumaran Thampi.
- ▶ **Famous Songs:** Some of Chowdhury's most memorable Malayalam songs include:
 - ◆ *Saagarame Santhamakane* (Madanolsavam)
 - ◆ *Oru Mukham Maathram Kannil* (Etho Oru Swapnam)
 - ◆ *Keli Nalinam* (Thulavarsham)
 - ◆ *Kaadaarumasam* (Ezhu Rathrikal)
 - ◆ *Sourayoodhathil* (Swapnam)
 - ◆ *Poovili Poovili Poonanamayi* (Vishukkani)
 - ◆ *Onappoove poove* (Ee Ganam Marakkumo)
- ▶ **Legacy and Influence:** Chowdhury's music continues to be influential in Malayalam cinema, with his distinctive style still being admired by modern composers and musicians. He also introduced famous singers like Lata Mangeshkar (*Kadhali Chenkadhali*) and Manna Dey (*Manasa Maine*) to sing in Malayalam films.
- ▶ **Last Composition:** His last Malayalam song was *Kaathil Thenmazhayayi* from *Thumboli Kadappuram* (1994), nearly 30 years ago. Despite this, his music remains fresh and relevant in Malayalam culture.

TWO UNDERSEA CABLES IN BALTIC SEA DISRUPTED

Context

Two undersea internet cables in the Baltic Sea have been suddenly disrupted, according to local telecommunications companies. This could be part of a larger campaign of hybrid warfare or espionage, particularly attributed to Russia.

What Happened?

- Two critical undersea **telecommunication cables** in the Baltic Sea were damaged, cutting off vital connections between several European countries.
 - ▶ **Lithuania-Sweden cable:** The first cable connected **Lithuania** to the Swedish island of **Gotland**. It was important for the **Baltic States**, which rely on strong connections for trade, diplomacy, and security communications within the **European Union and NATO**.
 - ▶ **Finland-Germany cable:** The second cable linked **Finland** and **Germany**. It was the only direct link between Finland and Central Europe. It spanned **nearly 1,200 kilometers (730 miles)** and was a key part of European communication infrastructure. This cable facilitated data flow for businesses, governments, and military communications.
- These cables were significant for **international communications**, with the **Finland-Germany cable** being the only direct link between Finland and Central Europe.
- These telecommunication cables are not only crucial for internet connectivity but also for **broader economic and security communications** between European nations.

About the Baltic Sea:

- The Baltic Sea is a **large brackish inland sea** bordered by several countries.
- It lies in northern Europe in a strategic location that is surrounded by nine countries.
- It stretches from St Petersburg to Denmark, including Finland, Sweden, Estonia, Latvia, Lithuania, Poland, Germany, and Denmark.
- It connects to the **Atlantic Ocean** through the **Danish Straits**.
- The Baltic Sea contains three major gulfs:
 - ▶ **the Gulf of Bothnia** to the north
 - ▶ **the Gulf of Finland** to the east
 - ▶ **the Gulf of Riga** slightly to the south

(See Figure No. 01 at Bottom)

MATES SCHEME

Context

Australia has introduced a new migration initiative, the *Mobility Arrangement for Talented Early-professionals Scheme (MATES)*, which provides Indian university graduates and early-career professionals with an opportunity to work in Australia for a period of up to two years.

What is MATES Scheme?

- This scheme is part of the broader **Migration and Mobility Partnership Arrangement (MMPA)** between India and Australia.



Figure No. 01

- ▶ **MMPA** is a bilateral framework that supports and promotes two-way migration and mobility between the two countries while addressing issues pertaining to illegal and irregular migration.
- The **MATES** program is designed to encourage young professionals to enhance their skills, gain international work experience, and contribute to sectors critical to both countries, including renewable energy, mining, engineering, and more.

□ Key Features of the MATES Scheme

- ▶ **Eligibility Criteria:** To apply for the MATES scheme, candidates must meet several specific requirements:
 - ◆ **Age:** Applicants must be aged 30 years or younger at the time of application.
 - ◆ **Previous Participation:** The scheme is open only to those who have not previously participated in the MATES program.
 - ◆ **Educational Qualification:** Applicants must have graduated within two years of the application date from an eligible educational institution. A bachelor's degree or higher qualification is required, with degrees in the following fields being prioritized:
 - ◆ Renewable Energy
 - ◆ Mining
 - ◆ Engineering
 - ◆ Information Communications Technology (ICT)
 - ◆ Artificial Intelligence (AI)
 - ◆ Financial Technology (FinTech)
 - ◆ Agricultural Technology (AgriTech)
 - ◆ **English Language Proficiency:** Applicants must demonstrate proficiency in the English language, with a minimum score of **6 in IELTS or an equivalent exam**. Additionally, candidates must score at least 5 in each module of the test (speaking, reading, writing, and listening).
 - ◆ **Eligible Universities:** Graduates from the top 100 Indian universities, as per the **National Institutional Ranking Framework (NIRF) 2024**, are eligible to apply.
- ▶ **No Employer Sponsorship Required:** Applicants do not need a **job offer or sponsorship from an Australian employer to apply**.



FACT BOX

National Institutional Ranking Framework (NIRF) 2024

- The **National Institutional Ranking Framework (NIRF)** was launched by the **Minister of Human Resource Development** in 2015. This framework outlines a methodology to rank institutions across the country.

- The **NIRF Rankings** assess institutions based on five broad parameters:
 - ▶ Teaching, Learning, and Resources (TLR)
 - ▶ Research and Professional Practice (RP)
 - ▶ Graduation Outcomes (GO)
 - ▶ Outreach and Inclusivity (OI)
 - ▶ Perception (PR)

2024 Ranking

- **Top Colleges:** Hindu College, Delhi, leads the list of top colleges, followed by Miranda House, Delhi, and St. Stephen's College, Delhi. This marks a change from last year's rankings where Miranda House was at the top.
- **Overall Rankings:** IIT Madras retains its position as the top institution overall for the sixth consecutive year, while the Indian Institute of Science (IISc), Bengaluru, is ranked as the best university.
- **Category Expansion:** Along with the regular 13 categories, the NIRF 2024 rankings have also been introduced for
 - ▶ Open universities
 - ▶ Skill universities
 - ▶ State-funded government universities
- **Top Institutions by Category:**
 - ▶ **Engineering:** IIT Madras
 - ▶ **Management:** IIM-Ahmedabad, Bangalore, and Calcutta are in the top five.
 - ▶ **University:** Indian Institute of Science (IISc), Bengaluru.

ICAO'S REVISED LIABILITY

Context

The **International Civil Aviation Organization (ICAO)**, a global UN agency that sets rules for international air transport, has increased the **liability limits for airlines** under the **Montreal Convention**. This change, effective from **December 28**, will have an impact on **Indian exporters** and those involved in air freight.

Revised Liability Limits

- The updated limits are measured in **Special Drawing Rights (SDR)**, a currency unit used by the **International Monetary Fund (IMF)**. The conversion rate for 1 SDR is roughly ₹111.66. The changes are as follows:
 - ▶ **Passenger death/injury:** The compensation limit increases from **SDR 1,28,821** to **SDR 1,51,880**.
 - ▶ **Delay in passenger/baggage/cargo transport:** The limit increases from **SDR 5,346** to **SDR 6,303**.
 - ▶ **Loss or damage to checked baggage:** The limit increases from **SDR 1,288** to **SDR 1,519**.

- ▶ **Loss or damage to cargo:** The limit increases from **SDR 22 per kg** of gross weight to **SDR 26 per kg**.
- This means that if **Indian cargo is lost or damaged**, the airline will now be liable to pay **compensation of about ₹2,900 per kg of cargo** (compared to ₹2,600 earlier).

Why This Matters for India?

- **Benefit to Indian Exporters:** The higher liability limits will help **Indian exporters** negotiate **better insurance premiums** for air shipments.
- In simple terms, if something goes wrong (like cargo getting lost or damaged), the airline will now have to compensate more, which in turn helps **underwriters (insurance companies)** recover more from the airline, reducing costs for shippers.
- **Impact on Exporters and Insurers:** For exporters, this higher compensation means they may **negotiate lower premiums** for **marine insurance** (the insurance that covers cargo during transport). If something goes wrong with the shipment, insurers can recover a larger amount from the airline, meaning less financial burden for the exporter.
- **How Does This Help Shippers?**
 - ▶ **Insurance:** If the shipment gets lost or damaged, shippers (exporters) can now **claim higher compensation** from the airline. This also means that exporters can **pay lower premiums** for insurance, as the airlines' liability is higher.
 - ▶ **Improved Coverage for Cargo:** For example, if a shipment of **1 kg of goods** is lost or damaged, the airline would be liable to pay about **₹2,900** (increased from ₹2,600). Exporters can also seek additional liability limits by paying a higher valuation charge.



