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GS Paper I - Mains Based Articles

Subject -Geography

The Dynamic Rise of Mount Everest: How the Arun River Influences the World's Tallest Peak

Sub Topic- Physical Geography, Important Geophysical Phenomena

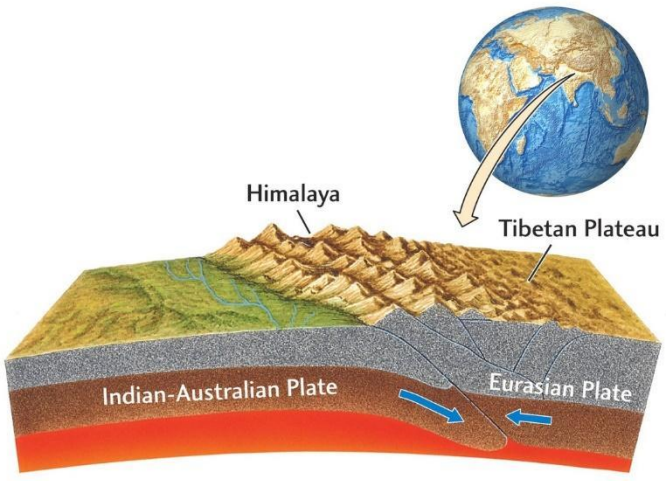
Context: A new study published in ***Nature Geoscience*** has shed light on an intriguing factor contributing to Everest's rise; **the erosion caused by the nearby Arun River**.

More in the News:

- Mount Everest, known as **Chomolungma in Tibetan and Sagarmatha in Nepali**, stands at a staggering **height of 8,849 meters (29,032 feet),** making it the tallest mountain in the world.
- While its height has been a subject of fascination for climbers and scientists alike, recent studies **reveal that Everest is not only tall** but also **continuously growing**.

About Plate Tectonic Theory and Its Contribution to Mount Everest's Rise:

- **Formation of the Himalayas:**
  - The Himalayas, including Mount Everest, were **formed approximately 50 million years ago** due to the collision of the **Indian and Eurasian tectonic plates.**
  - This tectonic activity continues to be a primary driver of elevation in this region.
  - As **these plates converge**, they create **immense pressure that forces land upwards,** contributing significantly to the mountain's height.



- **Continuous Geological Activity**

- While plate tectonics **remains a major factor behind Everest's formation** and continued growth, recent findings suggest that additional geological processes are at play.
- The **merging of river systems**, particularly around 89,000 years ago when the **Arun River joined with the Kosi River network**, initiated increased erosion and altered sediment transport dynamics in the area.

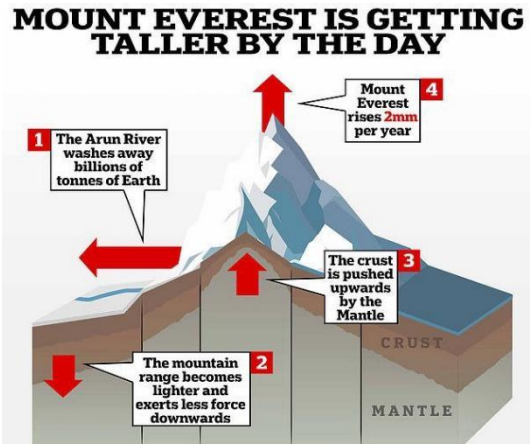
Recent Findings: How Rivers Influence the Height of Mount Everest

The researchers utilised numerical models to simulate river evolution and its geological impacts, leading to significant insights into how rivers can influence mountain formation in the following reasons:

- **Continuous Elevation Factors:** Mount Everest's continuous elevation is not solely due to tectonic activity but also by geological processes such as **isostatic rebound.**
  - This phenomenon occurs when land masses rise due to the removal of weight from the Earth's crust.
  - As erosion from rivers like the **Arun reduces surface weight**, the crust beneath can adjust and rise accordingly.
  - This process reveals a fascinating interplay between **erosion and uplift that has puzzled scientists for years.**

- **The Role of Isostatic Rebound:**
  - Isostatic rebound can be **likened to a boat rising in water when cargo is unloaded.**
  - When heavy materials like **ice or eroded rock are removed** from the Earth's crust, the land beneath slowly rises in response.
  - In the case of Mount Everest, this process has been **enhanced by changes in river systems over millennia.**

- **Erosion Dynamics:**
  - The recent study indicates that as rivers like the **Arun flow through mountainous terrains,** they erode substantial amounts of rock and soil from their banks.
  - This erosion **diminishes pressure** on the underlying mantle—a **semi-liquid layer beneath the Earth's crust**—allowing it to push upward more easily.
  - The study also highlights that the **loss of landmass in the Arun River basin**, located approximately **75 kilometres away from Everest**, is causing the mountain to rise by **up to 2 millimetres each year**.
  - Over the past 89,000 years, this **erosion has contributed to an increase in Everest's height by approximately 15 to 50 meters.**



- **The Impact of River Erosion:**

    - The study estimates that isostatic rebound accounts **for about 10% of Mount Everest's annual uplift rate.**
    - This means that as material is washed away by river flow, it not only contributes **to immediate changes in landscape** but also facilitates **long-term geological adjustments.**

- **The Process of Drainage Capture:**
    - The research also discusses a process known as drainage capture or **"river piracy."**
    - Approximately 89,000 years ago, when the **Arun River merged with other rivers in Tibet,** it significantly increased its erosive power.
    - This merger allowed **more water to flow through the Kosi River system**, enhancing its ability to carry away sediments and rock from surrounding areas.

Conclusion: The Dynamic Nature of Earth's Surface

While Mount Everest's towering presence has long captivated climbers and geologists alike, understanding its **growth offers deeper insights into geological processes influencing our planet.** As scientists continue to explore these relationships between rivers and mountains, they reveal not just how mountains rise but also how they are shaped by various environmental factors over time. The ongoing study of Mount Everest serves as a reminder that even seemingly stable features on Earth are subject to change driven by natural forces—an **ever-evolving landscape shaped by both tectonic activity and hydrological dynamics.**

2023 WMO Report: Driest Year for Global Rivers in 33 Years

Sub Topic- Physical Geography, Important Geophysical Phenomena

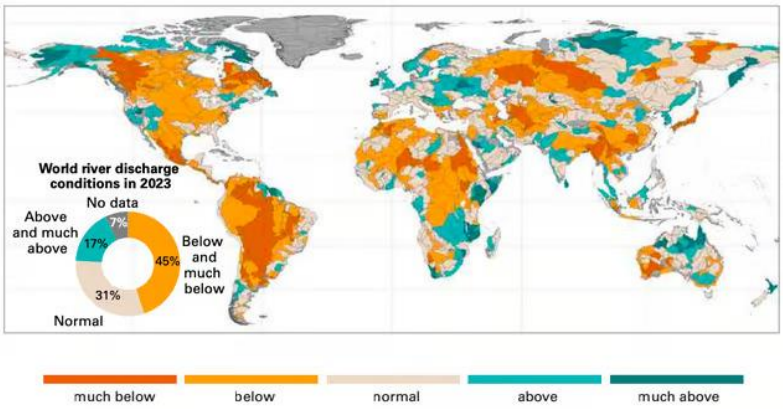
GS PAPER III - Environment & Climate Change

Context: According to the World Meteorological Organisation's ***State of Global Water Resources report***, released on October 7, 2024, 2023 was the driest year for global rivers in 33 years, signalling severe stress on global water supplies.

Key Findings:

- **Record Low River Discharge**: 2023 marked the driest year for global rivers in the past 33 years.
    - Significant **global water stress** indicated by severe droughts and below-average river flows.
    - Past five years consistently showed widespread **below-average river flows** and reservoir inflows.
- **Drier Conditions**: 2023, the hottest year on record, led to **prolonged droughts** and **increased temperatures**.
    - Most rivers experienced **drier-than-average** to **average** discharge conditions compared to the historical period (1991–2020).

- Over half of global catchment areas had **lower-than-average** river discharge, with fewer basins showing above-average conditions.



Regional Impacts:

- **North and South America**: Both regions faced **below- and much-below-average conditions** in river discharge.
- **Asia**: Major river basins, including the **Ganga** and **Brahmaputra**, reported lower-than-average conditions.
- **Global Trends**: The transition from **La Niña** to **El Niño** played a key role in the dry conditions.
  - ☐ Anomalous warming of the oceans further contributed to these conditions.

Reservoir Inflows and Storage:

- **Overall Reservoir Conditions**: Global reservoir inflows generally reflected below-average discharge conditions.
  - India's west coast experienced **below- and much-below-average inflows**; however, the Ganga basin saw **above-average reservoir storage**.
- **Australia and the Americas**: The **Murray-Darling** river in Australia reported below-average inflows.
  - Inflows were reduced across North America, particularly in the **Mackenzie River**, and in South America, especially the **Paraná River**.

Groundwater Levels:

- **Monitoring Results**: Average groundwater levels were below average in **19%** of monitored wells and average in **40%**.
  - Regions like **North America**, **southern Europe**, and **central Brazil** experienced lower groundwater levels.
- **Positive Trends**: Regions such as **New England**, **northern Europe**, and parts of **India** showed above-average groundwater levels.

Soil Moisture Conditions:

- **Dry Soil Rankings**: 2023 had predominantly **below or much below average soil moisture** across extensive global regions.
  - ☐ North America, North Africa, and West Asia had particularly low soil moisture levels during June to August.
- **Exceptions**: Regions such as **Alaska**, **northeastern Canada**, and parts of **India** reported **much-above-average soil moisture**.

Future Projections:

- **Water Accessibility**: Currently, **3.6 billion** people face inadequate water access for at least one month annually, projected to increase to **over five billion** by 2050.
- **Call for Action**: WMO Secretary-General Celeste Saulo emphasised the need for improved monitoring, data-sharing, and cross-border collaboration regarding freshwater resources.

New Sedimentary Rock Made from Slag

Sub Topic- Physical Geography, Important Geophysical Phenomena

Context: Researchers documented a **new type of sedimentary rock formed** from **coastal slag deposits** in the **U.K.**, **showcasing how human waste can lead to unusual geological formations**.

More on News:

- The **Anthropocene era signifies** significant **human impact on the Earth's landscape**, with **industrial waste** and **construction debris** drastically **altering** the **environment**.
  - ☐ This includes **changes in soil** and **water acidity, mineral distribution**, and the **very composition of sediments**.
- **In 2015**, **artificial ground contributed over 316 million tonnes** of **sedimentary material to oceans**, far exceeding natural supplies.

Slag Overview:

- A **by-product of steelmaking** is **a composite material composed of metal oxides** and **silicon dioxide**. It plays a significant **role in** the **creation of artificial ground**.
  - ☐ **In areas** like **Warton, England**, **researchers** are **investigating** the **process of slag hardening,** or **lithification**, which **transforms industrial waste into sedimentary rock**.
- **Over time**, as these **rocks weather**, they **release sediments** into the **environment**, often **containing toxic metals** that can **contaminate soil, water,** and **air**.
- **Despite** these **concerns**, **slag also presents opportunities**. It is **chemically stable** and has the **unique ability** to **neutralise acidity**, storing greenhouse gases like **carbon dioxide through mineral carbonation**.
  - ☐ This **process mimics natural weathering** and could be **crucial** in **rising slag production**, which is **projected to increase by 10.5% worldwide by 2031**.

Methodology

- The **research team collected slag samples from the Warton slag heap**, an

area with historical iron and steel operations from 1864 to 1929.
- **To analyse** the slag, they **employed a multi-step preparation process** involving **cutting, grinding,** and **sieving** the samples.
- They also i**nvestigated variations in exposure to seawater** and **rainwater** across the deposit.

Key Findings:

- The researchers **identified various minerals**, including a form of **calcium silicate called larnit**e, and the presence of **calcite**, a **form of calcium carbonate** that **aids in the lithification process**.
- **Stable isotope analysis revealed** variations in carbon and oxygen isotopes, shedding light on the **origins and dynamics of carbonate reactions** in the environment.
- **Two lithification mechanisms:**
  - ☐ **Calcite cement precipitation: Dominated** on the **top surface** and the **sea-facing side above average water levels**.
    - ☐ This **process occurs when minerals dissolve**, **releasing calcium** that reacts with atmospheric carbon dioxide to form calcite.
  - ☐ **Calcium-silicate-hydrate (CSH)** cement precipitation: The **presence of saltwater prevented** the **dissolution of slag minerals**, leading to the formation of CSH minerals with varying textures and elemental distributions.

Implications:

- **Carbon Capture:** Understanding these lithification processes can inform strategies for repurposing slag deposits for carbon capture.
  - ☐ The **calcite cement mechanism**, in particular, can **sequester atmospheric carbon dioxide** without the need for transporting carbon to additional processing facilities.
  - ☐ The **precipitation of CSH minerals** may help **limit** the **release** of potentially **toxic metals** like vanadium and chromium into the environment.
- **Environmental Protection:** The research also opens avenues for **recovering valuable resources** from slag deposits, **increasing recycled materials** in steelmaking.
- Additionally, the hardened slag could serve as a natural barrier against coastal erosion, marrying environmental protection with effective waste management strategies.

Subject - Indian Society

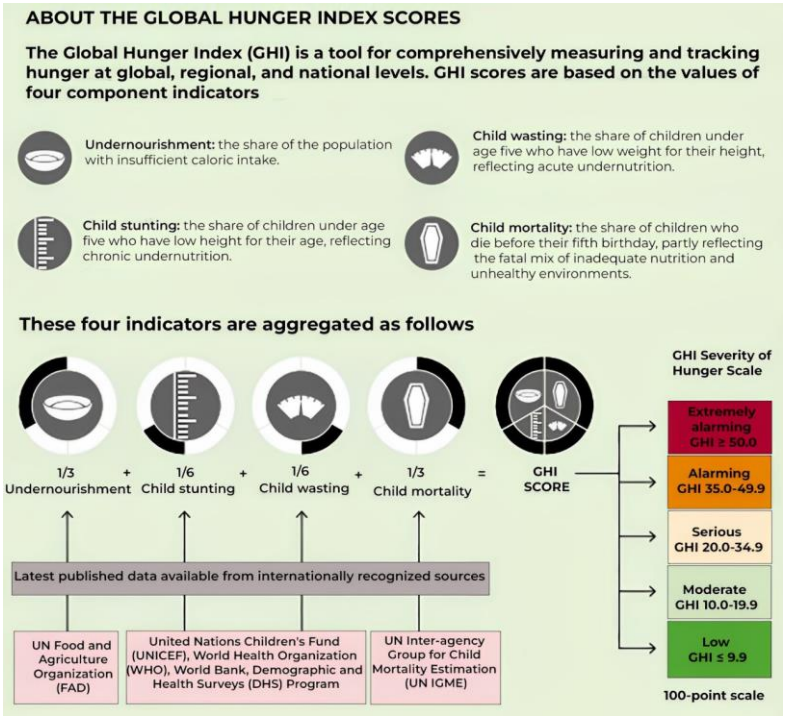
Global Hunger Index 2024 Points Alarming Situation In India

Sub Topic- Issues Relating to Poverty & Hunger, Health

Context: The Global Hunger Index (GHI) 2024 ranks India 105th out of 127 countries with a score of **27.3,** indicating a **'serious' level of hunger.**

Key Findings of the Report:

- **India's Position:** The GHI score is **based on four parameters: 35.5%** of Indian children **under five are stunted, 13.7%** of the population is **undernourished, 18.7%** of children are **wasted (the highest globally),** and **2.9%** of children **die before their fifth birthday.**
- **GDP Growth vs. Hunger:** The report emphasises that **GDP growth alone does not guarantee** improvements in food and nutrition security.
- **Crisis Fuelling Hunger in 2024:**
    - ☐ **Escalating Conflicts and Climate Change:** Conflicts and extreme weather have displaced over 115 million people, worsening hunger and inequality.
    - ☐ **Economic Instability and Rising Food Prices:** High debt and food prices deepen food insecurity, limiting access to nutrition for vulnerable populations.
    - ☐ **Agricultural Impact of Climate Change:** Climate events like El Niño disrupt agricultural production, increasing risks of child wasting and stunting.
    - ☐ **Debt Crisis and Resource Allocation:** Surging debt payments divert funds from essential services, hindering responses to food insecurity.



Key Highlights of the Report About India:

Positives about India:

- **Programs to Address Hunger and Undernutrition:** India has demonstrated political will to improve its food and nutrition security through initiatives like the **National Food Security Act, Poshan Abhiyan, PM Garib Kalyan Yojana, and the National Mission for Natural Farming.**
- **Progress in Reducing Child Mortality and Stunting:** Since 2000, India has made significant progress in **reducing child mortality and stunting**, but challenges remain. India still has the **highest global rate of child wasting and ranks 14th in child stunting.**

Areas of Concern and proposed Recommendations :

- **Social Safety Nets:** Improving access to programs like the Public Distribution Scheme, PMGKY, and ICDS is critical.
- **Mother and Child Health:** Prioritising the first 1000 days of life, complementary feeding, and hygiene practices are essential.
- **Agricultural Investments:** A holistic food systems approach that promotes diverse, nutritious, and climate-resilient crops, such as millets, is recommended.
- **Maternal Health:** Poor maternal nutrition contributes to child undernutrition, emphasising the need to address gender inequalities, maternal health, and infant feeding.

Gender, Climate, and Food Insecurity: A Converging Crisis

Gender inequality, food insecurity, and climate change exacerbate stress on households and communities, with women and girThe **report highlights** that **global hunger levels remain alarmingly high**, with little progress made in recent years.

ls disproportionately affected.

- **Gender Inequality in Food Systems and Climate Impact**
  - ☐ Women remain the most food insecure and face increased vulnerability due to systemic discrimination and the effects of climate change, such as heat waves and floods. This worsens their work burdens and limits access to resources.
- **Gender Justice: A Key to Food Security and Climate Resilience**
  - ☐ Achieving gender justice—recognition, redistribution, and representation—is essential for equitable outcomes in food security and climate resilience.
- **Key Dimensions of Gender Justice**
  - ☐ **Recognition:** Acknowledging different needs and transforming discriminatory norms.
  - ☐ **Redistribution:** Ensuring women's access **to resources and opportunities.**
  - ☐ **Representation:** Closing the gender gap **in leadership and decision-making.**

Policy Recommendations for Climate, Food, and Gender Justice

- **Strengthen Accountability to International Law and Right to Food**
  - ☐ States must uphold legal obligations to eliminate gender discrimination and ensure the right to adequate food.
  - ☐ Enforce the right to food through laws, monitoring, and accountability.
- **Promote Gender-Transformative Approaches**
  - ☐ Ensure inclusive governance and representation of women and marginalised groups in policy processes.
  - ☐ Integrate gender considerations into legal frameworks, including NDCs, NAPs, and food systems pathways.

Concerns about the Report:

- **Data Collection Methodology**
  - ☐ The Ministry of Women and Child Development expressed concerns about GHI's **reliance on external survey data instead of using India's own Poshan Tracker,** which reports child wasting rates consistently below 7.2%.
  - ☐ Experts argue that independent surveys like the **National Family Health Survey (NFHS) should be conducted regularly,** as they provide more reliable prevalence rates.

- ☐ **Country Comparisons:** The report's comparisons between countries can be problematic, as they might not account for varying socio-economic contexts and historical factors influencing hunger levels.

GS Paper I -Prelims Based Articles

Subject - Indian History, Heritage and Culture

Vithaldas Jhaverbhai Patel

Sub Topic- Important personalities

Context: 151st Birth Anniversary of Vithaldas Jhaverbhai Patel.

About:

- **Vithaldas Jhaverbhai Patel** was a prominent **Indian political leader** and a key figure in the Indian freedom movement, known for his contributions to **constitutional reforms** and **legislative practices** during the pre-independence era.

Early Life and Education:

- Born in **Karmasad**, **Gujarat**, Vithaldas Patel pursued higher education in law at the **Middle Temple** in **London**, where he excelled academically.
- After returning to India, he established a successful legal practice but shifted his focus to public service following personal tragedies, including the death of his wife in 1915.

Contributions to the Freedom Movement:

- **Political Engagement:** Vithaldas joined the **Indian National Congress** in 1915 and became actively involved in the national movement. He was instrumental in **organising protests** against oppressive laws like the **Rowlatt Act** and participated in various Congress sessions.
- **Formation of the Swaraj Party:** In **1922**, disillusioned with **Gandhi's non-cooperation strategy** after the **Chauri Chaura incident**, he co-founded the **Swaraj Party** with **Motilal Nehru** and **Chittaranjan Das**.
  - ☐ This party aimed to enter legislative councils to obstruct British governance from within.

- **Legislative Achievements:** Elected to the **Central Legislative Assembly** in 1924, Vithaldas became its **first Indian President** (**Speaker**) in 1925.
    - ☐ He was known for his **impartiality** and **independence**, establishing many **parliamentary procedures** that are still relevant today.
    - ☐ His leadership helped elevate the **Assembly's status** as a platform for voicing **Indian concerns** against colonial rule.
- **Advocacy for Education and Social Reforms: Vithaldas** championed various **social reforms**, including **extending primary education to municipal districts** and advocating for **medical regulations** that aimed to improve **healthcare standards**.
- **International Advocacy:** He represented India at international forums, including the **League of Nations**, where he sought support for India's independence. His efforts to articulate India's aspirations on global platforms were significant during a time when Indian voices were often marginalised.

Legacy:

Jawaharlal Nehru referred to him as an "***indomitable fighter for India's freedom***", highlighting his enduring impact on India's struggle for independence.

Shripad Amrit Dange

Sub Topic- Important personalities

Context: 125th Birth Anniversary of **SA Dange**.

About:

- **Shripad Amrit Dange** was a prominent Indian politician, trade union leader, and a founding member of the Communist Party of India (CPI).
- He played a crucial role in the Indian freedom movement and was instrumental in shaping the **labour rights landscape** in India.

Early Life and Political Affiliation:

- Dange was influenced by nationalist leaders like **Bal Gangadhar Tilak** and **Mahatma Gandhi**.
- His political journey began with his involvement in the **Non-Cooperation Movement** in 1920, which marked his transition from student to active participant in India's struggle against **British colonial rule**.
- Dange's ideological shift towards communism solidified when he became one of the founding members of the **CPI** during a meeting in **Kanpur** in 1925, alongside notable figures such as **Muzaffar Ahmed** and **Shaukat Usmani**.

- **Dange's commitment** to communist ideology was evident through his extensive involvement in trade unions.
- He led the **Girni Kamgar movement**, advocating for **textile workers' rights** in **Bombay** and significantly increasing union membership from 324 to 54,000. His leadership extended to serving as joint secretary and later president of the **All India Trade Union Congress**.

Role in India's Freedom Movement:

- Dange's activism led to multiple arrests; he spent approximately 13 years in prison due to his involvement in various conspiracies against British rule, including the **Kanpur Bolshevik Conspiracy case** and the **Meerut Conspiracy case**.
- These trials were pivotal in raising awareness about communist ideologies among the Indian populace.
- He viewed **imperialism as the primary enemy of the Indian masses**, arguing that Indian Communists should actively participate in the national movement.
- His efforts were not limited to labour rights; Dange also played a significant role in political reforms post-independence, notably advocating for the formation of Maharashtra as a separate state based on linguistic lines.

Ratan Tata: The Respected Business Leader of India

Sub Topic- Important personalities

Introduction: Ratan Tata epitomised the Tata tradition of ethical business practices and philanthropy, becoming a highly respected figure in India's corporate landscape.

Early Life and Background

- **Childhood Influence:** Raised by his strict father, Naval, and supportive grandmother, **Navajbai Tata**, who instilled the values of the Tata legacy.
- **Adoption of Tata Legacy:** Ratan was not a direct descendant of the Tata founder; he was adopted by Navajbai from an orphanage.

Professional Journey

- **Initial Struggles:** Began in the Tata Group without a defined role, often moving between departments, facing scepticism from senior leaders like **JRD Tata**.
- **Rise to Leadership:** Became chairman in **1991** after JRD's retirement; focused on restructuring and strengthening the group by dismantling the dominance of three powerful heads in various divisions.
- **Bold Acquisitions:**
    - **Tetley** (2000)
    - **Corus** (2007)

    - **Jaguar and Land Rover** (1998)
- **Financial Backbone:** Tata Consultancy Services (TCS) played a crucial role in supporting the group's profitability.

Ethical Standards and Philanthropy

- **Tata Values:** Emphasised integrity, ethical business practices, and philanthropy, inspired by the **Zoroastrian philosophy** inscribed at the headquarters, "Good Thoughts, Good Words and Good Deeds."
- **Philanthropic Contributions:** Funded various institutions such as the **Tata Institute of Fundamental Research** and **Tata Memorial Cancer Hospital**.

Leadership Style

- **Humility and Respect:** Known for treating everyone equally, from waitstaff to dignitaries, reflecting a modest lifestyle.
- **Inspiring Presence:** Commanded respect through quiet leadership, inspiring teams with his vision, integrity, and fairness.

Impact on India and Legacy

- **Global Ambassador:** Represented India with grace, leaving a lasting impression on global leaders and fostering international relationships.
- **Environmental Advocate:** Promoted sustainability within the Tata Group, supporting initiatives like **Swachh Bharat** and the **Tata Water Mission**.
- **Community Engagement:** Engaged directly with communities, exemplified by his interactions with unions during the Air India bid.

Conclusion: Ratan Tata's extraordinary journey embodies a legacy of ethical leadership, inspiring countless individuals and setting a high standard for future leaders in India and beyond.

Classical Language Status

Sub Topic- Indian Culture - Literature

Context: The Union Cabinet has **approved the recognition of five more languages as "classical," expanding India's list of culturally significant languages**.

More on News:

- **Marathi, Pali, Prakrit, Assamese, and Bengali** have now been granted the prestigious classical status.
- These languages **join the six already recognised as classical: Tamil (2004), Sanskrit (2005), Telugu (2008), Kannada (2008), Malayalam (2013), and Odia (2014).**

- This classification **fosters greater academic and cultural engagement,** while **opening new opportunities for research and preservation** of these ancient languages.

Criteria for Classical Language Status:

The recognition of a classical language is based on criteria established by a **Linguistic Experts Committee.**

The Linguistics Expert Committee includes **representatives from the Union Ministries of Home and Culture,** along with **four to five linguistic experts** at any given time. The committee is **chaired by the president of the Sahitya Akademi.**

To be considered classical, a language must meet the following standards:

- **High Antiquity:** The language must have **early texts and recorded history dating back over 1,000 years.**
- **Ancient Literature:** It must possess a body of ancient literature or texts **considered cultural heritage** by generations of speakers.
- **Knowledge Texts:** In addition to poetry, the language must have **prose works, including knowledge texts, epigraphical, and inscriptional evidence.**
    - ☐ The literary tradition of the language **must be original and not derived** from another speech community.
- **Distinct Evolution:** The classical language and its literature **may be distinct from its modern form or have evolved into newer forms**, potentially **discontinuous from its original structure.**

Benefits of Classical Language Status:

When a language is designated as classical, the **Ministry of Education offers several benefits** to promote it, including:

- **Two prestigious international awards each year** for distinguished scholars in the language.
- The establishment of a **Centre of Excellence for studies** in the classical language.
- A **request to the University Grants Commission (UGC) to create Professional Chairs** in Central Universities dedicated to the study of the classical language.

Ongoing Demands for Classical Language Status:

- **Maithili:** Despite its rich literary tradition and historical significance, Maithili has yet to receive classical status. Advocates argue that it has a documented history dating back over 2,500 years and a distinct literary heritage.
- **Tulu:** Similar to Maithili, Tulu speakers are pushing for recognition based on its unique cultural contributions and ancient texts.

- **Gujarati:** There are calls for Gujarati to be classified as a classical language, highlighting its historical literature and cultural importance.
- **Konkani:** The Konkani-speaking community is also seeking recognition, emphasising its distinctiveness and historical roots.

Nobel Prize in Literature

Sub Topic- Literature

Context: The **2024 Nobel Prize in Literature** has been awarded to **Han Kang,** a South Korean author, recognized for her ***"intense poetic prose that confronts historical traumas and exposes the fragility of human life."***

About Han Kang:

- **Birth Year:** 1970
- **Notable Works:** Her acclaimed works include **The Vegetarian**, **Human Acts**, and **Greek Lessons.**
  - ☐ The Vegetarian gained international attention after winning the **Man Booker International Prize in 2016**.
- **Significance:** Han Kang is the **first South Korean** and the **first Asian female laureate to receive this honour in literature,** marking a historic achievement for both her and Korean literature.

Praise:

- In its bio-bibliography, the academy says that in ***We Do Not Part***, Han Kang, with ***"imagery that is as precise as it is condensed, conveys the power of the past over the present,"*** and also ***"traces the friends' unyielding attempts to bring to light what has fallen into collective oblivion and transform their trauma into a joint art project, which lends the book its title."***
- In her oeuvre, the academy says Han Kang, confronts historical traumas and invisible sets of rules and, in each of her works, exposes the fragility of human life.
- "She has a unique awareness of the connections between body and soul, the living and the dead, and in her poetic and experimental style has become an innovator in contemporary prose," it contends. But most of all, Han Kang has shown the **power of literature to "speak the truth."**

India and Nobel in Literature

The **only Nobel Prize** in Literature awarded to an Indian is to **Rabindranath Tagore,** who received the honour in **1913.** He was recognised for his ***"profoundly sensitive, fresh and beautiful verse,"*** which he skillfully expressed in English, making his poetic thought a part of Western literature. Tagore is celebrated for his contributions to poetry,

music, and art, and he is often referred to as the **Bard of Bengal or Gurudev.**

Notable Works: His renowned collection **Gitanjali ("Song Offerings")** played a significant role in his recognition. Other important works include **Gora and Ghare-Baire.**

Battle of Buxar

Sub Topic- Modern Indian History

Context: The **Battle of Buxar**, fought on **October 22**, **1764**, marked a pivotal moment in the history of British colonial expansion in India. It was a confrontation between the forces of the **British East India Company**, led by **Major Hector Munro**, and a coalition of Indian rulers: **Mir Qasim** (**Nawab of Bengal**), **Shuja-ud-Daula** (**Nawab of Awadh**), and **Shah Alam II** (**Mughal Emperor**). As noted by **Frederic P. Miller** and **Agnes F. Vandome**, "*The British victory at Buxar had 'at one fell swoop' disposed of the three main scions of Mughal power in Upper India*".

Overview of the Battle:

- The battle took place near Buxar, a **fortified town** in Bihar.
- Despite being outnumbered, the British achieved a decisive victory due to **superior military tactics** and **coordination**.
- The aftermath saw significant casualties on both sides, with **British losses** reported at around **1,000 compared** to approximately **6,000 for the Indian coalition**.

Impact on British Consolidation:

- **End of Mughal Authority:** The defeat effectively dismantled the remaining power of the Mughal Empire in northern India. Mir Qasim fled into obscurity, while Shah Alam II shifted his allegiance to the British.
- **Territorial Control:** Following the battle, the **Treaty of Allahabad** was signed in 1765, which granted the **British East India Company** significant rights over **Bengal** and **Bihar**. This treaty allowed them to **collect taxes and assert administrative control** over these regions.
- **Economic Foundations:** The control over Bengal provided a substantial economic base for the Company, enabling further territorial expansions across the subcontinent.

Treaty of Allahabad:

- **Sovereignty Transfer:** The Mughal Emperor Shah Alam II ceded sovereignty of Bengal to the British East India Company.
- **Revenue Collection Rights:** The Company was granted **Diwani rights**, allowing it to collect taxes on behalf of the Mughal Empire.
- **Political Realignment:** The treaty also solidified alliances with local rulers like **Shuja-ud-Daula**, further embedding British influence in the region.

GS Paper II - Mains Based Articles

***Subject* - Polity, Governance, Constitution**

National Credit Framework (NCrF)

Sub Topic- Government Policies & Interventions

Context: The **National Credit Framework (NCrF),** a ground-breaking policy reform introduced **under the National Education Policy (NEP 2020)**, is poised to revolutionise the Indian education system.

About NCrF:

- The NCrF was collaboratively developed by several organisations, including the **University Grants Commission (UGC)**, AICTE, NCVET, NIOS, CBSE, NCERT, DGT, the Ministry of Education, and the Ministry of Skill Development.
- The **National Credit Framework (NCF) embodies the vision of the National Education Policy (NEP) 2020** by providing a comprehensive system that integrates academic, vocational education, training, and skilling **(VETS)**, **along with experiential learning.**
- The National Credit Framework (NCrF) is a **comprehensive meta-framework** designed to **accumulate credits** from school education, higher education, and vocational and skill education. This system assigns credits for academic learning and consists of three key verticals:
  - ☐ **National School Education Qualification Framework (NSEQF)**
  - ☐ **National Higher Education Qualification Framework (NHEQF)**
  - ☐ **National Skills Qualification Framework (NSQF)**

Key Elements of NCrF:

- **Integrated Learning Ecosystem**: NCF fosters a seamless education system **combining academics and vocational training**, allowing students to tailor their education according to their needs and aspirations.
- **Credit System**: Establishes a credit-based system that acknowledges all forms of learning, enabling the accumulation, transfer, and redemption of credits across academic and vocational education.
- **Support for Lifelong Learning**: NCF supports continuous skill development aligned with evolving industry demands and personal growth objectives.

- **Focus on Flexibility and Pathways**: SOPs encourage **multiple entry and exit** options, recognition of prior learning, and work-embedded education, ensuring students can easily navigate different education and skill pathways.
- **Empowerment and Multidisciplinarity:**
  - ☐ **Empowering Learners**: NCF, through its SOPs, emphasises multidisciplinary education, flexible learning pathways, and the empowerment of students at all educational levels.
  - ☐ **Vocational Education and Training (VETS)**: Special emphasis is placed on integrating vocational education and training into formal education, **ensuring that learners develop skills relevant to the industry**.

Significance of NCrf:

- **Adapting to Economic and Technological Changes:** NCrF enables HEIs to remain competitive and relevant by aligning curriculum with current and future job market needs.
- **Modern Role of HEIs: Beyond Knowledge Production:** HEIs must train students in both academic knowledge and practical skills to prepare them for emerging roles and self-employment.
- **Continuous Adaptation for Social Equity:** Reforms are essential for the democratisation of education and social equity. Resistance to change risks stagnation in the system.

- **Complements Multidisciplinary Education and Research Universities (MERUs):** MERUs should nurture intellectuals, but other HEIs should also emphasise vocational and skill training to improve employability.
- **Greater Student Mobility**: NCrF's unified credit system enables seamless credit transfer across institutions, promoting collaboration and a more interconnected education ecosystem.

Key Challenges Faced by the National Credit Framework (NCrF) in Higher Education Institutions (HEIs):

- **Resistance to Change**: HEIs rooted in traditional structures may resist adopting NCrF due to **reluctance to shift from conventional teaching and assessment methods.**
- **Implementation Complexity**: Integrating vocational training, internships, and skill-based courses requires significant changes in curricula, credit allocation, and assessment.
- **Faculty Training** to deliver multidisciplinary and skill-based education effectively.
- **Infrastructure Gaps** such as labs and vocational training resources, to implement NCrF.

Supreme Court Condemns Caste-Based Discrimination in Prisons

Sub Topic- Indian Judiciary

Context: The Supreme Court ruled that **caste-based discrimination against prisoners,** segregating their work according to caste hierarchy, and treating inmates from de-notified tribes as **"habitual offenders"** in prisons across India **violates fundamental human dignity and personality.**

About the Judgement:

- **Revision of Prison Manuals:** The court ordered that **prison manuals be revised within three months to remove the 'caste column'** and any references to caste in the registers of undertrials and convicts.
    - ☐ The court emphasised that arbitrary arrests of members of denotified tribes must not occur.
- **Violation of the Constitution:** Chief Justice of India, citing **Article 15(1)** of the Constitution, said that ***"If the state itself discriminates against a citizen, it is the highest form of discrimination. The state should prevent, not perpetuate, discrimination"***.
    - ☐ He held that caste-based discrimination among prisoners and allocation of work based on caste amounted to untouchability, **prohibited under Article 17** of the Constitution.
    - ☐ Degrading labour practices **violate the right against forced labour as per Article 23** of the Constitution.
- **Colonial Discrimination and Habitual Offenders:** Prison manuals that treat denotified and wandering tribes as "born criminals" or habitual offenders reinforce **colonial-era caste discrimination.**
    - ☐ The court declared that any references to 'habitual offenders' in prison manuals, without statutory backing, were **unconstitutional.**
- **A Form of Coercion:** Segregating prisoners based on caste **would only deepen caste animosity,** the court observed.
    - ☐ The court also stated that ***forcing marginalised caste inmates to perform tasks like cleaning latrines or sweeping, without giving them a choice and solely based on their caste, amounted to coercion.***
- **No Scavenger Class:** Prison manuals that assign tasks like manual scavenging to lower castes, or refer to them as the 'scavenger class', **practice untouchability.**
    - ☐ The court affirmed that the **Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013, applies in prisons** and prohibits such practices.

Caste in Modern Laws:

- The **Modern Prison Manual of 2016** and the **new Model Prisons and Correctional Services Act of 2023** still categorise **"habitual offenders,"** often

members of de-notified tribes, alongside rapists, murderers, prostitutes, and brothel keepers.
    - ☐ These laws **assign kitchen and cooking duties in prisons based on caste and religion**, perpetuating caste-based privileges.
- The ***court directed the Union government to amend the 2016 Manual and the 2023 Act to eliminate caste-based discrimination within three months.***

Dr. B.R. Ambedkar's Views

He is a prominent **social reformer and the principal architect of the Indian Constitution,** was a staunch advocate for the abolition of the caste system in India.

Ambedkar's Critique of the Caste System

- **Foundational Beliefs:** Ambedkar viewed the caste system as ***an oppressive structure that not only divided labour but also divided labourers,*** creating a **hierarchy that perpetuated inequality.** He argued that caste was **not merely a social division but a system that sanctioned discrimination** and restricted individuals' rights to choose their occupations freely, **leading to economic stagnation and social disintegration**. He famously stated, ***"There will be outcaste as long as there are castes,"*** emphasising that true emancipation for the oppressed could only be achieved through the complete destruction of the caste system.
- **Religious Underpinnings:** Ambedkar believed that the **caste system was deeply embedded in Hindu religious texts and traditions**, which he criticised for promoting inequality. He argued that **to eradicate caste, it was essential to dismantle the religious ideologies supporting it.** This perspective led him to **advocate for a secular approach to society,** where equality and fraternity would replace caste-based divisions.

Strategies for Abolition

- **Political and Social Reform:** He emphasised the **importance of political power for Dalits,** arguing that **without political representation, any efforts to improve their social status would be futile.** He was critical of leaders like Mahatma Gandhi, who sought to integrate Dalits into Hindu society rather than liberate them from its constraints. Ambedkar believed that **political democracy could not thrive without social democracy, which recognises liberty and equality as fundamental principles**.
- **Economic Empowerment:** In addition to political reforms, Ambedkar highlighted economic empowerment as crucial for Dalit liberation. He argued for **land reforms that would enable Dalits to gain economic independence and dignity.** His critique of land monopolies held by upper castes underscored his belief that economic disparities were intertwined with caste inequalities.

Ways to Eliminate Caste System:

- **Legal Reforms:**
    - ☐ **Strengthening Anti-Discrimination Laws:** While the Indian Constitution prohibits caste-based discrimination (Articles 15 and 17), **enforcement remains weak.** Strengthening laws like the **Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act** can help protect marginalised communities.

- ☐ **Fast-Track Courts:** Establishing fast-track courts for cases of caste-based violence can ensure timely justice for victims and deter future atrocities.

- **Educational Initiatives:**
  - ☐ **Access to Quality Education:** This includes **scholarships, special coaching programs, and infrastructure** improvements in rural areas.
  - ☐ **Awareness Campaigns:** Promoting awareness about the harmful effects of the caste system through educational programs can help change societal attitudes.
- **Economic Empowerment:**
  - ☐ **Skill Development Programs:** Initiatives like **"Skill India"** should focus on providing vocational training to Dalits and other marginalised groups.
  - ☐ **Financial Assistance:** Instead of caste-based reservations, providing financial support based on economic status can help uplift disadvantaged communities without perpetuating caste divisions.
- **Social Integration:**
  - ☐ **Community Dialogue:** Initiatives that promote **inter-caste marriages and social mixing** can also help break down barriers.
  - ☐ **Cultural Programs:** Celebrating diversity through cultural programs that include all castes can promote inclusivity and respect.
- **Political Will:**
  - ☐ **Government Accountability:** This involves taking a **firm stand against violence and discrimination** while promoting policies that support equality.
  - ☐ **Engagement with Civil Society:** Collaborating with NGOs and civil society organisations can enhance efforts to combat caste discrimination at grassroots levels.

CAT

Sub Topic- Tribunals, Government Policies & Interventions

Context: Four IAS officers, from Telangana Cadre were repatriated to the Andhra Pradesh (A.P.) cadre, have approached the **Central Administrative Tribunal (CAT) seeking relief.**They are seeking the **cancellation of the Department of Personnel and Training (DoPT) orders** that have repatriated them to the A.P. cadre.