FACT BOX

Montreal Convention

- The Montreal Convention, which governs international air transportation, sets rules on the responsibilities of airlines when it comes to **damaging or losing passengers' property**, including baggage and cargo.
- The Convention was created to simplify and standardize airline liability, replacing the older **Warsaw Convention of 1929**.
- **What the Montreal Convention Covers:** The **Montreal Convention** deals with several aspects of airline liability, including:
 - ▶ **Death or injury** to passengers.
 - ▶ **Loss or damage to baggage.**
 - ▶ **Loss or damage to cargo.**
 - **Delays** in transport.
- The liability limits are indicated in Special Drawing Rights (SDRs), a unit of account defined by the International Monetary Fund.

International Civil Aviation Organization (ICAO)

- International Civil Aviation Organization (ICAO) is a specialized agency of the United Nations.
- It leads the international alignment of technical standards and strategies, facilitating the safe, secure, and sustainable development of its 193 member states' aviation sectors and air services.

RECUSAL OF JUDGE

CONTEXT

Chief Justice of India (CJI) Sanjiv Khanna **recused** himself from hearing a petition alleging contempt against Delhi lieutenant governor (L-G) VK Saxena in his capacity as the chairperson of the Delhi Development Authority (DDA), citing a past association with him during a visit to Bihar jails. The contempt case relates to illegal tree felling in Delhi's Ridge area.

What is Recusal?

- Recusal refers to the voluntary withdrawal of a judge from hearing a case due to a potential conflict of interest or bias.
- It ensures impartiality and maintains the integrity of the judicial process by preventing any perception of bias.
- A judge may recuse themselves if there is a personal or financial connection to a party involved in the case, or if they have previously been involved in the case in a different capacity (e.g., having delivered a judgment as a High Court judge before being elevated to the Supreme Court).
- The practice is guided by the principles of "nemo iudex in sua causa" (no person should be a judge in their own case) and "justice must not only be done but must also be seen to be done."
- **Process for Recusal:** There are two types of recusals:
 - ▶ **Automatic Recusal:** This occurs when a judge voluntarily decides to withdraw from a case without any request from the parties involved, typically due to an identified conflict of interest or bias.
 - ▶ **Recusal Based on a Plea:** In this scenario, a party to the case raises a plea for recusal, suggesting that the judge has a potential conflict of interest or personal bias that may affect their impartiality.
- The decision to recuse **rests solely with the conscience and discretion of the judge**. No party can compel a judge to withdraw from a case.
- There are no statutory rules governing the process.

Recusal in Foreign Jurisdictions

- **United States:** Recusal in the U.S. is governed by Title 28 of the U.S. Code and the American Bar Association's Model Code, with grounds including financial interest, prior involvement in the case, or a relationship with a party, and judges can also recuse themselves voluntarily (*sua sponte*).
- **United Kingdom:** In the UK, judicial recusal is guided by the 'real danger' test (*R v. Gough*) based on evidence of bias, later modified to focus on the *appearance of bias* from the perspective of a fair-minded observer (*Lawal v. Northern Spirit Ltd*).

TRIBAL DEVELOPMENT PROJECTS

CONTEXT

On the occasion of **Birsa Munda's 150th birth anniversary (celebrated as 'Janjatiya Gaurav Divas')**, Prime Minister Narendra Modi launched development projects worth Rs 6,640 crore in Bihar's Jamui district.

About new Development Projects

- The newly unveiled projects span infrastructure, healthcare, education, and livelihood generation, aiming to uplift tribal regions.
- To improve healthcare accessibility, Modi launched 23 mobile medical units (MMUs) under **PM-JANMAN** and an additional 30 MMUs under the **Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DAJGUA)** for remote tribal areas.
- The PM also inaugurated **10 Eklavya Model Residential Schools** and **300 Van Dhan Vikas Kendras** to promote entrepreneurship and boost livelihoods.
- Additionally, Modi inaugurated two Tribal Freedom Fighters' Museums in Chhindwara and Jabalpur, Madhya Pradesh, along with two Tribal Research Institutes in Srinagar and Gangtok, to preserve tribal heritage and history.



FACT BOX

PVTGs in India

- There are 75 tribal communities across 18 states and the Union Territory of Andaman and Nicobar Islands identified as PVTGs, characterized by **backward social, economic, and educational indicators**.
- As per the 2011 Census, India has a **total Scheduled Tribe population of 10.45 crore**.

- According to data from the **Ministry of Tribal Affairs** and the 2011 Census, Odisha has the largest population of PVTGs at 8.66 lakh, followed by Madhya Pradesh at 6.09 lakh and Andhra Pradesh (which then included Telangana) at 5.39 lakh.
- The total PVTG population is more than 40 lakh.

Government's welfare outreach to ST communities

- **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN)** aims to enhance the development of Particularly Vulnerable Tribal Groups (PVTGs) by providing comprehensive and inclusive support.
- **Eklavya Model Residential Schools (EMRS)**, established to provide quality education to ST students in residential schools, were allocated Rs 6,399 crore.
- **The post-matric scholarship for ST students** also saw a rise in its allocation.
- **PM DAKSH scheme**, which is aimed at skilling people from the SC and ST communities, saw its allocation increase from Rs 92.47 crore to Rs 130 crore.
- **National Action for Mechanised Sanitation Ecosystem (NAMASTE) scheme**, aimed at eliminating manual scavenging by replacing it with mechanised cleaning of sewers, was allocated Rs 116.94 crore
- **Other schemes:**
 - ▶ PM JanjatiyaVikas Mission (PMJVM)
 - ▶ National Overseas Scholarship Scheme for SCs

AFSPA BACK IN PARTS OF RESTIVE MANIPUR AREAS

Context

The Union government reimposed the **Armed Forces (Special Powers) Act (AFSPA)**, in areas under the jurisdiction of six police stations across five Manipur districts, more than a year after it was removed from these places, amid a fresh wave of violence in the state.

What is AFSPA?

- The British passed the Act in its original version in response to the **Quit India Movement in 1942**. After Independence, then Prime Minister Jawaharlal Nehru chose to **retain the Act**.
- As per the AFSPA, after a state or portions of it are declared "disturbed" under **Section 3**, the Centre or the Governor of a state can impose exceptional powers for the armed forces on the state or parts of it.
 - ▶ **Section 3 of AFSPA defines "disturbed area"** as a region where there is "extensive disturbance of the public peace and tranquillity."

- According to **The Disturbed Areas (Special Courts) Act, 1976**, once a region is labelled "disturbed", it must preserve **status quo** for a minimum of three months.
- AFSPA allows security forces to conduct operations anywhere and arrest anyone without a warrant.
- It gives the military the ability to use force or even open fire after issuing a warning to someone who is found to be breaking the law.
- Army personnel acting under the AFSPA are **immune from all actions taken under other laws of the Indian Penal Code, the Criminal Procedure Code and civil suits**, unless otherwise sanctioned by the central government.

PRADHAN MANTRI AWAS YOJANA-GRAMIN (PMAY-G)

CONTEXT

For the first time, the Union Rural Development Ministry has introduced self-surveys to identify beneficiaries in the second phase of Pradhan Mantri Awas Yojana-Gramin (PMAY-G). This allows potential beneficiaries to register themselves through a mobile application, Awaas+, designed for data collection.

About the Initiative

- Pradhan Mantri Awas Yojana-Gramin (PMAY-G)** is a flagship rural housing scheme initiated by the Indian government in 2016.
- The scheme is aimed at providing affordable housing to rural households that lack proper housing facilities, focusing particularly on economically disadvantaged sections of the population.
- PMAY-G is designed to ensure that every rural family has a pucca house with basic amenities like sanitation, water, and electricity.
- The first phase of the scheme focused on constructing around **2.95 crore houses**, based on the beneficiary list derived from the **2011 Socio-Economic Caste Census (SECC)**.
 - After the success of the first phase, the second phase of the scheme was launched with a revised target to construct **2 crore houses**.
 - The Union Cabinet allocated a total outlay of **₹3,06,137 crore** for the second phase in August 2024. This phase also aims to enhance the scope and inclusivity of the scheme.

Progress So Far

- First Phase Completion:** Out of the original target of **2.95 crore houses**, about **2.67 crore houses** have been completed successfully. This marks a significant achievement in providing housing for rural households.
- Chhattisgarh's Lagging Progress:** Chhattisgarh is the only state that has been unable to meet the target for beneficiaries listed under the **SECC 2011**, but the state is expected to catch up in the coming months.

- Beneficiaries from SC and ST Communities:** Around **1.5 crore houses** out of the completed 2.67 crore are for beneficiaries belonging to **Scheduled Castes** and **Scheduled Tribes**.
- Second Phase Target:** The government is focusing on completing the survey and beneficiary identification by **November 30, 2024** to meet the targets for the second phase.

INDIA'S TUNA EXPORT GROWTH

Context

In 2023-24, **India's tuna fish exports** increased by **31.83%**. This growth has prompted the government to explore new areas for sourcing tuna, with a particular focus on the **Andaman and Nicobar Islands**. The global market for tuna is valued at **USD 41.94 billion**, and the **Indian Ocean** is the second-largest tuna-producing region in the world, responsible for **21%** of global tuna production.

Andaman and Nicobar Islands as a Potential Tuna Hub:

- The **Andaman and Nicobar Islands** are being targeted as a potential hub for tuna fishing and export. The Union Fisheries Department sees the region as having a lot of untapped potential.
- According to the department, the **Exclusive Economic Zone (EEZ)** around the islands has a variety of tuna species. The estimated potential yield is **64,500 tonnes** of tuna annually from these waters.
- Expected Tuna Species and Quantities:** The department expects the following tuna species to be available for export annually from the region:
 - Yellowfin tuna:** 24,000 tonnes
 - Skipjack tuna:** 22,000 tonnes
 - Bigeye tuna:** 500 tonnes
 - Neritic tuna:** 18,000 tonnes
- India's Current Tuna Export Statistics:** In the **2023-24** period, India exported **51,626 tonnes** of tuna, valued at **USD 87.96 million**.
- Challenges in Tuna Fishing in Andaman and Nicobar Islands:** Despite the high demand for tuna, the tuna fishing sector in the Andaman and Nicobar Islands is **underdeveloped** and **underutilized**.
 - Lack of **modern fishing technologies**,
 - Inadequate **infrastructure** for fishing, **processing**, and **storage**,
 - Limited access to **fish processing** facilities.
- Significance:** Tuna fishing, processing, and exports are expected to generate significant **employment** for local communities, especially in: **Fishing jobs**, **Processing unit workers**, and **Entrepreneurs** in related sectors like storage, transport, and distribution.

- ▶ Tuna is also a crucial source of **protein** for local island communities, many of whom have limited access to other food sources.



FACT BOX

India's Fisheries Sector

- India stands 2nd in global fish production after China
- The fisheries sector supports around 30 million people, especially from marginalized communities in India.
- As the world's second-largest fish producer, India achieved a record production of 17.5 million tonnes in 2022-23, contributing 8% to global fish production.
- The sector's significance is highlighted by its 1.09% contribution to India's Gross Value Added (GVA) and over 6.724% to India's agricultural GVA.
- **Government Initiatives for fisheries sector**
 - ▶ Pradhan Mantri Matsya Sampada Yojana (PMMSY)
 - ▶ Fisheries and Aquaculture Infrastructure Development Fund (FIDF)
 - ▶ Blue Revolution
 - ▶ Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PMMKSSY)

UK-INDIA TRADE TALKS TO RE-LAUNCH

Context

Free trade talks between India and the UK will be relaunched in the new year.

What is Free Trade Agreement?

- It is a pact between two or more nations to reduce barriers to imports and exports among them.
- Under a free trade policy, goods and services can be bought and sold across international borders with little or no government tariffs, quotas, subsidies, or prohibitions to inhibit their exchange.
- The concept of free trade is the opposite of trade protectionism or economic isolationism.

India-UK Trade Relations

- India's trade relationship with the United Kingdom continues to grow steadily, showcasing immense potential for deeper collaboration and strategic engagement.
- As per the latest data from April to September 2024, India's exports to the UK witnessed a robust growth of 12.38%, reaching USD 7.32 billion, compared to USD 6.51 billion during the same period in 2023.
- Mineral fuels, machinery, and precious stones,

pharmaceuticals, apparels, iron and steel and chemicals lead **India's export basket** to the UK, contributing a 68.72% share of total exports.

- The United Kingdom is a **priority country** for the achievement of India's ambitious USD 1 trillion export target by FY30, with exports to the UK expected to reach USD 30 billion by 2029-30.
- The UK remained the sixth largest investor in India, with a cumulative investment of approximately **USD 31.92 billion during FY 2000-22**. This constituted around **5.4% of the total Foreign Direct Investment (FDI)** into India.

CHENNAI-VLADIVOSTOK MARITIME CORRIDOR

Context

India has activated the **Chennai-Vladivostok maritime corridor** and is now plans to connect at least two other east coast ports—**Paradip and Vizag**—with this maritime corridor.

About the route

- The **Chennai-Vladivostok sea route (Eastern Maritime Corridor)** will cover a distance of about 5,600 nautical miles (about 10,500 km).
- The Chennai-Vladivostok Maritime route connects Chennai on India's east coast with **Vladivostok**, Russia's eastern port city.
- Vladivostok is the end point of the **Trans-Siberian Railway**, the fourth in terms of cargo turnover, and the first free seaport of the Far East.
- The Vladivostok-Chennai route passes through the **Sea of Japan** past the **Korean peninsula, Taiwan and the Philippines** in the **South China Sea**, past Singapore and through the **Strait of Malacca**, to emerge into the **Bay of Bengal** and then cuts across through the **Andaman and Nicobar archipelago** to Chennai.
- **Alternative to Red Sea:** In view of the current **Red Sea crisis**, and increased travel time, which has also pushed up costs, the **Vladivostok-Chennai maritime corridor** is seen as a possible alternative.
 - ▶ The **Red Sea route** now takes 48 days or say, against which Vladivostok route will be 15 days max. The Red Sea route accounts for 50 per cent of Indian exports and 30 per cent of imports.
 - ▶ Domestic companies use the Red Sea route through the Suez Canal to trade with Europe, North American, Africa and also Middle East.

Need for a New Route

- **Limited Trade Between India and Russia:** One of the key reasons for the limited trade between India and Russia, which has remained around USD 12-13 billion in recent years, is the lack of efficient connectivity.
- **Reduced Transportation Time:** The proposed new route would significantly reduce transportation time to

just 12 days, nearly one-third of the current time taken via the existing popular route from St. Petersburg to Mumbai.

- **Reduced Costs:** The new route is expected to lower transportation costs by approximately 30%, making trade between the two countries more cost-effective.
- **Strategic Location of Chennai Port:** Chennai Port, located on the Bay of Bengal, serves as an ideal gateway for trade with Southeast Asian nations such as Thailand, Vietnam, and Indonesia, further boosting India's regional presence.
- **Strategic Importance of Vladivostok:** The Port of Vladivostok in Russia offers access to the resource-rich Far East region, opening up significant business opportunities in sectors like energy, mining, and technology for Indian businesses.

Present route

- At present, the two countries are linked through the traditional European route which passes through Red Sea, Mediterranean Sea and Baltic Sea.
- Operationalised in 2000, the circuitous route spans from the Nhava Sheva Port in Mumbai to the Port of St. Petersburg in Russia and goods take an average of 40 days to cover the distance of 8,675 nautical miles or about 16,000 km.

Far East

- The Far East is the easternmost part of Russia.
- The macro-region borders two oceans, the Pacific and the Arctic, and five countries — China, Japan, Mongolia, the United States and the DPRK.
- Located on the Golden Horn Bay north of North Korea and a short distance from Russia's border with China, the region extracts 98 per cent of Russian diamonds, 50 per cent of Gold, 14 per cent of Tungsten, and 40 per cent of fish and seafood and has about one-third of Russia's coal reserves.

DECLINE IN POLLINATOR HEALTH AND IMPACT ON AGRICULTURE

Context

The issue of declining populations of insect pollinators, particularly bees, has gained attention recently due to growing concerns about their impact on **global food security**. A significant portion of the world's agricultural productivity depends on insects to pollinate over **75% of food crops**, fruits, and flowering plants. However, the health of pollinators is under threat from a variety of factors, including **pesticides, pollution, climate change, and habitat loss**.

Role of Pollinators:

- A significant portion of the world's agricultural productivity depends on small insect pollinators like **bees, wasps, beetles, flies, moths, and butterflies**. These insects are essential for the successful pollination of over **75%** of food crops, fruits, and flowering plants.
- **Threats to Pollinators:**
 - ▶ Pollinators face several threats, including pesticides, pollution, climate change, habitat loss.
 - ▶ A new emerging threat is **infectious diseases**, which have worsened due to the loss of natural habitats for these insects.
 - ◆ Research has shown that **pathogens (diseases)** can be transmitted between managed honey bees and wild pollinators, a process known as pathogen spillover.
 - ◆ The western honey bee can carry diseases, acting as a reservoir that infects wild pollinators. This poses a threat to the wider pollinator population.
 - ◆ Wild pollinators, like bees and hoverflies, had **10 times higher levels of pathogens** in areas where they shared floral resources with western honey bees. This shows that habitat overlap increases the risk of disease transmission between managed and wild bees.
- **Role of Habitat Diversity:** The researchers suggest that **diverse habitats with abundant floral resources** can reduce the chances of disease transmission between honey bees and wild pollinators. However, **habitat loss** forces pollinators into smaller areas, increasing the risk of disease spread.