About CAT:

Tribunals

- **Introduction:** Tribunals were not part of the original Constitution.
- **42nd Amendment Act, 1976:** Added Part XIV-A, which includes two articles:
  - ☐ **Article 323A: Administrative Tribunals**
  - ☐ **Article 323B: Tribunals for Other Matters**

Administrative Tribunals:

- **Empowerment**: **Article 323A** empowers Parliament to establish tribunals for disputes related to recruitment and service conditions in public services.
- **Administrative Tribunals Act, 1985**: Passed to establish **Central** and **State** administrative tribunals.

Central Administrative Tribunal (CAT):

- **Establishment**: Set up in **1985** with the **principal bench in Delhi** and additional benches across states.
- **Jurisdiction**:
  - ☐ **Recruitment and service matters** of **central public servants**.
  - ☐ **All-India services** (e.g., IAS, IPS, IFS).
  - ☐ **Central civil services** and posts under the Central Government.
  - ☐ **Civilian employees** of defence services.
- **Exclusions**: Does not cover **defence forces, Supreme Court officers, and Parliament secretarial staff.**
- **Procedure**: Not bound by the **Civil Procedure Code;** guided by **natural justice principles**.
  - ☐ **Rules of Procedure and Practice**: CAT frames its own rules, such as the Central Administrative Tribunal (Procedure) Rules, 1987, and Central Administrative Tribunal Rules of Practice, 1993.
- **Appeals**: Appeals against CAT orders go to high courts after the **Chandra Kumar case (1997)**.
- **Contempt: Under Section 17 of Administrative Tribunals Act, 1985** CAT holds the same contempt powers as a High Court.
- **Total Cases:** 8,82,085 cases instituted until June 30, 2022, with **91.18% disposal rate (8,04,272 cases disposed).**
- **Composition**:
  - ☐ **Chairman** and members (**Vice-Chairman position abolished** after the 2006 Amendment).
  - ☐ Chairman appointed for **5 years** or until age **65**, members until age **62**.
  - ☐ Appointments made based on recommendations of a **high-powered selection committee** chaired by a **sitting Supreme Court judge**, with approval from the **Appointments Committee of the Cabinet (ACC)**.

State Administrative Tribunals (SATs):

- **Establishment**: Created by the **Central government** at the request of state governments under the Administrative Tribunals Act, 1985.
- **Jurisdiction**: Handle **recruitment** and **service matters** of **state government employees**.
- **Appointments**: Made by the **President** in consultation with **state governors**.
- **Joint Administrative Tribunals (JATs)**: Provision exists for creating JATs for **two or more states** to manage joint service matters.
- Provision exists for **Joint Administrative Tribunals (JATs) for two or more states.**

Key Supreme Court Cases Related to CAT

- ***S.P. Sampath Kumar v. Union of India (1987)***
  - ☐ This case **questioned the constitutional validity of CAT.** The Supreme Court upheld the establishment of CAT, ruling that it serves as an **effective alternative to high courts** for the adjudication of service disputes. However, it emphasised that **judicial independence must be maintained.**
- ***L. Chandra Kumar v. Union of India (1997):* A landmark judgement, the Chandra Kumar case had significant implications for CAT:**
  - ☐ The Supreme Court declared the **exclusion of the jurisdiction of High Courts and the Supreme Court under Articles 323A and 323A as unconstitutional.**
  - ☐ The Court ruled that judicial review by the High Courts and the Supreme Court is **part of the basic structure** of the Constitution.
  - ☐ As a result, appeals against **CAT orders must first go to the concerned High Court** before approaching the Supreme Court.

Conclusion:

In order to improve the efficiency of CAT following **Modernization Initiatives** have been taken

- **Ambitious Plan Scheme:** CAT is undergoing modernization and computerization, including a new website, Case Information System, and Video Conferencing.
- **Real-Time Access:** Upon completion, this will facilitate access to orders, judgments, and efficient case management for litigants, lawyers, researchers, and the public.

Supreme Court upholds Section 6A of the Citizenship Act

Sub Topic- Government Policies & Interventions, Citizenship

Context: In a 4:1 majority judgement, the Supreme Court upheld the constitutionality of **Section 6A of the Citizenship Act, 1955,** allowing immigrants from Bangladesh residing in Assam to gain Indian citizenship.

Background:

- **Overview: Section 6A of the Citizenship Act, 1955:** This provision was **added following the Assam Accord of 1985.**

- **Eligibility Criteria**: It **grants citizenship to migrants from Bangladesh** who entered Assam before March 25, 1971, while excluding those who arrived after that date.

- **Challengers: Petitioners** challenging the case were **NGOs like Assam Public Works** and the **Assam Sanmilita Mahasangha.**

Constitutional Provisions Involved in the Case

- **Article 11:** Empowers Parliament to regulate citizenship, including the acquisition and termination of citizenship.

- **Article 14 (Right to Equality):** Petitioners argued that Section 6A violated Article 14 by **creating different cut-off dates for Assam and the rest of India,** which they claimed was discriminatory.

- **Article 29(1):** Protects the cultural and linguistic rights of citizens. The petitioners claimed that granting citizenship to migrants under Section 6A eroded the cultural identity of indigenous Assamese people.

Questions Raised Before Parliament by

- **Does Section 6A violate the right to equality (Article 14)?**
    - Petitioners argued that Section 6A's different citizenship cut-off date for Assam created an unequal treatment compared to other Indian states, thereby violating the right to equality.
- **Is Assam being unfairly singled out under Section 6A?**
    - The petitioners contended that Assam was being treated unfairly by being burdened with a larger number of immigrants without the same protections extended to other border states.
- **Does migration amount to "external aggression"?**
    - Petitioners cited the 2005 Sarbananda Sonowal case, arguing that large-scale illegal immigration from Bangladesh should be considered a form of external aggression.
- **Does Section 6A undermine the cultural rights of indigenous Assamese?**
    - They claimed that the demographic shift caused by immigration could erode the cultural and linguistic identity of the Assamese people, protected under Article 29(1).
- **Does Parliament have the Power to Regulate Citizenship?**

Supreme Court's Justifications:

- **Constitutional Validity of Section 6A:** The Court ruled that the differentiation in Assam's context, given its distinct migration issues, was reasonable and **did not violate Article 14.**

- **No "External Aggression":** The Court rejected the argument that controlled and regulated citizenship processes under Section 6A constituted external aggression. It

acknowledged **migration as a reality but viewed it as a challenge to be managed, not an existential threat.**

- **Protection of Cultural Rights:** The Court concluded that the presence of different ethnic groups in Assam **did not violate Article 29(1)** as long as there was **no direct infringement on Assamese culture.**

- **Fraternity and National Unity:** The Court emphasised the importance of fraternity and national unity, noting that disenfranchising immigrants who had been residing in Assam for decades would harm social cohesion.

- **Parliament's Power to Regulate Citizenship:**

    - **Articles 6 & 7:** These articles pertain to citizenship at the commencement of the Constitution (January 26, 1950). Petitioners argued Section 6A, dealing with migrants from East Pakistan (Bangladesh), effectively amended these provisions.

    - **Supreme Court Ruling:** The Court held that **Section 6A deals with those not covered by Articles 6 & 7,** and is a **valid exercise of Parliament's power under Article 11 and Entry 17 of the Union List,** allowing Parliament to regulate citizenship, naturalisation, and aliens.

- **Justifications for the Cut-off Dates**

    - **Unique Context of Assam:** The Supreme Court upheld Section 6A, recognizing that Assam's unique demographic and migratory challenges justified having different cut-off dates from the rest of India.

    - **March 24, 1971:** The **cut-off date, drawn from the Assam Accord (1985), was deemed reasonable.**

        - CJI Chandrachud pointed out that the date marked the eve of the launch of **Operation Searchlight** by the Pakistani Army on March 26, 1971, against the Bengali nationalist movement.

        - **Immigrants before this date were seen as victims of partition,** while those entering later were treated as war refugees.

    - **Balancing Concerns:** The cut-off date was viewed as a **balanced solution, addressing both humanitarian concerns for immigrants** and the need to preserve Assam's cultural identity.

Implications of the Supreme Court's Verdict :

- **Political Implications:**

    - **Support for the Assam Accord:** The ruling backs the Assam Accord, helping political parties that advocate for it and represent Assamese interests.

- **Effect on CAA:** It highlights Parliament's ability to control citizenship laws, which could affect future legal challenges to the Citizenship (Amendment) Act (CAA).

- **Political Divisions:** The decision might deepen political disagreements, especially in Assam, around issues of cultural identity and immigration.

- **Social Implications:**

  - **Demographic Issues:** The ruling aims to reassure the indigenous people of Assam by addressing migration legally, but concerns about changing demographics may still persist.

  - **Cultural Integration:** The Court focused on unity and social harmony, but tensions may remain about preserving Assamese culture.

  - **Regulated Immigration:** The ruling emphasises that immigration can be managed in a controlled way, reducing fears about illegal immigration threatening national security.

- **Federal Implications:**

  - **Parliament's Authority:** It confirms that Parliament can regulate citizenship, which might create tensions between the central government and individual states.

  - **Precedent for Local Laws:** The ruling sets an example for other states to seek their own specific citizenship laws based on local needs.

  - **Impact on NRC:** It will influence how the National Register of Citizens (NRC) is applied in Assam and possibly in other states.

- **International Relations:**

  - **Relations with Bangladesh:** The decision might lead to concerns in India-Bangladesh relations, especially regarding how migration is viewed.

  Refugee Policy: It could change how India handles refugees and migrants, especially from neighbouring countries.

Subject **- Social Justice**

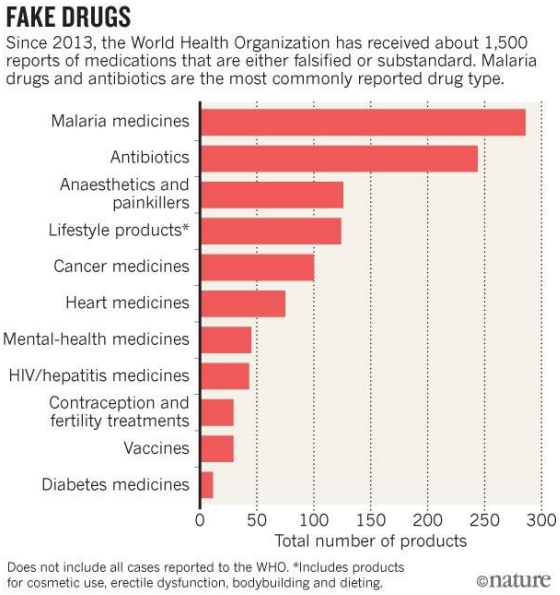
The Issue of Substandard and Fake Drugs in India

Sub Topic- Issues related to Health

Context: A case was registered recently against a group supplying fake drugs, including antibiotics, to government hospitals in Maharashtra, Chhattisgarh, Uttar Pradesh, and Jharkhand.

More on News

- These fake drugs were primarily **composed of talcum powder and starch**, with no active pharmaceutical ingredients.
- Simultaneously, the **Central Drugs Standard Control Organisation (CDSCO)** conducted a survey that revealed **50 commonly used medications**, including antibiotics, antacids, antipyretics, and antihypertensives, **were substandard.**
- Some of these drugs were manufactured by prominent companies like **Hindustan Antibiotics, Alkem, and Torrent.**



State-Level Drug Sampling and Consistent Issues

- Drug officers in India perform **random sampling of medications** in the market every month.
- The CDSCO has **consistently found numerous substandard drugs** in these samples, with many reports highlighting this ongoing issue.
- According to the **World Health Organisation (WHO)**, **1 in 10 medical products in low- and middle-income countries is substandard or falsified,** with India falling into the lower middle-income category.

Drug Regulation in India

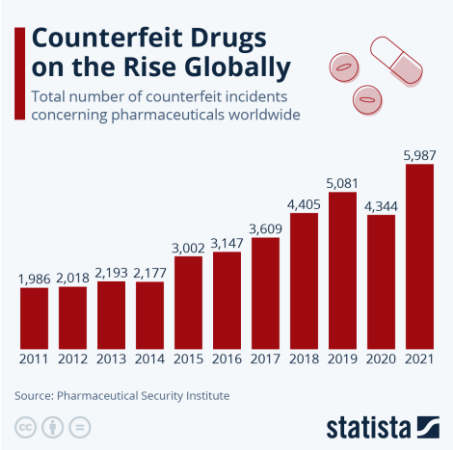
Drug regulation in India is primarily governed by the **Drugs and Cosmetics Act, 1940**, which establishes the framework for the approval, manufacture, distribution, and sale of drugs and cosmetics. The **Central Drugs Standard Control Organisation (CDSCO)**, headed by the **Drug Controller General of India (DCGI)**, is the principal regulatory authority responsible for ensuring drug safety and efficacy in the country.

Key Regulatory Bodies

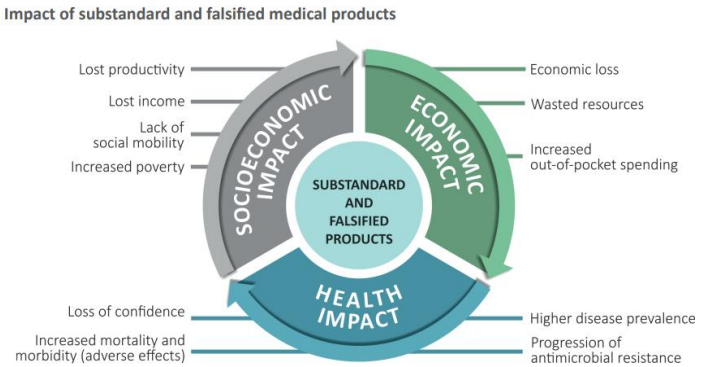
- **CDSCO:** Oversees drug approval processes, clinical trials, and quality control. It operates under the Ministry of Health and Family Welfare and has multiple zonal offices across India.
- **National Pharmaceutical Pricing Authority (NPPA):** Responsible for regulating drug prices to ensure affordability, particularly for essential medicines.
- **State Drug Control Authorities:** Manage local enforcement of drug regulations and quality standards.

Economic Impact of Substandard Drugs:

- Substandard and fake drugs negatively affect India's economy by **prolonging illnesses, increasing healthcare costs, and causing job losses** and higher **personal debt** due to healthcare expenses.
- In a country where many are **just one hospitalisation away from poverty**, this issue contributes to **pushing more people below the poverty line.**
- Ineffective drugs lead to **higher mortality rates,** particularly among infants and the elderly, and may contribute to **long-term dangers like antimicrobial resistance.**



Challenges Unique to India



- **Population:** India's **massive population** exacerbates the impact of substandard drugs. As the world's most populous country, the **scale of the issue is far greater.**
- **Economic Growth:** The problem poses a significant **threat to India's economic growth**, especially at a time when the country should be capitalising on its demographic dividend.
- **Global Reputation:** India has earned a reputation as the **"pharmacy to the world"** due to its generics and low-cost vaccines. However, the increasing prevalence of substandard and falsified medicines **could damage this reputation** and allow competitors to capture the global market for affordable pharmaceuticals.
- **Lack of Regulations:** Despite the discovery of substandard drugs, **manufacturers face little to no serious consequences.**
    - ☐ **Penalties are often small fines** that do not deter wrongdoing, and there is minimal effort to recall defective drug batches.
- **Weak Regulatory Capacity:** The **CDSCO heavily relies on state-level officials** for testing and regulation, but most states lack the capacity, expertise, and infrastructure to ensure strict quality control and enforcement.
- **Quality Control Issues:** Much of India's pharmaceutical **production is outsourced to small-scale manufacturers** that have **lax quality control practices.**
    - ☐ These manufacturers often **lack the resources to invest in proper instruments** for testing and quality assurance.

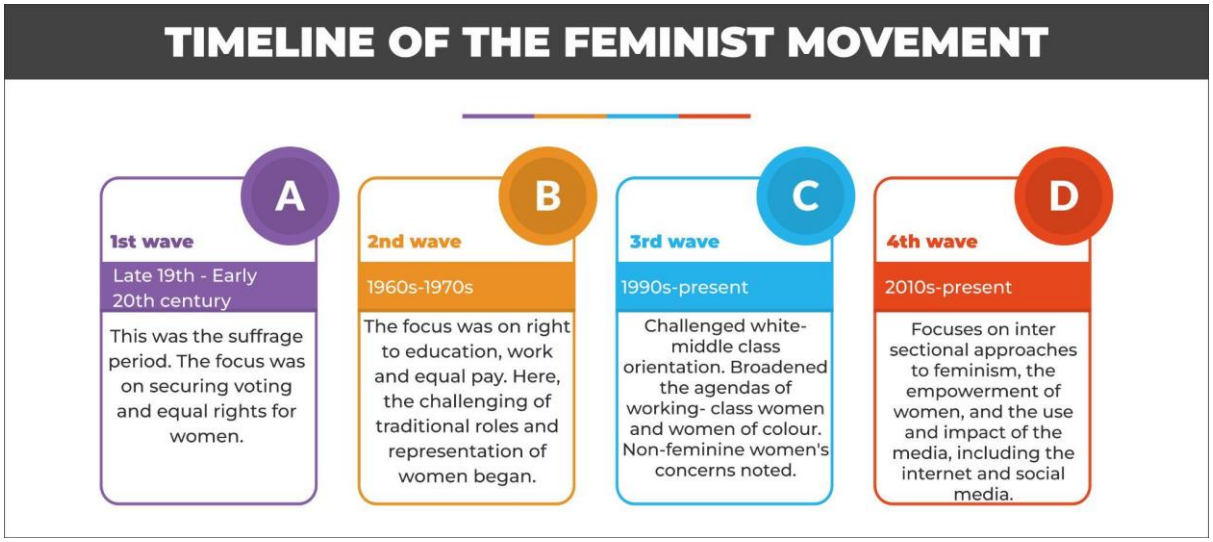
- **Low Priority:** Indian policymakers have historically placed low priority on healthcare, **both in terms of developing state capacity and enforcing laws** against substandard drug manufacturers.
- For India to **escape the middle-income trap and achieve high-income status** in the coming decades, policymakers need to address this issue with greater urgency. **Strengthening regulatory frameworks and enforcing stricter penalties** for violations are key steps that need to be taken.

Gender Performativity

Sub Topic- Issues related to Women & Social Sector

Context: Gender performativity, a concept that has greatly **shaped gender theory**, offers **a more fluid understanding of gender** by questioning fixed ideas of identity.

About Gender Performativity:



- Introduced by **poststructuralist scholar Judith Butler** in her 1990 work ***Gender Trouble***, the theory **critiques the essentialist notion that links sex to a strict binary of masculine and feminine.**
- Instead, Butler argues that **gender is a socially constructed identity**, shaped and sustained through repeated actions, behaviours, and discourse.
- As a result, gender **can never be fully stable,** even if it appears consistent.
- Butler further explains that **gender norms are so deeply ingrained in society that they seem natural,** trapping individuals in rigid gender roles.
- However, since these norms **rely on constant repetition for their stability**, they **can be challenged and subverted.**
- **Acts of resistance** within societal structures can lead to new understandings of gender. Butler's work **not only critiques traditional gender theories** but **also marks a key moment in third-wave feminism** and contributes significantly to queer theory.

Two Theories of Gender:

- There are **various debates** about the definition of gender, but **two key theories stand out:**
  - **Gender Essentialism:** It argues that **biology primarily explains gender** — sex chromosomes and DNA determine one's sex, **which in turn defines their gender.**
    - From this perspective, **traits, roles, and behaviours associated with masculinity and femininity are seen as natural**, as they are **biologically predetermined.**
  - **Social Constructivism:** It posits that **gender identity is shaped through discourse,** encompassing language, bodily expressions, and non-verbal actions.
    - Gender **norms become internalised** to the extent that they seem natural to individuals who align with their assigned gender.
    - For example, a child born with a uterus may be assigned female at birth, given the pronouns she/her, and encouraged to adopt traditionally feminine roles. Deviations from these norms are often met with **disapproval or punishment.**
- In many **Indian schools, girls are expected to keep their hair long and neatly tied**, while **boys growing long hair might face criticism and pressure** to conform to traditional masculine norms.
  - This reflects **how gender expectations shift based on assigned roles**, even in situations where uniformity should apply.
- **Iris Marion Young's** 1980 essay, ***Throwing Like a Girl: A Phenomenology of Feminine Body Comportment, Motility, and Spatiality***, explores how **gender norms can shape physical behaviour.**
  - Young illustrates how girls are expected to display weaker, more restrained movements, like using less space and energy when throwing a ball compared to boys. Interestingly, these gendered behaviours are not fixed and have shifted across time and cultures. For example, in the 19th century, pink was considered a masculine colour, while blue was associated with femininity.
- This idea also echoes **Simone de Beauvoir's** famous statement in ***The Second Sex (1949)***: **"One is not born, but rather becomes, a woman."** De Beauvoir emphasises that **gender identity is shaped by societal norms** rather than being an inherent quality.

Sex and Gender:

- **Judith Butler** builds on this discussion by **challenging second-wave feminism's** distinction between sex and gender.
- Scholars like **Gayle Rubin** argue that **sex is biologically determined,** while **gender is shaped by societal norms.**
  - However, **Butler rejects this separation, asserting that even "sex" is shaped by social interpretation.**
- According to Butler, **biological sex cannot be experienced outside of the social meanings attached to it.**
  - Thus, both sex and gender are socially constructed, with gender ultimately encompassing sex. The belief that a person's body predetermines their gender

identity is, Butler argues, a product of social discourse rather than biological reality.

- Butler emphasises that **gender is not something one is, but something one does.** Rather than being a static noun, she views **gender as a verb — something performed rather than possessed.**
    - ☐ One does not simply be a woman but rather **does 'womanness'.**
    - ☐ Gender, then, is the stylized repetition of actions over time.
        - ☐ This can be likened to the **act of speaking,** where language involves the repeated use of words within a structured framework.
        - ☐ Similarly, gender performativity involves the **repeated performance of behaviours and roles** in line with societal expectations.

Preparing for the Next Pandemic

Sub Topic- Issues related to Health

Context: Four years after the onset of Covid-19, **an expert group formed by NITI Aayog** has proposed **establishing a comprehensive framework to manage future public health emergencies or pandemics effectively.**

More on News:

- The **Pandemic Preparedness and Emergency Response (PPER) framework** advocates for the **introduction of a new Public Health Emergency Management Act (PHEMA)** and other measures to ensure a rapid and **efficient response within the first 100 days of an outbreak.**
- This **expert group**, constituted in June 2023, **based its recommendations on the lessons learned from the Covid-19 pandemic** and other public health crises.

Enactment of PHEMA:

- **Inadequate Laws:** Public health emergencies often require governments to **exercise special powers**, such as **mandatory screenings and restrictions** on movement.
    - ☐ During the Covid-19 pandemic, authorities invoked the **Epidemic Diseases Act (EDA) of 1897** and the **National Disaster Management Act (NDMA) of 2005.**
    - ☐ However, the expert group's report noted that **these laws were inadequate.**
        - ☐ The **EDA 1897 does not define terms like 'dangerous,' 'infectious,' or 'contagious diseases,'** nor does it clarify what constitutes an 'epidemic.' It also **lacks provisions for the distribution of drugs or vaccines,** quarantine measures, and other preventive steps.
        - ☐ Similarly, the **NDMA was not designed to handle health emergencies**, as it does not specifically address public health crises or

epidemics. Instead, it focuses on managing various types of disasters, primarily natural disasters.

- **Enactment of PHEMA:** To address these shortcomings, the report recommends the enactment of a Public Health Emergency Management Act (PHEMA).
    - ☐ This new law **would empower central and state governments to respond effectively to pandemics and other health emergencies,** such as those caused by non-communicable diseases, disasters, or bioterrorism.
    - ☐ It would also establish **public health cadres at national and state levels,** ensuring a trained and prepared first-response team.

Empowered Group of Secretaries (EGoS)

- It is a **committee of officials led by the Cabinet Secretary,** to prepare for public health emergencies and oversee preparedness during non-crisis periods.
- This group will **provide guidance on governance, finance, research and development,** surveillance, partnerships, and other critical areas that can be quickly scaled up for an emergency response.
- EGoS will be responsible for **developing Standard Operating Procedures (SOPs)** for pandemics and forming sub-committees to handle these specific functions, according to the report.

Strengthen Surveillance:

- The report emphasised the **need to strengthen the disease surveillance network,** highlighting that many epidemics and pandemics over the past 50 years, including Covid-19, were caused by viruses associated with various bat species.
    - ☐ Therefore, it stressed the **importance of continuous monitoring of human-bat interactions.**
- It recommended establishing a **national biosecurity and biosafety network**, involving top research institutions, biosafety containment facilities (labs designed with safety measures to protect against biological hazards), and genome sequencing centres.
- Additionally, the report called for the **creation of an emergency vaccine bank,** capable of sourcing vaccines both domestically and internationally.

Network for Early Warning:

- The report recommended **creating an epidemiology forecasting and modelling network** to predict the transmission dynamics of infectious diseases and assess the effectiveness of countermeasures, such as vaccination, across different scenarios.
- It also emphasised the **need for a network of Centres of Excellence (CoEs)** dedicated to researching priority pathogens.
- These centres would focus on **developing diagnostics, therapeutics, and vaccines** for pathogens identified from the **World Health Organization's priority list,** enabling proactive preparedness.

Independent Drug Regulator:

- India **requires a robust clinical trial network** recognized by international regulatory authorities to ensure rapid access to innovative solutions during public health emergencies.
- The report emphasised that the Central Drugs Standards Control Organisation **(CDSCO),** which oversees the import, sale, manufacture, and distribution of drugs, **should operate independently and be granted special powers**.
    - ☐ Currently, the **CDSCO functions under the Ministry of Health.**

India's Critical Role in Ending AIDS by 2030

Sub Topic- Issues related to Health

Context: The **UNAIDS director for** the **Asia Pacific and other regions** emphasised that **achieving** the **Sustainable Development Goal of ending AIDS** as **a public health threat by 2030** is **unlikely without significant contributions from India**.

More on News:

India has **shown** a **strong commitment to combating HIV/AIDS**, with **new HIV infections decreasing** by **44%** and **AIDS-related deaths decreasing** by nearly **80%** between **2010** and **2023**—outpacing the global average.

What Is HIV/AIDS?

- ***Human Immunodeficiency Virus*** is a virus that specifically **attacks** the **immune system**, **targeting cells** that are **essential** for **fighting infections**.
- The virus is primarily **transmitted through contact** with **certain bodily fluids**, most commonly **via unprotected sexual intercourse** or by **sharing injection drug equipment**.
- **If left untreated, HIV** can **progress** to **AIDS (*Acquired immunodeficiency syndrome*)**, which is **a more severe condition** characterised by a significantly weakened immune system.
- **A person is diagnosed with AIDS when:**
    - ☐ Their **CD4 cell count falls below 200 cells/mm³ of blood**. For a **healthy immune system, CD4 counts** typically **range** between **500 and 1,600 cells/mm³**.
    - ☐ They **develop one or more opportunistic infections**, regardless of their CD4 count.

Challenges:

- Despite these successes, challenges remain. **In 2023**, approximately **68,000 new HIV infections** were **reported in India**, indicating that **around 185 people** were **infected each day.**

- **To close this gap**, **UNAIDS stresses** the **importance of focusing on specific states** and **districts** where the prevalence of HIV is higher**.**

Key Strategies for Success:

- **Prevention is Key: UNAIDS Director emphasises** that prevention must be at the forefront of India's HIV response.
  - ☐ **Every new infection means a person requires lifelong treatment**, **making prevention crucial** for a sustainable HIV response.
- **Community-Led Initiatives:** The **global AIDS strategy calls for 80%** of **prevention services** to be delivered by community-led organisations.
  - ☐ These **organisations** are **best positioned to reach key populations** and **need** the **right resources** and **support** to **lead effectively**.
- **Sustainable Health Systems:** Planning for long-term sustainability beyond 2030 is essential.
  - ☐ This involves **ensuring** that **health systems** for HIV and general health are **co-designed** and **co-implemented** by **communities** and **civil society** to **respond to people's needs.**
- **Access to New Treatments: Continued progress** in **reducing AIDS-related deaths relies** on **expanding access** to **new treatments** and ensuring that people living with HIV receive the care they need.

90-90-90 Principle

- The **90-90-90 strategy** was **introduced by** the **United Nations Programme on HIV/AIDS (UNAIDS) in 2013** as a **global goal to tackle the HIV epidemic**.
- **The initiative aimed for significant milestones to be reached by 2020:**
  - ☐ **90% of people living with HIV will know their HIV status**. This goal **emphasises** the **importance of widespread testing and awareness**, ensuring that the majority of those infected are diagnosed.
  - ☐ **90% of those diagnosed with HIV will receive sustained antiretroviral therapy (ART)**. This means that **once diagnosed, individuals** will **have access to effective treatment** to manage their condition.
  - ☐ **90% of those on ART will achieve viral suppression**. This indicates that the **treatment is effective enough to reduce** the **viral load to undetectable levels**, significantly **lowering** the **risk of transmission to others**.
- The **90-90-90 strategy** is **grounded** in the **principle of "test and treat,"** which **highlights** that **early identification** and **timely treatment** can **prevent** further **transmission** of the **virus**.
  - ☐ By ensuring that a high percentage of people living with HIV are diagnosed and treated, the strategy aims to reduce overall incidence at the population level and move closer to controlling the HIV epidemic.

The Fight Against Sickle Cell Disease

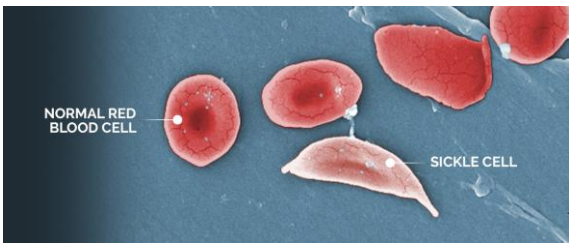
Sub Topic- Issues related to Health

Context: In rural Maharashtra, a committed **team of healthcare professionals** is tirelessly **fighting against sickle cell disease (SCD)**, a **genetic disorder** that has **affected** the **community for generations**.

- **Leading** this effort is **Chinchpada Christian Hospital**, where Doctors are making significant strides in enhancing the lives of those affected by this disease.

Sickle Cell Disease (SCD):

- **Sickle cell disease** is a relentless condition **characterised** by the **deformation of red blood cells into a sickle shape**.
- It **can reduce life expectancy by at least 20 years**, often **leading** to **slow-progressing organ failure in older patients** and **acute chest syndrome**, a serious lung injury, **in younger individuals**.



- **Most affected individuals** are **young, poor**, and **rural**, **presenting** with **symptoms** like **intense pain, high fever**, and **severe anaemia** requiring blood transfusions.
- **Symptoms vary widely** among patients, **resulting** in **complications** such as **anaemia from blood cell destruction** and **painful blockages in blood vessels**, which can **cause severe pain** and potentially **lead to organ failure**, **necessitating** ongoing **medical attention** and **intervention**.

Medical Management Challenges:

- **Healthcare Struggles:** The disease often challenges even experienced healthcare professionals, leading to feelings of defeat.
- **Long-term Care:** Treatment is lifelong, with options like **gene therapy** or **bone marrow transplants** being **cost-prohibitive** for many in India.

Initiatives at Chinchpada Hospital:

- **Blood Transfusion Support:** The hospital **secured State Blood Transfusion Council cards for 250 SCD patients**, **ensuring free blood transfusions**, a critical need for severe anaemia.
- **Preventive Healthcare:** The hospital **provides patients free vaccinations** to prevent infections such as **bacterial pneumonia, influenza,** and **meningitis**.
- **Subsidised Treatment:** The hospital **subsidises** the **cost of hydroxyurea**, a **medication** that **reduces defective haemoglobin** (Hb S) and **increases normal haemoglobin levels**.
    - ☐ **By using hospital funds** and donations, this **program improves patient compliance** and **quality of life**, **reducing** the **frequency of painful crises** and the **need for blood transfusions**.
- **Disability Schemes: Patients** are **enrolled** in **government disability programs** to **receive pensions** and **benefits**. This support **helps improve** the **financial stability of affected families**.

- **Palliative Care:** The hospital's experience in **palliative care enhances pain relief** and **symptom management for SCD patients**, focusing on improving overall well-being.
- **Community Engagement:** The hospital **organises events** like **World Sickle Cell Day** and **sends personalised birthday cards to patients**, fostering a supportive community atmosphere.
    - ☐ **Awareness programs** in villages and schools **educate** the **public about SCD,** its **symptoms**, and the **importance of early diagnosis**.
    - ☐ **Teachers**, including some **who are patients, play a key role in identifying children with symptoms**.
- **Ethical Stance:** The hospital **opposes policies** that **encourage prenatal diagnosis** of sickle cell disease, **which could lead** to **abortions**, advocating instead for support and care for affected individuals.

Ongoing Challenges:

- **Lack of Awareness:** There is a widespread lack of knowledge among medical professionals and communities, resulting in misdiagnosis and inadequate treatment.
- **Training Needs:** Medical students and young doctors require better training to recognise and manage SCD effectively.
- **Socio-economic Factors:** Addressing socio-economic barriers is crucial for comprehensive management and support for affected families.

Marital Rape

Sub Topic- Issues related to social sector

Context: The provision of **Marital Rape Exception(MRE)** is under **challenge before the Supreme Court of India** and the Centre has filed an affidavit in support of MRE.

Current Legal Framework on MRE:

- The Marital Rape Exception (MRE), in **Section 63, Exception 2 of the Bharatiya Nyaya Sanhita, 2023 (Section 375,** Exception 2 of the Indian Penal Code, 1860) states that 'Sexual intercourse or sexual acts by a man with his own wife, the wife not being under eighteen years of age, **is not rape.'**
- **The Justice J.S. Verma Committee Report (2013),** which was constituted in the aftermath of the Nirbhaya gang-rape case, recommended the criminalization of marital rape. However, the Indian government has yet to act on this recommendation.
- **Domestic Violence Act (2005):** Marital rape is only recognized under the Protection of Women from Domestic Violence Act, 2005, which provides civil remedies but does not criminalize marital rape.

Magnitude of Marital Rape in India and World:

- **International Centre for Research on Women (2011):** Reported that nearly 20% of Indian men have committed sexual violence against a female partner at least once.
- **National Health and Family Survey (NFHS-4) (2015-16):** 5.6% of women reported being physically forced by their husbands to engage in sexual intercourse against their will.
- **National Health and Family Survey (NFHS-5):** Found that **6% of women have experienced sexual violence,** with over 80% of these women identifying their husbands as the perpetrators. Additionally, 30% of women between the ages of 18 and 49 reported experiencing physical violence since the age of 15.
- **Global Status of Marital Rape Criminalization:** By 2019, over 150 countries had criminalized marital rape including Australia, Canada, South Africa and UK.

Centres stand for MRE:

- **MRE and Article 14 i.e Right to Equality :** MRE does not violate Article 14 (right to equality) since married and unmarried women are not similarly placed.
- **Sanctity of Marraige and Potential for Misuse:**Criminalizing marital rape would undermine the sanctity of marriage and lead to false allegations.
- **Outside Judicial domain in 2 grounds**
  - ☐ **Social, Not Legal Issue :** Marital rape is a social, not legal issue, and therefore outside the Court's jurisdiction.
  - ☐ **Under Legislative Domain and not Judicial**
- **Lack of Eyewitnesses:**As marital rape occurs within the private confines of marriage, lack of eyewitnesses presents significant challenges in proving the crime. However, this issue is also prevalent in other rape cases and those under the POCSO Act.

Argument against MRE:

- **Violation of Fundamental Rights:** Critics argue that the MRE violates the **rights to equality (Article 14) and personal liberty (Article 21).** Marital rape disregards a woman's right to bodily autonomy and dignity, making her vulnerable to abuse within the institution of marriage.
- **Changing Social Norms:** The institution of marriage has evolved, and the notion of spousal consent must be seen within the **larger framework of individual autonomy and dignity.**
- **Severe Form of Sexual Violence:**Marital rape is a serious form of sexual violence that many progressive societies criminalize as a step toward gender justice.
- **Perpetuation of Patriarchy:**Decriminalizing marital rape reinforces patriarchal beliefs, treating wives as property, thereby allowing husbands to exert unchecked power over them.
- **International Obligations:** India is a signatory to several international conventions, such as the Convention on the **Elimination of All Forms of Discrimination Against Women (CEDAW),** which call for the criminalization of all forms of violence against women, including marital rape.

Measures for addressing Marital Rape:

- **Legal Reforms**: Eliminate Section 375 (Exception) of the IPC to include marital rape in the definition of rape, enhancing legal protections for women against abusive spouses.
- **Empowering Survivors**: Ensure that legal changes provide necessary support for survivors, facilitating their recovery and protection from domestic violence and sexual abuse.
- **Changing Attitudes**: Promote a societal shift in attitudes towards marital rape, fostering awareness and condemnation of the issue among legal professionals and the general public.

Conclusion:

The argument that defining criminal offences is a legislative matter has some merit, but it may be largely irrelevant. The **Court's role is to assess the constitutionality of existing laws,** such as the **Marital Rape Exception (MRE), which falls under Part III of the Constitution of India.** While the Court may not decide if marital rape should be criminalized, it **can determine if MRE violates fundamental rights** and strike it down if it does.

***Subject* - International Relations**

Tech Diplomacy 4.0

Sub Topic- Regional Groupings, Bilateral Groupings & Agreements, Groupings & Agreements Involving India and/or Affecting India's Interests

Context: Prime Minister Narendra Modi's recent visit to the United States underscored the **central role of technological cooperation in India-US relations.**

More on News:

- Technology was a focal point in PM's meetings with President Joe Biden, the Quad summit, his discussions with US business leaders, and his address at the United Nations Summit of the Future.
- The breadth of the outcomes reflects the growing significance of technology diplomacy.

Tech Diplomacy 4.0:

It is **an emerging concept** that highlights the **intersection of technology and international relations,** recognising the growing **influence of technology on global governance and cooperation.**

Definition and Importance:

- **Tech Diplomacy:** Also referred to as **"techplomacy,"** this term was coined by the **Danish Ministry of Foreign Affairs in 2017.**
  - ☐ It involve**s using diplomacy to engage with the tech sector to address socio-economic, environmental, and security issues.**
  - ☐ It aims to **foster collaboration** between governments, tech companies, civil society, and other stakeholders to shape a beneficial global technology landscape.
- **Addressing Global Challenges:** As we navigate the **Fourth Industrial Revolution,** traditional forms of diplomacy are often inadequate for tackling complex issues such as climate change, cybersecurity, and the digital divide.
  - ☐ Tech diplomacy offers **innovative solutions by facilitating dialogue and cooperation among diverse actors.**

Key Components:

- **Engagement with Non-State Actors:** Tech diplomacy emphasises collaboration not just between states but also with non-state actors like **tech companies and civil society organisations.**
- **Policy Advocacy:** It seeks to **bridge regulatory gaps** by advocating for sound policies that address ethical concerns, privacy issues, and human rights implications associated with emerging technologies.
- **Investment and Partnerships:** Tech diplomacy involves **attracting investments from global tech companies and fostering partnerships** that can enhance local innovation ecosystems. This includes initiatives like joint research and development programs.
- **Capacity Building:** There is a focus on **enhancing digital literacy and infrastructure** in underserved communities to ensure equitable access to technology's benefits, thereby addressing the digital divide.

Global Trends:

- **International Recognition:** The establishment of **tech ambassadors and envoys** in various countries reflects the increasing importance of tech diplomacy in shaping international relations.
  - ☐ For example, **Denmark's appointment of its first tech ambassador** marked a significant step in recognising technology's role in diplomacy.
- **Inclusive Approaches:** There is a growing recognition that tech diplomacy **must include perspectives from lower-income economies** to ensure equitable participation in the digital economy.
  - ☐ Initiatives like the **Digital Cooperation Organisation** aim to foster inclusive growth through global multi-stakeholder cooperation.
- **Framework Development:** The creation of international frameworks for governance around emerging technologies is crucial.
  - ☐ This includes collaborative efforts like the **Global Partnership on Artificial Intelligence,** which seeks to establish guidelines for responsible AI use.

India's Tech Diplomacy:

Several factors like the Indian government's **focus on advanced technology development, Washington's search for reliable partners** amid its strategic rivalry with China and **Global efforts to reconfigure supply chains** played a crucial role.

- **Bilateral Cooperation with the US:** Modi's interactions with US leaders have focused on technological cooperation across various sectors such as **semiconductors, biotechnology, and clean energy,** emphasising India's strategic importance in global tech partnerships.
- **Partnership with other Countries:** India's technology engagement now extends to key nations like **France, Germany, Britain, Australia, Japan, South Korea, Singapore, and the European Union.**
- **Strengthening Domestic Capabilities:** The Indian government aims to **modernise its techno-industrial base** through collaborations that enhance both civilian and military technological capabilities.