Native Bees in India:

- India is home to over **700 bee species**, including **four indigenous honey bee species**:
 - ▶ **Asiatic honey bee** (*Apis cerana indica*),
 - ▶ **Giant rock bee** (*Apis dorsata*),
 - ▶ **Dwarf honey bee** (*Apis florea*),
 - ▶ **Stingless bee** (*Trigona sp.*).
- The **western honey bee** was introduced to India in **1983** to increase honey production.
- **Viruses Affecting Indian Bees:** A **Thai sacbrood virus** outbreak in **South India** in **1991-92** devastated around **90%** of the Asiatic honey bee colonies. The virus resurfaced in **2021** in **Telangana**. This virus affects the larvae of bees, causing them to die before they can mature.

UPSC PYQ

Q: Consider the following kinds of organisms/factors: (2012)

- (1) Bat
- (2) Bee
- (3) Water

Which of the above is/are pollinating agent/agents?

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

Solution: (d)

KING COBRA (*OPHIOPHAGUS KAALINGA*)

CONTEXT

The **king cobra** found in **Karnataka's Western Ghats**, locally known as '**Kalinga Sarpa**', is being formally recognized and named in the scientific world. The Western Ghats' king cobra lineage, which had been previously grouped under a single species name ***Ophiophagus hannah***, has now been scientifically identified as a separate species, ***Ophiophagus Kaalinga***.

About the Species

- **Ophiophagus Kaalinga** is found in the **Western Ghats**, a biodiversity hotspot in South India, specifically in regions like **Agumbe, Karnataka**.
 - ▶ The Western Ghats is known for its rich variety of flora and fauna and is considered one of the **world's eight "hottest hotspots" of biological diversity**.
- This species has fewer than 40 bands on its body.
- **Species Differentiation:** Historically, all king cobras were classified under a single species ***Ophiophagus hannah***. However, after extensive genetic research, it was found that there are four different lineages of king cobras across Asia, each living in different regions:
 - ▶ **Western Ghats lineage** (now identified as ***Ophiophagus Kaalinga***)
 - ▶ **Indo-Chinese lineage**
 - ▶ **Indo-Malaysian lineage**
 - ▶ **Luzon Island lineage** (from the Philippines, named ***Ophiophagus Salvatana***)

Significance:

- ▶ The formal naming of this species is not just a taxonomic achievement, but it also has **ecological and medical implications**. For example, there is currently **no specific anti-venom** for king cobra

bites in India. The identification of distinct species like ***Ophiophagus Kaalinga*** could lead to the development of targeted anti-venoms and better medical treatments for bites.

- ▶ **King cobra venom**, though not the most potent in terms of toxicity, is still highly dangerous due to the **large amount of venom** they can deliver in a single bite. Their venom acts as a **neurotoxin**, affecting the respiratory system and leading to **respiratory failure** and **cardiac arrest**.

Behavior:

- ▶ The **king cobra** is unique in that it is the only snake species in the world known to build **nests**. Female king cobras guard their nests, which can measure **4 feet by 3 feet**, and lay **23-43 eggs**. After laying the eggs, the mother leaves the nest, and the hatchlings emerge on their own.
- ▶ King cobras are **territorial** and **aggressive** when threatened, but they are also highly revered in local cultures due to their powerful and majestic presence.

Conservation status: king cobra is presently categorised:

- ▶ '**Vulnerable**' on **Red List** of Threatened Species by **International Union for Conservation of Nature (IUCN)**
- ▶ **Appendix II** of **Convention on International Trade on Endangered Species (Cites)**

AFRICAN PENGUIN (*SPHENISCUS DEMERSUS*)

Context

African penguins could be extinct by 2035, if not saved. At present there are fewer than 20,000 birds left in the wild.

About

- They are found only in Namibia and South Africa.
- **Protection:** African penguins have been protected under South Africa's Sea Birds and Seals Protection Act since 1973 (and more recently under the Marine Threatened or Protected Species Regulations since 2017).
- They have **pink glands** above their eyes that they can send blood to help cool down in the summer heat. The hotter a penguin is, the pinker its eyebrow glands become.
- African penguins live in **large colonies**. They spend their days at sea feeding and their nights gathered together on shore.
- They are **excellent swimmers** with perfectly streamlined bodies. They can swim up to 12 mph.
- They are **monogamous**, meaning they have one partner throughout their life.



FACT BOX

Penguins

- Penguins are flightless birds often associated with cold temperatures and icy habitats.
- All penguins live south of the equator, from the icy waters of Antarctica to the tropical Galapagos Islands off the coast of Ecuador, almost astride the equator.
- Penguins are specialized marine birds adapted to living at sea.
- There are 18 penguin species.
 - ▶ emperor – *Aptenodytes forsteri*
 - ▶ king – *Aptenodytes patagonica*
 - ▶ Adélie – *Pygoscelis adeliae*
 - ▶ gentoo – *Pygoscelis papua*
 - ▶ chinstrap – *Pygoscelis antarcticus*
 - ▶ northern rockhopper – *Eudyptes moseleyi*
 - ▶ southern rockhopper – *Eudyptes chrysocom*
 - ▶ macaroni – *Eudyptes chrysolophus*
 - ▶ royal – *Eudyptes schlegeli*
 - ▶ Fiordland crested – *Eudyptes pachyrhynchus*
 - ▶ erect-crested – *Eudyptes sclateri*
 - ▶ Snares Island – **Eudyptes robustus**
 - ▶ yellow-eyed – *Megadyptes antipodes*
 - ▶ fairy (little blue) – *Eudyptula minor*
 - ▶ Magellanic – *Spheniscus magellanicus*
 - ▶ Humboldt – *Spheniscus humboldti*
 - ▶ African – *Spheniscus demersus*
 - ▶ Galapagos – *Spheniscus mendiculus*
- The Antarctic Treaty legally protects all Antarctic penguins.

INDIA'S FIRST HYDROGEN-POWERED TRAIN

CONTEXT

In a landmark step towards sustainable transportation, India is set to unveil its first hydrogen-powered train in December 2024 (first trial will take place on the Jind-Sonapat route in Haryana), showcasing a revolutionary shift in rail travel.

About Hydrogen-Powered Train

- This zero-emission train, which will operate without diesel or electricity, is part of Indian Railways' broader strategy to reduce its carbon footprint and achieve "net zero carbon emissions" by 2030.
- The hydrogen-powered train operates using **hydrogen fuel cells** to generate the electricity required to drive its engines.

- Unlike traditional trains powered by diesel or electricity, this train produces only water and steam as byproducts, resulting in zero harmful emissions. **Hydrogen and oxygen** undergo a chemical reaction in the fuel cells, producing electricity without generating pollutants.

- Compared to diesel trains, hydrogen-powered trains are also much quieter, producing 60% less noise, enhancing passenger comfort.

Key Features and Trials

- ▶ **Speed and Distance:** The hydrogen train will reach speeds of up to 140 km/h and can travel up to 1,000 kilometers on a single tank of hydrogen fuel, making it suitable for longer distances.
- ▶ **Water Usage:** The train will require approximately 40,000 liters of water per hour to sustain the chemical reaction in the fuel cells.
- ▶ **Cost and Infrastructure:** The cost of each hydrogen-powered train is approximately Rs 80 crore. Indian Railways is investing in the infrastructure required for these trains, including **hydrogen storage and refueling stations, essential for supporting widespread use.**



FACT BOX

Hydrogen Fuel Cell

- A hydrogen fuel cell uses the **chemical energy of hydrogen** to produce electricity.
- It is a clean form of energy with electricity, heat and water being the only products and by-products.
- Hydrogen fuel cells generate electricity using a chemical reaction.
- Each fuel cell has two electrodes; **a negative anode and a positive cathode.**
- The reaction to produce the electricity happens at these electrodes, with an electrolyte carrying electrically charged particles between them and a catalyst to speed up the reactions.
- Hydrogen acts as the **basic fuel** in a hydrogen fuel cell, but the cell also needs oxygen to work.
- **Advantages over traditional combustion-based technologies:**
 - ▶ greater efficiencies and lower emissions
 - ▶ no carbon dioxide emissions or other pollutants released into the atmosphere