Phases of Tech Diplomacy:

- **First Phase (1950s):** India's pursuit of advanced technology began in the 1950s when **Prime Minister Jawaharlal Nehru prioritised acquiring cutting-edge technologies to drive economic modernisation.**
    - ☐ Along with scientist **Homi Bhabha,** Nehru sought support from the US and other Western powers to lay the foundations for **India's nuclear and space programs.**
    - ☐ The **US also supported India's Green Revolution** by collaborating on agricultural technology.
    - ☐ At the time, **India's perceived status as a democratic alternative to communist China,** coupled with the US's enthusiasm for **"scientific internationalism,"** provided a boost to India's technology diplomacy.
- **Second Phase (1970s):** By the 1970s, India's technological momentum **began to slow**.
    - ☐ Domestic **economic populism,** rising **anti-American sentiment,** growing **bureaucratic hurdles**, and a **shift towards Moscow** strained ties with the West.
    - ☐ India's **1974 nuclear test** and the subsequent **tightening of the global non-proliferation regime** further hampered its ability to engage in technology diplomacy.
    - ☐ The dismissal of opportunities in non-sensitive areas **led US semiconductor companies to relocate to Singapore and Malaysia**, while Indian scientists and engineers trained in the country's top institutions sought opportunities abroad, especially in the US.
- **Third Phase (1980s):** In the 1980s, Prime Ministers **Indira Gandhi and Rajiv Gandhi** made efforts to restore technological cooperation with the US.
    - ☐ Rajiv Gandhi, in particular, emphasised **telecommunications and computing**, helping to rekindle bilateral collaboration.
    - ☐ However, **internal bureaucratic resistance and external limitations** imposed by the non-proliferation regime prevented more substantial progress.

- India's **1998 nuclear tests initially worsened relations with the US**, leading to additional sanctions. However, this **also opened the door to reconciliation on nuclear issues.**
- The governments of Atal Bihari Vajpayee and Manmohan Singh worked to capitalise on this, culminating in the **2005 India-US Civil Nuclear Agreement.**
- Despite the breakthrough, **political divisions and resistance from the scientific establishment limited its impact.**

- **Fourth Phase (2014 Afterwards):** The fourth phase of India's technology diplomacy has injected fresh momentum into the partnership.
  - India **prioritised digital and green technologies** and expanded its **focus to AI and semiconductors**.
  - The strategic challenges posed by China has driven the US to deepen its defence and technology partnership with India, culminating in the **Initiative on Critical and Emerging Technologies (iCET).**
  - The recent **joint statement in Wilmington** builds on this framework of strategic and technological collaboration.

While the fourth phase of India's technology diplomacy has seized new international opportunities, it is imperative that India reforms its science and technology sectors to support this momentum. Without addressing internal bureaucratic resistance, the country risks achieving suboptimal outcomes in its technology-driven diplomacy.

Origin and Development of Cognitive Warfare Concept

Sub Topic- Effect of policies and politics of Developed and Developing Countries on India's Interests

GS Paper III - Internal Security

Context: Zeng Huafeng from the National University of Defense and Technology (NUDT) introduced the term 'national cognitive security'.

Cognitive Security

Cognitive security, often referred to as **COGSEC,** is an emerging field that focuses on **protecting decision-making processes from adversarial influences,** particularly in the context of social media and information warfare.

Historical Context

- The concept can be traced back to ancient military strategies, notably in Chinese military thought. As early as 2070 BC, **Chinese strategists *(Sun Tzu's "The Art of War")*** recognized the importance of **psychological manipulation** in warfare, coining the term **"war of attacking the heart"** to describe tactics aimed at

undermining an opponent's morale and will to fight.

- The formal academic discourse around cognitive warfare began in the early 20th century. **J.F.C. Fuller** introduced the term **"psychological warfare"** in 1920, highlighting its potential to replace conventional military engagements with strategies focused on manipulating perceptions and beliefs. This shift became particularly relevant during the **Cold War,** where both the **United States and the Soviet Union employed disinformation and psychological tactics** to influence public opinion and decision-making processes.
- In contemporary contexts, cognitive warfare has evolved significantly due to advancements in cognitive psychology and the rise of digital platforms. The advent of **cyberspace has amplified the capacity for disinformation campaigns**, allowing state and non-state actors to exploit cognitive biases on a massive scale.

Importance of Cognitive Security

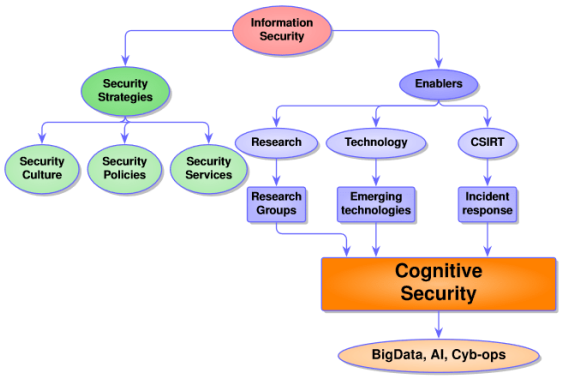
- **Enhanced Threat Detection and Response:** By learning from past incidents, cognitive security systems can predict and mitigate future attacks, enhancing overall security posture.
- **Automated Decision-Making:** Cognitive security tools can autonomously assess threats and decide on actions such as blocking or quarantining them.
- **Improved Incident Response:** By minimising the time required to detect and respond to threats, cognitive security helps organisations reduce the impact of cyber incidents.
- **Adaptive Learning:** Cognitive security systems continuously learn from new data, which enhances their accuracy over time.
- **Protection Against Manipulation:** Cognitive security also addresses the challenges posed by adversarial tactics aimed at manipulating public perception and decision-making processes.
- **Safeguarding Public Trust:** Cognitive security plays a critical role in countering misinformation campaigns that seek to undermine this trust, thereby supporting democratic processes and societal stability.
- **Comprehensive Defense Mechanism:** Cognitive security represents a shift from traditional cybersecurity measures by integrating cognitive science with technology.

Ethical Considerations

- **Manipulation vs. Autonomy:** Cognitive warfare often relies on disinformation and psychological manipulation, which **can undermine individual autonomy and informed decision-making.**
- **Justification of Means:** It raises concerns about the **potential normalisation of unethical practices** in pursuit of political objectives. The concept of **"dirty hands"** emerges here, where actions deemed morally questionable might be rationalised for perceived greater goods.
- **Attribution Challenges:** The difficulty in attributing responsibility for disinformation campaigns can lead to a **lack of transparency and accountability,** further eroding trust in democratic institutions.
- **Countermeasures vs. Values:** Defending against cognitive warfare often requires measures that may conflict with democratic values, such as freedom of speech and open discourse.

More on News:

- China's **Academy of Military Sciences (AMS)** published a book on **'mind superiority',** outlining the **PLA's strategy of using psychological warfare to dominate cognitive thinking and decision-making.**
- The goal is to **gain control of the enemy's cognitive domain** by weakening their will to fight and creating decision-making doubts, aiming to **'win without fighting'.**



Differences Between Cognitive Warfare and Other Non-Kinetic Warfare Forms:

- **Cognitive vs Propaganda Warfare:** Propaganda controls information flow to soldiers, while cognitive warfare shapes interpretation and response, targeting the general public.
- **Cognitive vs Cyber Warfare:** Cyber warfare attacks information systems, whereas cognitive warfare uses social media to shape perceptions.
- **Cognitive vs Psychological Warfare:** Psychological warfare affects soldiers' psychology, while cognitive warfare targets the cognition of an entire population.
- **Cognitive vs Public Opinion Warfare:** Public opinion warfare uses mass communication, but cognitive warfare leverages interpersonal and group communication.

Cognitive Warfare in China's Strategic Framework:

- **Suggestions for Improving Cognitive Warfare Capabilities:** Meng Haohan and Lan Peixuan from NUDT propose enhancing strategic communication, rejecting cognitive offensives, and integrating cognitive, physical, and information domains.
- **National Cognitive Security:** The security of China's cognitive domain focuses on protecting social cognition against external interference using AI, deep fakes, and social media bots.
- **Precautionary Measures for Cognitive Security:** China should strengthen ideological positions, resist **'historical nihilism',** and enhance cultural identity. It must also engage in global cyberspace governance and develop technologies to secure cognitive defence.

The Role of the Metaverse in Cognitive Warfare:

- **Metaverse as a Cognitive Warfare Tool:** Identified as a new frontier in future cognitive warfare, the metaverse can shape human cognitive thinking using a blend of virtual and real-world technologies.
- **Technological Advantage in Cognitive Warfare:** The metaverse's integration of augmented reality, AI, blockchain, and communication technologies gives it a strategic role in cognitive warfare.

China's Response to Cognitive Attacks:

- **Safeguarding Social Cognition:** With the rise of digital platforms, Chinese leadership under Xi Jinping saw the need to protect social cognition from external narratives, particularly from the West.
- **Wary of Colour Revolutions:** The Chinese government remains vigilant against 'Colour Revolutions' that could be instigated through cognitive warfare.
- **Countering US Cognitive Warfare:** China accuses the US of spreading false information in an organised manner as part of cognitive warfare against China.

Chinese Propaganda and Information Control Mechanisms:

- **Platforms Influencing Public Opinion:** Social media platforms like Weibo and Bilibili play a role in influencing domestic public opinion, especially among Chinese youth.
- **Weaponisation of Think Tanks:** Chinese analysts highlight the dangers of foreign think tanks influencing domestic narratives, emphasising the need to develop China-centric think tanks.

Strengthening Cognitive Defence through Military and Civil Research:

- **PLA's Use of Virtual Reality in Training:** The PLA uses VR technology in military training to enhance soldiers' cognitive and physical capabilities without real-world risk.
- **Government Support for Cognitive Science Research:** The Chinese government encourages universities and private companies like Tencent and Baidu to develop cognitive technologies, with focus areas including AI, brain-computer interfaces, and natural language processing (NLP).
- **Military Applications of NLP:** NLP-powered technologies like ChatGPT are seen as beneficial in intelligence gathering and battlefield management, enhancing real-time decision-making.

China-Vietnam Red diplomacy

Sub Topic- Regional Groupings, Bilateral Groupings & Agreements, Groupings & Agreements Involving India and/or Affecting India's Interests

Context: Vietnamese President To Lam's recent visit to China sought to rekindle the historical ties between the two nations, evoking the camaraderie of Mao Zedong and Ho Chi Minh to strengthen political trust.

Red Diplomacy

It is a term that generally refers to **the strategic use of "red lines" in international relations, particularly in diplomatic contexts.** These red lines signify boundaries or

thresholds that, if crossed, could lead to severe consequences or responses from a state.

Key Features of Red Diplomacy

- **Definition of Red Lines:** A red line is a **point or limit that must not be exceeded** or violated.
- **Purpose:** The main purpose of establishing red lines is **deterrence.**

Examples in Practice

- **U.S. and Syria:** The United States has historically used red lines in its foreign policy, notably **during the Syrian civil war when President Obama stated that the use of chemical weapons by the Assad regime would constitute a "red line"** that could trigger U.S. intervention.
- **Israel and Iran:** Israel has articulated red lines concerning **Iran's nuclear program,** indicating that certain levels of uranium enrichment would provoke military action to prevent nuclear proliferation.

More on News:

- For Beijing, which faces **increasing pressure from Western alliances**, this ***"communist breeze"*** from the South China Sea was a **welcome relief**.
- The visit occurred **amid efforts by the U.S. and the Philippines to align with Vietnam** to challenge China in the South China Sea.
- President Lam, after becoming General Secretary of the Communist Party of Vietnam (CPV), **chose China for his first foreign visit,** beginning in Guangzhou, the birthplace of the CPV.

Shared Future:

- Vietnam and China issued a joint statement reaffirming their commitment to strengthening their **"comprehensive strategic cooperative partnership"** and envisioning a **"Vietnam-China community with a shared future,"** in response to increasing external pressures.
    - ☐ The statement highlighted **Xi Jinping's prioritisation of Vietnam in China's neighbourhood diplomacy** and expressed support for Vietnam's Communist Party leadership.
- The joint statement stressed the **importance of theoretical exchanges, experience sharing, and cooperation between** the CPV and CPC **to further the socialist cause,** with Chinese experiences serving as a model for the CPV.
    - ☐ Despite their cooperation, **historical tensions**—such as the brief camaraderie that faded after the China-Vietnam war in 1979—indicate that their **shared socialist systems do not always translate into aligned worldviews or strategic interests.**

Expanding Partnerships:

- During the visit, Vietnam and China **signed 14 agreements** to strengthen their strategic partnership in areas like **connectivity, infrastructure, and healthcare.**
- In 2023, bilateral trade reached $171.9 billion, with **China as Vietnam's largest import market and second-largest export market.**

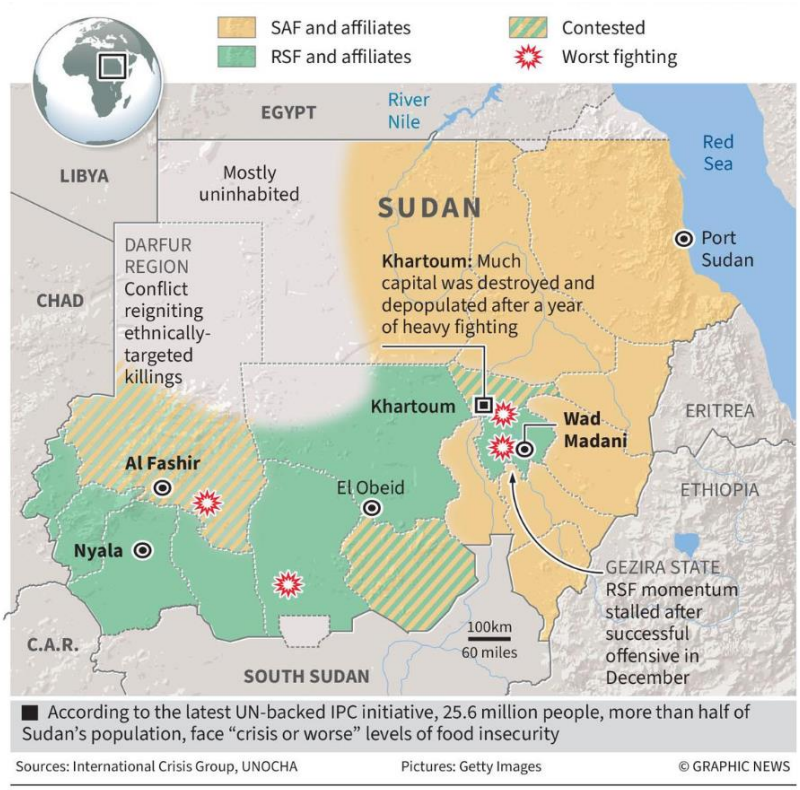
India and Vietnam:

- Despite ongoing **territorial disputes over the Paracel Islands**, trade imbalances, and security concerns, Vietnam has adopted a strategy known as **"Bamboo Diplomacy,"** introduced by late CPV General Secretary Nguyen Phu Trong.
    - ☐ This approach ***sees Vietnam cautiously navigating regional and international security dynamics by "hedging" with countries like the U.S., India, Russia, and Japan to protect and maximise its strategic interests.***
- For Vietnam, **India serves as a centre for religious pilgrimage** due to their **Buddhist civilizational ties,** while **China represents an ideological pilgrimage,** revitalising their shared revolutionary history and political alliances.
- New Delhi, in turn, **can leverage its cultural and historical connections,** including their shared colonial resistance, to strengthen its strategic partnership with Hanoi.
- The relationship between India and Vietnam remains **obstacle-free, driven by shared ambitions for a prosperous and multipolar Asia.**
- Under the **"Act East" policy**, India aims to **enhance its engagement with the region.**
- Deepening **cultural and economic ties with Vietnam will make it a key partner for India in Southeast Asia**, supporting their mutual vision for regional stability and global order.

Sudanese Civil War

Sub Topic- Regional Groupings, Bilateral Groupings & Agreements

Context: On September 26, the **Sudanese Armed Forces (SAF) launched a major offensive against the paramilitary Rapid Support Forces (RSF)** in Khartoum and Bahri, reigniting the conflict after a relatively quiet period.



More on News:

- Eighteen months into the civil war, the **United Nations has reported over 20,000 deaths,** while the **International Organisation for Migration (IOM) recorded around 10,890,722 internally displaced persons (IDPs)** as of October 1.
- Despite multiple ceasefire attempts, **all efforts at peace talks have failed,** with the latest offensive coming ahead of the U.S.-led negotiations at the UN General Assembly.

Key players in the conflict:

- The Sudanese civil war has been raging for over 18 months, primarily between **two military factions: the SAF and the RSF.**
- The conflict, rooted in a **power struggle between SAF leader Abdel Fattah al-Burhan and RSF head Hamdan Dagalo,** began in Khartoum but has since spread to areas like ***Omdurman, Bahri, Port Sudan, El Fasher, and the Darfur and Kordofan states.***
- The **RSF currently holds an advantage in several regions**, though the SAF has launched airstrikes and regained control of small areas around Khartoum since August.
- The **humanitarian crisis continues to worsen** across the country, particularly in the Darfur region, where access to aid and healthcare is severely restricted.
- Both sides have been **accused of war crimes,** including sexual violence and extrajudicial killings.

- ☐ In August, the UN declared famine in North Darfur's Zamzam camp, which hosts nearly 500,000 IDPs.
- ☐ Fourteen regions in Darfur, Kordofan, and Jazeera face similarly dire conditions.
- ☐ As of the latest UN report, **25.6 million Sudanese,** more than half the population, are experiencing **severe food insecurity,** compounded by heavy rains, floods, and a cholera outbreak that has claimed over 200 lives.

Why is the war still ongoing?

- **Legitimacy:** Both the **SAF and RSF remain determined to solidify their power and legitimacy.**
  - ☐ The **SAF claims** to be Sudan's legitimate government, a stance tentatively **recognised by the UN,** despite coming to power in a 2021 coup.
  - ☐ Meanwhile, the **RSF holds strategic territories** and opposes the SAF's attempts to represent Sudan internationally.
    - ☐ The RSF, originally an **Arab militia known as Janjaweed**, is seeking support from Arab nations to bolster its claim to power.
- **Easy Access to Weapons:** Although Sudan has been under a **UN arms embargo** since the Darfur crisis in 2004, **weapons have continued to flow into the country**.
  - ☐ A July report from **Human Rights Watch** revealed that **both sides are using advanced weaponry,** including drones, anti-tank missiles, and rocket launchers, **sourced from China, Russia, Iran, Serbia, and the UAE.**
- **Ethnic Dimension:** It is because **Arab and non-Arab militias aligning with the RSF and SAF, respectively.**
  - ☐ The RSF and its allied Arab militias have targeted non-Arab communities, particularly the Masalit in Darfur, intensifying the conflict.
- **External Players:** Additionally, the **SAF has accused the UAE and Russia's Wagner Group of supporting the RSF,** although both have denied direct military involvement.
  - ☐ The group is **allegedly helping supply weapons to the RSF through the Central African Republic,** while Russia has provided arms to the SAF.
- **Lack of Visibility:** Limited media attention and restricted access for international organisations in war zones have further complicated mediation efforts.

Peace Efforts:

- **Ceasefire Attempts:** Nine ceasefire attempts, **led mainly by the U.S. and Saudi Arabia, have all failed.**
  - ☐ Although both sides claim to be open to negotiations, they have **shown little willingness to comply with ceasefire agreements,** using these lulls to gain military advantages.
- **International Organisation:** Efforts by the **UN, African Union, EU, and Intergovernmental Authority on Development** have also been **unsuccessful.**
  - ☐ Egypt's call for an immediate cessation of hostilities at an Arab League meeting in May has similarly yielded no results.

Regional Impacts:

- **Neighbours:** The conflict has **forced more than two million people to seek refuge in neighbouring countries** such as **Chad, South Sudan, and Ethiopia.**
  - ☐ **Ethnic violence** has also increased along **Sudan's borders** with South Sudan, Ethiopia, and Eritrea, with more than 100 casualties reported in the **disputed Abiey region.**
  - ☐ **Clashes over agricultural land** have been frequent in the El Fashaga region on the Sudan-Ethiopia border, and the conflict has jeopardised an oil pipeline from South Sudan to the Red Sea.
- **Europe:** Refugee **camps are overwhelmed,** and there are **concerns in Europe that many will attempt to reach the continent.**
  - ☐ In February, a migrant boat carrying Sudanese refugees capsized along the **Tunisia-Italy route,** leading to dozens of deaths.

The Sudanese civil war remains complex, involving multiple actors across a wide geographic area, complicating international mediation efforts. Numerous failed ceasefires indicate the need to rethink diplomatic approaches. While the SAF has made some gains around Khartoum, defeating the RSF seems far off, and the RSF, lacking international recognition, is unlikely to compromise. There are growing fears of Sudan's potential division, similar to Libya's, as global attention is diverted to other crises, leaving Sudan's conflict to persist without resolution.

Chinese Blue Dragon Strategy

Sub Topic- Effects of Policies and Politics of developed and developing Countries.

Context: Recently China conducted large-scale military exercises around Taiwan, deploying 125 aircraft, including warplanes, drones, and the Liaoning aircraft carrier, to simulate blockading key ports.

More In News:

- This was seen as a **direct response to Taiwanese President Lai Ching-te's rejection of Beijing's claim of sovereignty over Taiwan during his National Day speech.**
- Taiwan labelled the drills as punishment for Lai's **"Taiwan independence"** stance.
- China has escalated military activities near Taiwan in recent years. Similar exercises occurred in 2**022 following the U.S. Speaker Nancy Pelosi's visit to Taiwan** and after Lai's inauguration in May 2024.

China's 'Blue Dragon' Strategy in the Indo-Pacific:

- **About:** China's Blue Dragon Strategy is a **multi-faceted geopolitical initiative** aimed at **asserting dominance in the Indo-Pacific region.**
  - ☐ It seeks to challenge U.S. influence by **expanding China's control across key maritime and continental areas,**
- **Frontiers:** It focuses on **four interconnected strategic frontiers.**

Taiwan and the East China Sea

- **Territorial Disputes and Military Pressure:** China aims to exert control over Taiwan and the **Senkaku Islands**.
- **Aircraft Carriers and Force Projection:** With the Liaoning and Shandong carriers, China demonstrates its naval capabilities, showcasing **grey-zone warfare tactics** to normalise its territorial claims.

South China Sea and Militarisation

- **Nine-Dash Line and New Map:** Despite international legal rulings against its claims, China continues to assert control over contested waters in the South China Sea, militarising artificial islands and enforcing the nine-dash line through naval and air exercises.

India, Sri Lanka, and the Indian Ocean

- **Encirclement of India:** China's territorial claims over **Aksai Chin and Arunachal Pradesh** serve to keep India militarily stretched. Additionally, **China's growing influence in Sri Lanka** through infrastructure investments like the Hambantota Port has alarmed India and the U.S.
- **Sri Lanka's Role:** China sees Sri Lanka as a crucial part of its Belt and Road Initiative, utilising it as a strategic foothold in the Indian Ocean.

Water Geopolitics and Southeast Asia

- **Control Over Major Rivers:** China's dam-building projects on the **Brahmaputra and Mekong rivers** give it geopolitical leverage over downstream countries like India and Bangladesh, creating dependency on Chinese water management policies.
- **Water Diplomacy:** By controlling these river systems, **China wields influence over agricultural and economic activities in Southeast Asia,** using water as a strategic asset.

Challenges for U.S. Containment Policy

- **Interconnected World:** Unlike the Cold War, the U.S. cannot simply divide the world into pro-China and pro-America blocs due to **intertwined global trade**, technology, and political relations.
- **Adaptation of U.S. Strategy:** The U.S. needs to maintain security guarantees through alliances like Quad and AUKUS while fostering stronger economic partnerships in the Indo-Pacific to effectively counter China's ambitions.

USA- Taiwan Porcupine strategy:

- **Origin:** The Porcupine Defense Strategy is a military and defensive concept primarily associated with Taiwan's defence against potential aggression from China. While it isn't formerly attributed to the United States, **the U.S. has supported Taiwan's adoption of this strategy** through arms sales and military cooperation.
- **Rationale for the strategy:**

Layered Defence Approach

- **Asymmetric Warfare:** Emphasis on smaller, mobile, and more agile military units capable of quick strikes and mobility rather than large conventional forces.
- **Distributed Defense Assets:** Rather than concentrating forces, defence assets are spread across a wide area, making them harder to target and neutralise.
- **Fortification of Key Assets:** Critical infrastructure, communication nodes, and defence systems are hardened to withstand initial strikes and remain operational in a conflict.
- **Use of Missiles and Anti-Access/Area Denial (A2/AD):** Taiwan would rely on an arsenal of missiles and defensive systems to deny China easy access to its territory, particularly along the Taiwan Strait.

☐ **Taiwan's Low Defence Budget:** Taiwan's **defence budget** for 2024 stands at **$27.6 billion,** significantly smaller than China's official military spending of **($327 billion).**

☐ **An Efficient Defence for Taiwan:** Taiwan's Porcupine Strategy has emerged as its most effective means of defence due to its **inability to compete with China conventionally.**

About the Strategy:

- **Deterrence through Resilience**

☐ The porcupine strategy is based on making a smaller country—like Taiwan—tough to invade, despite its relative size compared to a larger power like China.

☐ The idea is that by enhancing **defensive capabilities and creating a high cost of invasion, Taiwan becomes an unattractive target,** much like how a **porcupine's quills deter predators.**

- **Focus on Littoral Defence:** The strategy emphasises decisive battles in Taiwan's littoral zones, where **Chinese forces can be detected and targeted effectively**. The use of **small, inexpensive, and easily concealed weapons** is prioritised, including:
  - ☐ **Sea Mines:** To target Chinese naval vessels.
  - ☐ **Truck-Mounted Missiles:** Dispersed and hidden in urban or forested areas.
- **Shift from Conventional Equipment:** Taiwan is moving away from purchasing expensive conventional military assets, such as large armoured vehicles and fighter jets, to prioritise **cost-effective and survivable systems.**
- **Lessons from the Ukraine War:** Retired Admiral Lee Hsi-ming highlights the importance of lessons learned from the Ukraine conflict, **noting that even smaller forces can successfully resist larger adversaries.**
  - ☐ The porcupine strategy embodies this principle, **focusing on survival and resilience** in the face of a formidable threat.

Conclusion:

The **Porcupine Defense Strategy is** a cost-effective, resilience-focused approach to defending Taiwan from potential Chinese aggression. U.S. support for Taiwan's porcupine strategy is also a message to other allies in the region, signalling that the U.S. is committed to defending smaller nations against aggression from larger powers like China.

Churn on Durand Line

Sub Topic- Regional Groupings, Bilateral Groupings & Agreements

Context: India's public discourse is often **dominated by its bilateral relationship with Pakistan, diverting attention from more significant regional developments,** particularly those along the **Durand Line** between Pakistan and Afghanistan.

The **Durand Line** is a significant international border that **separates Afghanistan and Pakistan,** established in 1893 through an agreement between British diplomat Sir Henry Mortimer Durand and Afghan Emir Abdur Rahman Khan.

Key Issues:

- **Pashtun Qaumi Jirga:** The recent Pashtun Qaumi Jirga, held in the Jamrud area of Khyber district in Pakistan, **provides insights into the region's future**.
  - ☐ This **event may hold more relevance for South Asia than the speculation surrounding Indian External Affairs Minister S. Jaishankar's possible visit to Pakistan.**
- **Unchanging Nature of India-Pakistan Relations:** India-Pakistan relations are characterised by **great anticipation surrounding diplomatic engagements**, yet the structural problems persist.
  - ☐ Despite sporadic advances, **major breakthroughs in bilateral ties remain elusive**.
  - ☐ Even if Jaishankar's visit brings some positive outcomes, they are unlikely to significantly alter the deadlocked nature of the relationship.
- **Global Irrelevance of the Stalemate:** The frozen state of the India-Pakistan relationship, with intermittent military crises, has little significance for the region or the world.
  - ☐ **International attention only resurfaces during escalations** involving terror attacks, with concerns over potential nuclear conflict.
- **Bigger Geopolitical Shifts on Pakistan's Western Front:** While India-Pakistan ties remain stagnant, significant developments have occurred on Pakistan's western front.
  - ☐ Two key events from 1979—the **Iranian Revolution and the Soviet invasion of Afghanistan**—continue to shape regional and global geopolitics:
    - ☐ **Iranian Revolution:** The establishment of an Islamic Republic in Iran led to long-standing conflicts between Tehran and its neighbours, with **ongoing tensions between Iran, Israel, and the U.S.**, raising concerns of a potential larger conflict.

- **Soviet Invasion of Afghanistan:** The U.S.-backed jihad against Soviet forces in Afghanistan contributed to the rise of **Islamic militancy in the region**, which subsequently engulfed Pakistan itself, exacerbated by General Zia-ul-Haq's Islamisation policies.

Afghanistan and Regional Instability:

- **Afghanistan's Role in Regional Instability:** The **Taliban's return to power** in Afghanistan in 2021 has **intensified turbulence along the Durand Line.**
  - Pakistan's expectation of controlling Afghanistan through the Taliban has been dashed, as the **Taliban assert their autonomy and revive traditional Pashtun demands against Pakistan.**
  - Additionally, Kabul is accused of **harbouring the Tehrik-e-Taliban Pakistan (TTP),** which seeks autonomy in Pashtun regions, further destabilising Pakistan.
- **Pashtun Tahafuz Movement (PTM):** The PTM, **a movement representing Pashtun grievances, has risen in response to years of unrest** in the Pashtun regions.
  - Despite the government banning the movement, the recent Pashtun Qaumi Jirga put forth 22 demands, including the withdrawal of military forces from Pashtun lands, an end to state-enforced disappearances, and the restoration of visa-free travel across the Durand Line.
- **The Threat of Pashtunistan:** The demands for greater Pashtun autonomy **fuel Pakistan's fears of a potential independent Pashtunistan,** which could threaten the country's territorial integrity.
  - While the Pakistani military remains strong enough to suppress separatist movements, the unrest in the Pashtun lands, which has been building for over 50 years, is difficult to contain.
- **Unrest in Balochistan:** Adding to Pakistan's internal challenges is growing unrest in Balochistan, where **increasing violence against Chinese nationals and Punjabi settlers** is fueling further instability.
  - The discontent in both Pashtun and Baloch regions is likely to keep Pakistan's western borders volatile for years to come.

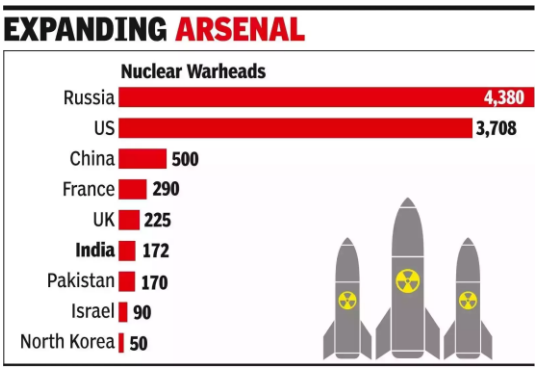
Conclusion

The continued destabilisation of Pakistan's western frontier is bound to have repercussions for its neighbours, including India. As Pakistan grapples with rising tensions on its western frontiers, India's approach to its bilateral relationship with Pakistan may need to be re-evaluated. The solutions to the enduring issues between India and Pakistan could be influenced by the lessons Pakistan learns from managing the unrest in its own western regions.

Resurgence of Nuclear Threats

Sub Topic- Effect of Policies & Politics of Countries on India's Interests

GS PAPER III - Nuclear technology



Context: The end of the Cold War once offered hope for a world free from the looming threat of nuclear weapons, with rival governments working together to reduce arsenals. However, recent developments suggest a return to heightened nuclear tensions.

More on News:

- Russian President Vladimir Putin has signalled a **shift in nuclear policy, underscoring Moscow's readiness to deploy atomic weapons if necessary.**
- This messaging **escalates the possibility of nuclear use,** despite no tangible signs of immediate preparations from Russian forces.
- Putin has also stationed nuclear weapons in Belarus, evoking concerns about the **destabilisation of NATO's eastern flank.**

Cases displaying Resurgence:

- **North Korea's Expanding Arsenal:** North Korea continues to expand its nuclear capabilities, raising alarms across Asia.
  - ☐ Its **partnership with Russia has deepened,** with North Korean leader Kim Jong Un reportedly **supplying artillery to Russia amid the Ukraine conflict.**
  - ☐ This alliance has **complicated global efforts to limit Pyongyang's nuclear ambitions,** as Russia has defied sanctions to facilitate trade with North Korea, further weakening the already fragile nonproliferation framework.
- **Iran's Nuclear Aspirations:** Iran's nuclear activities are advancing rapidly, sparking fears of a **potential arms race in the Middle East**.
  - ☐ Experts warn that Tehran is **just months away from developing a functional nuclear weapon.**
  - ☐ **Saudi Arabia** has declared that it **would pursue a nuclear program** if Iran crosses this threshold, adding to regional instability.
  - ☐ Similar discussions have emerged in **South Korea and Turkey**, with officials openly contemplating nuclear options to counter regional threats.

Erosion of Arms Control Agreements:

- **Collapse of U.S.-Russian Treaties:** Two key arms control agreements between the U.S. and Russia have unravelled in recent years.
  - ☐ The **Intermediate-Range Nuclear Forces (INF) Treaty** has already collapsed, and the **New START Treaty,** which limits the number of deployed warheads, will expire in 2026.
  - ☐ With no concrete replacement in sight, informal understandings may be the only remaining option to prevent an uncontrolled arms buildup between the two nations.

- **Vulnerability of the Nonproliferation Regime:** The 1970 Treaty on the **Non-Proliferation of Nuclear Weapons (NPT)** is under **significant strain.**
    - ☐ Once upheld by superpower consensus, the treaty now faces **growing scepticism** as tensions between the U.S., China, and Russia increase.
    - ☐ While most of the 191 NPT signatories abide by the treaty's principles, countries like **North Korea, Iran, and potentially others are testing its limits.**
    - ☐ The **erosion of trust** in the global nonproliferation system raises fears of new nuclear states emerging, undermining the treaty's core mission.

Global Implications of Nuclear Developments:

- **Potential for an Arms Race:** The growing uncertainty around nonproliferation has heightened the risk of an arms race.
    - ☐ **Iran's nuclear progress** could trigger **Middle Eastern countries**, such as Saudi Arabia, to pursue atomic capabilities.
    - ☐ **South Korea** has floated the idea of developing nuclear weapons to address the North Korean threat.
    - ☐ Similarly, **Turkey** has hinted at exploring nuclear options.
- **China's Nuclear Expansion:** China's nuclear buildup is unprecedented in both pace and scale.
    - ☐ With a current stockpile of **around 500 warheads**, Beijing is projected to reach **1,500 by 2035,** putting it on par with Russia and the U.S.
    - ☐ Despite these developments, China has shown **no willingness to engage in arms control negotiations.**
    - ☐ Its expansion has further complicated global nuclear dynamics, adding pressure on the U.S. and its allies to respond accordingly.

Strategic Responses to Nuclear Threats:

- **U.S. Policy Considerations:** The U.S. faces the **dual challenge** of **deterring both Russian and Chinese nuclear threats** while maintaining its **alliances in Europe and Asia.**
    - ☐ The Biden administration is **balancing diplomacy with efforts to prevent nuclear proliferation.**
    - ☐ In 2023, the U.S. secured a **commitment from South Korea to abstain** from developing nuclear weapons, in exchange for **enhanced American support** in the event of a North Korean attack.
- **International Cooperation and Nonproliferation Efforts:** Despite the setbacks, experts believe the global nonproliferation regime can still be preserved **through strategic diplomacy.**
    - ☐ While the focus often centres on rogue states like Iran and North Korea, **most countries remain committed to the NPT's principles.**
    - ☐ **Strengthening extended deterrence**—the U.S.'s assurance to protect allies using its nuclear umbrella—could restore confidence among partner nations and prevent them from pursuing independent nuclear programs.

However, **Rafael Grossi**, **Director-General of the International Atomic Energy Agency** (IAEA), has expressed concern about the growing appeal of nuclear weapons in

today's geopolitical climate. With great-power rivalry on the rise, the challenges to nonproliferation are becoming more pronounced, making cooperative efforts to curb nuclear ambitions more urgent than ever.

GS Paper II - Prelims Based Articles

Subject **- Polity, Governance, Constitution**

Biplab Sarma Committee Report

Sub Topic- Government Policies & Interventions

Context: After a meeting with representatives of the All Assam Students' Union (AASU), the Chief Minister of Assam initiated the process to implement 52 recommendations from the **Justice Biplab Sarma Committee** concerning Clause 6 of the Assam Accord.

More on News:

- This move comes over **four years after the Centre-appointed high-level committee submitted its report in February 2020.**
- However, **15 key recommendations requiring Constitutional amendments will not be implemented** at this time, with the chief minister stating that these issues will be raised with the Centre at an appropriate forum.

Biplab Sarma Committee Report:

- It was the result of a 14-member panel formed by the Union Home Ministry in July 2019 to **suggest ways to implement Clause 6 of the historic Assam Accord.**
  - ☐ The **Assam Accord**, signed in 1985 between the Rajiv Gandhi-led Union government and leaders of the Assam Movement, including the All Assam Students' Union (AASU), **aimed to address concerns about the influx of Bangladeshi migrants into Assam.**
  - ☐ **Clause 6** of the accord promised **constitutional, legislative, and administrative safeguards** to protect the **cultural, social, and linguistic identity of the Assamese people.**
- Chaired by **retired Assam High Court Justice Biplab Kumar Sarma**, the committee included judges, bureaucrats, writers, AASU leaders, and journalists.
- One of its primary tasks was to **define "Assamese people"** eligible for these safeguards.
- The report's key recommendation defined "Assamese people" **as Indigenous Tribals, Other Indigenous Communities of Assam, Indian citizens residing**

in Assam on or before January 1, 1951, and their descendants, and Indigenous Assamese.

- It also **proposed reservations** for Assamese people in Parliament, the State Assembly, local bodies, and public sector jobs.

Rising Litigation in India

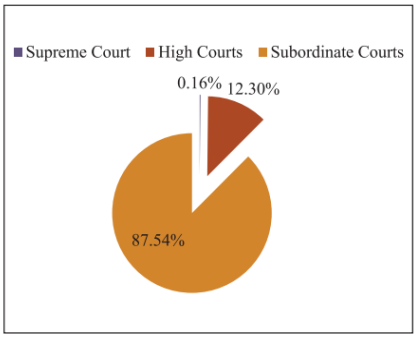
Sub Topic- Indian Judiciary

Context: The Indian judiciary faces significant delays, causing people to hesitate in seeking justice. This issue was highlighted by President Droupadi Murmu, who referred to the phenomenon as the **"black coat syndrome,"**.

About Black Coat Syndrome:

- While the term is symbolic, it underscores a real issue — that **many people are reluctant to engage in litigation due to the gruelling process,** which includes endless adjournments, numerous appeals, and escalating legal costs.

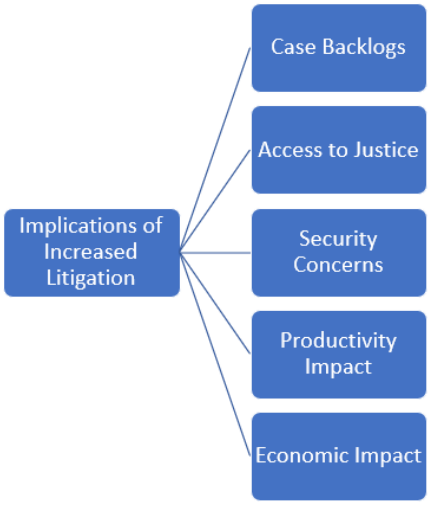
Figure 1: Distribution of Pending Cases among different levels of Courts in India



Source: Supreme Court of India and NJDG, 2019.

Reasons for Rising Litigations:

- **Challenges in Court Scheduling and Case Management: Although Case Flow Management Rules were introduced** to improve efficiency, inconsistent implementation has limited their effectiveness.
- **District Judiciary Pressures:** Judges face systemic pressures, **often prioritising certain cases based on higher court directives,** which can disrupt scheduling.
- **Incentives and Evaluations:** Judges are often not incentivized to adhere to timelines, and extensions are frequently granted.
    - ☐ The **"units system"** for performance evaluation encourages judges to **prioritise simpler cases over complex ones**, leading to further delays.
- **Impact of Lawyers:** Lawyers influence court schedules by strategically choosing which cases to attend. The unpredictability of case hearings leads to congestion and increased adjournments.



- **Delays Due to Stays and Interim Orders:** Obtaining stay orders can diminish the urgency of resolving cases, contributing to backlogs.
- **Witness Scheduling Challenges:** Witnesses face uncertainty in scheduling, disrupting their lives and discouraging participation, which exacerbates trial delays.

Section 6A of the Citizenship Act, 1955

Sub Topic- Government Policies & Interventions, Citizenship

Context: The Supreme Court has upheld the constitutional validity of Section 6A of the Citizenship Act, 1955. This decision maintains the existing framework of citizenship in Assam, a region with a complex history of demographic tensions.

More on News:

- Petitioners from Assam challenged Section 6A, arguing **it treated the state differently** by legalising illegal immigrants between 1950 and 1971.
- They claimed it **violated Assamese cultural and linguistic rights (Article 29)** and that the provision had become unconstitutional due to non-implementation.

Article 29 is part of the Fundamental Rights enshrined in the Indian Constitution, aimed at protecting the cultural and educational rights of citizens, particularly those belonging to minority groups. It emphasises the importance of preserving India's diverse cultural landscape.

- The **Supreme Court**, by a 4-1 majority, **upheld Section 6A,** dismissing these challenges.

About Section 6A:

- Section 6A, **introduced as part of the Assam Accord (1985),** provides a **distinct citizenship regime for Assam** to address concerns over illegal immigration.
- It grants citizenship to individuals who settled in Assam between 1950 and 1966 and offers a pathway to citizenship for those who entered between 1966 and March 25, 1971.
- Only immigrants who arrived after March 25, 1971, are considered illegal and ineligible for citizenship.

Assam Accord

It is a significant Memorandum of Settlement signed on August 15, 1985, between the **Government of India** and **leaders of** the Assam Movement, primarily represented by the All Assam Students' Union **(AASU)** and the **All Assam Gana Sangram Parishad (AAGSP)**. This agreement aimed to **address the issues stemming from illegal immigration in Assam**, which had escalated into a violent agitation starting in 1979.

Supreme Court Ruling:

- The **majority judgement,** led by Chief Justice DY Chandrachud, **recognised that Section 6A is essential to the Assam Accord**, a political settlement.

- The ruling emphasised that **federalism allows the Union to have tailored relationships** with individual states based on their unique histories and needs.
- The Court also acknowledged that striking down the section would render many residents stateless, creating a humanitarian crisis.
- However, the **ruling expressed concern about judicial overreach**, given the complications caused by the court-monitored **National Register of Citizens (NRC)** process.

Relation with Assam:

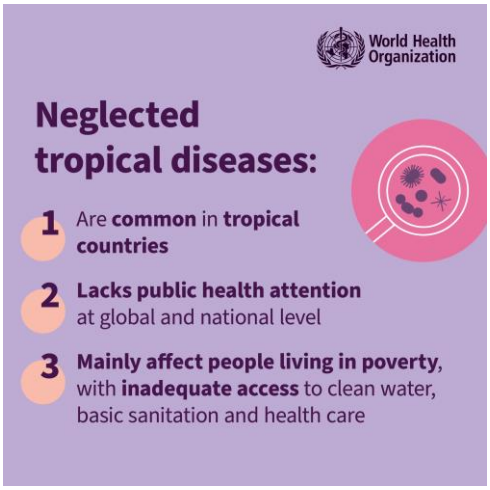
- Assam has a **history of agitation against illegal immigration**, particularly targeting migrants from (then) East Pakistan and later Bangladesh.
- The **Assam Accord sought to balance peace with demographic concerns** by defining a citizenship framework specific to the state.
- The **NRC process** in Assam identified 19 lakh individuals (5.77% of the population) as potential non-citizens, including people across religious, linguistic, and tribal lines.
- Many excluded individuals, including married women, lack documentary proof, making deportation or reapplication for citizenship under the Citizenship Amendment Act (CAA) unfeasible.

***Subject* - Social Justice**

India Declared Trachoma-Free

Sub Topic- Issues related to health

Context: The **World Health Organization (WHO)** has **officially certified India** as having **eliminated Trachoma as a public health problem**, making it the **third country** in the **South-East Asia Region** to **achieve** this **milestone**.



More on News:

- The **WHO categorises Trachoma** as a **neglected tropical disease**, with an **estimated 150 million people affected globally**, of which **around 6 million face** the **risk of blindness or severe visual impairment**.
  - ☐ **Neglected Tropical Diseases (NTDs)** encompass a diverse group of 20 diseases recognized by the World Health Organization (WHO), including but not limited to: Buruli ulcer, Chagas disease, Dengue fever, Dracunculiasis (Guinea worm disease), Leprosy, Lymphatic filariasis, Schistosomiasis and Trachoma, etc.

- It predominantly **affects underprivileged communities living in poor environmental conditions**.

Trachoma

- It is a **bacterial infection of the eyes**, primarily **caused by** the **bacterium *Chlamydia trachomatis***.
- It is **highly contagious** and **spreads through contact with the eye**, **eyelid**, **nose**, or **throat secretions** of **infected individuals**.
- **If left untreated**, Trachoma can **lead to irreversible blindness**.

Historical Context and Government Efforts:

- **Trachoma** was one of the **leading causes of blindness** in **India** during the **1950s** and **1960s**.
- **To combat this**, the **Government of India launched** the **National Trachoma Control Program in 1963**, later **integrating** these **efforts into the National Program for Control of Blindness (NPCB)**.
- **In 1971**, the **incidence of blindness** due to Trachoma was **recorded at 5%**.
- Through persistent interventions under the **NPCB** and the **implementation of the WHO SAFE strategy—comprising Surgery, Antibiotics, Facial cleanliness**, and **Environmental improvement—**this number has dramatically **decreased to less than 1% today**.
- **In 2017, India** was **declared free from infectious Trachoma**, but **surveillance** for trachoma cases continued across all **districts from 2019 to 2024**.

The Certification Process:

- **To officially declare** the **elimination** of **Trachoma**, a **National Trachomatous Trichiasis (TT only) Survey** was **conducted** in **200 endemic districts** from 2021 to 2024, in alignment with WHO mandates.
- The **WHO confirmed** that **India** has **successfully eliminated Trachoma** as a public health problem.
    - ☐ This **achievement not only underscores** the **effectiveness of India's health initiatives** but also **serves as a beacon of hope for other countries** grappling with similar public health challenges.

Conclusion:

The elimination of Trachoma is a remarkable testament to the commitment and resilience of India's healthcare system and its dedicated workforce. With continued efforts to maintain surveillance and improve community health, India sets a precedent for combating neglected tropical diseases and enhancing public health standards across the globe.

Subject - International Relations

The Geopolitics of North Korea's Juche Ideology under Kim Jong-un

Sub Topic- Effect of policies and politics of Developed and Developing Countries

Introduction

Juche, introduced by Kim Il-sung in 1955 to promote self-reliance and autonomy, shaped North Korea's post-Cold War nuclear weapons program while the economy remained closed and underdeveloped, heavily reliant on Soviet aid for recovery and industrialisation following the Korean War.

Juche Idea and Kim Jong-un

- **Cultural Roots**: Derived from Confucianism and Cheondogyo religion, later politicised by Kim Il-sung.
- **Philosophy**: Masses as the driving force of revolution; strategy to strengthen Kim dynasty legitimacy.
- **Byungjin Policy**: Focus on simultaneous military and economic development.
- **Military Developments**: Increased indigenisation of defence production; multiple nuclear tests and ballistic missile launches since 2011.

Recent Floods in North Korea and Juche Idea

- **Flood Impact**: Significant devastation in provinces, destruction of homes and agriculture.
- **Government Response**: Declared emergency areas; Kim Jong-un's personal visits and threats to officials neglecting recovery.
- **Media Narrative**: State media portrayed floods transparently, but rejected foreign aid, promoting self-sustenance instead.

Geopolitics and North Korea's Refusal of Foreign Aid

- **Hostile Relations**: Tensions with the US remain; North Korea brands South Korea as an enemy.
- **Rapprochement Failure**: Previous attempts to normalise relations with the US have failed; military belligerence as a response to negotiations' breakdown.
- **Deteriorating South-North Relations**: South Korea's increased cooperation with Japan and the US against North Korea's nuclear threats.

North Korea's Strained Relations with China

- **Historical Context**: Close ties historically, but tensions have arisen over North Korea's nuclear ambitions.
- **Recent Strains**: No high-level meetings since 2019; failed Chinese investment proposals; Pyongyang's disregard for Beijing's aid offers.

North Korea–Russia 'Comprehensive Strategic Partnership'

- **Military Alliance**: Strengthened through a partnership agreement for mutual military support.
- **Aid Refusal**: North Korea rejected Russian aid for flood victims, possibly to avoid overburdening an ally facing its own challenges.

Conclusion

- **Influence of Juche**: Deeply embedded in North Korean nationalism and governance; impedes economic liberalisation.
- **Geopolitical Implications**: Ongoing hostilities with the US, strained relations with China, rising tensions with South Korea, and cautious partnership with Russia.
- **Future Prospects**: Uncertain how long North Korea can maintain Juche without adopting economic reforms, especially in light of its isolation and humanitarian challenges.

Nobel Peace Prize 2024

Sub Topic- Important International Organisations

Context: Recently the **Nobel Peace Prize was awarded to Nihon Hidankyo**, a **Japanese organisation** comprising survivors of the atomic **bombings in Hiroshima and Nagasaki in 1945**.

More on News:

This **recognition honours** their relentless **efforts to achieve a world free of nuclear weapons** and highlights the **impactful testimonies of Hibakusha**—those affected by the bombings—who have significantly raised awareness about the devastating humanitarian consequences of nuclear weapon use.

Background

The **U.S. dropped two atomic bombs on Japan in August 1945—"Little Boy" on Hiroshima** and **"Fat Man" on Nagasaki**—resulting in catastrophic destruction and loss of life.

The **bombings prompted Japan's surrender on August 15, 1945**, with Emperor Hirohito referencing **"a new and most cruel bomb"** that **threatened** not only Japan but also the **survival of human civilization** itself.

About Nihon Hidankyo:

- **Founded on August 10, 1956**, Nihon Hidankyo is the **only nationwide organisation representing** A-bomb **survivors in Japan**.

- Its primary **objectives** include **promoting** the **welfare of Hibakusha, advocating for nuclear disarmament**, and **seeking compensation for victims** of the bombings.
- The organisation plays **a crucial role in sharing the experiences and ongoing struggles of Hibakusha**, both **within Japan and internationally**.
- **Nihon Hidankyo's activities** include **sending survivors to** the **United Nations** and engaging with nuclear-armed states to advocate for disarmament.
- It is **part of a larger tradition of Nobel Peace Prize recipients focused** on **disarmament**.
    - ☐ With at least **ten awards** given for **related efforts since 1901**, including the **2017 prize awarded to the International Campaign to Abolish Nuclear Weapons (ICAN)**.
- **Their work** has been pivotal in **fostering** a **powerful international norm against** the **use of nuclear weapons**, often **referred** to as the **"nuclear taboo"**.

Nuclear Taboo at Risk:

- The **Nobel Committee acknowledged** the **crucial role of Hibakusha** in **establishing** the **nuclear taboo**, which has helped **prevent** the **use of nuclear weapons since 1945**.
- However, this **taboo is increasingly under threat as more countries seek nuclear capabilities** and existing arsenals are modernised.
    - ☐ **Reports indicate** that the **U.S.** may **invest over $1 trillion** to upgrade its nuclear arsenal by the 2040s.

What happens when a nuclear weapon explodes?

Immediate Death Toll: A nuclear **explosion could kill tens of millions of people instantly**, flattening cities and causing deadly firestorms, building collapses, and flying debris. **Oxygen deprivation** and **carbon monoxide poisoning from fumes** would **contribute** to **fatalities**.

Long-Term Health Effects: **Ionising radiation** from the blast would **result** in further deaths over the following days and years, leading to **genetic damage in future generations**.

- An **estimated 2.4 million people** may eventually **die from cancers linked to atmospheric nuclear tests** conducted from 1945 to 1980.

Environmental and Climate Impact: Nuclear radiation can linger for decades, rendering areas around Ground Zero uninhabitable. Multiple nuclear explosions could cause permanent changes to the planet's climate and environment.

Comparison of Bomb Yields: The atomic bombs dropped on Hiroshima (15 kilotons) and Nagasaki (25 kilotons) are significantly weaker than modern nuclear weapons.

- The **most powerful nuclear explosion**, the **Russian Tsar Bomba (1961)**, had a yield of 50 megatons, which is over **3,800 times greater than the Hiroshima bomb**.

GS Paper III - Mains Based Articles

Subject - Indian Economy & Agriculture and Banking

Ten Years of Make in India

Sub Topic- Industrial Growth, Industrial Policy

Context: The Make in India has completed ten years on September 25, 2024.

About Make in India:

- On September 25, 2014, the newly elected Union government launched the **Make in India (MI) policy with two key objectives:**
  - (i) to **increase the manufacturing sector's share of GDP from 14%-15% to 25%**
  - (ii) to create **100 million additional industrial jobs (from about 60 million) by 2025.**
- This policy **mirrored the earlier New Manufacturing Policy of 2012,** which had been formulated but not implemented.

Outcomes:

Ten years later, the **outcomes are mixed:**

- According to **National Accounts Statistics (NAS)**, the **real gross value added (GVA) growth rate in manufacturing has slowed from 8.1% during 2001-12 to 5.5%** between 2012-23.
  - The **sector's share of GDP has stagnated at 15%-17% for three decades,** though it's slightly higher in the new GDP series due to methodological revisions.
- **Employment in manufacturing has also declined.**
  - As per **NSSO sample surveys**, **manufacturing employment fell from 12.6% in 2011-12 to 11.4% in 2022-23**.
  - Most jobs in this sector come from the **informal or unorganised segment**, which saw a drop in employment by 8.2 million—falling from 38.8 million in 2015-16 to 30.6 million by 2022-23.

    - ☐ Meanwhile, **agriculture's share of the workforce has increased,** from **42.5% in 2018-19 to 45.8%** in 2022-23.
- **Increased FDI:** The initiative has successfully attracted significant foreign investments across various sectors, including defence and railways.
- **Global Partnerships:** Collaborative efforts with countries like the USA and Russia have **strengthened India's position** as a manufacturing hub.
- **Local Initiatives:** States have launched their own initiatives **(e.g., "Make in Odisha," "Vibrant Gujarat")** aligned with the national campaign, fostering regional development.

Deindustrialisation:

This trend marks a significant **reversal in structural transformation**, with the **workforce moving from higher-productivity manufacturing to lower-productivity agriculture.** Such premature deindustrialisation is unprecedented in post-independence India, indicating a **failure to achieve industrial maturity** before shifting away from manufacturing, unlike advanced economies. **Several factors contributed to this de-industrialisation:**

- Industrial production growth stagnated despite the official annual GDP growth of 6%-7%.
- Fixed investment growth also faltered.
    - ☐ Data from the **Annual Survey of Industries (ASI)** show that **both GVA and gross fixed capital formation (GFCF) growth were minimal** between 2012-13 and 2019-20.
- Why didn't domestic investments pick up under the MI policy, despite India's significant improvement in the World Bank's **Ease of Doing Business (EDB) index,** moving from 142nd place in 2014-15 to 63rd in 2019-20?
    - ☐ One reason is that the **EDB index is flawed**—politically motivated and lacking a solid analytical or empirical foundation.
    - ☐ In hindsight, the **government wasted six valuable years pursuing a dubious metric.**

Way Forward:

- To reverse de-industrialisation, India must **rethink its industrial policy.**
- Trade and industrial policies **need to align in a way that promotes domestic value addition and fosters learning.**
- **Protectionist measures should focus on building dynamic comparative advantages,** rather than offering cash subsidies for static gains.
- India should aim for **investment-driven growth and technological catch-up,** supported by **domestic R&D** that encourages adaptive research and indigenisation of imported technologies.
- Additionally, **publicly funded development finance institutions or "policy banks" are essential** to provide affordable, long-term credit to socialise the risks involved in learning and catching up to the technological frontier.

India's Health Expenditure Trends

Sub Topic- Inclusive Growth

Context: According to the latest National Health Accounts Estimates for 2021-22, India has **witnessed** a significant **rise in per capita health expenditures over** the **past decade**.

- The **report highlights** an **82% increase in per capita health spending**, which surged from Rs 3,638 in 2013-14 to Rs 6,602 in 2021-22.

Key Findings:

- **Total Health Expenditure**: For 2021-22, total health expenditure was estimated at Rs 9,04,461 crore, representing **3.83%** of **GDP**.
- **Out-of-Pocket Expenditure**: A share of total health expenditure **decreased by 39%**, indicating improved financial protection for households.
- **Current Health Expenditure**: **Includes only recurrent healthcare costs**, was Rs 7,89,760 crore, constituting **87% of total health expenditure**.
- **Funding Sources:**
  - ☐ The **Union government** contributed **15.94%, while state governments** contributed **21.77%** to the current health expenditure.
  - ☐ **Households** remained the **highest contributors, accounting for 51%** of the current health expenditure, **including insurance contributions**.
- **Private Health Insurance**: Insurance expenditures **rose 118%** from 2013-14 to 2021-22, totalling Rs 66,975 crore (7.40% of total health expenditure).

Evolution of Health Expenditure in India:

- In the early 2000s, **India's health expenditure** was **relatively low**, with a significant portion funded out-of-pocket by households.
  - ☐ **For instance**, **out-of-pocket expenditures constituted** around **69.5%** of **total health expenditures** in some reports from that era.
- **Recent Trends:** Government health expenditure as a share of total health expenditure **increased by 68%**, from 28.6% in 2013-14 to 48% in 2021-22.
- The **decline** in the **percentage** of **out-of-pocket expenditure** aligns with the **National Health Policy 2017's** goals to enhance access and affordability.

Factors Driving Health Expenditure:

- **Increasing Population:** India's rapidly growing population is putting a strain on its healthcare resources. As the number of people increases, so does the demand for medical services.
- **Urbanisation:** The shift from rural to urban areas has increased access to healthcare facilities but also led to higher healthcare costs. Urban areas often have more expensive private healthcare options.
- **Changing Disease Patterns:** India is experiencing a transition from infectious diseases to non-communicable diseases such as heart disease, cancer, and diabetes. These diseases require more complex and expensive treatment.

- **Rising Healthcare Costs:** The cost of healthcare services, including medications, medical devices, and hospital stays, has been steadily increasing. This is partly due to inflation and advancements in medical technology.

Implications for India's Healthcare System:

- **Financial Strain:** The government faces increasing pressure to allocate more resources to healthcare. This can be challenging given competing demands for public funds.
- **Out-of-Pocket Spending:** Many Indians rely on out-of-pocket payments to cover their healthcare costs. This can lead to financial hardship for families, especially those with limited resources.
- **Inequality in Healthcare Access:** The growing gap between the rich and poor has resulted in unequal access to healthcare. Those with higher incomes can afford better quality care, while the poor may be limited to basic government services.
- **Quality of Care:** The strain on healthcare resources can affect the quality of care provided. Overcrowded hospitals and overworked healthcare professionals may lead to delays in treatment and suboptimal outcomes.

Government and Policy Responses:

- In response to rising health costs, the **Indian government** has **implemented various health schemes** and **initiatives** aimed at **expanding access** and **improving service quality**.
- The **National Health Mission** provide affordable healthcare to all citizens. The **policy aimed** to **increase government health spending** to **2.5%** of **GDP** by **2025**, driving significant changes in funding allocations and priorities.
- As **India's economy** has grown, so has its capacity to invest in healthcare. **Increased GDP** has **allowed** for **higher public spending**, which is crucial for expanding healthcare infrastructure and services.
- **Health Insurance Initiatives:** Programs like **Ayushman Bharat** have played a vital role in **reducing out-of-pocket expenses** and **improving** access to healthcare for low-income populations, contributing to the overall decline in financial barriers.

India's Agroforestry Potential and Carbon Finance Integration

Sub Topic- Agriculture & Forestry

Context: India has vast potential in the agroforestry sector, offering a unique opportunity to integrate with carbon finance projects through **Afforestation, Reforestation, and Revegetation (ARR) initiatives.**

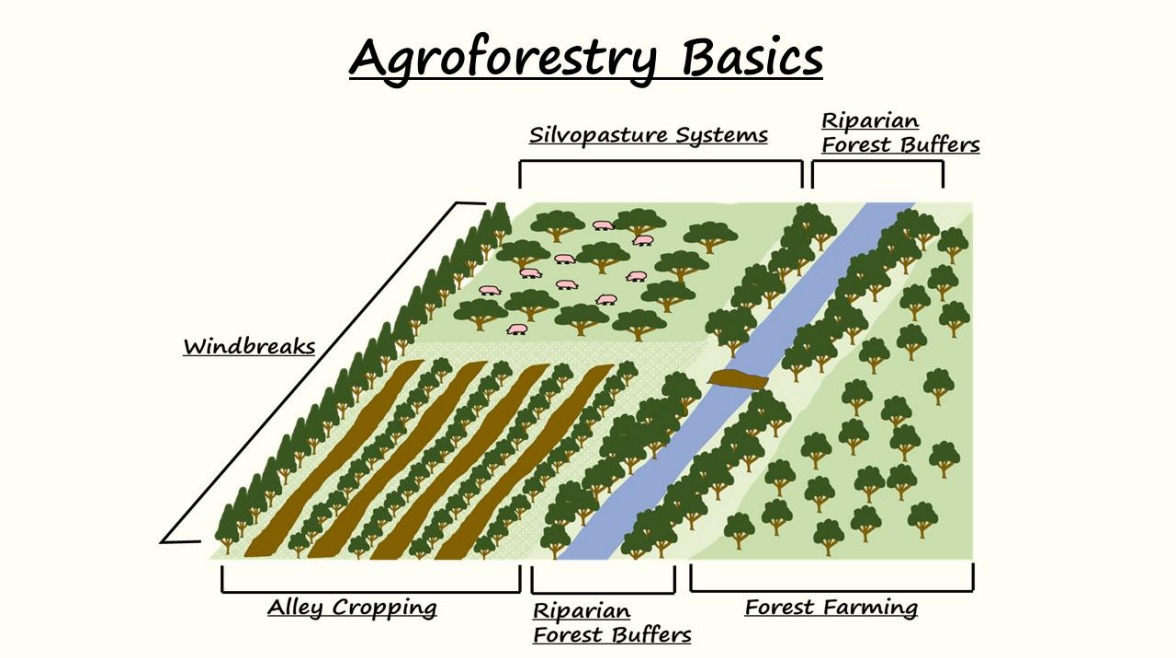
More on News:

- The **current agroforestry coverage of 28.4 million hectares** could **expand to 53 million hectares by 2050.**

- Agroforestry, accounting for **8.65% of India's total land area**, contributes **19.3% to the country's carbon stocks**, playing a crucial role in environmental sustainability and economic growth.
- Research suggests that with proper policies, financial support, and incentives, agroforestry could contribute **an additional carbon sink of over 2.5 billion tons of CO_2 equivalent by 2030.**

Agroforestry

It is a **sustainable land management approach** that **integrates trees and shrubs with crops and/or livestock on the same piece of land.** This method **aims to optimise the interactions between these components to enhance productivity, improve environmental health, and provide economic benefits.**



Key Features of Agroforestry:

- **Intentional Integration:** Agroforestry involves **deliberately combining trees with agricultural crops and livestock,** creating a holistic management system rather than treating each component separately.
- **Intensive Management:** These systems require careful management to maintain their productive and protective functions, often involving practices such as cultivation, fertilisation, and irrigation.
- **Ecological Interactions:** Agroforestry seeks to **maximise positive interactions** (like mutualism) while **minimising negative ones** (such as competition for resources) among the various components.

Benefits of Agroforestry:

- **Economic Advantages:** By integrating multiple products (crops, timber, fodder), agroforestry can increase overall farm profitability. The total output per unit area is often greater than that from monoculture systems.
- **Environmental Sustainability:** Agroforestry helps in soil conservation, reduces erosion, enhances biodiversity, and improves water quality by filtering runoff. Trees can also sequester carbon, contributing to climate change mitigation.

- **Improved Soil Health:** The presence of trees enhances soil structure and nutrient cycling, leading to healthier soils that support crop production.
- **Biodiversity Enhancement:** Agroforestry systems create habitats for various species, promoting biodiversity both above and below ground.
- **Resilience to Climate Change:** By diversifying production systems, agroforestry can help farms adapt to changing climate conditions and reduce risks associated with crop failures.

The "Common Practice" Challenge in Carbon Standards:

- In carbon finance, the **"common practice" criterion assesses whether a project provides additional environmental benefits beyond standard practices.**
- For **ARR projects**, this involves **evaluating whether similar activities are already common in the region.**
- Carbon standards like **Verra's Verified Carbon Standard (VCS)** and the **Gold Standard** may deny credits to activities deemed "common practice" as they are not considered additional.
- However, these global standards are often **designed for large-scale agricultural systems** seen in regions like Latin America or the United States, where landholdings are extensive.
- In contrast, India is characterised by **small, fragmented landholdings—86.1% of Indian farmers are small and marginal,** with landholdings under two hectares.
    - ☐ Their agroforestry practices are often **scattered and informal,** which may not meet the additional criteria under current carbon standards.
- This creates a **significant barrier**, excluding many Indian farmers from participating in ARR carbon finance projects and missing out on potential income from carbon credits.

Need for India-Centric Carbon Standards:

- India's unique agricultural landscape requires a **redefinition of the "common practice"** criterion to better reflect the realities of its agroforestry sector.
- Even small **improvements in land management**, like adopting **systematic agroforestry techniques,** can have transformative impacts.
- **Revising carbon standards** to account for India's smallholder model would unlock the vast potential for carbon sequestration, allowing more farmers to participate in carbon finance projects.

Significance:

- Adopting an India-centric approach in carbon credit platforms would **incentivise systematic agroforestry,** enhancing both **environmental sustainability and rural livelihoods.**
- ARR projects, integrated with agroforestry, provide **alternative income streams for farmers** while **addressing challenges like low productivity, monsoon dependence,** and environmental degradation.

- These projects **help diversify income by promoting tree planting and forest restoration,** allowing farmers to earn through carbon sequestration.
- Additionally, ARR initiatives **offer environmental benefits** such as improved soil fertility, water retention, and erosion control, boosting long-term agricultural productivity.

Supporting Small and Marginal Farmers:

- Institutes like **The Energy and Resources Institute (TERI)** have already demonstrated the potential of ARR projects in India, with **19 projects across seven states benefiting over 56,600 farmers.**
- However, **scaling these initiatives requires international carbon finance platforms to revise their standards** to align with India's agricultural realities.
- As India seeks to expand its agroforestry sector, it is **essential for international carbon standards to evolve to reflect the specific conditions** of the Indian subcontinent.
- Revising the "common practice" guidelines to include Indian agroforestry practices would allow millions of small and marginal farmers to participate in ARR projects.
    - ☐ This would **not only drive sustainable development but also provide much-needed income support** to rural households, enhancing the country's overall economic and environmental resilience.
    - ☐ **Carbon credit platforms** like Verra and Gold Standard must **recognise the need for India-centric standards** to fully realise the potential of agroforestry and ARR initiatives. Doing so will pave the way for a greener, more sustainable, and economically prosperous future for India's farmers.

Key Regulatory Changes by SEBI

Sub Topic- Capital Market, Mobilisation of Resources

Context: The **Securities and Exchange Board of India (SEBI)** has introduced several **key regulatory changes**, including a new mutual fund scheme for passive funds, enhanced investor rights in alternative investment funds (AIFs), and expanded definitions related to insider trading.

Faster Rights Issue and Allotment Flexibility:

- SEBI has drastically **reduced the timeline for rights issues from an average of 317 days to just 23 working days** after approval.
- This gives existing shareholders **a quicker opportunity to invest in a company's future growth**.
- Companies also **no longer need to submit a draft letter of offer to SEBI,** and can directly file with stock exchanges.

Pro-Rata and Pari-Passu Rights for AIF Investors:

- AIF investors will now have **rights and returns proportional to their investments (pro-rata),** with most investors enjoying **equal rights (pari-passu)**.
- SEBI has also **allowed AIFs to offer differential rights to certain investors without impacting others,** subject to standardised terms.
- **Large funds may retain flexibility** through side letters, provided they secure explicit waivers from investors.

Expanded Definitions for Insider Trading:

- SEBI has **expanded insider trading regulations to include the entire firm** where a 'connected person' is employed, as well as individuals residing with them.
- The term **'relative' now covers spouses and their parents,** siblings and their spouses, as well as children and their spouses.

Insider trading refers to the buying or selling of a company's securities by individuals who possess material, nonpublic information about that company. This practice can lead to unfair advantages in the financial markets and is subject to strict regulations.

'MF Lite' Framework for Passive Funds:

- SEBI's 'MF Lite' framework **simplifies eligibility criteria for sponsors** of passive mutual funds, including aspects like net worth and profitability, along with streamlined trustee responsibilities and reduced disclosure requirements.

Disclosure Requirements for ODIs and FPIs:

- SEBI has aligned the disclosure requirements for **offshore derivative instruments (ODIs)** and segregated portfolios of **foreign portfolio investors (FPIs)** with those for FPIs.
- Non-compliance will result in the redemption of ODIs or liquidation of segregated portfolios within 180 days, with defaulting ODI subscribers being barred from future participation.

The New Asset Class:

- Currently, investment products range from mutual funds with a minimum investment of ₹500, to **portfolio management services (PMS)** requiring a minimum of ₹50 lakh, and alternative investment funds with a threshold of ₹1 crore.
- SEBI's new asset class is **designed to bridge the gap between mutual funds and PMS,** offering investors more flexibility in portfolio construction.

Benefits of the New Investment Product:

- This new product aims to provide investors with a **professionally managed, well-regulated option** that **offers greater flexibility** and the ability to take on higher risks for larger ticket sizes.
- It also ensures that **proper safeguards and risk mitigation measures** are in place to protect investors. Key safeguards include:
  - ☐ Prohibition on leverage.
  - ☐ No investments in unlisted or unrated instruments beyond those allowed for mutual funds.
  - ☐ Derivatives exposure capped at 25% of assets under management (AUM), except for hedging and rebalancing purposes.
  - ☐ **Minimum Investment Requirement:** SEBI has set a minimum investment **limit of ₹10 lakh per investor** for this new asset class, across all investment strategies offered by a specific asset management company (AMC).

Food Safety Laws

Sub Topic- Food Security, Food Processing and related Industries in Indian

GS PAPER II - Government Policies & Interventions

Context: Recently, the **Uttar Pradesh government mandated that food establishments must prominently display the names of the operator, proprietor, manager**, and other relevant personnel.

More on News:

- Himachal Pradesh minister Vikramaditya Singh also announced a similar requirement, stating that every eatery and fast food cart in the state would need to display the owner's ID.
- On July 22, the **Supreme Court stayed similar orders issued by police in Uttar Pradesh and Uttarakhand** for the kanwar yatra, stating that while the "competent authority" under the Food Safety and Standards Act, 2006 (FSSA) could issue such directives, the **police could not assume this authority.**

Food Safety and Standards Authority of India (FSSAI)

It is a **statutory body** established under the **Food Safety and Standards Act, 2006.** It plays a crucial role in ensuring food safety and regulating food standards in India.

Key Functions of FSSAI: Regulation and Standards, Licensing and Registration, Surveillance and Monitoring, Consumer Awareness, Research and Development and Collaboration with Stakeholders

Regulatory Framework: Food Products Standards and Food Additives Regulations, 2011, Licensing and Registration Regulations, 2011, Prohibition and Restriction of Sales Regulations, 2011 and Contaminants, Toxins, and Residues Regulations, 2011 and Health Supplements and Nutraceuticals Regulations.

What must Food Establishments Display under the FSSA?

- Food establishments in India are **required to either register or obtain a licence from** the Food Safety and Standards Authority of India **(FSSAI)** to operate.
- This is **regulated by the Food Safety and Standards (Licensing and Registration of Food Businesses) Rules, 2011**.
- **Small-scale food businesses,** such as hawkers and vendors, must register with the FSSAI and display a registration certificate and photo identity card prominently on the premises or cart.
- **Larger food operators** are required to obtain a licence, which also must be prominently displayed.
    - ☐ **Failure** to obtain the required licence or registration can result **in penalties,** including **imprisonment for up to six months and fines of up to ₹5 lakh under Section 63 of the FSSA.**

Can States Mandate Additional Display Requirements?

- Under **Section 94(1) of the FSSA**, state governments **may make rules with prior approval from the Food Authority** to carry out their duties under the Act.
- **Section 94(2)** outlines specific areas where **states can create rules,** such as the functions of the Commissioner of Food Safety.
- **Section 94(2)(c)** allows states to **make rules on other matters** that require regulation.
    - ☐ However, these rules **must be presented to the state legislature for approval.**
- The UP government's statement on September 24 suggested that amendments to the FSSA should be made to ensure compliance with its latest directives.

Consequences for Violating FSSA Provisions

- If a food business violates any provision of the FSSA, the food authority can issue an **'Improvement Notice',** detailing the **grounds for non-compliance, corrective measures, and a compliance timeline.**
- Continued non-compliance can result in **suspension or cancellation of the business's licence.**
- The penalty for contraventions not specifically covered by the Act can extend to ₹2 lakh, with higher fines for repeat offences and possible licence revocation.
- The recent UP directives did not specify penalties for non-compliance, but under Section 58, a general penalty of up to ₹2 lakh may apply.

Can State Directives Be Challenged in Court?

- Earlier orders from UP and Uttarakhand police were challenged in the Supreme Court on **grounds of discrimination, arguing that they violated Article 15(1) of the Constitution** by forcing individuals to reveal their religious and caste identities.

- Petitioners also claimed the **orders could lead to economic boycotts** of Muslim minorities, violating their right to practise any profession under **Article 19(1)(g),** and supporting untouchability, prohibited by **Article 17.**

Merger of Agriculture Schemes & National Mission on Edible Oils - Oilseeds

Sub Topic- Agriculture, E-technology in the aid of farmers

Context: The Union Cabinet has merged all central schemes in the agriculture sector into two major schemes: **Pradhan Mantri Rashtriya Krishi Vikas Yojana (PM-RKVY) and Krishonnati Yojana (KY),** with a total expenditure of ₹1,01,321.61 crore. The central share will be ₹69,088.98 crore, while states will contribute ₹32,232.63 crore.

Objectives and Focus Areas

- ☐ **PM-RKVY**: Allocated ₹57,074.72 crore, it focuses on promoting sustainable agriculture.
- ☐ **KY**: With ₹44,246.89 crore, it aims to address food security and agricultural self-sufficiency.
- ☐ Both schemes **will tackle challenges like nutrition security, sustainability, climate resilience, value chain development, and increased private sector participation.** States will have flexibility in developing strategic agricultural plans.

Significance of Rationalisation:

- The rationalisation **avoids duplication,** ensures **convergence of resources,** and offers **states the flexibility** to reallocate funds as per local needs.
- Existing schemes like Soil Health Management, Rainfed Area Development, AgroForestry, and Paramparagat Krishi Vikas Yojana will be merged into the new schemes.

National Mission on Edible Oils - Oilseeds (NMEO-Oilseeds)

- **Timeline and Outlay:**The Cabinet has also approved the **National Mission on Edible Oils - Oilseeds**, with an outlay of ₹10,103 crore **over seven years (2024-25 to 2030-31).**
- **The mission aims to:**
  - ☐ **Increase oilseed production** from 39 million tonnes to 69.7 million tonnes by 2030-31.
  - ☐ **Focus on key crops** such as rapeseed-mustard, groundnut, soybean, sunflower, and sesamum.
  - ☐ **Enhance extraction from secondary sources** like cottonseed, rice bran, and tree-borne oils.
- **Reducing Import Dependency:**The mission targets reducing India's dependency on imported edible oil **from 57% to 28% within seven years,** ensuring greater self-reliance.

- **Strategic Initiatives**
  - ☐ To achieve these goals, the mission **will promote high-yielding seed varieties,** extend cultivation into fallow lands, and adopt advanced technologies like genome editing.
  - ☐ The **SATHI portal** will support seed traceability and ensure a steady supply of quality seeds.

NITI AAYOG Document named: Promoting MILLETS IN DIETS BEST PRACTICES ACROSS STATES/UTs OF INDIA Gives an Overview of Odisha Millet Mission (OMM)-

- Launched in 2017, the Odisha Millet Mission (OMM) **aims to revive millet cultivation and consumption, particularly in tribal areas.**
- The initiative focuses on **production, processing, consumption, and marketing of millets,** with a special emphasis on including them in government schemes.

Pre-Mission Situation

Before OMM, Odisha **faced significant challenges:**

- High rates of malnutrition among children under five, especially in tribal areas.
- Decline in millet cultivation due to a shift towards commercial crops, drudgery in millet processing, lack of storage, and insufficient government support.

Objectives of Odisha Millet Mission

- Promote **household consumption** of millets.
- **Improve millet productivity** through better agronomic practices.
- Support market linkages by promoting **Farmer Producer Organisations (FPOs).**
- **Set up decentralised processing units** to reduce drudgery.
- **Incorporate millets into government schemes** like **ICDS** (Integrated Child Development Scheme), **MDM** (Mid-Day Meal), and **PDS** (Public Distribution System).

Key Impacts of OMM

- **Expansion:** OMM started in 30 blocks (7 districts) in 2017 and has expanded to 142 blocks (19 districts) by 2021.
- **Farmer Participation:** Over 11 lakh farmers have adopted millet cultivation on more than 54,000 hectares.
- **Increased Productivity:** Millet production per hectare more than doubled from 5.79 quintals/hectare to 12.72 quintals/hectare.
- **Market Support:** OMM procured 3,23,000 quintals of millets from 41,286 farmers in 2021-22. FPOs have been integral in supporting farmers' marketing efforts.
- **Income Growth:** The gross value of produce per farmer household increased threefold, from ₹3,957 to ₹12,486 between 2018 and 2021.
- **Gender and Climate Resilience**
  - ☐ **Reduced Women's Drudgery:** Decentralised processing has alleviated the workload for women.
  - ☐ **Climate Resilience:** The increased focus on millets, particularly finger millet, has improved farmers' resilience to drought and other climate challenges.

Millets in ODISHA Government Schemes

- **Ragi Distribution:** Ragi has been distributed to over 50 lakh beneficiaries in 14

districts through PDS.

- **Ragi Laddu in ICDS:** Ragi laddu was introduced as a morning snack for preschool children in Keonjhar and Sundargarh, benefiting 1,50,682 children in 7,066 Anganwadi centres.
- **Expansion of Millet Inclusion:** Plans are underway to scale up the inclusion of millet-based products in ICDS, MDM, and PDS.

Millet Shakti Cafés and Nutritional Benefits

- **Millet Shakti Cafés:** These cafes serve millet-based dishes, reaching over 4.4 lakh people in two years.
- **Nutritional Security:** OMM focuses on the nutritionally vulnerable, particularly children, by including millet-based entitlements in government schemes.

National Recognition and Future Plans

- **Recognition:** Odisha was named the **"Best Millet Promoting State" by ICAR-IIMR and FAO.**
- **Scaling Up:** The program is set to expand into more blocks and districts, with the inclusion of ragi in more government schemes. **Other states like Chhattisgarh are looking to replicate the OMM model.**

Tax Simplification and Rationalisation

Sub Topic- Government Budgeting, Mobilisation of Resources

Context: The Indian government has set up **a committee**, led by V.K. Gupta, Chief Commissioner of Income Tax, **to review and update the Income Tax Act.**

More on News:

- The aim is **to simplify and rationalise the Act without altering its fundamental structure.**
- This move is **significant as the Income Tax Act of 1961** has undergone thousands of amendments over the past six decades, yet it remains outdated in many ways.
- With the evolving economic landscape, especially due to the **rise of digital commerce and globalised trade**, there is an urgent need for tax laws to reflect modern realities.

Committee's Mandate:

- The committee's mandate primarily focuses on **simplifying the language of the Income Tax Act** and ensuring it aligns with contemporary business needs.
- Once a new law is enacted, **making further amendments becomes challenging**, so the current revision **could be pivotal in shaping a modern tax framework**.
- Key areas of focus include **provisions related to mergers and acquisitions (M&As)**, **dispute resolution**, and **taxation of salaried individuals**, among others.

What is Tax Rationalisation and Simplification?

- **Tax Rationalisation:** It refers to the **process of restructuring tax policies to make them more efficient, equitable, and aligned with economic goals**.
  - ☐ This often involves ***lowering tax rates while broadening the tax base***, reducing loopholes, and ensuring fairness across different sectors.
  - ☐ For example, **India's corporate tax rate was reduced to 25%** in recent years, a significant departure from the excessively high 97% marginal rate seen in the 1970s.
- **Tax Simplification:** It involves **making tax laws easier to understand and comply with**.
  - ☐ A prime example in India is the **Goods and Services Tax (GST),** which replaced a complex web of indirect taxes with a unified system.
  - ☐ Similarly, the **current review of the Income Tax Act aims to simplify provisions** that have become too complicated due to numerous amendments over the years.

Importance of Tax Rationalisation and Simplification:

- **Streamlining Tax Rates:** The primary objective of tax rationalisation is **not merely to increase revenue but to simplify the existing tax structure.**
  - ☐ In the context of **GST,** this involves **reducing the number of tax slabs and addressing issues such as the inverted duty structure**, where input tax rates exceed output rates, which can hinder cash flow for various industries.
- **Reducing Litigation and Compliance Costs:** A simplified tax structure can significantly decrease litigation related to tax classifications and compliance costs for businesses.
  - ☐ For instance, proposals to combine certain GST slabs aim to **alleviate the administrative burden** on manufacturers and service providers1.
- **Encouraging Compliance:** Simplified tax codes tend to encourage higher compliance rates among taxpayers.
  - ☐ Recent data indicates that **over 72% of taxpayers opted for a new, simpler income tax regime in 2023-24,** reflecting a growing preference for transparency and ease of understanding in tax obligations.
- **Enhanced Predictability:** A simplified tax system provides greater predictability for taxpayers, allowing them to **plan their finances more effectively**.
- **Equity in Taxation:** Simplification efforts also focus on **achieving horizontal and vertical equity in taxation.**
- **Administrative Efficiency:** Streamlining the tax framework can enhance the efficiency of tax administration.
  - ☐ This includes reducing the complexity of determining tax liabilities and **improving compliance through technology-driven processes**.
- **Support for Economic Growth:** By creating a more **business-friendly atmosphere** through rationalised tax policies, the government aims to bolster domestic manufacturing and attract foreign investments, ultimately contributing to sustainable economic growth.