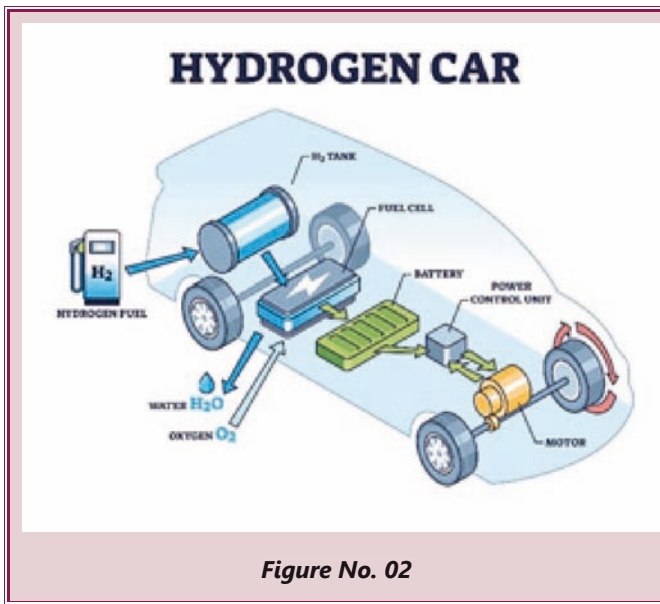


Figure No. 02

HUMAN-ELEPHANT CONFLICTS IN HASDESO ARAND

Context

The expansion of coal mining in the PEKB block has led to severe ecological consequences, particularly affecting local wildlife. The destruction of elephant habitats has caused these animals to wander into nearby human settlements, resulting in a significant increase in **human-elephant conflicts**. This has led to fatal encounters, drawing attention to the long-term environmental and socio-economic impacts of mining activities in the region.

About Hasdeo Arand

- Often referred to as the "lungs of Chhattisgarh," Hasdeo Arand covers nearly 1,500 square kilometres of dense forest.
- The region is rich in biodiversity, home to over 25 mammalian species, many of which are endangered.
- A critical elephant corridor runs through these forests, connecting elephant populations in Jharkhand to Chhattisgarh's Korba district.
- The forest also serves as the catchment area for one of the Mahanadi River's largest tributaries, a lifeline for millions downstream.
- Historical Mining Restrictions:** In 2010, the Ministry of Environment, Forest, and Climate Change (MoEFCC) declared the entire Hasdeo Arand a "no-go" zone for coal mining, due to its critical ecological importance. Despite this, the "no-go" status has been gradually eroded over the years due to growing economic pressures.
- Recent Developments and Contradictory Reports:** In October 2021, the government allowed mining to resume in Parsa and Kete Extension coal blocks, and operations had already started in Parsa East and Kanta Basan (PEKB).

Impact of Expansion of Coal Mining in the PEKB Block

- Ecological and Wildlife Consequences:** It has led to the destruction of large areas of forest since the first phase of mining began in 2013. This has disrupted vital water sources for elephants, forcing them to migrate farther in search of water.

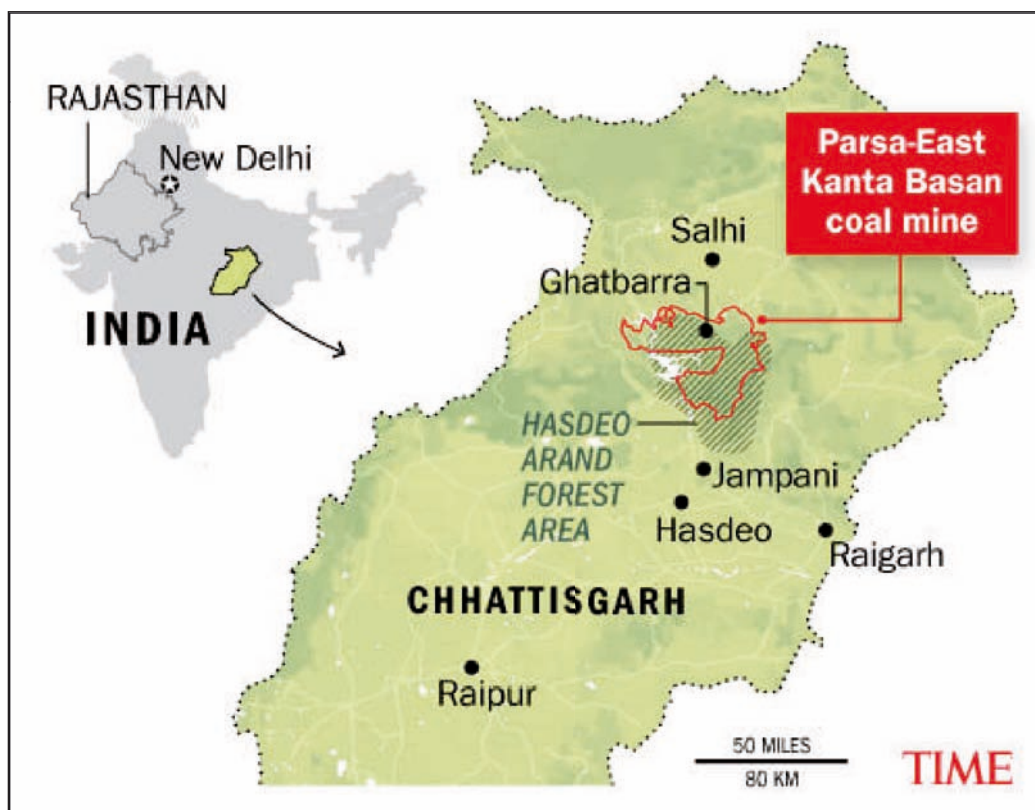


Figure No. 03

- **Increased Human-Elephant Conflicts:** As a result, elephants have ventured into human settlements, leading to increased human-elephant conflicts. Elephants, once predictable in their movements, have become more aggressive due to the loss of their natural corridors. Over the past four years, 72 elephants have died, and human fatalities from elephant attacks have surged, with one death occurring every five days.

“DROWNING” MANGROVE FORESTS IN MALDIVES

Context

An extreme rise in sea levels driven by the **Indian Ocean Dipole** have caused some **Maldivian islands** to lose more than half of their **mangrove** (a shield against destructive storms across many coastlines) cover since 2020.

About

- Mangroves are **tropical trees** that thrive in conditions most timber could never tolerate — salty, coastal waters, and the interminable ebb and flow of the tide.
- Mangrove forests only grow at tropical and subtropical latitudes near the equator because they cannot withstand freezing temperatures.

Significance of Mangroves:

- ▶ Mangrove forests stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides.
- ▶ They have the ability to store vast amounts of carbon, thus, they are key weapons in the fight against climate change.
- ▶ The **intricate root system of mangroves** also makes these forests attractive to fish and other organisms seeking food and shelter from predators.
- **Reason behind declining Mangroves:** From 2017 to 2020, sea levels around the Maldives rose at a rate of over 30mm per year – much faster than the mangroves could build up sediment to stay above water. This rapid rise was linked to a climate phenomenon called the **Indian Ocean dipole**, which was unusually intense between 2019 and 2020.
- The Maldives is the world’s lowest-lying country, with an average elevation of just 1.5m above sea level. This makes it acutely vulnerable to rising sea levels.

Mangroves in India:

- India has about 3% of the total Mangrove cover in South Asia.
- West Bengal (2,112 sq km) and Gujarat (1,177 sq km) are the top 2 states with the highest cover.

Major Mangroves forests in India

- ▶ Sundarbans Mangrove Forest, West Bengal
- ▶ Bhitarkanika Mangroves, Odisha

- ▶ Godavari-Krishna Mangroves, Andhra Pradesh
- ▶ Gulf of Kutch Mangroves, Gujarat
- ▶ Mangroves of Thane Creek, Maharashtra
- ▶ Pichavaram Mangroves, Tamil Nadu
- ▶ Chorao Island Mangroves, Goa
- ▶ Baratang Island Mangroves, Andaman

Indian Ocean Dipole (IOD)

Indian Ocean dipole is a climate pattern which causes changes in wind, sea surface temperature and rainfall across the **Indian Ocean basin**.

Phases:

- ▶ During a positive phase countries in the western Indian Ocean, including the Maldives, experience warmer sea surface temperatures and an increase in sea level as the ocean expands. Meanwhile, the eastern Indian Ocean experiences cooler waters and a drop in sea level.
- ▶ During a negative phase, this pattern is reversed

(See Figure No. 4 on Next Page)

AIR CRISIS IN DELHI

Context

Delhi’s worsening air quality has brought the state’s action under scrutiny. The Supreme Court reprimanded the Delhi government for delay in implementing **stage 4** measures under the **Graded Response Action Plan (GRAP-4)**.