Challenges:

- **Complex M&A Provisions:** Current laws do not adequately address modern business practices like mergers and acquisitions.
    - ☐ For example, **only manufacturing companies can set off losses during mergers**, while service companies are excluded.
- **Unfair Tax Deductibility Rules:** In strategic acquisitions, the tax-deductibility of interest on borrowed money is capped unfairly at 20% of dividends, which often does not align with the actual costs incurred.
- **Dispute Resolution:** India's tax dispute resolution mechanism is **slow and cumbersome.**
    - ☐ Alternative dispute resolution methods and advanced ruling systems **need urgent reform to prevent tax disputes** from dragging on for years.
- **Salaried Individuals:** The standard deduction for salaried individuals, currently ₹50,000, is **too low and does not account for the real expenses** incurred by high-income earners.
- **Employee Stock Ownership Plans (ESOPs):** The current taxation framework for ESOPs, where taxes are levied when options are exercised, does not consider the fact that there is no actual monetisation at that stage.

Way Forward:

- **Update M&A Tax Provisions:** Tax laws must be modernised to allow losses from mergers across all sectors, not just manufacturing.
- **Enhance Dispute Resolution Mechanisms:** This could include reviving the **advanced ruling system,** making it accessible to more businesses, and ensuring that cases are resolved within a few months.
- **Revise Salary Taxation Rules:** Increasing the standard deduction for salaried individuals and revising how ESOPs are taxed will make the system more equitable.
- **Rationalise TDS Provisions:** The burden on tax deductors must be reduced, and the rates and compliance requirements for tax deducted at source (TDS) should be simplified.

National Agriculture Code (NAC)

Sub Topic- Agriculture, E-technology in the aid of farmers

Context: The **Bureau of Indian Standards (BIS)** has initiated the process of creating a **National Agriculture Code (NAC)**, similar to the existing National Building Code and National Electrical Code.

More on News:

- The BIS, **responsible for setting standards across various sectors**, has already established **guidelines for agricultural machinery** like tractors and harvesters, **as well as inputs** such as fertilisers and pesticides.
- However, **many aspects of agriculture**, such as field preparation and water use**, still lack standardised practices.**

- As a result, **policymakers have recognised the need for a comprehensive framework,** which the NAC aims to provide.

About NAC:

- **Standardisation:** The NAC **will cover the entire agricultural cycle and include guidelines for future standardisation efforts.**
- **Two Parts:** It will be divided into **two parts: general principles** applicable to all crops and **crop-specific standards** for major crops like wheat, paddy, pulses, and oilseeds.
- **Reference:** This code will serve as a **reference for farmers, agricultural universities, and field officials.**
- **Scope:** In addition to standards for **agricultural machinery**, the NAC will address various processes and post-harvest operations such as: **Crop selection, Land preparation, Sowing and transplanting,** Irrigation and drainage, Soil and plant health management, Harvesting and threshing, Primary and post-harvest processing, Sustainability practices and Record maintenance.
    - ☐ It will also include **standards for managing inputs like fertilisers and pesticides,** as well as guidelines for crop storage and traceability.
    - ☐ The NAC will cover **emerging areas such as natural farming, organic farming,** and the use of the **Internet of Things (IoT) in agriculture.**
- **Timeline:** The BIS has already formed working groups for 12-14 areas to draft the code, which is **expected to be completed by October 2025.**
    - ☐ Afterward, **training programs for farmers on NAC standards will be organised** in collaboration with agricultural universities, with financial assistance provided by the BIS.

Objectives of the NAC:

- **Code:** Developing a **comprehensive, implementable code** that considers agro-climatic zones, crop types, and socio-economic diversity.
- **Quality:** Promoting a culture of quality in Indian agriculture by providing a **reference for policymakers and regulators.**
- **Guidance:** Offering guidance to farmers to support **better decision-making** in agricultural practices.
- **Integration:** Integrating existing Indian standards with recommended agricultural practices.
- **Horizontal Issues:** Addressing horizontal issues in agriculture, such as **sustainability, traceability, and SMART farming.**
- **Capacity-Building:** Supporting capacity-building programs led by agricultural extension services and civil society organisations.

Standardised Agriculture Demonstration Farms (SADFs):

- In addition to drafting the NAC, the BIS is setting up Standardised Agriculture Demonstration Farms (SADFs) at selected agricultural institutions.
- These farms will be **used to test and demonstrate agricultural practices and technologies based on Indian standards.**

- The BIS **plans to sign Memoranda of Understanding (MoUs) with leading agricultural institutes** to develop these farms, with 10 institutes already identified.
- Two MoUs, including one with the Govind Ballabh Pant University of Agriculture and Technology (GBPUAT), have been signed.
- These farms will offer hands-on learning opportunities for officials, farmers, and industry professionals.

The successful implementation of the NAC holds the potential to transform India's agricultural sector by creating a more conducive environment for farmers, ultimately benefiting both the agricultural community and the economy at large.

Export Led Growth

Sub Topic- Growth & Development

Context: Jamshyd Godrej, Chairman of the Godrej Reemphasised **Economic Survey 2022-23 view** that India's manufacturing sector **should focus on export-led growth driven by climate-friendly processes** and view regulations like the **Carbon Border Adjustment Mechanism (CBAM)** as an opportunity to enhance its global presence.

About Export Led Growth:

- **About:** Export-led growth refers to an **economic strategy that prioritises increasing the volume of exports** as a means of stimulating overall economic growth. This approach can be **especially important for India,** given its large population and growing domestic market.

Successful Examples of Export-Led Growth:

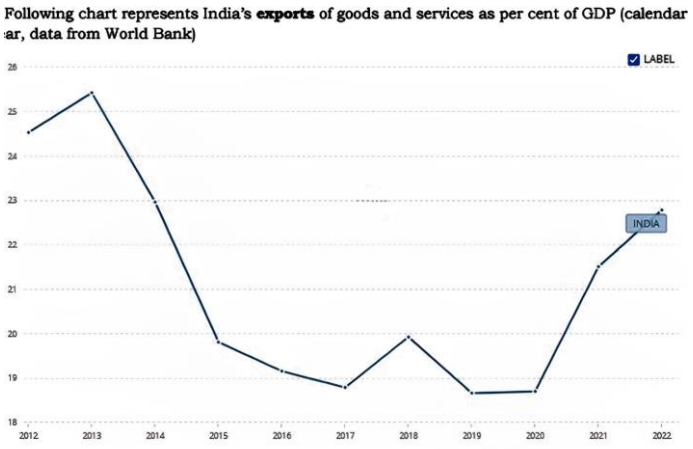
- **Japan (1950s–1980s):** Focused on high-quality manufacturing exports, especially electronics and automobiles, and Became the second-largest economy by the 1980s.
- **South Korea (1960s–Present):** Shifted to export promotion with major companies like Samsung and Hyundai leading global markets and Transformed into a technological and industrial powerhouse.
- **China (1980s–Present):** Opened its economy with reforms, focusing on low-cost manufacturing and exports. Special Economic Zones (SEZs) became major hubs for global trade. Grew to be the **world's second-largest economy, dominating global manufacturing.**

Limitation in India's achieving Export-Led growth model vis -a- vis China:

- **Changed Global Trade Environment:** Increased **protectionism and fewer favourable trade agreements** limit India's market access compared to **China's rise in a more liberalised trade era.**

- **Established Global Supply Chains:** China dominates global manufacturing, and new competitors like **Vietnam and Bangladesh have already captured market share.**
- **Shrinking Labour Advantage: Automation** reduces the benefit of low-cost labour, and India's labour costs are not as competitive as other emerging markets.
- **Environmental Pressures:** India must adopt **greener practices, like CBAM** facing stricter sustainability standards that increase production costs.
- **Focus on Self-Sufficiency:** India's push for domestic manufacturing **(Atmanirbhar Bharat)** may conflict with export-driven strategies, unlike China's dual focus on exports and domestic consumption.

Arguments in Favour of Export-Led Growth for India:



- **Boosts Economic Growth:** Taps into global demand, increasing GDP and foreign exchange.
- **Job Creation:** Creates millions of jobs, especially in labour-intensive sectors.
- **Enhances Competitiveness:** Drives innovation and quality improvements in Indian industries.
- **Increases Foreign Exchange Reserves**: Exporting boosts foreign exchange inflows, strengthens the currency, and provides a buffer against global economic fluctuations.
- **Technology Transfer and Skill Development**: Global supply chains promote technology transfer and skill development, helping Indian industries modernise and improve workforce capabilities.

Arguments Against Export-Led Growth for India:

- **Dependence on Global Demand:** Vulnerable to global economic fluctuations.
- **Infrastructure Bottlenecks:** Weak infrastructure hampers competitiveness.
- **Environmental Concerns:** Increased production could worsen pollution and resource depletion.

Challenges in Achieving Export-Led Growth:

- **Infrastructure Limitations:** India's manufacturing sector faces challenges like inadequate infrastructure, which can hinder efficiency and increase costs.
- **Regulatory Barriers:** Complex regulations and bureaucratic hurdles can slow down the export process and deter potential exporters.
- **Global Competition:** Indian manufacturers face stiff competition from established players in countries like China and Vietnam.

Key Steps to Promote Export-Led Growth in India:

- **Improve Infrastructure:** Enhance ports, develop industrial parks, and strengthen transport networks.
- **Simplify Regulations:** Streamline export procedures and provide tax incentives.
- **Diversify Markets:** Explore new markets and leverage **Free Trade Agreements (FTAs).**
- **Focus on High-Value Exports:** Shift to technology-intensive sectors and invest in R&D.
- **Boost MSME Exports:** Improve access to finance and provide training for MSMEs.

Important Schemes to promote Export

- **Foreign Trade Policy (FTP)**: The updated FTP (2021-26) aims to enhance export competitiveness by promoting the manufacturing sector, boosting exports of goods and services, and simplifying procedures.
- **Export Promotion Schemes**: Initiatives like the Merchandise Exports from India Scheme (MEIS) and Services Exports from India Scheme (SEIS) offer incentives and rewards to exporters in specific sectors.
- **Market Access Initiatives (MAI)**: This program assists Indian exporters in discovering new markets through trade fairs, exhibitions, and market research to enhance export potential.
- **Digital Initiatives**: The government promotes digital platforms like the e-Export initiative to help small and medium enterprises (SMEs) access global markets through e-commerce.

Universal Basic Income

Sub Topic- Growth & Development, Employment

Context: Global job growth is lagging due to **automation and AI,** with youth unemployment in India prompting renewed interest in UBI as a social safety net.

About UBI:

- **Definition:** Universal basic income is an **income support mechanism** taking forward the concept of **Redistributive Justice.**

- **Key Features:**

    - **Periodic:** It is a recurrent payment , rather than a one-off grant.

    - **Cash payment:**It is paid in cash, allowing the recipients to convert their benefits into whatever they may like.

    - **Universal:** It is paid to all, and not targeted to a specific population.

    - **Individual:** It is paid on an individual basis (versus household-based).

- **Unconditional:** It involves no work requirement or sanctions; it is accessible to those in work and out of work, voluntarily or not.

- **Countries:** UBI experiments have been conducted in countries as different as **Kenya, Finland, Namibia, India, and Canada.**

- **Variations and Historical Context**

  - **Thomas Paine's "Ground-Rent":** A one-time grant aimed at combating poverty transmission.

  - **Milton Friedman's "Negative Income Tax":** A proposed replacement for welfare systems.

  - **Philippe Van Parijs' UBI:** Regular, unconditional cash transfers.

  - **Anthony Atkinson's "Participation Income":** Conditional on social contributions.

- **The Case for Universal Basic Income (UBI)**

  - **Conceptual/Philosophical Foundations**

    - **A Paradigm Shift:** UBI represents a transformative shift in views on social justice and economic productivity, asserting that a **just society** must ensure a minimum income for its citizens.

    - **Social Justice:** Influential thinkers like **Tom Paine and John Rawls** argue that societies lacking a minimum income for all cannot be considered just.

    - **Poverty Reduction:** UBI could effectively reduce poverty in India by providing a basic income, promoting **personal agency and dignity.**

  - **Employment and Administrative Efficiency:** UBI supports labour market flexibility and can **improve the efficiency of welfare delivery** through existing technologies like JAM (Jan-Dhan, Aadhaar, and Mobile).

  - **Psychological Benefits**: UBI can serve as a form of basic insurance against income shocks, enhancing cognitive resources and overall well-being.

  - **Access to Formal Credit**: By raising incomes, UBI could facilitate greater access to formal credit and reduce reliance on informal loans.

- **Counterarguments Against UBI:**

  - **Economic Concerns:** Critics raise issues about potential work disincentives, but the proposed income levels are likely minimal guarantees rather than disincentives.

- **Detachment from Employment:** The argument that UBI separates income from employment is **countered** by the existing societal structure where the **wealthy receive non-work-related income.**

- **Reciprocity:** Critics question the **justification for unconditional income without societal contribution;** however, UBI acknowledges the various forms of contributions individuals make to society.

I in India:

Historical Context: Previous discussions around **UBI emerged post-2016-17 nomic Survey,** highlighting the potential of direct benefit transfers **(DBTs) via the JAM** n-Dhan, Aadhaar, Mobile) infrastructure.

Current Cash Transfer Schemes

- **Rythu Bandhu Scheme (2018):** Provided unconditional payments to farmers.

- **PM-KISAN (2019):** Expanded to include all farmers with an estimated cost of ₹75,000 crore (0.4% of GDP).

Challenges and Way Forward:

- **Financial Feasibility**

  - **Cost Concerns:** Full UBI proposals may require **3.5%-11% of GDP,** necessitating cuts to existing programs or significant tax increases.

  - **Taxation for Funding:** Increasing the **direct tax-to-GDP ratio in India could provide the necessary funds** to support UBI initiatives.

- **Logistical Challenges:** Ensuring access to cash-out points and addressing electronic payment issues are critical for success.

- **India's constitutional provisions that support a Universal Basic Income (UBI)**

  - **Fundamental Rights (Article 21)**: Right to life and personal liberty, which can be interpreted to include the right to a dignified life, potentially encompassing income support.

  - **Directive Principles of State Policy**: **Articles 39(a)** (right to adequate means of livelihood) and **41** (right to work, education, and public assistance) establish a framework for state welfare initiatives.

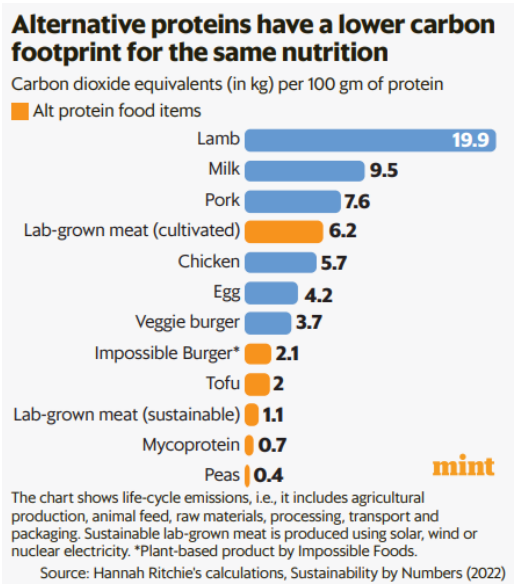
  - **Article 46**: Promotes the educational and economic interests of weaker sections, reinforcing the need for social safety nets.

Subject - Science & Technology

Smart Proteins

Sub Topic- Awareness in the field of Science & Technology

Context: August marked significant milestones for alternative proteins, or **"smart proteins."**



More on News:

- **India** launched its B**iotechnology for Economy, Environment, and Employment (Bioe3)** policy, focusing on smart protein production.
- **Singapore** approved **eight new insect species as edible protein sources**, while in the **US,** Burger King's Impossible Whopper celebrated five years.

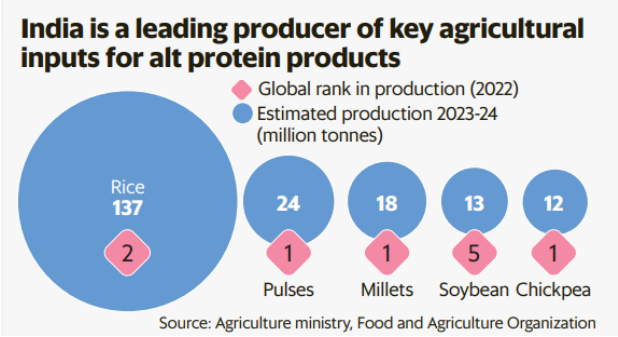
Smart Proteins:

- Alternative or smart proteins, also known as **alt proteins,** include proteins **derived from unconventional sources like algae, fungi, or insects,** as well as those produced through **innovative methods like fermentation or lab-cultivated cells.**
- This category also encompasses **plant-based proteins,** which have been available for decades.
- Alt proteins provide **an alternative to animal-based sources** like dairy, meat, and seafood.
- They are **more sustainable,** with **plant-based meat production using 72-99% less water and 47-99% less land**, according to data from the **Good Food Institute (GFI) India.**

Growing Demand:

- **As incomes rise,** people **tend to consume more protein,** and **India** has seen an increase in protein's share of total calorie consumption, rising from **9.7% in 1991 to 11% in 2021.**
- Alt proteins present a **sustainable solution** to meet this demand.
    - ☐ They also **offer food safety benefits** and are considered a **more humane and ethical source of protein**.

- Familiar plant-based products such as **soya chaap, nuggets, and soy milk** are already present in India, though the **domestic market remains small, valued at $45 million in 2022 according to a GFI-Deloitte report.**
- However, **rapid growth is projected**, with estimates placing the **market's value between $946 million and $2.4 billion by 2030.**
- The **COVID-19 pandemic accelerated the popularity of non-animal proteins,** with GFI **India recording 377 alt protein products across 41 formats from 73 brands in 2023.**
    - ☐ A GFI-Kantar survey revealed that **awareness of plant-based dairy and meat is higher in urban areas**, especially among younger, wealthier consumers and non-vegetarians.



Barriers:

Barriers to wider adoption remain, including **challenges around taste, texture, and price.**

- **Diversity:** Unlike the West, where plant-based burgers dominate the alt protein market, **Indian consumers prefer a variety of products,** from unflavored protein powders to flavorful tikkas, biryani, and kebabs.
- **Dairy:** It **remains popular**, with many choosing regular cheese over vegan options in plant-protein burgers.
- **Texture:** It is another challenge, as **alt-meat products may not feel "meaty" enough** for non-vegetarians or may be too similar to meat for vegetarians.
    - ☐ Companies are addressing this with diverse ingredients such as **jackfruit (Wakao), soy (Shaka Harry), and pea and quinoa (GoodDot)**.
    - ☐ Surveys show that soy and almond milk are the most familiar products in the alt protein category, while mock-chicken is a top choice in plant-based meat trials, indicating these may serve as effective entry points for consumers.
- **Price:** It is a major concern, **especially for budget-conscious buyers,** who may find **traditional options like paneer or chicken better value** for money than mock-chicken nuggets.

India's Chance

- **Expanding Global Market:** It **offers India significant export opportunities**.
    - ☐ As a **leading producer of crops** like chickpeas, lentils, millets, peas, rice, and soybeans, **India is well-positioned to become a key supplier of plant-based protein ingredients.**
    - ☐ The market for **protein-rich additives like concentrates, isolates, and flours also holds great potential.**
    - ☐ Indian companies are already making inroads internationally, with Shaka Harry's plant-based meat products entering Singapore's Mustafa supermarket and GoodDot partnering with ADF Foods to reach the US market.

- **Agriculture Sector:** India's **large agricultural sector, ample labour force, and unique flavours** provide a **strong foundation** for developing an alternative protein ecosystem.
    - ☐ However, **changing consumer habits will take time.**
    - ☐ Indian manufacturers could benefit from **partnerships with alt protein innovators** in hubs like Singapore to refine product taste and reduce costs.
    - ☐ Recognising the potential of alternative proteins, the Indian government may consider launching **an awareness campaign** to boost public interest, especially among Gen Z. To succeed, alt proteins will **need to be marketed as trendy**, not just healthy—**similar to** how the National Dairy Development Board promoted eggs in the 1980s with its **"roz khao ande"** campaign or Amul's **"Piyo glass full doodh"** campaign for milk in the 1990s.

Stem Cell Therapy: A New Hope for Type 1 Diabetes in India

Sub Topic- Achievements in the field of Biotechnology

Context: Stem cell therapy represents a cutting-edge **advancement in regenerative medicine**, offering the possibility of **a functional cure for Type 1 diabetes (T1D)** by **enabling** the **regeneration of insulin-producing beta cells**.

More on News:

A **recent case** in **China reported** a **woman with T1D regaining insulin production after receiving reprogrammed stem cells**, marking a significant milestone in diabetes management.

The Science Behind Stem Cell Therapy:

- **Stem cell therapy operates** within the **realm of regenerative medicine**, **utilising pluripotent stem cells** capable of differentiating into various cell types, including **insulin-producing beta cells**.
- These **pre-programmed cells** can be **transplanted into** the **body**, where they **may begin producing insulin** to **help regulate blood glucose levels**, representing a potential game-changer for T1D treatment.
- **Scientists** have been **advancing techniques** to **create cells** that **mimic** the **functionality** of **pancreatic islets** from **different pluripotent stem cell sources. This includes:**
    - ☐ **Embryonic Stem Cells (ESC):** Derived from early-stage embryos, these can differentiate into beta cells.
    - ☐ **Induced Pluripotent Stem Cells (iPSCs):** Adult cells are reprogrammed to a pluripotent state, allowing them to become insulin-producing cells. This approach offers a less controversial alternative to ESC.

Challenges:

- **Invasiveness:** The procedure is invasive and carries inherent risks.

- **Immune Rejection:** Newly transplanted cells may be rejected by the body, necessitating long-term immune suppression, which can increase the risk of infections and cancer.
- **Encapsulation Technology:** While methods exist to protect transplanted cells from immune rejection, these may also pose long-term risks.
- **Durability of Beta Cells:** There is uncertainty regarding the need for periodic replenishment to maintain the functionality and durability of the transplanted cells.
- **Regulatory Approvals:** Before stem cell therapy can become widely available, it must undergo rigorous regulatory scrutiny.

Indian Perspective:

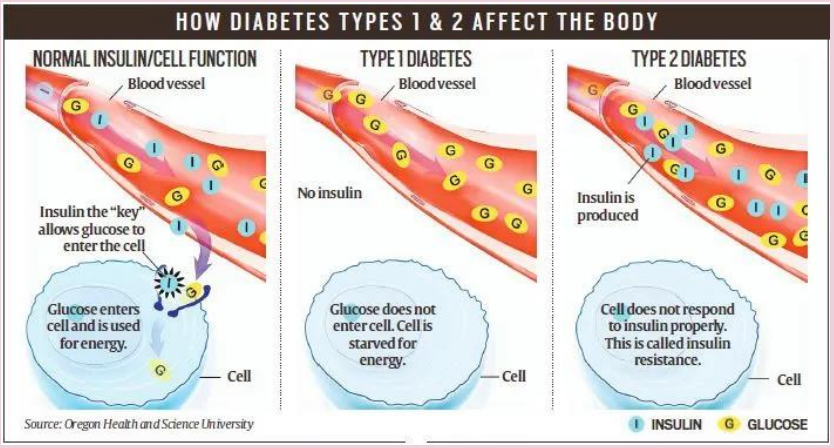
- **Prevalence:** Over 860,000 people in India live with T1D, facing high healthcare costs and challenges in daily management.
- **Current Treatments:** New insulin therapies and advanced delivery devices (like AI-enabled insulin pumps and continuous glucose monitors) have improved management, especially in children.

Future Outlook:

- **Potential Revolution:** If successful, stem cell therapy could shift T1D treatment from insulin replacement to restoring the body's natural ability to regulate blood glucose.
- **Further Research Needed:** More studies are necessary to establish the long-term efficacy and scalability of stem cell therapy for the broader population.
- **Accessibility Concerns:** Given high costs and the need for scalable solutions, significant time may be required before stem cell therapy becomes a standard treatment for T1D.

What is Type 1 Diabetes?

- *Type 1 diabetes (T1D) is **an autoimmune condition** in which the **pancreas completely stops producing insulin**, a crucial **hormone** that **regulates blood glucose levels** by **facilitating** its **absorption** into the **liver, fat,** and **other cells**. Unlike **type 2 diabetes**, which is **characterised** by **reduced insulin production** or **insulin resistance**, T1D results in total insulin deficiency.*



- ***Key Features :***
  - ☐ ***Onset:*** *T1D is primarily diagnosed in children and adolescents, although it can occur at any age.*
  - ☐ ***Severity:*** *While less prevalent than type 2 diabetes, T1D is more severe.*
    - ☐ ***Individuals** with T1D **require lifelong insulin therapy** for survival; without it, they can experience life-threatening conditions within weeks.*
  - ☐ ***Symptoms:*** *Common symptoms include **frequent urination, extreme thirst, fatigue,** and **weight loss**. **Many children present** with **severe symptoms**, and about **one-third** may have **diabetic ketoacidosis (DKA)**, a serious complication where the body produces high levels of ketones due to inadequate glucose absorption.*

WHO Approves First Mpox Diagnostic Test

Sub Topic- Achievements in the field of Biotechnology

Context: The **World Health Organisation (WHO)** has **taken** a significant **step in** the **fight against Mpox by approving** the **first in vitro diagnostic (IVD) test** for emergency use.

More on News:

- This **approval, under** the **Emergency Use Listing (EUL) procedure**, is **expected** to **enhance global access to mpox testing**, particularly in **regions grappling with outbreaks**.
- The **EUL process accelerates** the **availability of life-saving medical products** (vaccines, tests, treatments) during public health emergencies, highlighting its importance in the global health response to Mpox.

Current Testing Capacity

- **In India, 35 laboratories** are **currently equipped** to test suspected Mpox cases.
- **Since** the **WHO declared Mpox** a **public health emergency** in mid-August 2024, **India** has **reported 30 confirmed Mpox cases.**

Key Highlights:

- The **newly approved test**, the **Alinity m MPXV assay**, is **manufactured by Abbott Molecular Inc. Designed to detect monkeypox virus (clade I/II) DNA from human skin lesion swabs**.
- The **monkeypox virus** is **confirmed through nucleic acid amplification testing**, including real-time or conventional polymerase chain reaction (PCR) tests.
  - ☐ The **recommended specimen** for diagnostic confirmation is **lesion material**, specifically **from pustular or vesicular rashes**.

- This **test is intended for use by trained clinical laboratory personnel** proficient in PCR techniques and IVD procedures.

What is PCR?

- Polymerase Chain Reaction (PCR) is a fast, **inexpensive technique** used to **amplify** small segments of DNA, making molecular and genetic analyses possible.
- This method, developed by **Kary B. Mullis**, earned him the **Nobel Prize in Chemistry** in 1993 due to its revolutionary impact on DNA studies.
- PCR is crucial in fields like the **Human Genome Project**, **DNA fingerprinting**, **pathogen detection** (such as **HIV/AIDS**), and diagnosing **genetic disorders**.
- The process involves **denaturing DNA** by heating it, followed by **synthesis of new strands** using the enzyme **Taq polymerase**.
- This cycle repeats, producing **billions of DNA copies** in just a few hours, controlled by an automated **thermocycler** machine.

Limitations of PCR:

- **Requires Prior Knowledge:** PCR needs prior sequence information to design primers, limiting its use for unknown targets.
- **Error-Prone Polymerases:** DNA polymerases used in PCR can introduce mutations, potentially affecting accuracy.
- **Sensitivity to Contamination:** PCR is highly sensitive, and even small contaminations can lead to misleading or ambiguous results.

Addressing a Critical Need:

- The **approval comes** at a crucial time **as countries face increasing mpox outbreaks**.
- **Early diagnosis** is **essential for timely treatment** and **containment** of the **virus**. However, **limited testing capacity** and **delays** in **confirming cases** have **been significant challenges**, especially **in Africa**.
    - ☐ **In 2024** alone, over **30,000 suspected cases** have been **reported** across the region, with the **highest numbers** in the **Democratic Republic of the Congo, Burundi,** and **Nigeria1**
    - ☐ **In** the **DRC**, only **37%** of **suspected cases** have been **tested this year**, **highlighting** the **urgent need** for **improved diagnostic capabilities.**
- The **Alinity m MPXV assay** will **enable health workers** to **confirm suspected mpox cases efficiently**, thereby aiding in the control of the virus.

Way Forward:

- **With** the **approval** of the Alinity m MPXV assay, **WHO aims to bolster global testing capacities** and ensure that countries can respond more effectively to mpox outbreaks.

- This **development marks a pivotal step towards improving public health responses** and **safeguarding communities worldwide**.

About Mpox:

- **Mpox** (formerly known as monkeypox) is a disease caused by the **Monkeypox virus.**
- It is **caused** by an **orthopoxvirus**, was first **identified** in **humans** in **1970** and is **endemic** to **central** and **west Africa**.
- It is **characterised** by a **rash** and **fluid-filled bumps**.
- It **exists** in **two main strains: clade I** and **clade II**.
- It **spreads** through **contact** with **contaminated items** such as **utensils, towels,** and **bedding**.
- The **disease** also has a **long incubation period (5 to 21 days)**, which can **lead** to **undetected transmission across borders**.
- **Initial symptoms**, such as **fever** and **swollen glands**, are **vague** and can be **mistaken for other illnesses**.
- **Proactive measures** by **WHO** and **international collaboration** with **Africa CDC, NGOs** and **civil society** to manage the current outbreak and **prevent** further **global spread** of MPOX.

Monopolisation of Space

Sub Topic- Awareness in the field of Space technology

Context: Last month, **Elon Musk,** the CEO of Tesla, SpaceX, and social media platform X, **announced that SpaceX now controls nearly two-thirds of all active Earth satellites.**

More on News:

- This revelation **sparked concern over the concentration of power in the satellite market** and raised **questions about the governance of space resources.**
- The rapid growth of **SpaceX's Starlink satellite constellation** has been made possible by the company's reusable Falcon launch vehicle, allowing it to deploy hundreds of satellites in low-earth orbit (LEO) each month.
- The company's **long-term goal is to establish a constellation of 42,000 satellites,** providing global internet coverage and potentially dominating the world's satellite communication infrastructure.

What is the Monopolisation of Space?

- It refers to **a situation where a single entity,** such as SpaceX, **controls a disproportionate share of orbital slots and satellite infrastructure.**
- This dominance gives **a first-mover advantage in the allocation of orbital slots**, a **shared global resource,** on a first-come, first-served basis.
- The monopoly **extends beyond satellite deployment.**
    - ☐ SpaceX, through its **Starlink network, aims to capture a significant portion of global internet traffic,** further consolidating its power over global communications.

Disadvantages:

- **Concentration of Power: SpaceX's control over two-thirds of Earth's satellites** gives it significant market power, limiting competition and **enabling it to dictate the terms of satellite communication and internet services globally.**
- **Political Influence:** With vast control over critical communication infrastructure, SpaceX can exert political influence, as **Musk has demonstrated by refusing to comply with governmental or military requests.**
    - ☐ This concentration of power **undermines democratic processes and global governance.**
- **Environmental Impact:** The increasing number of LEO satellites contributes to **space debris**, **creating potential risks for space operations.**
    - ☐ Additionally, **radio-frequency pollution** from these satellites disrupts the work of astrophysicists and astronomers.
- **Lack of Competition:** The Monopolisation of LEO slots stifles competition, leaving **limited options for consumers and governments alike**

Actions Taken to Prevent Monopolisation:

- While regulatory bodies have begun **acknowledging the dangers** of Monopolisation, **concrete steps to curb SpaceX's dominance remain limited.**
- The **U.S. Federal Communications Commission (FCC) has raised concerns about competition** in the satellite market, and international organisations like the **International Telecommunication Union (ITU)** govern the allocation of the radio spectrum needed for satellite communication.
- However, **much of the space industry still operates on a first-come, first-served basis for orbital slots,** allowing well-resourced companies like SpaceX to outpace competitors.
    - ☐ **Countries like China are also working on launching their own satellite constellations** to counter SpaceX's dominance.
- Furthermore, **global discussions around space governance and satellite regulation are gaining momentum**, with an emphasis on preserving space as a shared resource for all of humanity.

Way Forward:

- **Strengthening International Regulations:** International bodies like the ITU should develop stricter guidelines for the allocation of orbital slots and ensure that space remains a global commons accessible to all nations.
- **Promoting Competition:** Governments should support the development of homegrown satellite constellations and invest in competing technologies to prevent the dominance of a single player in the space industry.
- **Encouraging Responsible Use of Space:** Policymakers must ensure that satellite operators adhere to environmental regulations and minimise the creation of space debris. Collaboration between spacefaring nations is crucial to managing the growing risks of space congestion.
- **Balancing Technological Advancement with Regulation:** While encouraging innovation in the space industry, governments must also ensure that competition laws are robust and applied effectively to prevent any single entity from gaining unchecked power.

Conclusion:

The Monopolisation of space by SpaceX highlights the urgent need for stronger global governance and competition policies. While SpaceX's technological advancements are impressive, the concentration of power in the hands of one company poses serious risks to competition, democracy, and space sustainability.

NASA's Europa Clipper Mission

Sub Topic- Achievement in the field of Space technology

Context: NASA is preparing to launch the Europa Clipper, a spacecraft destined to explore Jupiter's moon Europa, a prime candidate for harbouring life beyond Earth.

More on News:

- While the **mission won't directly search for life,** it will **determine whether conditions beneath Europa's icy crust could support it**—laying the groundwork for future missions that might investigate further.
- Liftoff is scheduled for this month aboard SpaceX's Falcon Heavy rocket from NASA's Kennedy Space Center, marking the start of a $5.2 billion mission.

About Europa:

- Europa is **one of Jupiter's 95 moons and nearly the size of Earth's moon.**
- It is **encased in a thick ice sheet,** estimated to be between 10 to 15 miles (15 to 24 kilometres) thick, beneath which lies an ocean possibly 80 miles (120 kilometres) or more deep.

- **Geysers spotted by the Hubble Space Telescope** suggest that water from the hidden ocean may be erupting from cracks in the ice.
- Europa was **first discovered by Galileo in 1610** and is part of the four Galilean moons, **alongside Ganymede, Io, and Callisto.**

Mission Goals:

- The Clipper's mission focuses **solely on whether Europa's ocean or water pockets within the ice could support life.**
- Water, organic compounds, and energy sources are essential for life as we know it.
- In Europa's case, **thermal vents on the ocean floor could provide that energy**, **similar to how deep-sea bacteria thrive** around Earth's hydrothermal vents.

A Supersized Spacecraft for a Complex Mission:

- Europa Clipper is **NASA's largest planetary spacecraft.**
- When fully unfurled, its solar panels and antennas span more than 100 feet (30 metres)—about the **size of a basketball court.**
- It weighs nearly 13,000 pounds (6,000 kilograms), with large solar wings necessary to generate power far from the Sun.
- The spacecraft houses **nine scientific instruments, including radar** to penetrate the ice, cameras to map the surface, and sensors to analyse the moon's thin atmosphere.
    - ☐ These tools will allow the Clipper to fly within 16 miles (25 kilometres) of Europa's surface, much closer than previous missions.

Navigating a Radiation Hazard:

- Jupiter's powerful radiation belts pose a significant risk to spacecraft.
- Europa passes through these radiation zones, which are **second only to the Sun in intensity within our solar system.**
- To protect its electronics, Clipper's instruments are housed in a radiation-resistant vault with **dense aluminium and zinc walls.**

The Long Journey to Europa:

- Clipper's journey to Jupiter spans **1.8 billion miles (3 billion kilometres)** and will take **5.5 years.**
- The spacecraft **will use a gravitational assist by flying past Mars in early 2025 and Earth in late 2026 to gain speed.**
- It **will arrive at Jupiter in 2030**, beginning its science operations the following year.
- During its mission, Clipper will **orbit Jupiter and fly by Europa 49 times** before ending with **a planned crash into Ganymede—the largest moon in the solar system—by 2034.**

A History of Exploring Europa:

- NASA's **twin Pioneer spacecraft and Voyagers 1 and 2** provided the first detailed images of Jupiter and its moons in the 1970s.
- Galileo conducted close flybys of Europa in the 1990s, coming within 124 miles (200 kilometres) of the surface.
- More recently, **NASA's Juno spacecraft has continued to study Jupiter and occasionally capture new images of Europa.**
- In 2031, just a year after Clipper's arrival, the **European Space Agency's JUICE mission** will join the effort, further investigating Europa, Ganymede, and Callisto.

Europa and Other Ocean Worlds:

- **Jupiter:** Europa **isn't the only celestial body believed to contain a hidden ocean**.
  - ☐ **Ganymede,** Jupiter's largest moon, is **thought to harbour a vast ocean beneath an ice sheet** possibly 100 miles (160 kilometres) thick.
  - ☐ **Callisto may also have an underground ocean**, but with an even thicker ice crust.
- **Beyond Jupiter: Saturn's moon Enceladus** has geysers ejecting water vapour, and **Titan** is suspected of having a subsurface sea.
  - ☐ While no ocean worlds have been confirmed outside our solar system, scientists believe they could be common in the galaxy.

Messages for Future Discoverers:

- Like many robotic explorers, the Europa Clipper carries messages from Earth.
- A triangular metal plate attached to the spacecraft features a design called **"water words," showing the word "water" in 104 languages.**
- On the reverse side is a **poem by Ada Limón, the U.S. poet laureate**, along with a **silicon chip containing the names of 2.6 million people** who signed up to symbolically "ride" along on the mission.

The Europa Clipper offers a unique opportunity to explore a world that may be habitable today. With its sophisticated instruments and unprecedented close encounters, the mission will provide critical insights into Europa's potential for supporting life.

Subject - Environment, Bio-diversity and Disaster management

India's Clean Energy Transition

Sub Topic- Renewable Energy, Environmental Pollution & Degradation

Context: India aims to become a developed nation by 2047, focusing on inclusive and sustainable growth.

More on News:

- The **goal** is to **improve living standards while protecting public health** and **minimising emissions**.
- Achieving this **goal requires a balanced approach to energy planning**, as energy **accounts for nearly three-quarters** of the **country's greenhouse gas emissions**.

India's per-capita primary energy consumption *is about* ***23%*** *of* ***China's*** *and nearly* ***35%*** *of the* ***global average****. To meet the aspirations of its growing economy and population, India's energy consumption must grow significantly. This* ***rising demand can be met sustainably*** *through the* ***principles of Lifestyle for Environment (LiFE)****, which* ***aim to deliver quality living standards*** *equivalent to those of developed nations.*

The Need for Integrated Energy Planning:

- **Energy security** is a pivotal aspect of **India's clean energy transition**.
- **Currently, energy accounts** for **nearly three-quarters** of the **country's greenhouse gas emissions**, making it a significant **lever for economic** and **social development**.
- To achieve a **low-cost transition pathway** for **sustainable growth**, **India must adopt an integrated energy planning approach.**
    - ☐ This involves enhancing energy efficiency, increasing the share of renewables, and reducing energy poverty by bridging the urban-rural energy gap.

Key Objectives for 2047:

- **Energy Accessibility:** By 2047, **every Indian should have access to modern clean energy**. This includes **addressing** the **urban-rural energy gap** and **transitioning rural households** from **traditional biomass to cleaner fuels**.
- **Increased Energy Demand:** Total **energy demand** is **expected** to **double** in the **next 25 years**, with **per capita energy consumption increasing** from **0.43 tonnes** of **oil equivalent (toe)** in 2022 to **0.8 toe** by 2047.
- **Renewable Energy Expansion:** The **share of electricity in total energy demand** is anticipated to **grow** from **18.3%** in 2022 **to 40.3%** by 2047, underlining the **need for a cleaner energy system** that can meet rising demand.
- **Drivers of Energy Security:** India heavily relies on fossil fuel imports, making energy security a priority. The **transition to clean energy is essential** to manage these dependencies, **aiming for clean energy to make up 40% of the primary energy mix** by 2047.

Challenges:

- The **transition to clean energy** is **crucial for tackling climate change.** Still, **it faces several challenges**, including **outdated infrastructure** that **struggles** to **integrate renewable sources**, the **need for expensive energy storage solutions,** and **geopolitical issues** that **complicate supply chains**.
    - ☐ **Existing power grids require modernisation**, including the **implementation of smart grid technologies**, to efficiently handle increased renewable energy flows.
- **Financially, trillions of dollars** are **required for this shift**, with fluctuating market conditions and immediate economic needs in developing countries often taking precedence over long-term sustainability.
- **Additionally, inconsistent policies create uncertainty** for **investors**, while the **disparity between developed** and **developing nations complicates policy implementation**.

Transition to Clean Cooking Fuels by 2047

- Currently, **56%** of **rural households rely** on **traditional biomass** for cooking.
- **By 2047**, it is hoped that these **households will shift entirely** to **cleaner fuels**, while **urban areas will achieve** a **100% switch** to **relatively low carbon-intensive fuels** such as gas much earlier.
- **Electric cooking** is also expected to **gain traction**, with about **15%** of rural households and 20% of urban households adopting induction cooking by 2047.

Strategies for Sustainable Energy Transition:

- **Emphasis on Renewables:** A conducive environment for the growth of renewables and cleaner fuels is vital for a sustainable transition.**Natural Gas and Nuclear Energy: Increasing** the **supply of natural gas** and **exploring small modular reactors (SMRs)** can **contribute** to a **low-emission energy landscape**.
- **Energy Pricing Reforms:** Addressing **electricity pricing** and **reforming** the **subsidy system** through measures like **Direct Benefit Transfer** can enhance energy efficiency and reduce the financial strain on the exchequer.

☐ **Innovations** like **solar rooftops** and **smart meters** can **help manage consumption** and **costs more effectively.**

Government Initiatives in Clean Energy:

- **National Solar Mission: Launched** in **2010**, this **mission aims to install 100 GW** of **grid-connected solar power capacity by 2022**. It has been successful in increasing India's solar power generation capacity.
- **National Hydrogen Mission: Announced** in **2021**, this mission **aims to establish India** as a **top global producer** and **supplier of green hydrogen**.
    - ☐ **By 2030**, the **mission targets** the **installation of at least 5 million metric tonnes of green hydrogen capacity**, supported by around **125 gigawatts** of **renewable energy**.
- **Renewable Energy Certificates (RECs):** RECs are **tradable certificates** that **represent** the **environmental benefits of renewable energy generation**. They can be **used by companies to offset their carbon emissions**.

- **Pradhan Mantri Kisan Urja Suraksha e-Vam Utthaan Mahabhiyan (KUSUM):** Designed to **provide energy security for farmers in India** while **supporting** the **country's goal to boost** the **share of electric power from non-fossil fuel sources** to **40% by 2030**.

Future Directions:

- **NITI Aayog** is **leading efforts to create** a **roadmap** for **achieving** a **net zero economy** by **2070**, focusing on various sectors like **agriculture, manufacturing,** and **transport**.
- **Collaborations**, such as **with** the **Ashoka Centre for People-centric Energy Transition**, aim to **ensure** that **energy policies align** with **broader societal needs**.
- This **approach highlights** the **importance of innovative financing** and **policy frameworks to support India's transition toward sustainable energy** and economic growth, setting the stage for a more resilient and equitable energy future.

The Energy Transition Summit India 2024

- **Scheduled** for **October 8-9, 2024** at The **Oberoi in New Delhi**.
- This event will **bring together senior policymakers**, **global investors**, and **leaders** from the energy, metals, and manufacturing sectors **to discuss India's transition to cleaner** and more **sustainable energy sources**.
- **Key topics will include:**
  - ☐ **Scaling up renewable energy**
  - ☐ **Decarbonising industries**
  - ☐ **Balancing energy security** with the need to reduce fossil fuel dependence

Community-Oriented Flood Forecast System Launched in Kerala

Sub Topic- Disaster management, Environmental Pollution & Degradation

Context: On September 28, 2024, a decentralised, community-oriented, and impact-based flood forecast and early warning system was launched for the Periyar and Chalakudy river basins in Kerala.

- This innovative system **enhances disaster preparedness, rescue operations, and flood mitigation**, especially for disaster-prone areas affected by recurring floods since the devastating 2018 deluge.

Key Features of the Project

- **Community-Sourced Data Collection:**
  - ☐ The system is part of the **Project CoS-it-FloWS** (Community-Sourced Impact-based Flood Forecast and Early Warning System).
  - ☐ Data is gathered **using 100 rain gauges operated by community volunteers**.

- ☐ This data is sent daily to the Ernakulam District Emergency Operation Centre (EOC) for better flood management decisions.

- **Technological Innovations:**
  - ☐ Developed by **Equinoct, a Kochi-based modeling solution provider**.
  - ☐ Incorporates a novel rain gauge system suited for extreme rainfall events.
  - ☐ A **mobile app, "gather,"** has been developed for **real-time data transmission** from volunteers to the authorities.
- **Impact-Based Forecasting:**
  - ☐ The system **simulates multiple weather and hydrological parameters** to forecast potential impacts of flooding.
  - ☐ It **addresses gaps in the current flood forecasting models**, particularly in small tropical river basins, and helps in issuing timely warnings.
- **Data Mobilisation and Monitoring:**
  - ☐ **Community volunteers**, including children and senior citizens, play a pivotal role in data collection.
  - ☐ The **data gathered includes rainfall, river levels, tidal information, and groundwater measurements**.
  - ☐ Data is analysed and visualised using a "**climate dashboard**," which helps decision-makers during flood events.
- **Local Community Engagement:**
  - ☐ The project **fosters significant community involvement**, empowering local residents to monitor and report hyper-local climate data.
  - ☐ Volunteers from diverse backgrounds, including young children and elderly individuals, contribute to the monitoring process.

Advantages and Significance

- **Improved Disaster Preparedness:**
  - ☐ The system **enhances flood preparedness and enables quicker response times** for evacuation and rescue.
  - ☐ It **addresses existing issues in India's early warning systems**, such as inadequate impact-based forecasts and last-mile connectivity challenges.
- **Bridging Data Gaps:**
  - ☐ The **hyper-local data gathered through the system** helps bridge existing data gaps in flood forecasting.
  - ☐ This model, **being community-driven and cost-effective**, can be **replicated in other flood-prone regions in India and Global South nations**.
- **Enhanced Decision-Making:**
  - ☐ The **climate dashboard presents real-time, actionable data** to district and state authorities.
  - ☐ This **aids in making well-informed decisions** during floods and other extreme weather events.

Future Prospects

- **System Testing During Disasters:**

- ☐ The project will be tested during real flood events to fine-tune its effectiveness.
- ☐ Government support could scale up the system to provide hourly updates, improving real-time flood response.

- **Expansion and Scaling:**
  - ☐ With further improvements, the model has the potential to expand beyond Kerala and be adopted by other vulnerable regions.
  - ☐ The initiative could evolve to include AI modules for more precise flood forecasting.

Conclusion:

The community-oriented flood forecasting system for the Periyar and Chalakudy river basins is a pioneering approach that empowers local communities to actively participate in disaster management. This system, with its potential for nationwide and global replication, represents a significant step forward in managing climate-related flood risks and improving early warning systems.

Use of Salt Pan Land for Housing: Controversy and Ecological Concerns

Sub Topic- Environmental Pollution & Degradation

Context: The Maharashtra government has allocated **255.9 acres** of **salt pan land** in Mumbai for the **Dharavi Redevelopment Project**, sparking controversy due to environmental and urban planning concerns.

- This decision raises questions about the ecological importance of salt pans and the implications of using these lands for housing.

Background:

- In **October 2024**, the Maharashtra government allocated **255.9 acres** of salt pan land in Mumbai's eastern suburbs for the **Dharavi Redevelopment Project** (DRP).
- The objective is to construct **rental houses** for residents displaced from the slum area of **Dharavi**.
- The decision has ignited a debate among **urban planners**, **environmentalists**, and **government officials** regarding its ecological and urban planning implications.

What Are Salt Pans?

- **Salt pans** are low-lying coastal areas where **salt is cultivated** through seawater evaporation.
- **Ecological Importance**:
  - ☐ Act as natural **sponges**, absorbing rainwater and mitigating flood risks.
  - ☐ Support **intertidal activities** and host diverse **flora and fauna**.
  - ☐ Serve as a natural defence against **storms** and **flooding**.

The Maharashtra Government's Decision:

- **Total Salt Pan Land**: Approximately **13,000 acres** in Maharashtra, with **5,378 acres** in Mumbai.
- **Land Allocation**:
  - ☐ **Arthur Salt Works, Kanjur**: 120.5 acres
  - ☐ **Jenkins Salt Works, Kanjur and Bhandup**: 76.9 acres
  - ☐ **Jamasp Salt Works, Mulund**: 58.5 acres
- These parcels are part of the **Development Control and Promotion Regulations (DCPR) 2034** plan, which opens **1,781 acres** of salt pan land for development.
- **Ownership**: The allocated lands are owned by the **Central government**, which approved the transfer to Maharashtra in **September 2024**.

Terms for Land Allocation:

- Leased for **99 years** at **25%** of the prevailing market rate.
- **Dharavi Redevelopment Project Private Limited (DRPPL)** will manage costs and bear expenses for **labour resettlement**.
- The land can only be used for **rental housing**, **slum rehabilitation**, and **affordable housing** for economically weaker sections, prohibiting **commercial activities**.

Concerns from Urban Planners & Environmentalists:

- **Ecological Impact**:
  - ☐ Salt pan lands play a crucial role in **flood protection**.
  - ☐ Call for an **impact assessment study** before large-scale development.
- **Formation of Ghettos**:
  - ☐ Relocating residents to different areas risks creating isolated **ghettos** instead of integrated communities.
  - ☐ Emphasis on **in-situ rehabilitation** (resettlement within the original locality).
- **Legal Challenges**:
  - ☐ Potential legal disputes regarding **environmental clearances**.
  - ☐ Environmentalists may challenge the decision based on ecological concerns.

What Lies Ahead?

- The **Central government** will transfer the land to Maharashtra, which will provide **clearance** to DRPPL for construction.
- DRPPL must obtain approvals from the **Ministry of Environment, Forest and Climate Change** for construction plans.
- Environmentalists argue that the entire process can be challenged legally, highlighting the need for thorough impact studies.

Conclusion:

- The decision to use **salt pan lands** for housing developments raises significant concerns about the **balance** between addressing urban housing needs and **protecting the environment**.

- As salt pan lands are essential for **flood defence**, careful assessment of ecological impacts is crucial to prevent long-term consequences in **Mumbai**'s urban landscape.

Brazil Passes 'Fuel of the Future' law to boost Sustainable Aviation

Sub Topic- Environmental Pollution & Degradation

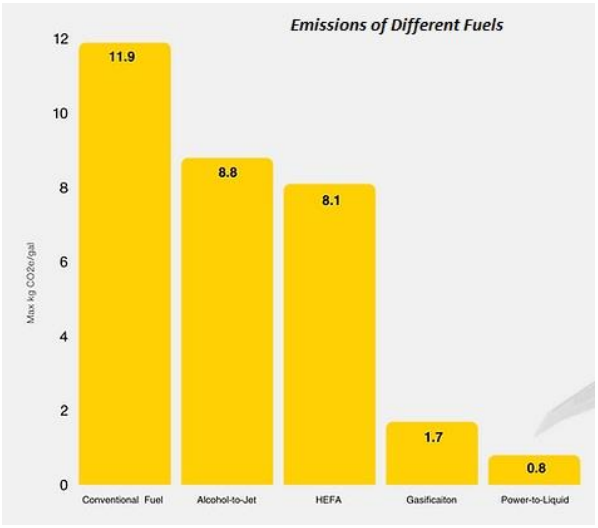
Context: Brazil has approved the **"Fuel of the Future" law,** which promotes the production and use of **Sustainable Aviation Fuels (SAF).** This move is part of the country's broader efforts to transition toward greener energy, reducing carbon emissions in the aviation sector and encouraging sustainable practices.

About SAF:

- **SAF is a liquid fuel currently used in commercial aviation which reduces CO_2 emissions by up to 80%.**

The four pathways for producing SAF are:

- **The Fats Way (HEFA):** Biofuel is made with feedstocks such as vegetable oils, waste oils or animal waste fat.
- **The Corn Way (Alcohol-to-Jet):**Biofuels that use agriculture crops such as corn to produce ethanol, which is then refined into jet fuel.
- **The Garbage Way (Gasification):**Gasification is a process that converts raw material like municipal waste into syngas, which is then turned into jet fuel.
- **The Air Way (Power-to-Liquid / eSAF):**Power-to-Liquid (PtL) fuels, also known as e-SAF, are not biofuels as they do not use direct organic compounds as feedstocks. Instead, this **fuel is made from CO_2, water and renewable energy.**
- **The eSAF/ Power-to-Liquid (PtL) Advantage :** Fuels represent the most promising SAF pathway.
  - ☐ These fuels have industry-leading emissions **reduction potential of up to 90% while using 30x less land and 1,000X less water compared to other SAF.**



Global SAF Market:

- **United States:** 45-50% production and consumption.
- **European Union:** 30-35% production and consumption.

- **Asia-Pacific (Japan, Singapore):** 5-8% combined production and consumption.
- **Others (UK, Brazil, etc.):** 10-15%.
- **Future Prospect:** Despite rapid growth, SAF still represents a small fraction (<1%) of global aviation fuel demand. However, global production capacity is expected to grow tenfold by 2030.
- **India** is projected to produce 8-10 million tonnes of Sustainable Aviation Fuel (SAF) by 2040, necessitating investments between US$ 70-85 billion.

Significance of SAF Growth:

- **Increasing Farmers Income:** SAF production could enhance farmers' incomes by 10-15% by utilising agricultural residue as feedstock, thereby offering a sustainable alternative to the current practice of burning.
- **Environmental Impact**
  - ☐ Reduction in Carbon Emissions
  - ☐ Decarbonizing Aviation
- **Economic Impact**
  - ☐ Job Creation and Growth
  - ☐ Export Potential
- **Industrial and Technological Impact**
  - ☐ Support for Innovation
  - ☐ Energy Diversification
- **Global Leadership**

Challenges in Promoting SAF in India

- **High Production Costs:** SAF is more expensive to produce than conventional jet fuel, making it financially challenging for adoption without subsidies.
- **Lack of Infrastructure:** Limited facilities for large-scale SAF production and distribution require significant investment and development.
- **Policy Gaps:** India lacks clear mandates and incentives to support SAF development, unlike the U.S. and EU.
- **Feedstock Availability:** Scaling up the collection and processing of feedstocks like used cooking oil and agricultural waste requires organised supply chains.
- **Technological Barriers:** R&D for advanced SAF production technologies is still in early stages, needing substantial investment for commercial viability.
- **Industry Support:** Increased awareness and commitment from airlines and fuel suppliers are essential for widespread adoption.
- **Market Demand:** Low demand and high costs make SAF less commercially attractive unless airlines are willing to pay a premium.

Conclusion:

The law is expected to enhance Brazil's role in global aviation sustainability, boosting not only environmental efforts but also economic growth through increased exports, job creation, and technological advancements.

Greenwashing Guidelines

Sub Topic- Conservation

Context: The **Centre** has **introduced new guidelines** to **prevent companies from making false or misleading claims about** the **environmental benefits** of their **products** and **services**.

More on News: These **Guidelines for Prevention and Regulation of Greenwashing**, issued **by** the Central Consumer Protection Authority (**CCPA**), **mandate** that **companies substantiate** their **environmental claims with scientific evidence**.

> ***Greenwashing*** *is a term that* ***describes*** *the growing trend of companies, organisations, and even* ***countries making dubious or unverifiable claims about*** *the* ***environmental benefits of their activities or products****. With increasing public awareness of climate change, there is mounting pressure on both corporations and governments to minimise their environmental impact. This pressure often leads to exaggerated or misleading claims. Moreover,* ***countries can engage*** *in* ***greenwashing by overstating*** *their* ***forests' ability to absorb carbon dioxide*** *or misrepresenting the effectiveness of new regulations on carbon emissions.*

Key Highlights:

- **Objective**: The guidelines aim **to curb greenwashing and misleading environmental claims** as part of the government's broader effort to **combat misleading advertisements**.
- **Regulatory Framework**: These guidelines **complement** the **existing 2022 regulations** on misleading **advertisements** and **endorsements**.
- The **guidelines acknowledge** that with **heightened awareness of climate change**, entities often make exaggerated or misleading claims to meet legal commitments or public expectations regarding sustainability.

Overview of Common Practices:

- Greenwashing often manifests through **vague claims**, **misleading advertising**, and **unsubstantiated environmental certifications**.
    - ☐ **Terms** like **"eco-friendly," "organic," "natural,"** and **"sustainable"** are often **used without proper substantiation**, misleading consumers into believing that a product is more environmentally friendly than it is.
- **Companies may invest** more in **marketing their "green" initiatives than in actual sustainable practices**, creating an illusion of commitment without significant change.

Examples of Greenwashing:

- The **2015 Volkswagen scandal**, where the **company** was found to have **cheated on emissions testing** for its **diesel vehicles** marketed as environmentally friendly.
- **Corporate Examples**:
    - ☐ **Shell**: Faced criticism for promoting its investments in renewable energy while continuing to prioritise fossil fuel extraction.
    - ☐ **BP**: BP's **"Beyond Petroleum"** campaign was criticised for diverting attention from its continued investments in oil and gas.
    - ☐ **Coca-Cola**: Accused of promoting its water conservation initiatives while facing scrutiny for excessive water consumption in various regions.
- The **UN Secretary-General** has previously **called for a zero-tolerance policy** towards greenwashing, emphasising the **need for robust measures** to **curb misleading environmental claims**.

Key Aspects of the New Guidelines:

- The **CCPA's guidelines** focus specifically on **preventing greenwashing in advertisements**. They define **greenwashing** as **"any deceptive or misleading practice"** that **either conceals** or **exaggerates environmental claims**.
    - ☐ This includes the **use of misleading terms, symbols, or imagery** that highlights positive environmental attributes while downplaying or **hiding negative impacts**.
- The **guidelines allow** for the **use** of **"obvious hyperboles" or "puffery"** in advertising, provided they do not constitute deception.
- **Generic terms** such as **"clean," "green," "eco-friendly,"** and **"sustainable"** can only be **used if backed** by **adequate scientific evidence**.
- Additionally, **companies must provide "accurate" qualifiers** and disclosures when making such claims.
- **Technical terms** (e.g., "environment impact assessment," "greenhouse gas emissions") **must** be **explained in consumer-friendly language**.
- **Specific environmental claims—**such as "compostable," "non-toxic," or "100% natural"—must be substantiated with credible certifications, reliable scientific evidence, internal verifiable evidence, and certificates from statutory or independent third-party verification.

Enforcement and Penalties:

- The Central Consumer Protection Authority (**CCPA**) will **oversee** the **enforcement** of these guidelines.
- These guidelines are **applicable** to **manufacturers, service providers, traders, ad agencies**, and **endorsers**.
- **Companies** found **violating** these **rules** could **face penalties or even jail** terms for misleading advertising.
- The aim is to foster truthful practices where environmental claims are both truthful and meaningful, enhancing consumer trust and encouraging genuine sustainable practices.

Subject - Internal Security

National Maritime Cyber Security Framework for India

Sub Topic- Basics of Cyber Security, Challenges to Internal Security through communication networks

Context: The **formulation of a National Maritime Cyber Security Framework** is **essential to counter** the ever-evolving landscape of **cyber security threats in** the **maritime domain**.

More on News:

This **framework involves collaboration** between the **armed forces, civil authorities** like **CERT** (Computer Emergency Response Team) and **NCIIPC** (National Critical Information Infrastructure Protection Centre), and the private sector.

Maritime cyber security *refers to the* ***protective measures*** *and* ***protocols*** *established to* ***safeguard maritime systems, vessels,*** *and* ***shore-based infrastructure*** *from* ***cyber threats*** *and* ***attacks****. This includes* ***safeguarding*** *operational technology (****OT****) and information technology (****IT****)* ***components*** *that are increasingly interconnected.*

Importance of Integrated Transport Systems:

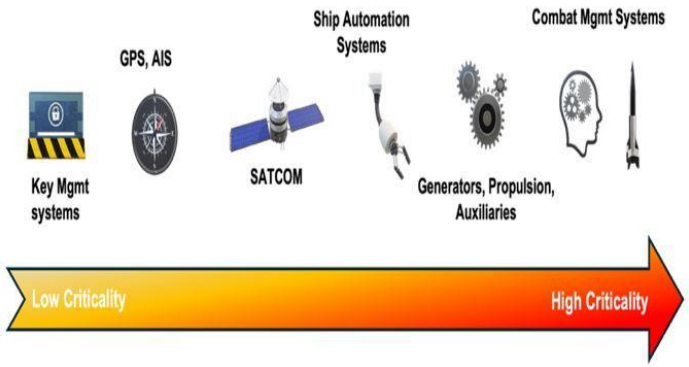
- The maritime domain is particularly vital, **serving as a key conduit for trade**, energy security, and resource exploitation.
- **In India, over 95%** of **trade by volume** and **70%** by value is **transported by sea**, making the maritime sector a potential target for adversaries.

Overview of India's Current Maritime Landscape:

- **India's strategic location** in the Indian Ocean Region (**IOR**) **offers** significant **economic opportunities** but also presents unique security challenges.
- The **country** is **investing** in **modern port infrastructure** as part of **initiatives** like the **Maritime India Vision 2030**, which necessitates **robust cyber security measures to protect against emerging threats**.

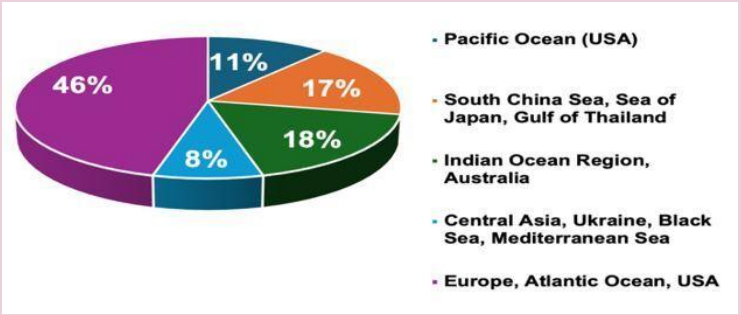
Current Status of Cyber Security in the Maritime Sector:

- The **integration of disruptive technologies** such as **cloud computing** and **artificial intelligence** has **changed how warfare is conducted**. Both countries and non-state groups are using cyber warfare to cause harm and disrupt systems.
- **In India**, the Indian Register of Shipping (**IRCLASS**) **published** its **guidelines** on **maritime cyber security in 2018**, emphasising cyber risk management and incident response procedures.
- However, **there is an urgent need for focused initiatives addressing** operational technology (**OT**) and communication technology (**CT**) **vulnerabilities** in both **merchant** and **naval platforms**.



Recent Cyber Incidents

- **AIS and GPS Spoofing**: In June 2021, British and Dutch NATO warships were misled into believing they were closer to the Crimean coast than they actually were, showcasing the risks of digital deception.
- **GPS Disruptions**: Reports from late 2023 indicated widespread GPS disruptions affecting maritime and aerial operations in several European countries.



- **Cyber Attacks on Shipping Companies**: The NotPetya malware incident inflicted damages worth $300 million on Denmark's Maersk, underlining the potential financial repercussions of cyber attacks.

Need for a National Maritime Cyber Security Framework:

- In an increasingly interconnected world, the **maritime sector faces growing cyber threats** that jeopardise trade, national security, and critical infrastructure.
  - ☐ **A robust** National Maritime Cyber Security **Framework** is essential to **safeguard** these **vital assets** against evolving cyber risks.
- This **framework would facilitate collaboration** among government, military, and private sectors, ensuring comprehensive **protection** and **resilience** in maritime operations.

Global Maritime Cyber Security Initiatives:

- **US National Maritime Cyber Security Plan (2020)**: Prioritises cybersecurity in maritime transportation systems and emphasises information sharing and workforce development.
- **IMO Guidelines on Maritime Cyber Risk Management (2022)**: Outlines best practices for managing cyber risks in maritime operations.
- **UK National Strategy for Maritime Security (2022)**: Details strategies for bolstering maritime cybersecurity capabilities.

Strengthening India's Cyber Readiness:

- **Developing a Dedicated Cyber Force**: This force should be well-trained and equipped with advanced analytical tools to bolster cyber defense.
- **Collaboration Across Sectors**: Engagement between military, government, academia, and private sectors is crucial for innovation and training.
- **Adopting the Cyber Triad**: This includes "Think Cyber" (enhancing skills and awareness), "Defend Cyber" (mitigating vulnerabilities), and "Use Cyber" (developing offensive capabilities).

Way Forward:

- **Immediate Response Teams**: Establish Maritime Cyber Quick Response Teams (QRT) at major ports for swift action against cyber threats.
- **AI-Based Cyber Forensics**: Leveraging advanced technology for threat detection and recovery.
- **Unified Cyber Situational Awareness:** Creating collaboration among various maritime and defence agencies to enhance national security.

The Future of Warfare: Integrating VR and AR

Sub Topic- Security Challenges, Various Security forces and Technology Missions

Context: The **integration of** Virtual Reality (**VR**) and Augmented Reality (**AR**) **technologies into military operations** is **transforming** the landscape of **modern warfare**.

- These advanced **technologies** offer unprecedented **advantages** in **training, mission planning,** and **real-time combat scenarios**.

*Virtual Reality (**VR**) and Augmented Reality (**AR**) are **revolutionising military training, operations,** and **medical practices**. By **immersing soldiers in realistic combat scenarios without** the **risk of physical harm**, VR enhances preparedness, while AR overlays crucial information onto the soldier's view, **improving situational awareness on the battlefield**.*

Historical Context of Technology in Warfare:

- The concept of immersive reality has long fascinated culture, most notably represented in the 1999 film **The Matrix**.
- This highlighted the potential of virtual environments to simulate convincing experiences, useful for **educational and training** purposes.
- VR and AR technologies operate on a **reality–virtuality continuum**, with **Mixed Reality (MR)** blending physical and virtual elements.
- VR models complex environments impractical to recreate in real life, while AR **enhances sensory engagement**, essential for combat scenarios.

Virtual Reality in Military Use:

- The **military's initial use of VR focused** on **flight simulators for pilot training**, but it has since expanded to encompass various training and operational applications.
- **Military Applications:** VR now includes a range of technologies, such as **computer simulations, flight simulators,** and **multi-domain simulators** for combat scenarios.
- **Military Medicine:** The **Office of Naval Research developed** the **"Virtual Iraq" application** to **aid soldiers** in **treating PTSD**, with positive outcomes reported in cognitive functions and stress resilience.
    - ☐ **VR exposure therapy, combining cognitive-behavioural treatment** with immersive environments, has shown promise in **addressing trauma** by helping individuals process their experiences.
- **Examples of effective VR training systems:**
    - ☐ **Aviation Combined Arms Trainer**: A networked simulator used by the US Army for training diverse mobile units, allowing for joint exercises among geographically dispersed teams.
    - ☐ **Taiwanese Military Experiments**: Implementing body area networks to gather real-time data on soldiers' physical actions during VR simulations, bridging the gap between physical and virtual training environments.

Augmented Reality in Military Use:

- AR technologies can **integrate intelligence, surveillance,** and **reconnaissance data** to provide a comprehensive operational picture. However, **managing information overload** in chaotic environments remains **a critical challenge**.
- The **ideal setting for AR applications** is **urban warfare**, where clutter and rapid urbanisation necessitate enhanced situational awareness.
- AR has potential **applications in peacetime as well,** such as improving tabletop wargaming, maintenance training, and open-source intelligence operations.

Use of AR and VR in the Indian Armed Forces:

- The **Indian Armed Forces** are gradually adopting **VR and AR technologies** to enhance both training and operational capabilities.

- While simulators have been part of military training since the 1970s, VR-based systems are gaining traction.
- During the **Army Commanders' Conference in 2023**, VR systems were recognised as crucial components of the military's evolving toolkit.

Indian Army's Initiatives:

- Establishing a **wargaming centre** that integrates **VR, AR, AI (Artificial intelligence)**, and **data analytics** to create advanced training environments.
- Using VR for **terrain familiarisation** along sensitive borders like the **Line of Control**, and **missile simulators** for realistic training without actual missile depletion.
- **AR for mechanised operations**: The development of **Future Ready Combat Vehicles (FRCV)** includes integrating **see-through armour** with data from drones, enhancing soldiers' field of view while maintaining safety.

Challenges and Ethical Considerations:

- **Psychological Impact**: The long-term effects of VR on soldiers are uncertain. A 2020 study indicated that excessive gaming could impact **emotional and behavioural development**, raising concerns about young recruits, especially those aged 17-19.
- **Militainment**: The gamification of military training, or "militainment," raises ethical concerns about the **desensitisation to violence** and detachment from the realities of combat.

Future Directions and Developments:

- **Balancing Immersion and Reality**: While VR creates strong **immersive experiences**, careful monitoring is required to prevent recruits from becoming overly engrossed in simulated environments.
- **Cost-Benefit Analysis**: Although VR and AR offer savings in **ammunition** and **training time**, the initial investment in **infrastructure**, **software**, and maintenance must be balanced against long-term benefits.

Indigenisation Opportunities: As the cost of wearable technology declines and local chip production advances, there is potential for greater integration of VR and AR in India's armed forces, provided safeguards are implemented.

GS Paper III -Prelims Based Articles

Subject - Indian Economy & Agriculture and Banking

Evolving Trends in India's Job Market

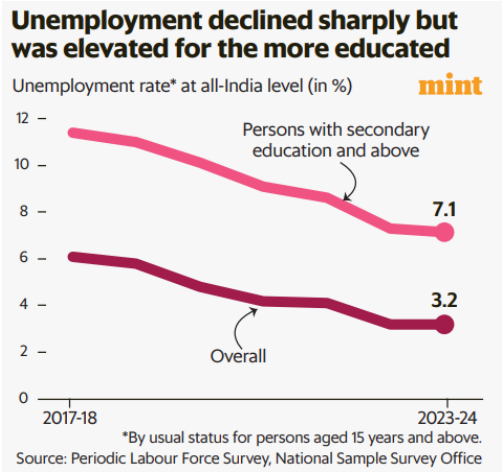
Sub Topic- Employment, Growth & Development, Skill Development, Human Resource

Context: The latest **Periodic Labour Force Survey (PLFS)** reveals **a significant drop in the unemployment rate,** which nearly **halved to 3.2% in 2023-24 (July-June) from 6.1% in 2017-18.**

More on News

- The PLFS also highlights a rise in self-employment, a substantial gender pay gap, and extended working hours for regular wage and salaried workers.

About the Trend:



1. **Education Paradox:** The PLFS report reveals that the **unemployment rate for individuals aged 15 and above remained steady at 3.2%,** showing a significant decline over the years.
   a. Even during the **pandemic years** of 2019-20 and 2020-21, the unemployment rate was **relatively low at 4.8% and 4.2%, respectively.**
   b. While unemployment among **those with secondary education or higher has decreased** from double-digit levels in 2017-18, it **remained relatively high at 7.1% in 2023-24.**
   c. The **overall unemployment figure is lowered primarily by those with little to no education,** as their unemployment rate is less than 1%.
   d. Experts attribute the high unemployment among the educated to a **lack of high-quality job opportunities.**
2. **Question of Quality:** The decline in the jobless rate suggests **more jobs are available**, but **their quality may not have improved—** in fact, it has worsened since the pandemic, with more people turning to self-employment.

a. The share of **"own-account workers"** slightly **increased** from 38.6% in 2017-18 to 39.0% in 2023-24, driven by a **rise in "helper in household enterprise."**

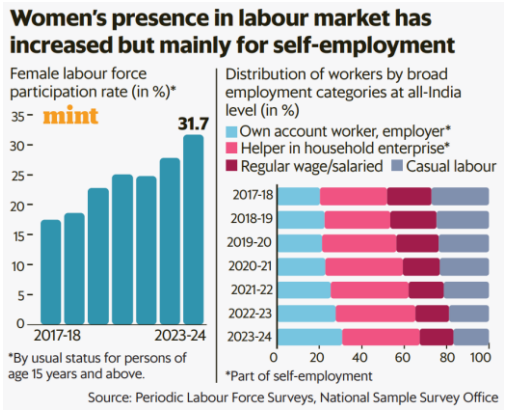
b. Meanwhile, **salaried jobs have seen a modest recovery** in 2023-24.

c. This is concerning because even with **strong economic growth of around 8%**, the **employment structure has not improved**.

3. **Female Force:** For years, the **low female labour force participation rate has been a concern for policymakers.**

a. However, the PLFS data shows a **significant rise in women's participation,** increasing from 17.5% in 2017-18 to 27.8% in 2022-23 and further to 31.7% in 2023-24.

b. Despite this rise, **most women are self-employed**, with their **share in salaried jobs or casual labour shrinking.**



i. Self-employment remains popular among women due to **flexible work hours and the ability to work from home.**

c. The share of self-employed women surged from 51.9% in 2017-18 to 67.4% in 2023-24, while salaried employment dropped from 21.0% to 15.9% and casual labour from 27% to 16.7%.

4. **Pay Pain:** While **self-employment has seen significant growth** in recent years, **salaried jobs continue to offer the highest earnings.**

a. In 2023-24, **average monthly pay for salaried jobs was about 56% higher than for self-employment and 65% higher than for casual labour.**

b. However, a **substantial gender pay gap** persists, with **women earning only ₹75-76 for every ₹100 earned by men** in salaried positions.

5. **Cloaking Hours:** Recent concerns have emerged regarding **long work hours** in the formal sector, leading to **stress and a poor work-life balance.**

a. Despite the **global standard of a 40-hour workweek** for employee well-being, **salaried workers in India logged 49.3 hours per week in 2022-23 and 48.8 hours in 2023-24.**

b. The situation is more pronounced for **men, who worked 51-52 hours per week** in the past two years, compared to **43 hours for women.**

Foreign Portfolio Investment (FPI)

Sub Topic- Mobilization of Resources, Capital Market

Context: The Securities and Exchange Board of India (SEBI) has launched **an outreach cell for Foreign Portfolio Investors (FPIs)** to assist them in accessing the Indian market.

More on News:

- This cell, **part of the Alternative Investment Fund** and **Foreign Portfolio Investors Department (AFD)**, will directly engage with FPIs, offering guidance on documentation, compliance, and other pre-application requirements.
- It will also **provide support during the onboarding process** by addressing any operational challenges.
- Additionally, SEBI is considering further measures to **simplify and expedite the onboarding and application process for FPIs.**

Foreign Portfolio Investment (FPI):

- It refers to **investments made by foreign entities in a country's financial assets,** such as stocks and bonds, without seeking direct control or management of the companies involved.
- Unlike Foreign Direct Investment (FDI), where investors have a significant degree of control and involvement, FPI is **characterised by passive ownership and is typically more liquid and easier to trade.**

Pros	Cons
Feasible for retail investors	No direct control/management of investments
Quicker return on investment	Volatile
Highly liquid	Cause of economic disruption (if withdrawn)

Recent Trends in FPI:

India has experienced a significant **resurgence in Foreign Portfolio Investment (FPI) flows,** particularly in the fiscal year 2023-24.

Record Inflows:

- **High Net Inflows:** As of March 2024, India is on track to **achieve record FPI inflows,** with net investments **expected to reach approximately ₹12,000 crore ($1.4 billion)** in the first week of March alone.

☐ Cumulatively, net inflows for FY24 **have crossed $36.6 billion, surpassing the previous high of $36.2 billion recorded in FY21.**

- **Equity vs. Debt:** Of the total inflows this fiscal year, **$22.5 billion has been directed towards equities,** while $13.4 billion has flowed into debt instruments.

Economic Drivers:

- **Strong GDP Growth:** The third quarter GDP growth rate of 8.4% has significantly boosted investor sentiment, positioning **India as a resilient market amid global uncertainties.**

- **Market Stability:** The ongoing rally has seen **indices like Sensex and Nifty50** reaching record highs, further encouraging FPI participation.

Geographic Distribution:

- **Dominance of U.S. Investors:** By March 31, 2024, the **United States accounted for the largest share** of FPI investments in India, with 3,457 registered FPIs.
- This was **followed by Luxembourg and Canada,** highlighting a diverse international interest in Indian markets.

BFSI Companies

Sub Topic- Mobilization of Resources, Capital Market

Context: Despite leading earnings growth post-pandemic, companies in the banking, finance, and insurance (BFSI) sector have underperformed in the stock market, creating a disconnect between their earnings and share prices.

About BSFI:

- BFSI stands for Banking, Financial Services, and Insurance.
- This sector encompasses a wide range of services and products that are essential for the financial stability and economic growth of a country.

Components of BFSI:

- **Banking:** Includes commercial banks, cooperative banks, and investment banks that provide services like accepting deposits, offering loans, and facilitating fund transfers.
- **Financial Services:** Encompasses services such as investment banking, asset management, stock broking, and financial advisory.
- **Insurance:** Covers various types of insurance products including life insurance, health insurance, property insurance, and liability insurance.

Role of BFSI:

- **Economic Stability:** The BFSI sector plays a crucial role in maintaining economic stability by facilitating capital movement and credit flow within the economy.
- **Risk Management:** It helps manage financial risks through various products and services that provide coverage against unforeseen events.
- **Financial Inclusion:** The sector promotes financial literacy and inclusion by offering accessible banking and insurance services to underserved populations.
- **Job Creation:** BFSI is a significant source of employment opportunities, contributing to the overall economic development of a country.

Contribution to India's GDP: The BFSI sector is a substantial component of India's economy:

- The BFSI sector contributes nearly one-third of India's GDP and holds $1.3 trillion in market capitalization, with Bank NIFTY representing 35% of the stock index.

- The sector grows at 1.5 times the GDP and leads in IPOs, mergers & acquisitions, and secondary sales in India.
- India is projected to have 75 BFSI and fintech unicorns by 2027 and 150 by 2030.
- The sector not only drives economic growth but also creates millions of jobs across various roles in banking, finance, and insurance.

Current Trends in BFSI:

- **Technological Advancements:** The rise of fintech has revolutionised traditional banking and financial practices, leading to innovations in digital payments, online banking, and automated investment services.
- **Regulatory Changes:** Governments are implementing new regulations to enhance consumer protection, ensure transparency, and promote competition within the sector.
- **Sustainability Focus:** There is an increasing emphasis on sustainable finance practices that consider environmental, social, and governance (ESG) factors in investment decisions.

Managing Conflicts of Interest in Regulatory Roles

Sub Topic- Mobilization of Resources, Capital Market

Context: A former SEBI chairperson was mocked for not having experience with share certificates, casting doubts on their ability to regulate securities markets. Today, the tables have turned, with a new chairperson facing criticism for having too much experience, raising concerns about conflicts of interest.

Managing Conflicts of Interest in Regulatory Roles

In any market economy, **conflicts of interest are common,** but **issues arise when regulators allow personal interests to affect official decisions.** Excluding individuals with conflicts may limit the talent pool, so the goal should be **managing, not eliminating, conflicts of interest.**

- **Safeguards:** In the U.S., market professionals frequently move between regulatory agencies like the Securities and Exchange Commission (SEC) and private firms, sharing expertise between regulators and industry.

☐ Safeguards like **disclosure, cooling-off periods, and recusals are employed to manage conflicts of interest.**

The **Glass-Steagall Act,** enacted in 1933, was a significant piece of legislation aimed at **restoring public confidence in the banking system** following the **Great Depression.** It primarily sought to **separate commercial banking from investment banking**, thereby reducing the risks associated with speculative activities

that could jeopardise depositors' funds.

- **Independent Regulators:** Historically, the **government was both a business operator** (e.g., BSNL, LIC) **and a regulator** in sectors like telecom and insurance, creating perceptions of bias.

☐ **Independent regulators** (like SEBI, CERC, PNGRB) **were established to eliminate conflicts of interest.**

SEBI's Conflict Management

- **Barring Directors:** SEBI was tasked with **regulating securities markets,** and its early mandate **barred company directors from serving on its board** to avoid conflicts.

☐ The **SEBI Act was amended in 1995** to allow directors with capital market expertise to join, while ensuring mechanisms to manage conflicts.

- **Code to Manage:** SEBI attracts professionals from public and private sectors. **Public sector professionals typically don't hold shares,** facing fewer conflicts, while private sector professionals may own securities, raising conflict potential.

☐ SEBI introduced a **Code on Conflict of Interest for Board Members in 2008** to address these issues.

- **Demutualisation:** SEBI identified conflicts among frontline regulators like stock exchanges, which were historically governed by brokers.

☐ To address repeated misconduct, **exchanges were demutualised and corporatised** in 2005, separating regulatory and commercial functions.

- **Conflict Management:** SEBI uses conflict management **to improve governance across markets, asset management, and product distribution.**

☐ Insider trading, front-running, and personal gain from confidential information are prohibited.

☐ Investment advisers and analysts must disclose conflicts and cannot promote products they have personal interests in.

- **Governance in Asset Management:** Key executives in asset management companies **must invest in the schemes they manage to align their interests with investors.**

☐ **Employees are restricted from trading in securities** related to companies they invest in or oversee.

- **Independent Directors and Related-Party Transactions: Independent directors are not allowed to hold stock options** to ensure unbiased decisions.

☐ Related parties are barred from voting on related-party transactions to avoid conflicts.

☐ As the securities market grows more complex, SEBI and the government need to attract diverse talent while implementing a robust conflict management framework. This should cover all regulators and ensure transparency, following governance norms, market practices, and international standards.

Nobel Prize Awarded for Explaining Why Nations Fail or Succeed

Sub Topic- Growth & development

Context: The **2024 Nobel Prize in Economics** was awarded to **U.S. economists** for their **research on how institutions are formed** and their **impact** on **economic prosperity**.

- This recognition underscores the importance of understanding the **fundamental reasons** behind the vast **economic disparities between nations**.