Delhi’s Air Emergency

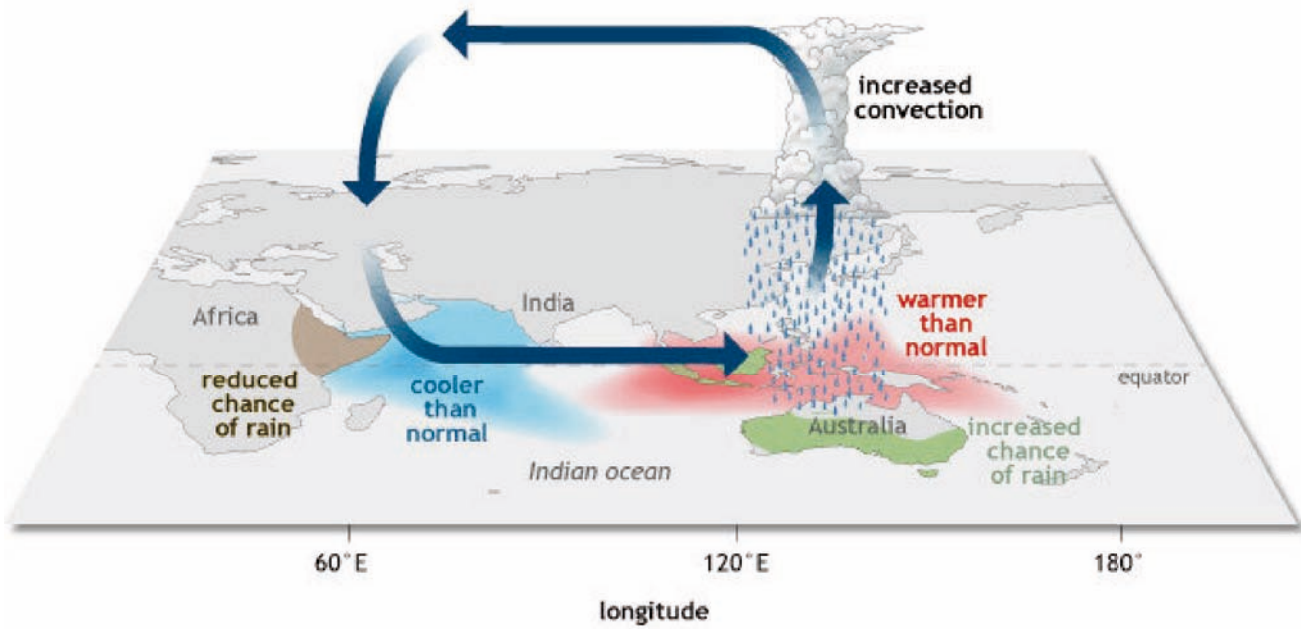
- Delhi’s air quality Index (AQI) — a measure of the severity of air pollution based on the levels of five toxins — shot up to 499 in some places.
- That meant a categorization of
 - ▶ **“severe plus”** on India’s **System of Air Quality Forecasting and Research (SAFAR)** scale

“hazardous” under the U.S. AQI measurement system

- India’s pollution control authority has classified the air in Delhi as “severe plus”, after the city passed 450 according to its measurements
- According to the WHO, air with AQI values above 300 are considered to be hazardous for health.
- India’s **Commission for Air Quality Management** had implemented **stage 4 of the Graded Response Action Plan (GRAP)** — bringing the strictest emergency measures offered to mitigate the impacts and try to reduce pollution.

INDIAN OCEAN DIPOLE

Negative phase



INDIAN OCEAN DIPOLE

Positive phase

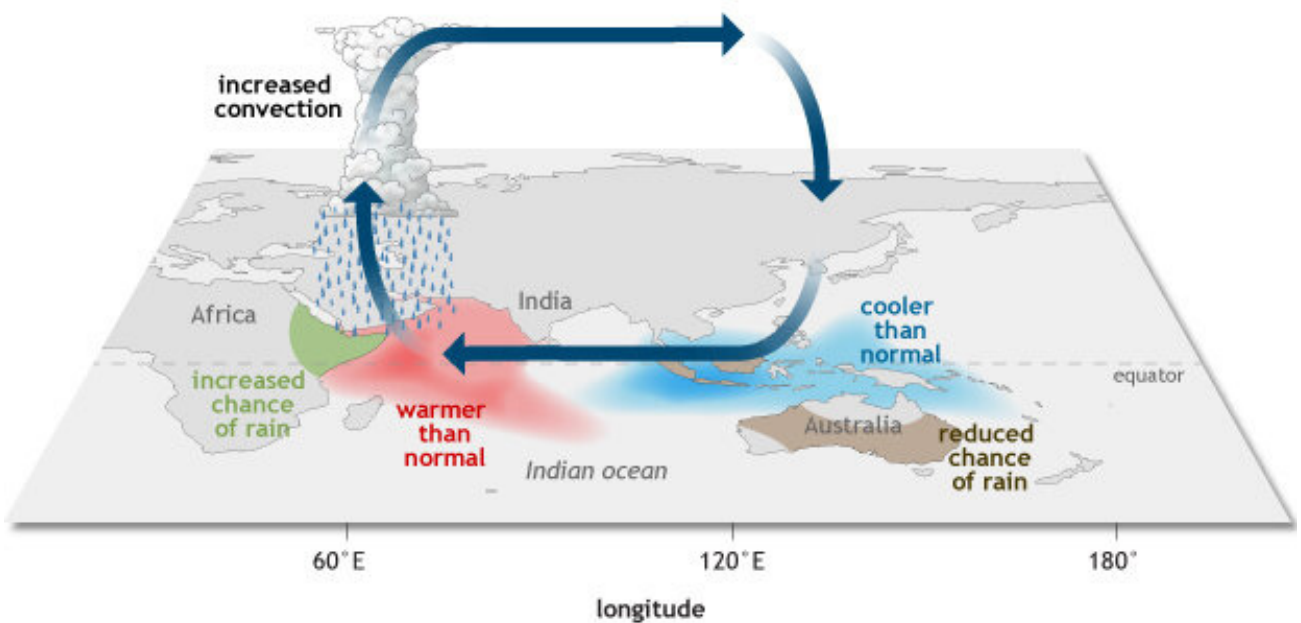


Figure No. 04

Why is Delhi air so bad?

- Delhi’s air quality suffers from several causes including emissions from industries, construction sites and thermal power plants.
- **Overpopulation** also contributes to higher pollution, with more vehicles and waste adding to the problem.
- **Pollution:** Many of the city’s older vehicles release harmful gases, and construction work generates dust, especially in dry conditions.
- **Stubble burning:** Farmers in neighbouring states like Punjab, Haryana, and Uttar Pradesh burn crop stubble, releasing large amounts of smoke into Delhi’s air.
- **Winter season:** In winter, cold weather traps pollutants, causing smog to linger. Although emissions remain similar throughout the year, pollution and hazardous air quality worsen in Delhi-NCR during winter months. This can be attributed to multiple factors including
 - ▶ **temperature inversion** in which a layer of cool air forms near the ground, trapping pollutants and preventing them from dispersing
 - ▶ **low wind speeds** during the winters reduce the dispersion of pollutants
- As Delhi’s AQI worsens to ‘severe plus,’ GRAP IV measures have been enforced. First implemented in 2017, the GRAP outlines anti-pollution actions based on the severity of air quality. These include tighter pollution controls, a truck entry ban, and the suspension of public construction projects.

- When the AQI falls in the **Severe** range (401-450), **Stage III measures** are activated. These measures aim to reduce pollution levels and minimize exposure to harmful air quality.
- **Implementing Agency:** The Commission for Air Quality Management (CAQM) in NCR and adjoining areas oversees the implementation of GRAP.
 - ▶ It collaborates with the **Ministry of Environment, Forest and Climate Change (MoEFCC)**.

Air Quality Index

- The Air Quality Index (AQI) is issued by government agencies to gauge air pollution levels and communicate risks to the public.
- It indicates how air pollution can affect health, with higher AQI values indicating more severe health concerns.
- The AQI is calculated based on air pollutant concentrations over a specific period, and the results are categorised into ranges with corresponding health advisories.
- According to the AQI scale, the air quality check between
 - ▶ 0 and 50 is “Good”
 - ▶ 51 and 100 “Satisfactory”
 - ▶ 101 and 200 “Moderate”
 - ▶ 201 and 300 “Poor”
 - ▶ 301 and 400 “Very Poor”
 - ▶ 401 and 450 “Severe”
 - ▶ over 450 as “Severe +”



FACT BOX

Commission for Air Quality Management (CAQM)

- CAQM is a statutory body.
- It is established under the Commission for Air Quality Management in National Capital Region (NCR) and Adjoining Areas, Act 2021.
- Its main task is to manage air quality in Delhi and its surrounding areas, has been working to implement stricter measures each year to curb pollution in the national capital.

Graded Action Response Plan (GRAP)

- **GRAP (Graded Action Response Plan)** is a set of measures introduced by the government to combat air pollution in Delhi and its surrounding areas during the winter season. It operates in **four stages**, depending on the AQI level:
 - ▶ **Stage I (AQI 201-300)** - Poor air quality
 - ▶ **Stage II (AQI 301-400)** - Very Poor air quality
 - ▶ **Stage III (AQI 401-450)** - Severe air quality
 - ▶ **Stage IV (AQI >450)** - Severe Plus air quality

TEESTA VALLEY DISASTER AND RECOMMENDATIONS FOR MITIGATION

Context

In **October 2023**, a **glacial lake outburst flood (GLOF)** occurred in the Teesta Valley, affecting parts of **Sikkim** and **West Bengal**. This was triggered by the bursting of **South Lhonak Lake** in Sikkim, which had expanded significantly over the years. This flood not only caused immediate damage but also left long-term risks, as the valley remains vulnerable to future floods.

About the disaster

- The disaster was occurred due to a glacier lake outburst flood (GLOF), from South Lhonak glacial lake that inundated the **Teesta River**.
 - ▶ The **South Lhonak lake** is among the largest high-altitude glacier lakes in Sikkim and has been the poster child of potential GLOF disasters in the Himalayas.

- It resulted in widespread devastation across Sikkim, West Bengal, and Bangladesh.
- Location:**
 - Located approximately 60 kilometres downstream of the lake, in Chungthang town of Mangan district, was the 1,200 MW Teesta III dam, the biggest hydropower project in Sikkim.
 - Chungthang is a small town on the confluence of the Lachen chu (river) and Lachung chu, which form the Teesta.
 - It is a gateway to tourist destinations further north, and an important forward base of the Indian Army.
 - The Teesta III dam, which started functioning in 2017, was developed by Teesta Urja Limited; the majority share is now owned by the Government of Sikkim.
- The Need for Urgent Action:** There are only **six months left** before the **2025 monsoon**, and the authorities must act now to prevent further damage.
 - Joint Approach:** The two states, **Sikkim** and **West Bengal**, need to work together on disaster management, treating the Teesta Valley as a shared problem. A **joint committee** could help coordinate efforts between the states, instead of working in isolation.
 - Task Force for Action Plan:** A task force, including experts in **geo-hydrology**, **environmental science**, **engineering**, and **sociology**, should be formed to develop a comprehensive plan to restore and fortify the region. This plan should address the **ecological**, **infrastructure**, and **community welfare** aspects.
 - Restoring Infrastructure:**
 - Repairing Roads and Bridges:** Many roads and bridges have been damaged or destroyed. These must be repaired to restore connectivity and enable disaster relief efforts.
 - Strengthening Evacuation Centres:** Existing evacuation centres should be reinforced and equipped with **solar backup power** to remain functional during future emergencies.
- Protection from Floods:** Re-channeling the Teesta River; Protecting Low-lying Areas
- Non-Structural Measures:** Early Warning Systems; Backup Communication Systems; Risk Management and Awareness Campaigns; Afforestation and Ecosystem Restoration



FACT BOX

Glacier lake outburst flood

- GLOF is the sudden release of water from a lake situated at the terminus or surface of a glacier.
- These lakes are created by moving glaciers that erode the valley bottom topography and create depressions below the glacier surface.

- When the glacier retreats, as is occurring due to climate change globally, the meltwater can accumulate in this depression and form a lake that may be dammed by the moraine (rocks, finer eroded material, even ice, and other debris the glacier pushed forward in earlier stages when it had been advancing).
- A GLOF occurs when the moraine fails, which often results in the release of a catastrophic amount of water.

PINAKA SYSTEM

Context

The **Defence Research and Development Organisation (DRDO)** has successfully completed the **flight tests** of the **Guided Pinaka Weapon System** as part of the **Provisional Staff Qualitative Requirements (PSQR) Validation Trials**. The successful validation marks a significant step towards the system's **induction into service**, reinforcing India's efforts to modernize and strengthen its artillery capabilities.

About the Pinaka System

- The **Pinaka** is a **multi-barrel rocket launcher system** developed by DRDO's **Armament Research and Development Establishment (ARDE)**. Initially designed to meet the requirements of the **Indian Army**, the system has undergone significant upgrades to enhance its range, accuracy, and overall performance.
- Phased Development:
 - Pinaka Mk-I:** The basic version with a 38 km range and capable of firing multiple rocket salvos.
 - Pinaka Mk-II:** An upgraded version with an extended range of up to 60 km.
- Extended Range Pinaka:** The latest variant, with a range of 75 km, capable of striking targets at longer distances with greater precision.
- The development and testing journey for Pinaka has spanned several years, with the system undergoing rigorous field trials to ensure it meets the operational needs of the Indian Army.

Key Features and Capabilities of the Pinaka System

- Salvo Launch Capability:** The Pinaka is capable of launching a **salvo of 12 rockets** within **44 seconds**, covering an area of **700 x 500 meters**. This allows the system to deliver a high volume of fire in a short span of time, making it effective against enemy positions and formations.
- Range:** The initial version, **Pinaka Mk-I**, has a range of **38 km**. Later versions, including **Pinaka Mk-II**, extend this range to **60 km**, and the **Extended Range Pinaka** can hit targets at distances of up to **75 km**, providing the Indian Army with significant standoff capability.

- **Upgraded Performance:** The Pinaka system has undergone various upgrades over time, improving its **accuracy, reliability, and operational effectiveness**. In 2020, for example, the **Enhanced Pinaka** variant was successfully tested at the **Integrated Test Range (ITR)** in Chandipur, Odisha, achieving the desired range and performance goals. The **Extended Range version** was tested in 2021 with 25 successful launches at ranges up to 45 km.
- **Guided Munition:** The **Guided Pinaka** system, a key feature of the recent flight tests, introduces guided rockets, offering enhanced precision and accuracy compared to traditional unguided rockets. This development is crucial for targeting specific enemy positions with minimal collateral damage.
- **Production and Strategic Partnerships:** The development of the Pinaka system has been supported by several **Indian industry partners**, such as **Munitions India Limited** and **Tata Advanced Systems Limited**, ensuring greater **domestic production** and reducing reliance on foreign weapon systems.
- **Potential for Export:** The **Pinaka system** has garnered international attention, with the **French Army** expressing interest in the system as a potential solution for their own military needs. This aligns with India's broader goals of **defence exports**, as the system is seen as an essential asset for **India's growing presence in the global defence market**.

- Falcon 9's established reliability, reusability, and capability to carry heavy payloads made it the ideal choice for launching the GSAT-N2 satellite, as India's own **LVM-3 rocket** could not handle the 4,700 kg payload of the GSAT-N2.

About the Rocket (SpaceX's Falcon 9)

- The Falcon 9 is a **reusable, two-stage rocket** designed and manufactured by SpaceX to efficiently transport payloads into Earth orbit and beyond.
- It is the **world's first orbital-class reusable rocket**, making space access more cost-effective by enabling the reuse of its most expensive components.

SPACEX LAUNCHES ISRO'S GSAT-20 SATELLITE

CONTEXT

SpaceX successfully launched the **Indian Space Research Organisation's (ISRO) GSAT-N2 communication satellite** from the Cape Canaveral Space Force Station in Florida. This launch marks a significant milestone in India's space collaboration with the global space technology giant, SpaceX.

Key Highlights of the Launch

- It is India's first commercial collaboration with SpaceX.
- The GSAT-N2 satellite was successfully placed into a geosynchronous transfer orbit.
- GSAT-N2, developed by ISRO's Satellite Centre and Liquid Propulsion Systems Centre, offers a data transmission capacity of 48 Gbps.
- It is designed to improve broadband services, in-flight connectivity, and support India's Smart Cities Mission.
- The satellite will operate for 14 years and includes 32 user beams, enhancing communication networks across India, especially the Northeast region.
- For this mission, the Falcon 9's first-stage booster completed its 19th flight. This booster has previously supported a variety of missions, including **Starlink launches, SES-22, Amazonas-6, and others, proving its reliability**.

WORLD DIABETES DAY

Context

World Diabetes Day is celebrated annually on November 14 to raise awareness about diabetes as a critical global public health issue. The **International Diabetes Federation (IDF) and WHO** established **World Diabetes Day** in 1991 in response to growing global concerns about diabetes as a major health concern.

What is Diabetes?