> ***Institutions*** *are* ***established structures, rules,*** *and* ***norms*** *that* ***govern social, economic,*** *and* ***political interactions within a society****. They include* ***organisations, laws,*** *and* ***practices*** *that* ***shape behaviour*** *and influence decision-making.* ***Examples*** *of institutions include* ***governments, legal systems, educational systems,*** *and* ***financial organisations****. Institutions play a crucial role in* ***maintaining order, promoting cooperation,*** *and* ***facilitating economic growth****.*

Key Highlights:

- The **laureates' research focuses** on the role of institutions in **shaping** a **country's economic** and **political landscape**.
- They have demonstrated that **societies with strong, inclusive institutions tend to thrive,** while those with poor institutions often struggle.
- Their work **combines theoretical** and **empirical approaches**, analysing over 500 years of statistical evidence to show how the quality of institutions affects prosperity
- **Historical Analysis**: Their **research**, particularly in the **book *Why Nations Fail***, **examines** historical **instances** where **colonial powers established different types of institutions** based on their intent to settle.
- **For example, British colonial policies** in the United States **fostered inclusive institutions**, while in **India, extractive institutions were implemented** for short-term exploitation.

Significance of Research:

- The Nobel Committee highlighted the **importance of** this **research** in **explaining** the **divergence in economic outcomes between countries**.

☐ The **richest 20%** of countries are **30 times richer than the poorest 20%**, and understanding the **role of institutions helps to address** this **disparity**

- **Understanding Economic Disparities**: The primary factor influencing a nation's economic fate, as opposed to other theories like colonialism, resource endowment, or intelligence.

The Role of Institutions:

- **Inclusive vs. Extractive Institutions**: Economists differentiate between "inclusive" institutions (which promote secure property rights and democratic governance) and "extractive" institutions (which enable elites to extract resources at the expense of broader prosperity).

☐ Their findings suggest that **inclusive institutions lead** to **sustainable economic growth**, while **extractive** ones **lead** to **stagnation** and **poverty**.

Importance of Institutions:

- **Rules of the Game**: Institutions define the incentives individuals face in society, influencing their decisions to invest, work hard, and contribute to economic growth. Secure property rights encourage individuals to invest in their futures, while insecure rights lead to fear of expropriation and reduced economic activity.
- **Cultural Factors**: Institutions also encompass cultural influences that affect economic behaviour and institutional design.

Challenges and Implications:

- **Rulers' Incentives**: When rulers can extract resources without the need for reforms, they have little incentive to change the status quo. However, the threat of a popular uprising can compel rulers to implement more inclusive measures.
- Their findings suggest that fostering inclusive institutions is essential for sustainable economic growth, a lesson that resonates across nations striving for improvement.

Global Supply Chain Stress

Sub Topic- Mobilization of Resources

Context: The **World Bank's trade watch report,** released earlier this week, **stated that global supply chain stress** remained elevated through September 2024, amid disruptions in **West Asia, the Mediterranean, and Asia,** as shipping rates stayed **"more than twice as high"** as a year ago.

Key Findings of the Report:

- The **Global Supply Chain Stress Index** reached 1.4 million TEUs in September, a **72% rise** from the previous year.
- **Indian exports are currently valued at $450 billion**, comparable to China's figures from 2004.
- **Financial Outlook:** The Red Sea crisis **has led to soaring profits for global shipping lines,** including Maersk, which has revised profit forecasts upward due to high freight rates.
- **Geopolitical Consequences**: Conflicts in West Asia **have created disruptions as far as East Asia,** with shipping routes being significantly **altered to avoid conflict zones**, adding time and costs to logistics.

Reasons for the Global Supply Chain Stress:

- **Weather-Related Delays: Recent typhoons** have also contributed to supply chain stress, with major delays reported in Southeast Asia and the China Sea.
- **Geopolitical Tensions:** Ongoing conflicts and sanctions, especially related to Russia and Ukraine, have reshaped trade relationships and increased risks. For instance, the **US's share of trade with China has declined** due to rising tensions, while **Russia's trade share with China has doubled.**
- **Increased Shipping Costs:** The costs for shipping have risen significantly, driven by **disruptions in trade routes and higher demand for container space.**

Positives for India:

- **Increased Focus on Domestic Shipping Capacity:** The crisis has prompted the Indian government to **prioritise expanding its shipping fleet and container manufacturing capabilities**, which could enhance long-term self-sufficiency.
- **Opportunities for Indian Shipping Lines:** A push for developing a globally recognised Indian shipping line **could reduce dependency on foreign shipping companies,** benefiting Indian micro, small, and medium enterprises **(MSMEs).**
- **Export Growth Potential:** The need for **enhanced logistics and shipping solutions may spur innovation and investment** in the shipping and logistics sectors, potentially boosting overall export performance in the long run.
- **Diversification of Trade Routes:** Rerouting exports **through the Cape of Good Hope** may open new trade partnerships and markets, allowing Indian exporters to adapt to changing geopolitical dynamics.

Negatives for India:

- **Rising Shipping Costs** may squeeze profit margins for exporters, especially in **low-margin sectors like textiles.**
- **Export Vulnerability:** Disruptions in key markets due to geopolitical tensions could hinder export growth, particularly affecting high-volume products that rely on stable shipping routes.
- **Supply Chain Disruptions:** Ongoing conflicts in the Middle East and changes in shipping routes are causing delays and complications in logistics, impacting timely delivery of goods.
- **Dependence on Global Trade:** India's reliance on international markets for its exports makes it vulnerable to global geopolitical tensions, which can have cascading effects on the economy.
- **Operational Challenges:** Exporters are facing challenges related to slot availability with foreign shipping lines, which could complicate logistics and increase operational costs.

Rich People and Household Surveys

Sub Topic- Mobilization of Resources, Inclusive growth

Context: For a rapidly growing country like India, where incomes are rising swiftly, excluding a large segment of the population from government surveys leads to skewed estimates favouring low-income households, jeopardising evidence-based policymaking.

More on News:

- The Indian government has acknowledged this issue. In a brainstorming session last month, the **Ministry of Statistics and Programme Implementation (MoSPI) invited stakeholders** to suggest strategies **for improving survey responses** from high-income groups and gated communities.
- This marked the **first initiative of its kind by the ministry**, indicating the government's intent to take practical steps to address the problem.

The Reluctance of the Wealthy:

- There are **several reasons why affluent individuals hesitate to share information** with surveyors:
  - ☐ **Lack of Awareness:** About the importance of surveys.
  - ☐ **Scepticism:** About how the data will be used.
  - ☐ **Societal Distrust** of strangers
  - ☐ Discomfort of answering **lengthy questionnaires.**
- However, **collecting data** through household surveys is **crucial,** and this **process collapses if respondents are unwilling to participate** or under-report socio-economic data.
- The **Collection of Statistics Act 2008** supports data collection on **various aspects,** ensuring **protections and restrictions on the use of personal information**.
  - ☐ It also imposes **penalties for refusal to provide information or false reporting**.
- Despite these measures, the **rising non-response rate necessitates a shift to alternative methods of data collection**, particularly as technology plays a larger role in everyday life.

Harnessing Data from UPI, Travel, and Housing:

- **UPI Usage:** The growth of **UPI usage** in India has been remarkable. As one of the flagship achievements of the **"Digital India"** initiative, it has **transformed payment methods from cash to digital transactions.**
  - ☐ UPI transactions have skyrocketed, **from 220 crore in 2013-14 to an astounding 18,592 crore in 2023-24.**
  - ☐ The **transaction value has grown by over 280%**, from Rs 952 lakh crore to Rs 3,658 lakh crore.
- **Insights:** When combined with data from e-commerce platforms, **digital payment records offer rich insights into consumer spending patterns.**
- **Potential:** The government has recognised the potential of such unconventional data sources and is exploring the **collection of e-commerce data from 12 towns** to track popular items for a new **Consumer Price Index (CPI) series.**

- **Digitisation:** Similarly, the **digitisation of Banking, Financial Services, and Insurance (BFSI)** is **another source of rich financial data**.
- **Online Platforms:** Additionally, **online platforms for travel, accommodation, and real estate** offer vast amounts of data.
    - ☐ The **Real Estate Regulatory Authority (RERA)** can be tapped for timely and reliable information on pricing and consumption patterns in the housing sector.

Striking a Balance Between Caution and Innovation:

Unlocking diverse data from digital sources could revolutionise the way official data is generated and utilised. However, caution is necessary in following aspects:

- **Data security and Privacy:** These are major concerns, **especially for high-income groups** who are reluctant to share personal information.
    - ☐ To alleviate these fears, the **government must introduce legislation** that guarantees **data will only be used for generating social and economic insights**, aiding in data-driven decision-making.
- **Advantages of New Approach:** While traditional survey methods remain important, **exploring new approaches could prove advantageous.**
    - ☐ For instance, **government employees** residing in gated communities **could be more inclined** to participate in surveys due to their awareness of the process.
    - ☐ These employees could even be enlisted as surveyors in their local areas.
    - ☐ Public awareness campaigns are also critical to building trust.
- **Household Diaries:** In some affluent countries, a method involving household diaries is used, where **respondents record daily expenses over a period,** and these diaries are collected later.

Embracing digital data sources and innovative methods could significantly enhance data collection in India, ensuring more accurate, comprehensive insights. However, safeguarding privacy and building public trust remain essential for the success of these efforts.

Subject - Science & Technology

Medical Textiles Quality Control Order, 2023

Sub Topic- Development and their applications and effects in everyday life

Context: The **Ministry of Textiles** has **officially notified** the **Medical Textiles (Quality Control) Order, 2023**, which is set to come into effect on **October 1, 2024**.

More on News:

- The **Quality Control Order mandates** that all **products** falling under its scope **must obtain** a **Bureau of Indian Standards licence** for **manufacturing, importing, distributing, selling, hiring, leasing, storing,** or **displaying products** for **sale**.
- This **measure aims to ensure** that these **widely used products consistently meet essential quality benchmarks**, safeguarding both children and adults.

Key Highlights of the QCO:

- **Effective Date:** October 1, 2024.
- **Products Covered:** Sanitary napkins, baby diapers, reusable sanitary pads, and dental bibs.
- **Mandatory BIS Certification:** All products must have a BIS licence to be legally manufactured, imported, or sold in India.
- **Exemptions:** Small-scale enterprises and Self-Help Groups (SHGs) are exempted from the QCO requirements.

Quality Standards:

- The notified **specifications** include **critical performance criteria** such as **pH levels, hygiene testing, bacterial** and **fungal bioburden, biocompatibility evaluations,** and **biodegradability**.
- Notably, there is a strong **emphasis** on **testing** for **phthalate levels** in baby diapers, as these **chemicals** can pose **risks** to **both users** and the **environment**.

Government's Commitment:

- This **initiative** is **part** of the **government's comprehensive strategy** to **enhance** the **quality** and **safety** of essential consumer products.
- By **enforcing** these **regulations**, the **Ministry of Textiles** aims to **ensure** that **medical textiles adhere** to the **highest safety standards**, thereby **protecting public health** and **promoting consumer confidence**.

Airtel Unveils AI-Powered Spam Detection System

Sub Topic- Awareness in the field of Artificial Intelligence

Context: Bharti Airtel has **launched** a **network-based solution** that **employs artificial intelligence (AI) to detect spam calls** and **messages**.

- The **solution utilises 250 parameters** and can **identify 97% of spam communications**.

Key Features of the AI-Powered System:

- The **newly introduced system** is designed to **process** an immense **volume of data** in **real-time**. It **evaluates** various factors such as **caller usage patterns, call/SMS frequency, call duration**, and more.

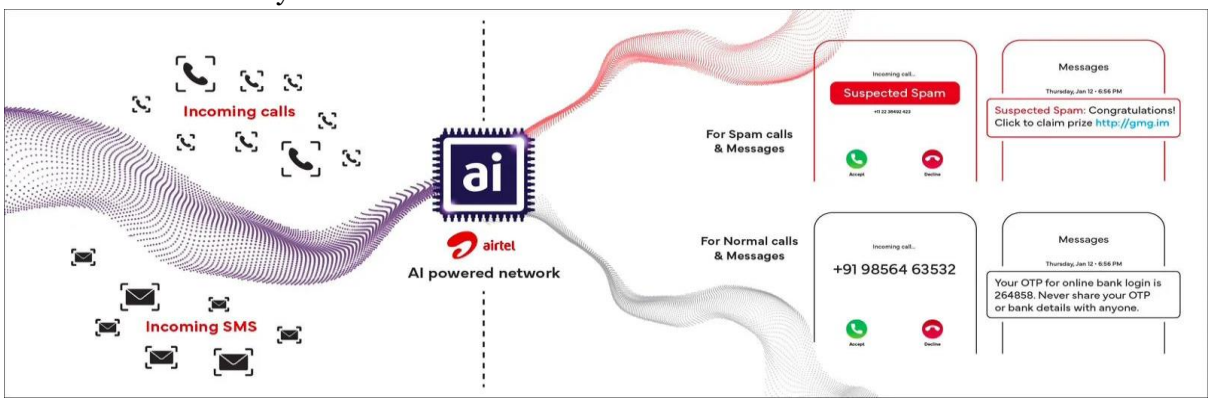
Key parameters

- Velocity and volume of calls
- Frequency of device changes
- Number of short-duration calls
- Geographical spread of calls
- Time spent on the network
- Number of names on the same KYC
- Detection of robo-calling devices

- **By cross-referencing** this data **against known spam patterns**, the system can **accurately flag suspected spam calls** and **messages.**
- **Dual-Layer Protection:** The solution **employs a dual-layered AI shield**, with one filter at the network level and another at the IT systems layer. This **ensures** that **every call** and **SMS** is thoroughly **analysed before reaching** the **customer**.
- **Real-Time Processing:** Airtel's system processes **1.5 billion messages** and **2.5 billion calls daily**, equivalent to handling **1 trillion records** in **real-time**.

☐ This capability allows the system to **identify 100 million** potential **spam calls** and **3 million spam SMSes each day.**

- **Customer Alerts:** The AI-powered solution also **alerts customers** to **malicious links received via SMS**. By maintaining a centralised database of blacklisted URLs, the system scans every SMS in real-time to warn users about suspicious links.
- **In-House Development: Developed** by **Airtel's data scientists**, the proprietary algorithm behind this system is a testament to the company's commitment to innovation and customer security.



Comparison with Existing Solutions:

- **Airtel's approach contrasts** with apps like **Truecaller**, which **depend on user feedback** and **internet connectivity**.
- The **real-time detection capability** is emphasised, as **users** will be **alerted immediately** about **suspected spam**.

Limitations:

- The **system** will **not block spam calls**, as some **legitimate businesses might** be flagged incorrectly.
- It **currently applies only** to **calls** on the **Indian network**, leaving **international spam calls** and **OTT communications** unaddressed.

Conclusion:

Airtel's AI-powered solution marks a significant milestone in the **fight against spam** and **scam calls**. By leveraging advanced AI technology, **Airtel aims** to **provide** a **spam-free network**, enhancing the overall user experience and **ensuring greater security** for its **subscribers**. This initiative not only sets a new standard in telecom services but also demonstrates Airtel's commitment to innovation and customer satisfaction.

Three New Supercomputers for India

Sub Topic- Achievement in the field of IT & computer

Context: The **Prime Minister dedicated three new supercomputers** at leading **scientific institutions in Delhi, Pune,** and **Kolkata**, aiming to **enhance research in astronomy, medicine,** and **high-energy physics**.

More on News:

- The initiative also includes **upgraded computing power** for **weather** and **climate research**, with **two additional HPC systems installed** at **atmospheric sciences institutes** in **Pune** and **Noida**, which already host supercomputers.
- ☐ **These new systems, worth ₹850 crore**, have **increased** the **Ministry of Earth Sciences' computing capacity** from **6.8 petaflops five years ago** to a record **total of 22 petaflops**.

Significance:

- These **High-Performance Computing (HPC) systems advance India's scientific capabilities**, stating they will provide cutting-edge facilities to the domestic scientific community and **support research across** fields including **physics, cosmology,** and **earth sciences.**
- **India's commitment** to **self-reliance** through research, states that advancements in technology should also **empower** the **common citizen**.

New Installations:

- The **three** indigenously-built **PARAM Rudra supercomputers** were **developed** under the **National Supercomputing Mission** at a total **cost** of **approximately ₹130 crores**.

☐ **Locations:**

☐ **Giant Metrewave Radio Telescope (GMRT), Pune:** One of the largest and most powerful radio telescopes in the meter-wave range, equipped with a **supercomputer with a capacity of 1 petaflop**.

☐ **Inter-University Accelerator Centre (IUAC), Delhi:** Hosts the most powerful supercomputer of the three, with a **capacity of 3 petaflops**.

☐ **S N Bose National Centre for Basic Sciences, Kolkata:** Equipped with a **supercomputer capable of 838 teraflops**.

- Additionally, the **Arka system** at **IITM** has a **capacity of 11.77 petaflops**, improving the country's horizontal resolution for global weather prediction models from 12 km to 6 km.
- **The HPC Arunika**, with an **8.24 petaflop capacity**, will enhance weather forecast resolution at block levels.

*The **National Supercomputing Mission (NSM)** is a significant initiative **by** the **Government of India**, **launched** in **2015** with the **objective** of **enhancing** the **country's supercomputing capabilities**. **Implemented jointly by** the Department of Science and Technology (**DST**) and the Ministry of Electronics and Information Technology (**MeitY**), the mission **aims to establish a network of over 70 high-performance computing (HPC) facilities** across various academic and research institutions in India.*

Impact and Future Prospects:

- **Supercomputers** have great potential to **boost artificial intelligence (AI)** and **machine learning (ML)**, helping **ensure** that **technology benefits all citizens**.
- These **supercomputers symbolise** a **commitment** to **advancing India's technological landscape** and **enhancing** its **research infrastructure**.

SASTRA Ramanujan Prize 2024

Sub Topic- Awareness in the field of Science & Technology

Context: The **2024 SASTRA Ramanujan Prize** will be **awarded to Dr. Alexander Dunn** from the **Georgia Institute of Technology (Georgia Tech), USA**.

More on News:

Dr. Alexander Dunn is a prominent young **researcher in analytic number theory**, known for his significant breakthroughs in **modular forms, half-integral weight forms, metaplectic forms**, and their **connections to prime numbers and integer partitions**.

About SASTRA Ramanujan Prize:

- It is a prestigious **award established** in **2005** to **honour** the memory of the **Indian mathematician Srinivasa Ramanujan.**
- **Established By:** The **Shanmugha Arts, Science, Technology, and Research Academy (SASTRA)** in **Kumbakonam, Tamil Nadu, India**.
- **Award Amount**: $10,000.
- **Eligibility**: Mathematicians **not exceeding** the **age of 32**.
- **Purpose**: To **recognise outstanding contributions** in **areas of mathematics influenced by Srinivasa Ramanujan**.
- **Significance of Age Limit**: The age limit reflects Ramanujan's remarkable achievements within his brief 32 years of life.

***Srinivasa Ramanujan, born** on **December 22, 1887, in Erode, Tamil Nadu, India,** was an **extraordinary mathematician** known for his significant **contributions** to **mathematical analysis, number theory, infinite series,** and **continued fractions**. Despite having little formal training in mathematics, his remarkable talent became apparent at a young age. His extraordinary **journey from a self-taught mathematician in India to an internationally recognised genius** highlights his **enduring legacy in** the **world of mathematics**.*

ABHED (Advanced Ballistics for High Energy Defeat)

Sub Topic-Achievement in the field of Defence Technology

Context: Recently, in a notable breakthrough in personal protection, Defence Research and Development Organisation (DRDO) and IIT Delhi have developed **lightweight bullet-proof jackets called ABHED** at the DIA-CoE in IIT Delhi.

More on News

- The DRDO has also set up collaborative research facilities known as **DRDO-Industry-Academia Centres of Excellence (DIA-CoEs)** at various academic institutions across India, including a significant partnership with IIT Delhi.

☐ These centres focus on fostering innovation in cutting-edge and restricted defence technologies.

- As of now, DRDO has **established 15 DIA-CoEs,** aimed at leveraging the collective expertise of academia, research fellows, niche technology industries, and DRDO scientists to drive research and innovation in advanced defence technologies.

About ABHED

- **ABHED (Advanced Ballistics for High Energy Defeat)** jackets are **made from polymers and indigenous boron carbide ceramic material,** provide superior protection against high-threat levels and are designed to be lighter than the weight limits set by the Indian Army.
- Weighing between **8.2 kg and 9.5 kg,** depending on the BIS level, the jackets offer **360-degree protection with front and rear armour.**
- The Ministry of Defence (MoD) highlighted the success of the R&D trials, ensuring these jackets meet all required standards.
- Manufacturing will be handled by the private sector, with three Indian companies already shortlisted for technology transfer.

Detecting Cancer with Sound Waves

Sub Topic-Achievement in the field of Science & Technology

Context: An **associate professor** at the **University of Alberta**, **led** a **study on** the **new ultrasound technique for cancer detection**.

More on News:

- **Traditionally**, **biopsies** involve **extracting tissue** from **suspected cancerous areas using** a **needle**, a process that can be **painful** and **carries risks**.

☐ **Scientists aim to mitigate these issues** by **employing ultrasound** to harvest biomarkers directly from the bloodstream.

- "**Ultrasound** can **enhance** the levels of these **genetic** and **vesicle biomarkers** in blood samples **by over 100 times**," allowing for **more efficient cancer detection**.

The Science Behind the Technique:

- The **new technique utilises high-energy ultrasound** to **convert** a small portion of **cancerous tissue into droplets**, which are **then released into** the **bloodstream**.
- These **droplets contain valuable biomarkers—molecules** such as **RNA, DNA,** and **proteins—**that can be **analysed to identify specific types of cancer**.
- This method **marks** a significant **advancement over conventional imaging techniques**, which primarily **provide pictures of internal organs** but **do not facilitate direct testing for cancer**.
- Estimates that this technique could **help clinicians avoid** nearly **50% of all biopsies**.

Promising Results:

- One of the most remarkable aspects of this research is its **ability to detect a single cancer cell circulating in the blood**.
- **Cancer cells can spread to other parts of the body** through the bloodstream, making **early detection vital for effective treatment**.

- **Traditional methods** for detecting these circulating tumour cells are **often expensive and complex**.
  - **For example, the 'CellSearch' test costs** around **$10,000**. **In contrast**, this **new method** could **reduce** this **cost to approximately $100**.
- **By passing ultrasound waves through blood samples** from prostate cancer patients, the team was able to release biomarkers from the cancer cells into the blood, **confirming** their **presence** and **indicating** a **successful detection**.

Implications:

- **Researchers** are **exploring** the **application** of this technique **for other cancers**, particularly **breast cancer** and **melanoma**.
- The researchers **emphasise** the **importance of conducting large cohort studies** to **validate** the **technique** across **different cancer types** and **patient demographics**.

Future Prospects:

- The **U.S. National Cancer Institute** is launching a **Cancer Screening Research Network** with a pilot study set for **2025** involving **24,000 participants** to evaluate various screening tests.
  - Expected to conclude in **four years**, with potential future support for other innovative screening methods, including the ultrasound technique.
  - If clinical trials yield favourable results, the ultrasound-based technique could be commercially available within about **five years** after seeking regulatory approval.

2024 Nobel Prize in Physiology or Medicine

Sub Topic-Achievement in the field of Nanotechnology

Context: The **2024 Nobel Prize** in Physiology or Medicine was awarded to **Victor Ambros** and **Gary Ruvkun**, two American scientists.

- They were honoured for discovering a tiny class of molecules known as **microRNA**, which play a key role in **cellular development** and **protein production**.

Role of MicroRNAs in Cellular Development: MicroRNAs are a class of **ribonucleic acid molecules (RNA)** that control the **amount and type of protein** produced by cells.

- These molecules are present in both **cells** and the **bloodstream**, and are essential for the development and functioning of multicellular organisms, including humans.

Groundbreaking Discovery in Gene Regulation: Their discovery of **microRNAs** revealed a new principle of **gene regulation** that explains how different cell types, such as muscle or nerve cells, behave differently even though they share the same **DNA**.

Function of MicroRNAs in Protein Production: MicroRNAs work by attaching to **messenger RNA (mRNA)**, either destroying them or delaying protein production.

- This process determines the unique protein production in each cell type, such as muscle cells or nerve cells.

Research and Impact on Understanding Multicellular Organisms: Their research involved the worm **Caenorhabditis elegans**, a tiny organism with specialised cell types like those found in larger animals, including humans.

- This study helped understand how tissues develop and mature in **multicellular organisms**.

Diseases Linked to MicroRNAs: MicroRNAs play a vital role in preventing diseases. When they fail, they may contribute to conditions like **cancer** or **congenital disorders** such as hearing loss and skeletal issues.

Recognition of Long-Term Scientific Contributions: Ambros and Ruvkun's work was published in **1993** in the **Cell** journal, marking a significant contribution to molecular biology over the last few decades.

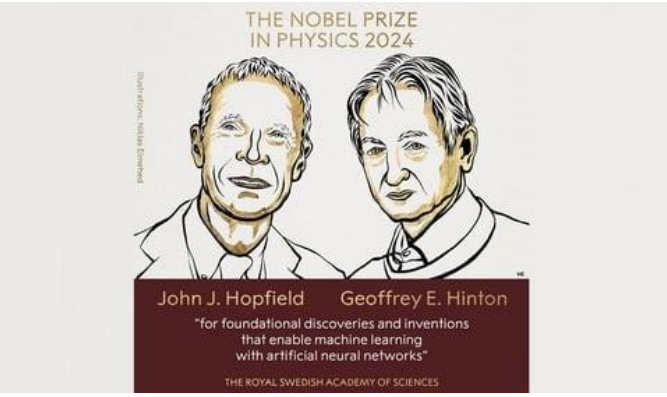
Connection to Previous Nobel Prize: In **2023, the Nobel Prize in Physiology or Medicine** was awarded to **scientists who developed mRNA vaccines against COVID-19,** demonstrating the continued importance of RNA research in medical advancements.

2024 Nobel Prize in Physics

Sub Topic-Achievement in the field of IT, Computer

Context: John J. Hopfield and Geoffrey E. Hinton were awarded the 2024 Nobel Prize in Physics for their groundbreaking work in the 1980s that laid the foundation for **machine learning** with **artificial neural networks** (ANNs).

Key Contributions



- **Hopfield's Contribution**:
  - Developed **Hopfield networks**, an associative memory model.
  - Capable of **storing and reconstructing data** with noise or partially erased information.
- **Hinton's Contribution**:
  - Created methods allowing **ANNs** to independently discover properties in data.
    - ☐ These methods enable tasks like identifying specific elements in images.

Machine Learning and ANNs

- **Artificial Neural Networks (ANNs)**:
  - Inspired by the brain's **neurons** and **synapses**.
  - ANNs are built from **nodes** that simulate neuron connections.
  - ☐ They strengthen or weaken connections based on training, unlike traditional software.
- **Applications of ANNs**:
  - Used in **particle physics**, **material science**, **astrophysics**, and everyday technology (e.g., **facial recognition** and **language translation**).

Foundational Discoveries:

- Both laureates contributed to the **building blocks of machine learning**.
- Their work enables machines to **make faster and more reliable decisions** by mimicking human memory and learning.

Conclusion:

The discoveries of Hopfield and Hinton have made a lasting impact on both artificial intelligence and physics, enabling significant advancements in both fields. They join a prestigious list of 224 Nobel laureates in Physics.

2024 Nobel Prize in Chemistry: Pioneering Work on Proteins

Sub Topic-Achievement in the field of Biotechnology

Context: The 2024 Nobel Prize in **Chemistry** honours **Demis Hassabis and John M. Jumper** (Google DeepMind) for using AI to predict protein structures and **David Baker** (University of Washington) for designing new proteins that do not exist in nature.

Demis Hassabis and John M. Jumper: AI and Protein Structure Prediction

- **Achievement:** Awarded for developing an AI model, **AlphaFold2**, that predicts the 3D structure of nearly all known proteins.
- **Significance:** Solved a **50-year-old problem** of predicting protein structures from amino acid sequences.
- **Impact:** Predicted the 3D structures of **almost all 200 million known proteins** using AI.
- **Technique:** The model uses databases of known protein sequences and identifies co-evolving amino acids, predicting their structural folds.

- **Result:** AI matched the accuracy of **X-ray crystallography** in protein structure determination, which had previously been the standard.

David Baker: Designing New Proteins

- **Achievement:** Recognised for creating **computational tools** to design proteins that had never existed in nature.
- **First Innovation:** Designed the protein **Top7** in 2003, containing **93 amino acids**, the largest man-made protein at the time.
- **Applications:** New proteins have potential applications in **nanomaterials, pharmaceuticals, vaccines**, and **environmentally friendly industries**.
- **Significance:** Protein design can lead to the development of **sensitive sensors, targeted therapies**, and a **greener chemical industry**.

Key Facts

- **Nature of Proteins**: Proteins are composed of 20 different amino acids, with their sequence determining their 3D structure and function (e.g., enzymes, hormones, antibodies).
- **Significant Developments**: AI model trained on known amino acid sequences to predict structures of unknown sequences.
  - **AlphaFold2's Training:** Trained on known amino acid sequences and 3D structures, AI predicts proteins by analysing evolutionary patterns.
  - ☐ AlphaFold2 used by over 2 million researchers across 190 countries since its inception.
  - ☐ **Impact of Discoveries:** The discoveries fulfil a 50-year quest in the field of protein research, enhancing the understanding of protein folding and function.

Major Atmospheric Cherenkov Experiment (MACE) Observatory

Sub Topic-Achievement in the field of Defence Technology

Context: Recently the **Secretary of the Department of Atomic Energy (DAE)** and **Chairman of the Atomic Energy Commission**, **inaugurated** the **MACE Observatory** in **Hanle, Ladakh**.

Cherenkov experiments involve the **study of Cherenkov radiation**, a phenomenon that occurs **when charged particles**, such as electrons or protons, **travel through a dielectric medium** (like water) at speeds exceeding the speed of light in that medium. This results in the emission of a characteristic blue light, similar to a sonic boom produced by an object travelling faster than sound.

More on News:

- This **state-of-the-art facility** is the **largest imaging Cherenkov telescope in Asia** and holds the distinction of being the **highest of its kind globally**, **situated** at an **altitude of approximately 4,300 metres**.
- This **inauguration** was **part of the DAE's Platinum Jubilee celebrations**.

Key Highlights:

- **Indigenous Development: Built** by the **Bhabha Atomic Research Centre (BARC)** in **collaboration with** the **Electronics Corporation of India Ltd (ECIL)** and other Indian industry partners.
- **Research Focus:** MACE is **set to position India** at the **forefront** of **global cosmic ray** research by **enabling** the **study of high-energy gamma rays**.
- **Construction Features**: Lightweight yet strong design with high-temperature endurance.

☐ **Ultra-fast backend electronics** optimised for low-power and cold-temperature operations, with nanosecond digitisation capabilities.

- **Observation Capabilities**: MACE can capture gamma-ray flares from sources up to 200 million light-years away.
- **Hanle's Unique Conditions**: The **area's extremely low light pollution** provides **ideal conditions** for **gamma-ray observations**.

☐ Its **geographical position allows MACE to monitor cosmic sources** that are not visible from other locations worldwide.

> ***Gamma Ray Detection**: **Gamma rays do not reach the Earth's surface due to atmospheric absorption** but generate high-energy particles that emit Cherenkov radiation. MACE captures this radiation using its mirrors and cameras, tracing it back to its cosmic source.*

Future Aspirations:

- **Scientific Impact**: MACE will enhance India's capacity to study high-energy phenomena like **supernovae and black holes,** complementing global observatories.
- **International Collaboration**: Aims to foster partnerships and strengthen India's position in the global scientific community.
- **Inspiration for Future Generations**: Encourages exploration of new frontiers in astrophysics among students and young scientists.

Conclusion:

The inauguration of the MACE observatory marks a significant advancement for India in the field of astrophysics and cosmic-ray research, enhancing its capabilities to explore the mysteries of the universe.

Dragon Drones

Sub Topic-Achievement in the field of Defence Technology

Context: A new **and** deadly weapon has emerged in the Russia-Ukraine war: drones that release molten metal, referred to as **"dragon drones."**

More on News:

- These **drones** are capable of **dropping** a **substance** known as **thermite** originally developed over a century ago for welding railroad tracks.
- This development marks a significant **evolution in aerial warfare tactics** for both nations.

> ***Thermite*** *has a* ***history of use in warfare****, including during both World Wars. German zeppelins dropped thermite bombs in WWI, and by WWII, both* ***Allied*** *and* ***Axis forces utilised thermite*** *in their* ***aerial bombing campaigns****.*

What Are Dragon Drones?

- Dragon drones are **advanced unmanned aerial vehicles (UAVs)** that release a substance called **thermite—a mixture of aluminium and iron oxide**.
- When **ignited, thermit**e triggers a self-sustaining reaction that **produces molten metal burning at 2,427°C**.

☐ This **intense heat** allows it to **penetrate** nearly **any material**, including **clothing, trees**, and even **military-grade vehicles**.

- On human targets, thermite can **cause severe burns and bone damage**, making these drones particularly dangerous.

Significance:

- The **combination of thermite and precision drones** has been described as **"highly effective" and "dangerous" by** the anti-war advocacy organisation Action on Armed Violence (**AOAV**).
- This synergy **allows the drones to bypass traditional defences**, delivering incendiary payloads with alarming accuracy.

Legal Status of Thermite in Warfare:

- The use of thermite in weaponry is **not prohibited under international law**, but its **deployment** against civilian targets is **restricted by** the **Convention on Certain Conventional Weapons**.
- This guidance **limits its use to military targets** due to its indiscriminate nature and potential to cause severe injuries.

Terminal High Altitude Area Defense (THAAD)

The **U.S.** is **deploying** a **Terminal High Altitude Area Defense (THAAD) battery to Israel**, along with **about 100 troops to operate it**.

About THAAD: It is one of the **U.S. military's most advanced anti-missile systems**. **Designed to intercept ballistic missiles** at **ranges** of **150 to 200 kilometres** (93 to 124 miles) with a near-perfect success rate in tests. **THAAD can destroy short-, medium-,** and **intermediate-range ballistic missiles** during their terminal phase of flight, whether inside or outside the atmosphere.

TRAI's "Regulatory framework for Ground-based Broadcasters'

Sub Topic-Achievement in the field of IT

Context: The Telecom Regulatory Authority of India (TRAI) issued a consultation paper to address the Regulatory Framework for Ground-based Broadcasters.

About the Report

- **Examination of Existing Guidelines:** The Telecom Regulatory Authority of India (TRAI) has released a consultation paper **examining the existing uplinking and downlinking guidelines** issued by the Ministry of Information and Broadcasting (MIB).

- **Exploration of more efficient Technology: The existing MIB guidelines mandates the use of satellite technology** for broadcasters to deliver content to Distribution Platform Operators (DPOs).

  - The consultation paper explores the need for **revising these guidelines to incorporate newer, more efficient technologies for content transmission.**

- **Technological Advancements**

  - In recent years, significant advancements in ground-based technologies, such as **broadband networks and fibre optics,** have made it possible for **broadcasters to transmit television** channels terrestrially.

  - These technologies **allow content delivery to DPOs without the need for satellite uplinking or downlinking**. Terrestrially transmitted channels can now be carried across multiple DPO networks for **retransmission to subscribers, similar to traditional satellite-based methods.**

Need for Regulatory Framework of GGB:

- A new regulatory framework **is required to govern the use of ground-based broadcasting technologies.** This will:

  - Enable broadcasters to leverage more **cost-effective technologies.**

- Promote flexibility in content delivery, **improving efficiency.**
- **Ensure fair and proper governance** of these new transmission methods.

- **The widespread availability of high-speed wired and wireless internet has revolutionised broadcasting :**
  - Technologies such as **cloud platforms and fibre-optic networks enable high-quality, real-time transmission of TV content**.
  - The rise of such technologies is making ground-based broadcasting (GBB) increasingly viable and scalable.

Satellite- Based Broadcasting VS Ground-Based Broadcasting (GBB):

Aspect	**Satellite-Based Broadcasting (SBB)**	**Ground-Based Broadcasting (GBB)**
Transmission Method	**Uses satellites for uplinking and downlinking** content	**Utilises terrestrial methods (cloud platforms, fibre optics)**
Technology	Employs **geostationary satellites**; supports SD and HD channels	**Leverages cloud platforms and internet transmission**
Coverage	**Effective in remote/rural areas;** nationwide reach within satellite footprint	**Can operate locally or regionally;** limited coverage in poor infrastructure
Cost and Scalability	**Generally expensive due to satellite costs;** highly effective for broad coverage	**More cost-effective without satellite leasing fees;** appealing for specific regions but challenging for scalability and national reach

Scandium Nitride (ScN)

SubTopic- Indigenization of technology and Developing new technology

Context: In a groundbreaking development for the semiconductor industry, researchers have uncovered new insights into the factors limiting electron mobility in semiconductors.

More on News:

• This study, marking a significant step forward in understanding the electronic properties of these materials, could pave the way for more efficient electronic devices.

Scandium Nitride (ScN):

- **Semiconductors are essential to modern technology, driving everything from smartphones and computers to medical devices and space systems.**

• As demand grows for faster, more efficient, and reliable electronics, the search for advanced semiconductor materials has intensified.

• Scandium Nitride (ScN), a rocksalt semiconductor, has emerged as a promising candidate for next-generation electronics due to its superior thermal stability, durability, and favourable electronic properties.

- **However, despite its potential, ScN's relatively low electron mobility has hindered its practical application, with researchers seeking to understand the mechanisms behind this limitation.**

Scandium nitride (ScN)

It is a binary III-V indirect bandgap semiconductor with significant potential in various applications, particularly in electronics and energy harvesting.

- **Structure: ScN has a rock-salt crystal structure characterised by a lattice constant of approximately 0.451 nanometers.**
- **Electrical and Optical Characteristics: ScN has been shown to possess high electron mobility and hardness, making it suitable for a variety of semiconductor applications.**
- **Sublimation and Recondensation: ScN can be synthesised through sublimation techniques, where scandium is reacted with nitrogen gas under controlled conditions.**
- **Magnetron Sputtering: This method involves depositing ScN nanolayers onto substrates like MgO (001) through reactive sputtering, allowing for epitaxial growth.**
- **Applications: Semiconductors, Energy Harvesting and Optical Communication.**

About the Research:

- **A team of scientists from the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) in Bangalore, an autonomous institution under the Department of Science and Technology (DST), has delved into the factors restricting electron mobility in ScN.**
- **The research focused on identifying the dominant scattering mechanisms that impede electron flow.**
- **They found that while the intrinsic electron-phonon interaction (Fröhlich interaction) sets an upper limit on ScN's mobility, factors such as ionised-impurity and grain-boundary scatterings substantially diminish it.**

The study suggests that fabricating single-crystalline ScN free from impurities and defects could greatly enhance its electron mobility.

Smart Insulin

Sub Topic-Achievement in the field of Biotechnology

Context: Scientists have **achieved** a **"smart" insulin** that **responds in real-time** to **fluctuations** in **blood sugar levels**, heralded as the **"holy grail"** of diabetes treatments.

More on News:

- **Diabetes affects** over **half a billion people globally** and **causes** nearly **seven million deaths** each year.
- The **prevalence** of this disease, marked **by high blood sugar levels**, has rapidly **increased** in **recent decades**.

Understanding Diabetes and Current Treatments

- Diabetes is **categorised into two types**, both relating to the body's insulin response:
- **Type 1 Diabetes**: Often diagnosed in childhood, this condition occurs when the pancreas produces little to no insulin.
- **Type 2 Diabetes**: This type is characterised by the body's cells becoming resistant to insulin, requiring more of the hormone than the pancreas can produce.
- **Both types** are typically **managed through synthetic insulin administration**. However, this poses **challenges**, as **blood glucose levels are not static**.
    - ☐ **Overdosing on insulin** can **lead** to **dangerously low blood sugar levels**, a potentially **life-threatening situation**. Patients must frequently monitor their blood glucose and adjust their insulin doses accordingly.

Key Highlights:

- An international team from Denmark, the UK, and Czechia, along with the University of Bristol, has engineered a new form of insulin called **NNC2215**.
- **On-and-Off Switch**: The insulin contains **a ring-shaped structure** that interacts with a glucoside molecule.
    - ☐ When blood sugar is low, the glucoside keeps the insulin inactive. As blood sugar rises, glucose replaces the glucoside, activating the insulin to lower blood sugar levels.
- **Efficacy in Animal Models**: Initial tests on rats and pigs show that NNC2215 is as effective as human insulin in lowering blood glucose.

Benefits of Smart Insulin:

- **Improved Blood Sugar Control:** By automatically adjusting insulin levels, smart insulin can help maintain stable blood sugar levels, reducing the risk of both high and low blood sugar episodes.
- **Reduced Burden on Patients:** Patients no longer need to constantly monitor their blood sugar levels and manually adjust their insulin dosage. This can significantly improve their quality of life.
- **Potential for Fewer Injections:** With smart insulin, the need for frequent insulin injections may be reduced, making diabetes management more convenient.

Implications:

- While promising, **NNC2215 has limitations**. Its **activation requires** a significant **glucose spike**, resulting in a sudden surge of insulin, which is **not ideal for gradual blood sugar control**.

Researchers are focused on refining this insulin to ensure a more controlled release, aiming for a smoother transition in insulin levels.

Subject - Environment, Bio-diversity and Disaster management

India Joins International Energy Efficiency Hub

Sub Topic- Conservation

Context: The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, has approved India's signing of the 'Letter of Intent' to **join the International Energy Efficiency Hub,** reinforcing its commitment to energy efficiency and sustainable development.