- Diabetes mellitus, also known as diabetes, is a metabolic disease marked by consistently elevated blood sugar levels.
- Diabetes is a **chronic illness** in which the body either produces insufficient amounts of insulin or is unable to use the insulin that it does produce efficiently.
- The pancreas secretes the hormone insulin, which is crucial for controlling blood sugar levels. Blood sugar levels can rise and cause issues with the **heart, kidneys, feet, and eyes** if insulin is not functioning properly.
- **Types:**
 - ▶ **Type 1 diabetes:** This type of diabetes is also called insulin-dependent diabetes. People with Type 1 diabetes must take insulin and also may take other medications daily. This makes up for the insulin not being produced by the body.
 - ▶ **Type 2 diabetes:** Type 2 diabetes is the most common form of diabetes. Type 2 diabetes has historically been diagnosed primarily in adults. But adolescents and young adults are developing Type 2 diabetes at an alarming rate because of family history and higher rates of obesity and physical inactivity.

(See Figure No. 05)

CHIKUNGUNYA

CONTEXT

Following a spike in chikungunya cases in Telangana, the U.S. Centres for Disease Control and Prevention (CDC) has issued a 'Level 2' travel advisory for U.S. travellers returning from Telangana.

TYPES OF DIABETES

TYPE 1



BODY DOES NOT MAKE ENOUGH INSULIN

- Can develop at any age
- No known way to prevent it

More than 18,000 youth diagnosed each year in 2008 and 2009



In adults, type 1 diabetes accounts for approximately

5%

of all diagnosed cases of diabetes

TYPE 2



BODY CANNOT USE INSULIN PROPERLY

- Can develop at any age
- Most cases can be prevented



Currently, at least 1 out of 3 people will develop the disease in their lifetime

What is Chikungunya?

- Chikungunya is a **viral disease** that is spread through the bite of infected **Aedes aegypti mosquitos**. These mosquitos also carry and spread dengue and the **Zika virus**.
- This viral disease is caused by the Chikungunya virus. It belongs to the Togavirus family.
- The virus can be found in many parts of the world, including Africa, the Americas, Asia, **Europe, and islands in the Indian and Pacific Oceans**.
- The virus belongs to a group of viruses called **alphaviruses**. Other alphaviruses causing a similar disease include **Mayaro virus** and **Ross River virus**.
- **Common symptoms** include fever, joint pain, headache, muscle pain, joint swelling, and rash. While most individuals recover within a week, severe joint pain can persist for months or even years in some cases.
- People at higher risk of severe illness include newborns, older adults and those with pre-existing conditions such as diabetes, heart disease or high blood pressure.

HYPERTENSION (HIGH BLOOD PRESSURE)

Context

The study **TOPSPIN (Treatment Optimization for Blood Pressure with Single-Pill Combinations in India)**, conducted over two years with collaboration between **All India Institute of Medical Sciences (AIIMS), Delhi** and

Imperial College, London, aimed at finding an effective and easy way to manage **high blood pressure (hypertension)** in India.

Key Findings of the Study:

- The study looked at the effectiveness of combining two blood pressure (BP) drugs into a single pill that can be taken once a day. This is a simpler approach for people who need different BP medications at different times of the day.
- It found that two-drug combinations of three widely used medicines used in patients with high blood pressure (BP) are far more effective in controlling the condition than single medicines.
- The TOPSPIN Study evaluated three two-drug combinations—
 - **Amlodipine + Perindopril**
 - **Amlodipine + Indapamide**
 - **Perindopril + Indapamide**
- All three combinations were **equally effective** at reducing BP. After **six months**, the average reduction in BP was around **14/8 mmHg** for **ambulatory BP** (measured throughout the day) and **30/14 mmHg** for **office BP** (taken at the doctor's office).
- **70% of participants** achieved BP levels below **140/90 mmHg**, which is the target for BP control. This was a **fivefold improvement** compared to the current BP control rates in India.
- **Safety:** The study found **excellent safety** for all drug combinations, with **less than 3% of participants** discontinuing the drugs due to side effects.

- ▶ The combination pills have fewer side effects compared to taking two separate medicines at full doses.

Why is this Important?

- This is the **first randomized study** to test the best drug combinations for controlling BP specifically in **Indians and South Asians**, a group that makes up about 25% of the world’s population.
- **India** has over **300 million people** suffering from hypertension, and currently, less than **15%** of hypertensive patients in India manage to control their BP effectively.
- This study shows that using **combination pills** once a day could significantly improve BP control and is a practical approach to managing hypertension in India.



FACT BOX

Figure No. 05

High Blood Pressure

- **High blood pressure (hypertension)** happens when the force of blood pushing against the walls of blood vessels is too high. High blood pressure can lead to other serious problems such as heart attack and stroke.

- **Low blood pressure (Hypotension)** occurs when blood pressure is too low.
- **Blood pressure** is the force that moves blood through the circulatory system.
 - ▶ It is an important force because it allows the blood, which contains oxygen and nutrients, to travel around the body to nourish tissues and organs.
- The device used to measure blood pressure is a **sphygmomanometer**.
- **Blood pressure vs heart rate:** Blood pressure is how powerfully blood travels through blood vessels. Heart rate is the number of times heart beats in one minute.

Government Initiatives

- **Hypertension Control Initiative Programme:** It is a large-scale hypertension intervention under the National Health Mission and has been recognised for its positive work done within the country’s existing primary healthcare system.
- **Indian Hypertension Control Initiative (IHCI)** is a 5-year initiative involving the Ministry of Health & Family Welfare, Indian Council of Medical Research, State Governments, and WHO-India.

See Figure No. 6 at bottom

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

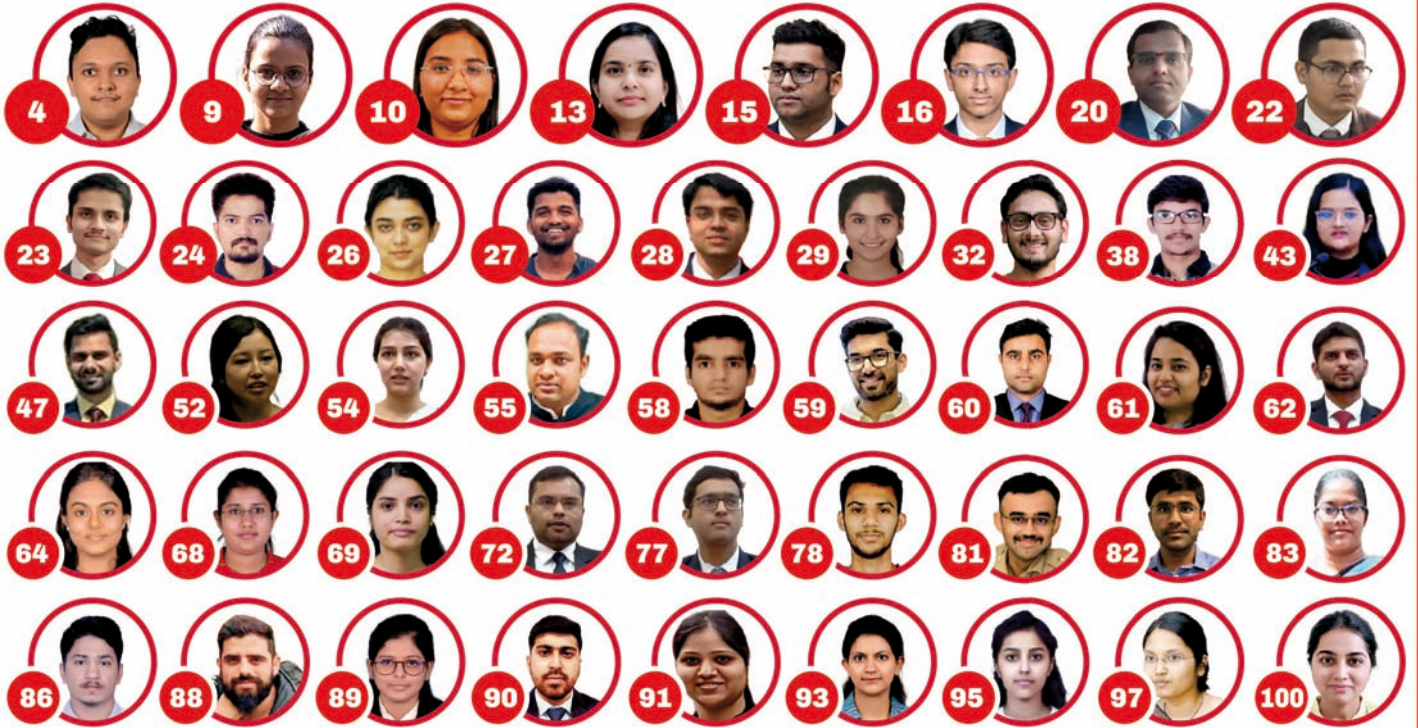
Figure No. 06





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