About the Hub:

- The Hub, established in 2020 as the successor to the **International Partnership for Energy Efficiency Cooperation (IPEEC),** fosters **collaboration among governments, international organisations, and private sector entities.**
- The Hub is a **voluntary collaboration** and As of July, 2024, **sixteen countries** (Argentina, Australia, Brazil, Canada, China, Denmark, European Commission, France, Germany, Japan, Korea, Luxembourg, Russia, Saudi Arabia, United States and United Kingdom) have joined the Hub.

Bureau of Energy Efficiency (BEE), the statutory agency, has been designated as the implementing agency for the Hub on behalf of India. BEE will play a crucial role in facilitating India's participation in the Hub's activities and ensuring that India's contributions align with its national energy efficiency goals.

Significance of India joining the Hub:

- **Access to Expert Networks** for Enhanced Domestic Energy Efficiency Enhancing its domestic energy efficiency initiatives.
- **Global Collaboration:** India joins a 16-nation group, sharing innovations and learning from global leaders like the U.S. and China on energy-efficient technologies.
- **Boosting Domestic Initiatives:** Access to expert networks will enhance India's energy efficiency programs, reducing energy demand and costs.
- **Climate Action:** Supports India's Paris Agreement goals, aiding in the transition to a low-carbon economy through energy-efficient solutions.
- **Energy Security:** Reduces energy consumption and import dependency, strengthening resilience against market fluctuations.
- **Economic & Technological Growth:** Fosters collaboration on technology, driving economic growth, green jobs, and sustainable development.
- **Global Leadership:** Positions India as a key player in shaping future global energy policies.

Challenges of India Joining the International Energy Efficiency Hub:

- **Implementation of Global Standards:** Adapting international best practices to India's unique energy landscape, infrastructure, and regulatory environment may pose difficulties.
- **Technological Adaptation:** Integrating cutting-edge global technologies into India's existing systems and infrastructure may face technical hurdles, requiring customised solutions and innovation.

Conclusion:

By joining the Hub, India is taking a significant step towards a more sustainable future. The country's participation in this global platform will help to accelerate the transition to a low-carbon economy and improve energy security.

Little Prespa Lake

Sub Topic- Conservation

Context: Little Prespa Lake is **experiencing** a **severe ecological crisis**.

- **Once a pristine body of water**, it is **now turning into** a **marshy wasteland**, **jeopardising local livelihoods** and the **region's biodiversity**.

Causes of Decline:

- **Human Intervention:** In the 1970s, the **Albanian government diverted** the **Devoll River to irrigate fields around** the **city of Korca**. This significantly reduced the water inflow to the lake, marking the beginning of its ecological decline.
- **Climate Change: Rising temperatures, mild winters with little snowfall**, and **a scarcity of precipitation** have exacerbated the problem.

☐ The **lake's water levels** have **dropped** significantly, with the water on the Albanian side now 10 metres lower than in the late 1970s.

About Little Prespa Lake:

- **Locally known** as **Small Lake Prespa**, **spans** primarily **Greek territory**, with **only** its **southern tip crossing** into **Albania**.
- **Covering** an **area** of **48.5 sq km** (of which 5 sq km belongs to Albania), it has a **deepest point of 8.4 m** and an **average depth of 4 m**.
- It is a **long** and **narrow lake**, **measuring** up to **13.6 km in length**.
- **Formed from** a former **single Lake Prespa through sediment deposition** from the **Agios Germanos stream-torrent**.
- The **lake's water flow** was **redirected between 1936-1945** to **connect** to the **Great Prespa**, with **overflow occurring** via the **stream "Koula."**
- **Vegetation:**

☐ **Deciduous** forests on higher mountain slopes.

☐ **Reedbeds** and **hydrophilic plants** in **lower zones.**

- **Islands: Agios Achilleios** and **Vidronisi**.
- **Environmental Significance:**

☐ **Protected habitat** within **Prespa National Park**.
☐ A significant **portion** is **included** in the **Natura 2000 network**.
☐ **Features large shallow zones** with **swampy vegetation** and **steep shores**.

Impact on Local Communities:

- The **once-thriving fishing industry has collapsed**, **depriving locals** of their **primary livelihood**.
- **Abandoned boats** now **lie stuck in the mud**, and **cows wander where fish once swam**.
- The **transformation** of the **lake into a marshland** has also **led** to significant **biodiversity loss**.

Environmental and Regional Implications:

- The **decline** of Little Prespa Lake **serves as a stark warning** for the broader Balkan region, which is rich in water resources but lacks effective management.
- The **death of the lake could have repercussions on neighbouring lakes**, such as the larger **Prespa** and **Ohrid lakes**.

Conclusion:

The **plight of Little Prespa Lake underscores** the **urgent need for sustainable water management practices** and **climate change mitigation efforts**. Without immediate action, this once beautiful lake could disappear entirely, leaving behind a barren landscape and a stark reminder of the consequences of environmental neglect.

Unusual Plankton Bloom off Madagascar Driven by Southern African Drought

Sub Topic- Conservation

Context: A **new study** revealed that **windborne dust** from **drought-stricken southern Africa** triggered an **unusually strong phytoplankton bloom** off the **southeast coast of Madagascar** between **November 2019 and February 2020**, marking the **most significant bloom in two decades** during an unexpected period.

Role of Phytoplankton in Climate and Carbon Cycles:

- **Phytoplankton** play a significant role in regulating **Earth's climate** and **carbon cycles**.
- Like terrestrial plants, phytoplankton contain **chlorophyll** and use **photosynthesis** to generate oxygen and absorb large amounts of **carbon dioxide**.

Dust and Desertification:

- **Drylands**, which cover **41% of global land**, are vulnerable to **drought** and **desertification**.
- Loss of vegetation in dry regions leads to **wind-driven soil particle mobilisation**, resulting in increased **dust emissions** into the atmosphere.
- Dust often carries essential nutrients such as **iron**, **nitrogen**, and **phosphorus**, which can fertilise nutrient-poor ocean waters and boost **primary productivity**.

Study Findings:

- The study published in **PNAS Nexus** (October 1, 2024) revealed that **dust from southern Africa** was deposited into the **nutrient-limited waters** southeast of Madagascar, triggering the **phytoplankton bloom**.
- **Key dust sources** include the **Etosha** and **Makgadikgadi Pans** (Namibia, Botswana), coastal **Namibian desert**, and the **Kalahari Pan belt**.

Impact of Climate Change and Drought:

- **Southern Africa** is considered a **climate change hotspot**, with projections showing **rising temperatures** and increased **aridity**.
- Prolonged and extreme **multi-year droughts** have intensified over the last decade, with 2019's **austral spring** (September-November) being one of the **driest in 40 years** for parts of **Zimbabwe**, **Namibia**, **Botswana**, and **South Africa**.

☐ **90,000 livestock** were lost in Namibia, and over **11 million people** faced severe **food insecurity** during this period.

Dust and Ocean Fertilisation:

- From **November to December 2019**, strong **dust aerosol optical depth anomalies** were recorded over southern Africa, especially **Namibia**, **Botswana**, and **western South Africa**.
- The **dust aerosols**, rich in **iron**, were transported to the ocean and contributed to the unusual bloom.
- The **phytoplankton bloom** started **2.5 months earlier** and lasted **three weeks longer** than previous blooms in the area.

Methodology and Future Implications:

- Researchers used **standardised anomalies of dust aerosol optical depth** from the **Copernicus Atmosphere Monitoring Service (CAMS)** and **in-situ data** from the **Aerosol Robotic Network** to measure atmospheric dust over Madagascar.
- **Dust-driven ocean fertilisation events** could become more frequent due to **intensifying droughts** driven by **climate change**.
- These events could significantly impact the **carbon dioxide uptake** of the oceans, affecting global **carbon cycles**.

Researchers Uncover Mechanisms Behind Plant Response to Warming

Sub Topic- Conservation, Climate change

Context: Researchers at the **University of California San Diego** have **unveiled** new insights into **how plants adapt to rising temperatures by examining** the **role of microscopic pores on leaf surfaces**.

More on News:

- **Microscopic pores called stomata** on leaves **enable plants to control water loss** and **intake carbon dioxide** for **photosynthesis** and **growth**.
- **As global temperatures continue to rise**, the **ability of stomata** to widen is increasingly recognised as a crucial mechanism for minimising heat stress in plants.

Background

- **Historically, scientists struggled to understand** the **mechanisms behind stomatal openings** in response to rising temperatures **due to the complexities of maintaining constant humidity** (vapour pressure difference, or VPD) while increasing temperature.
- The **researchers developed a method to stabilise VPD values under varying temperatures**, allowing them to investigate genetic mechanisms involved in stomatal responses.

Key Findings:

- The **study, published** in the **journal *New Phytologist***, **identified two primary pathways** that **plants utilise to cope with elevated temperatures:**
- **Carbon Dioxide Sensors as Central Players**: The researchers discovered that carbon dioxide sensors are **integral** to the **plant's stomatal responses to warming**.

☐ When l**eaves experience** rapid **temperature increases**, these s**ensors detect** the resultant **rise** in **photosynthesis**, **which lowers carbon dioxide levels**.

☐ This **reduction triggers the stomatal pores to open**, allowing for increased carbon dioxide intake, ultimately benefiting the plant’s growth.

- **Alternative Heat Response Pathway**: **Under extreme heat conditions**, the study found that **photosynthesis** can **become stressed**, leading to a **decline in its effectiveness**.

☐ In these scenarios, the **stomata bypass the typical carbon dioxide sensor responses** and instead engage a secondary heat response pathway.

☐ This **mechanism functions similarly to a backdoor entry**, **enabling the plant to "sweat" and cool itself down**, thereby **mitigating heat stress**.

Implications for Plant Health and Agriculture:

- **By deciphering** the **mechanisms** through which plants regulate stomatal function under varying temperatures, **researchers** can better **predict how different species** might r**espond to future climatic conditions**.

☐ This **knowledge can guide agricultural practices**, helping to select crop varieties that better withstand heat stress and use water more efficiently.

☐ **As global temperatures rise**, enhancing our **understanding of plant physiological responses is crucial** for developing sustainable agricultural practices and **ensuring food security in** an increasingly **unpredictable climate**.

Bihar's Second Tiger Reserve in Kaimur

Sub Topic- Conservation

Context: The central government has approved the establishment of Bihar's second tiger reserve in **Kaimur district** following the proposal by the Bihar government. This development arises from the need to manage the growing tiger population in the **Valmiki Tiger Reserve (VTR)**, which has exceeded its capacity.

Approval of Kaimur Tiger Reserve:

- **In-principle approval** from the National Tiger Conservation Authority (NTCA) at its 12th meeting.
- Official confirmation by Bihar's Forest, Environment and Climate Change Minister.
- Additional technical approvals required before a formal declaration.

Valmiki Tiger Reserve's Overcapacity:

- **VTR**, located in **West Champaran district**, was Bihar's only tiger reserve.
- VTR's tiger population has grown to **54 tigers**, exceeding its capacity of **45**.
- The **Status of Tigers Report 2022** highlighted the tiger population increase at VTR from **31 in 2018** to **54 in 2022**.

Kaimur Wildlife Sanctuary's Development:

- **Kaimur Wildlife Sanctuary (KWLS)** will be developed into the new tiger reserve.
- A tiger relocation plan will transfer some tigers from VTR to Kaimur to **manage population pressure** and maintain an eco-friendly environment.

Proposal History and Wildlife Significance:

- The proposal began in **2018**, following sightings of tiger pugmarks and prey remains in KWLS.
- Kaimur has **1,134 square kilometres** of forest, the largest in Bihar, with **34% green cover**.
- It connects with wildlife corridors in **Jharkhand, Uttar Pradesh,** and **Madhya Pradesh**.
- **Shergarh Fort** and **58 villages** are included in the **buffer zone**, while 450 sq km of forest is designated as the **prime tiger habitat**.

Challenges and Adjustments:

- Earlier objections from the NTCA led to reducing the core area from **900 sq km to 450 sq km**.
- The sanctuary's potential as a tiger reserve was confirmed by a team of experts led by **AJT Johnsingh**, former Director of the Wildlife Institute of India (WII).

Global Nature Positive Summit

Sub Topic- Conservation

Context: Leaders from government, private sector, research, environment, and First Nations communities are gathering in Sydney this week for the **world's first Global Nature Positive Summit**.

More on News:

- The summit highlights the **need not only to conserve remaining biodiversity** but also **to actively restore degraded ecosystems** to benefit from their valuable services.
- Co-hosted by the **Australian and New South Wales** governments, the summit aims to **drive increased private sector investment** in environmental protection and restoration efforts.

Key Objectives:

- **Investment in Nature:** The summit seeks to drive private sector investment to support nature-positive projects that prioritise environmental health.
- **Policy Framework:** It will emphasise the need for **clear and consistent policies** that encourage businesses to invest confidently in nature-related initiatives.
- **Global Commitments:** The event aligns with the **Kunming-Montreal Global Biodiversity Framework,** which mandates that **at least 30% of land and waters be protected or restored by 2030**.

Nature Repair Markets:

- In December 2023, **Australia passed legislation** to establish a nature repair market.

☐ This market **issues certificates for biodiversity projects** that enhance or protect ecosystems beyond what would occur naturally (a concept called **"additionality"**).

- Certificates, issued once projects are sufficiently advanced, **allow biodiversity outcomes to be traded independently from the land.**

☐ Multiple certificates can be issued for the same project area, a practice known as **"stacking."**

- However, **concerns** have been raised about the **integrity of such markets.** Issues include:

☐ **Complexity:** Stacking presents **implementation challenges**, including **risks of double-dipping.**

☐ **Clarity:** The **dual issuance of certificates** for actual and projected outcomes raises concerns about potential **misleading claims under Australian consumer law.**

☐ **Demand Uncertainty:** It's unclear if enough businesses will voluntarily buy these certificates, leaving the market's viability uncertain while biodiversity continues to decline.

Alternatives to Market-Based Solutions:

- **Reducing or stopping activities harmful to nature**, including eliminating harmful subsidies.

☐ The **Wentworth Group** of Concerned Scientists estimated that $7.3 billion annually for 30 years (a total of $219 billion) could fund critical activities to reverse Australia's biodiversity decline. Yet, the government currently spends 50 times more on subsidies harmful to biodiversity than on conservation efforts.

- **Increasing federal government investment in conservation** to at least 1% of the annual budget, which would have a transformative impact.
- **Implementing overdue environmental law reforms** promised by the Albanese government.

Way Ahead:

- **Aligning Economic and Environmental Policies:** The **economy is a subsidiary of the environment,** and government investment in conservation is not only affordable but also far more efficient.

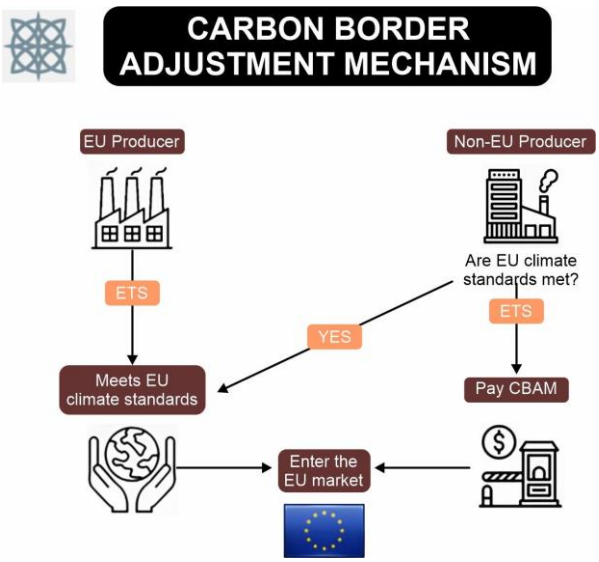
☐ **Stopping harmful practices** would provide the most direct route to improving biodiversity outcomes.

- **Environmental Law Reform and Government Action:** The Albanese government has promised comprehensive environmental law reform but has yet to deliver.
- Urgency of Government Action: To achieve the global goal of becoming nature-positive by 2030 and fully recovering biodiversity by 2050, binding commitments must be made at the Global Nature Positive Summit.

European Union's Carbon Tax

Sub Topic- Conservation, Environmental Pollution & Degradation

Context: India's Finance Minister recently criticised the European Union's **Carbon Border Adjustment Mechanism (CBAM)** as ***"unilateral and arbitrary,"*** asserting that it poses a significant barrier to trade for Indian industries.



More on News:

- This statement comes in the wake of **India's decision to retaliate against the EU's steel tariffs,** emphasising ongoing tensions between India and the EU regarding trade regulations.

What is CBAM?

- It is a **proposed regulation by the EU aimed at imposing tariffs on imports from carbon-intensive sectors,** such as steel and cement, starting January 1, 2026.
- It **requires exporters to report their carbon emissions,** which Brussels argues is necessary for assessing carbon footprints.

Impact on Indian Exports:

- **Cost:** The implementation of CBAM **could raise costs for Indian exports by 20% to 35%,** significantly impacting sectors like iron, steel, and aluminium.
- **Competitiveness:** In 2022, over a quarter of India's exports in these categories were directed towards the EU, raising **concerns about competitiveness.**

India's Response to EU Tariffs:

- **Retaliation Measures:** In response to the EU's steel tariffs, which India claims have resulted in **trade losses of $4.41 billion from 2018 to 2023**, India has **notified the World Trade Organisation (WTO) of its intention to increase tariffs** on selected EU products as a form of retaliation.
- **Trade Losses:** The proposed suspension of concessions due to these tariffs highlights India's significant financial losses and its **determination to protect its domestic industries** from what it perceives as unfair trade practices.

Key Concerns Raised by India:

- **Unilateral and Arbitrary Nature:** The Finance Minister emphasised that measures like CBAM are **unilateral and do not consider the economic realities** faced by developing nations like India, which are investing heavily in energy transitions.

- **Lack of Level Playing Field:** She argued that such regulations create an uneven playing field, **disadvantageous to Indian industries** compared to their European counterparts.
- **Data Sharing Requirements:** Indian exporters express concerns about the burdensome data-sharing requirements under CBAM, **fearing that compliance could expose sensitive trade secrets** while increasing operational costs.
- **Broader Trade Implications**

☐ **Impact on Free Trade Agreement (FTA) Negotiations:** While these issues would not derail ongoing FTA negotiations with the EU, they **remain a point of contention** that could affect discussions.

☐ **Other Environmental Regulations:** India is also wary of additional EU regulations, such as the **Deforestation Regulation**, which could further complicate trade relations and disrupt supply chains.

Historical Context of India-EU Trade Relations:

- **Resumption of FTA Talks:** Negotiations for a Free Trade Agreement between India and the EU were **relaunched in June 2022** after being stalled for several years. The current talks **aim to address various trade barriers and enhance bilateral economic ties.**
- **Trade Statistics:** As of 2023, the **EU is India's largest trading partner**, accounting for €124 billion in trade. This includes significant exports from India in sectors like pharmaceuticals and textiles.

Future Outlook:

- **Potential Outcomes:** The ongoing tensions regarding CBAM and other regulations may complicate FTA negotiations but could also prompt both sides to **seek more balanced solutions** that consider each other's economic contexts.
- **India's Green Transition Initiatives:** India is actively pursuing green transition initiatives through schemes like the **Production Linked Incentive (PLI)** for emerging sectors and household energy programs.
- The Finance Minister noted that achieving India's climate goals by 2070 remains feasible if current momentum continues.

Subject - Internal Security

'Digital Arrest'

Sub Topic-Cyber Security, Cyber Warfare

Context: A fraudster impersonated Chief Justice of India DY Chandrachud, creating a fake virtual courtroom and documents that closely resembled authentic ones. This elaborate

scheme led to the deception of SP Oswal, head of Vardhman Group, resulting in a loss of ₹ 7 crore.

What is Digital Arrest?

A form of cybercrime where fraudsters pose as law enforcement officials and trick victims into believing they are involved in illegal activities, coercing them into staying connected via video calls.

Modus Operandi

- **Initial Contact**: Fraudsters contact victims, claiming they are implicated in crimes such as money laundering or drug trafficking.
- **False Accusations**: Victims are accused of crimes, with threats of imminent arrest if they don't comply.
- **Digital House Arrest**: Victims are forced to remain on video calls, being told they are under "digital arrest."
- **Isolation**: Victims are isolated by being instructed not to contact others, increasing their vulnerability.
- **Financial Demands**: Fraudsters demand money to "settle" the case or avoid arrest.

Common Pretexts Used by Scammers

- **Parcel Scam**: Claiming a parcel containing illegal items implicates the victim.
- **Family Involvement**: Accusations that a family member is involved in a crime.
- **Aadhaar or Phone Number Misuse**: Victims are told their Aadhaar or phone number is linked to illegal activities.

How to Protect Yourself

- **Beware of Unsolicited Calls**: Avoid answering unknown numbers, especially those claiming to be from law enforcement.
- **Verify Identity**: Confirm the caller's identity through official channels.
- **Don't Share Personal Information**: Never share sensitive data like bank details or passwords over the phone.
- **Stay Calm**: Scammers rely on panic; remain composed and end the call if pressured.
- **Educate Yourself**: Stay informed about the latest scams and share this information with others.
- **Report the Scam**: Immediately report any suspicious activity to the police or cybercrime authorities.
- **Government Action:** The Indian Cyber Crime Coordination Centre (I4C) and Department of Telecommunications (DoT) are working to prevent scams and block fraudulent calls.

Species in News

Gibbons: The Dancing Apes

Context: Gibbons, small apes found in Southeast Asia, are known for their acrobatic abilities and musical voices. A recent study has revealed another intriguing aspect of their behaviour: female gibbons engage in a unique form of robotic dancing.

The Study

- A trio of researchers from Institut Jean Nicod, Heinrich Heine University, and the University of Oslo observed **female gibbons dancing in a jerky and rhythmic manner**, often with their backs turned towards an observer.
- This **behaviour was not associated with any obvious purpose**, such as attracting a mate, and was performed for both male and female gibbons, as well as other animals.

Overview of Gibbons (Family: Hylobatidae)

- Approximately **20 species of small apes**.
- **Found in tropical forests of Southeast Asia**.
- **Humanlike build**, **no tail**, **but lack higher cognitive abilities** compared to great apes.
- Notable for **long arms**, **dense hair**, and **throat sacs used for amplifying sound**.

Physical Characteristics:

- **Smaller size compared to great apes**: 40–65 cm (16–26 inches) in length, 5.5–7.5 kg (12–17 pounds) in weight.
- **Largest species:** Siamang (Symphalangus syndactylus) – up to 90 cm (35 inches) and 10.5–12 kg (23–26 pounds).

Social and Behavioural Traits:

- **Arboreal, moving through trees with agility**.
- **Monogamous social structure, forming long-term bonds**, sometimes mating for life.
- **Active during the day, defending treetop territories**.
- **Vocal communication includes loud, musical calls**; duet “great calls” for territorial marking.

Diet and Reproduction: Primarily frugivorous (fruit-eating), with some leaves, insects, bird eggs, and young birds.

- Single offspring born after 7-month gestation.
- Offspring take approximately seven years to mature.

Genera and Species of Gibbons:

1. **Hoolock:** Found in **Myanmar, India, and Bangladesh**.
    - ☐ **Males black, females brown**. Both have throat sacs and harsh voices.
2. **Hylobates:** Includes white-handed gibbon, dark-handed gibbon, and pileated gibbon.
    - ☐ Species found in **Sumatra, Malaysia, Thailand, Cambodia, and China**.
3. **Nomascus:** Found **east of the Mekong River in Vietnam, China, and Laos**.
    - ☐ Includes red-cheeked gibbon and black crested gibbon.
    - ☐ Females lighten in colour with maturity.
4. **Symphalangus:** Largest genus, includes the siamang.
    - ☐ Found in **Sumatra and Malaysia**.

Habitat: Native to **rainforests of East, South, and Southeast Asia**.

- **Countries:** China, Thailand, Cambodia, Laos, Vietnam, Myanmar, Bangladesh, **India**, Malaysia, Indonesia (Sumatra, Borneo, Java).
- Arboreal lifestyle, spending most time in the canopy.

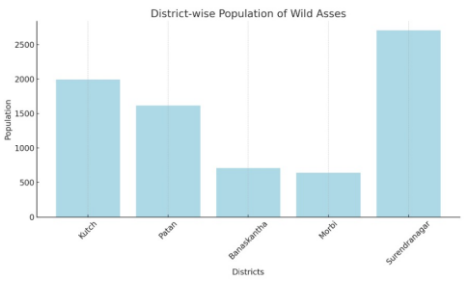
Conservation Status: Most species are **endangered or critically endangered** (IUCN).

- Habitat destruction and hunting for food and medicinal purposes are major threats.
- Hainan gibbon population is stable but highly restricted to one location in China.

Species in News: Indian Wild Ass

Context: The **latest census data reveals** a remarkable **26% increase in** the **population of the Indian Wild Ass (Equus hemionus khur)** in **Gujarat**.

More on News:



- The population has **risen from 6,082 in 2020 to 7,672 in 2024**, according to the **Gujarat Forest Department**.
- This increase was **announced by** the **state government following** the **10th Wild Ass Population Estimation** conducted across 15,500 square kilometres.
- The **population estimation, known** as the **Wild Ass Population Estimation (WAPE)**, is **conducted every four years**.

About Indian Wild Ass:

- The Indian wild ass (Equus hemionus khur), **also known** as the **Indian onager** or ***Ghudkhur*** in **Gujarati**, is a **subspecies of onager native** to **South Asia**.
- **Family:** Equidae
- This species, which is **found only in India**, particularly **thrives** in the **Little Rann of Kutch (LRK)**, a unique habitat characterised by both **wetland** and **desert** features.

- **Known** for their **strength**, wild asses **can run** at impressive **speeds** of **50 to 70 kilometres per hour**, making them well-suited for their harsh environment.
- **Conservation Status:** Classified as **endangered** by the **IUCN in 2008**.
    - ☐ **Listed under Schedule I** of the **Wildlife Protection Act, 1972**. It is also included in the IUCN's Red List of Threatened Species.
- **Adaptability**: They can **survive extreme temperatures (45-50°C)** in the Wild Ass Sanctuary.
- **Diet:** Primarily **feed** on **grass** that grows on the islands within the desert.
- **Threats** due to **habitat loss** and **competition** with **livestock**.
- **Conservation efforts** have played a crucial role in **stabilising** and **increasing** its **population**. These **measures include habitat protection** and **management**, which have contributed to the successful recovery of this unique species.

Long Articles & Book Review

Long Article :

India's Road to Escaping the Middle-Income Trap: Opportunities and Challenges

Introduction

India is one of the fastest-growing economies in the world, with its diverse industries and large population shaping the global market. However, despite its achievements, India risks falling into the middle-income trap. This trap occurs when a country's growth slows after reaching middle-income levels, making it difficult to transition to high-income status. Escaping this trap is essential for India to achieve long-term prosperity and improve the living standards of its people. This essay explores the challenges India faces and strategies it can adopt to break free from this trap, focusing on areas such as manufacturing growth, innovation, and infrastructure development.

What is the Middle-Income Trap?

The middle-income trap happens when a country grows to a moderate level but struggles to sustain this growth, failing to reach high-income status. According to the World Bank, middle-income countries have per capita incomes between $1,136 and $13,845. As countries develop, they often lose their competitive edge in low-wage industries but fail to transition to high-tech or high-value industries, leading to economic stagnation.

Historically, only a few countries, like South Korea and Chile, have successfully escaped the middle-income trap. They achieved this through strategic investments in education, infrastructure, and innovation, often supported by state-driven policies that focused on specific industries.

Challenges for India

India faces several challenges in its efforts to escape the middle-income trap. These challenges are both structural and economic, affecting multiple sectors of the economy.

1. Premature Deindustrialisation

One of the major problems India faces is premature deindustrialisation. This refers to the decline of the manufacturing sector before the country has fully industrialised. India's manufacturing industry is not growing as fast as it should, and the economy is shifting more toward services like IT and finance. However, manufacturing is crucial for creating jobs and producing high-value goods that can be exported to generate income. Historically, countries like South Korea and Japan relied heavily on manufacturing to grow their economies and transition to high-income status.

In India, the share of manufacturing in the overall economy has been shrinking, contributing only about 14-17% of India's GDP. This decline limits India's ability to compete globally in high-value industries like electronics and machinery. Moreover, as manufacturing struggles, many workers are moving back to low-paying jobs in agriculture, which produces much less income per worker. The lack of a strong manufacturing base means fewer jobs for people, especially those with fewer skills, resulting in higher unemployment and lower income growth.

Additionally, the shift to services leaves many low-skilled workers out of the growth process, increasing income inequality. To address this, India needs to rebuild its manufacturing sector through investments and policy reforms to create jobs, raise wages, and achieve sustainable economic growth.

2. Slow Wage Growth

Another challenge for India is slow wage growth. While the economy has been growing at around 7% in recent years, workers have not seen corresponding wage increases. Wages have barely kept up with inflation, meaning that many workers' real incomes

have remained stagnant. When workers do not benefit from economic growth, low consumption demand hampers further economic expansion.

India must focus on ensuring fair wages so that all segments of society benefit from economic progress. By increasing wages, India can create a stronger domestic market, which is essential for long-term growth and escaping the middle-income trap.

3. Unequal Wealth Distribution

The concentration of wealth among a small group of elites is another hurdle. While some businesses in India have thrived, many others struggle to invest and innovate. This uneven distribution of wealth limits broader economic participation, reduces overall investment, and slows down growth in sectors like manufacturing and technology.

To address this issue, India needs policies that promote fair competition and ensure that the benefits of economic growth are shared more equitably. The government must reward businesses based on their performance, not political connections, to encourage innovation and investment across all sectors.

4. Global Economic Challenges

India also faces challenges from the global economy. In recent years, the world economy has slowed, and protectionist policies have made it harder for countries like India to rely on exports for growth. Slower demand and trade barriers limit India's ability to grow its export sector, which is essential for generating foreign income and fostering innovation.

Strategies for Escaping the Middle-Income Trap

Despite these challenges, there are several strategies that India can implement to escape the middle-income trap. These strategies focus on boosting investment, fostering innovation, improving infrastructure, and promoting inclusive growth.

1. Strengthening the Manufacturing Sector

The "Make in India" initiative, launched to boost the country's manufacturing sector, plays a crucial role in escaping the middle-income trap. This initiative encourages both domestic and foreign companies to set up manufacturing operations in India, which can help revitalise the sector. Manufacturing more high-value goods, such as electronics and automobiles, can generate substantial income for the country.

Off-shoring manufacturing units from China to India, as global companies look for alternative locations, can also contribute to industrial growth. By positioning itself as a preferred destination for these companies, India can benefit from the influx of capital, technology, and expertise that comes with foreign investment.

2. Job Creation

The lack of well-paying jobs is a major obstacle in overcoming the middle-income trap. Manufacturing has historically been an engine for job creation, especially for low- and semi-skilled workers. The "Make in India" initiative focuses on creating millions of jobs in sectors like electronics, automobiles, and textiles. As more companies set up manufacturing operations in India, it will open up employment opportunities and reduce unemployment.

By creating jobs in manufacturing, India can absorb workers from low-productivity sectors, such as agriculture, helping raise wages and improve living standards.

3. Fostering Technological Advancement

Both "Make in India" and the relocation of manufacturing units to India can help the country adopt advanced technologies and skills. When foreign companies set up operations in India, they bring with them expertise and innovations that can boost productivity.

Encouraging technological advancement is critical for escaping the middle-income trap. By becoming more integrated into global value chains, India can develop its own innovation clusters and research and development centres, driving further advancements in technology.

4. Investment in Infrastructure

Investment in infrastructure is essential for boosting productivity and economic growth. India must invest heavily in transportation networks, energy systems, and digital infrastructure to improve connectivity and reduce business costs. Better infrastructure will also help India integrate into global value chains, making it easier for industries to compete in international markets.

5. Promoting Inclusive Growth

Inclusive growth ensures that the benefits of economic growth are shared more equally across society. India must implement policies that address wage stagnation and income inequality, such as minimum wage reforms and social safety nets.

Human capital development through education and skill training is also crucial for building a workforce capable of filling high-productivity jobs. By investing in education, India can prepare its workforce for the demands of a modern economy, ensuring more people participate in and benefit from growth.

6. Economic Diversification

While India's service sector is strong, it alone may not be sufficient to lift the country to high-income status. India must diversify its economy by increasing the role of manufacturing. A more balanced economy that includes both manufacturing and services will be more resilient to global market changes, reducing the risk of falling into the middle-income trap.

Conclusion

India's journey to escape the middle-income trap is challenging, with obstacles like premature deindustrialisation, slow wage growth, and global economic difficulties. However, with the right strategies, India can overcome these challenges and achieve long-term prosperity. By investing in infrastructure, promoting innovation, and ensuring inclusive growth, India can build a stronger, more resilient economy that benefits all its citizens. With sustained efforts from both the public and private sectors, India can address the structural issues that hold its economy back and successfully transition to high-income status.

Beyond Institutions: A Comprehensive Approach to Understanding Economic Disparities Among Nations

The question of why some nations succeed economically while others remain trapped in poverty has fascinated scholars for centuries. Nobel laureates Daron Acemoglu, James A. Robinson, and Simon Johnson offer a compelling explanation based on the role of institutions in determining a country's economic fate. Their theories, especially outlined in the book *Why Nations Fail* (2012) and other works, argue that institutions—both political and economic—shape the long-term prosperity of nations. Inclusive institutions, which encourage broad participation and fairness, lead to sustainable economic growth, while extractive institutions, which concentrate power and wealth in the hands of a few, often result in stagnation and poverty. Although their thesis provides important insights, it has its limitations, particularly in its narrow focus on institutions and its failure to fully account for other factors, such as geography and culture. In this essay, we first explore the Nobel laureates' ideas, using examples from South Asia, before critically examining their limitations.

The Importance of Institutions in Economic Development

The primary argument put forth by Acemoglu, Robinson, and Johnson is that the success or failure of nations is fundamentally tied to the nature of their institutions. Inclusive institutions are those that provide security, promote democracy, and protect property rights. These systems encourage innovation, entrepreneurship, and broad-based participation in economic activities. In contrast, extractive institutions are designed to enrich a small elite while restricting opportunities for the majority of the population. They often undermine incentives for innovation and limit economic growth.

One example frequently cited by the laureates is the comparison between North and South Korea. Despite sharing the same cultural and geographic background, North Korea's extractive political regime has resulted in widespread poverty, while South Korea's inclusive institutions have driven rapid economic growth and technological

advancement. Similarly, the divergent paths of the United States and Mexico in the 19th century underscore how inclusive institutions can foster innovation and long-term prosperity.

The laureates' work builds on the foundation laid by earlier economists, such as Douglass North, who argued that institutions are the "rules of the game" that shape human behaviour. If individuals are assured that their property and rights are secure, they have more incentive to invest and work hard, leading to greater prosperity. However, if they fear expropriation by the state or other elites, their motivation to participate in economic activities diminishes.

Examples from South Asia: Inclusive vs. Extractive Institutions

The experiences of South Asia provide valuable examples of how institutions influence economic outcomes. After gaining independence in 1947, India established democratic institutions that promoted inclusive participation in political and economic life. Though economic growth was initially slow, the economic reforms of the 1990s, which included deregulation and privatisation, allowed for broader participation in the economy, resulting in rapid growth. This demonstrates the laureates' argument that inclusive institutions are crucial for sustained development.

In contrast, Pakistan's political instability and frequent periods of military rule have led to the establishment of extractive institutions. These systems have concentrated wealth and power in the hands of a small elite, stifling innovation and discouraging investment. As a result, Pakistan has struggled to achieve the same level of economic growth as India. Bangladesh, on the other hand, made significant strides in the 1990s by moving towards more inclusive institutions, particularly in the garment sector, leading to both economic growth and poverty reduction.

These examples from South Asia illustrate the Nobel laureates' thesis that inclusive institutions are key to long-term economic development, while extractive institutions hinder progress. However, these cases also demonstrate the importance of other factors, such as political stability and external economic pressures, in shaping a nation's success.

Criticism of the Institutional Thesis

Despite the laureates' compelling arguments, their institutional thesis has drawn criticism for being overly simplistic. One major critique is that their theory focuses too narrowly on institutions as the primary drivers of economic success, while downplaying other critical factors such as geography, culture, and historical circumstances.

Geography, for instance, has played a significant role in shaping economic outcomes. The colonial strategies of European powers were often influenced by the geographical characteristics of the regions they controlled. In areas with dense populations, such as Mexico, colonists established extractive institutions to exploit local labour. In less densely populated areas like North America, more inclusive institutions were set up, promoting long-term economic growth. This geographical influence on institutional development suggests that the relationship between institutions and economic outcomes is more complex than the laureates' theory acknowledges.

In addition, cultural factors have historically influenced the functioning of institutions. Social norms and historical legacies often shape how institutions operate and evolve over time. For example, deeply ingrained systems of hierarchy or patronage can persist even within formally inclusive institutions, limiting their effectiveness. Thus, a purely institutional analysis might overlook the important role that culture plays in shaping a nation's economic trajectory.

The Short-Term Success of Extractive Institutions

Another important critique of the laureates' thesis is its failure to account for the short-term economic successes that can occur under extractive regimes. While Acemoglu, Robinson, and Johnson emphasise the long-term inefficiencies of extractive institutions, historical evidence suggests that such systems can sometimes generate rapid economic growth, at least in the short run.

For instance, both Soviet Russia and Maoist China experienced periods of significant industrialisation and economic expansion under highly centralised, extractive regimes. However, these gains were not sustainable, and both countries eventually faced economic stagnation or collapse. This suggests that extractive institutions can, under certain conditions, foster rapid growth, even if such growth is not sustainable in the long term.

The Middle-Income Trap and Institutional Reform

A further limitation of the laureates' thesis is its applicability to countries caught in the so-called "middle-income trap." Many nations, such as Turkey and Chile, have achieved moderate economic success but struggle to transition to higher levels of prosperity. These countries often exhibit a mix of inclusive and extractive institutions, which allow for some growth but prevent the economy from reaching its full potential .

Acemoglu and his colleagues argue that deep institutional reform is necessary to escape the middle-income trap, but this is easier said than done. Elites who benefit from extractive institutions are often deeply entrenched and resistant to change. The global economic environment can also influence whether reforms succeed or fail,

making institutional change a more complex process than the laureates' theory suggests.

Conclusion

The Nobel laureates' explanation of why nations succeed or fail based on the nature of their institutions offers a valuable framework for understanding the long-term economic trajectories of countries. Their distinction between inclusive and extractive institutions provides important insights into how political and economic systems shape development. Historical examples from South Asia and other regions demonstrate the validity of their thesis, particularly the importance of inclusive institutions in fostering growth and prosperity. However, their focus on institutions as the primary determinant of economic success overlooks other important factors such as geography, culture, and global dynamics. Furthermore, their thesis fails to fully account for the short-term economic gains that can occur under extractive regimes or the complexities of institutional reform in countries caught in the middle-income trap. Ultimately, while institutions are undoubtedly a crucial element in determining a nation's economic trajectory, a more comprehensive theory of development would consider a broader range of factors. By integrating geography, culture, and global economic trends into the analysis, we can gain a fuller understanding of why some nations succeed while others fail.

Successes and Challenges of Ethanol in India's Energy Sector

Introduction

Ethanol, a renewable biofuel, has become a key component of India's energy strategy, helping the country reduce its dependence on fossil fuels while supporting agricultural producers. The Ethanol Blending Programme (EBP), first introduced to address the surplus sugarcane production in Northern India, has evolved into a broader initiative aimed at reducing carbon emissions and enhancing energy security. By blending ethanol with petrol, India has achieved substantial milestones, but challenges related to feedstock availability and environmental impact persist. This essay provides an analysis of India's use of ethanol, including its successes and the obstacles it faces. We will explore how ethanol blending benefits India's economy, energy security, and agriculture, while also examining concerns about food security, sustainability, and climate resilience.

Energy Security and Economic Benefits of Ethanol

The primary objective of India's Ethanol Blending Programme is to reduce its reliance on imported crude oil. By replacing a portion of petrol with domestically produced ethanol, India has saved over ₹1 trillion in fuel imports since 2014. Additionally, as of 2023, India has achieved a 15% ethanol blending rate, with a goal of reaching 20%

(E20) by 2025. This achievement has provided energy security by substituting 18 million tonnes of crude oil with ethanol.

Ethanol's economic impact extends beyond fuel imports. The programme has stabilised the agricultural market by providing a valuable outlet for surplus sugarcane and maize. For sugarcane farmers, whose crops often exceed demand, the ethanol industry offers a new source of income that has helped stabilise prices and reduce the need for government bailouts. Maize farmers, too, have benefited from ethanol demand, often receiving prices higher than the government-set minimum support price.

Ethanol production also supports India's commitment to reducing carbon emissions. The use of ethanol in fuel blending has prevented the release of 54 million tonnes of carbon dioxide into the atmosphere. This aligns with India's pledge to achieve net-zero carbon emissions by 2070, positioning the country as a leader in sustainable fuel practices.

Agricultural Impact and Feedstock Challenges

India's ethanol programme has diversified the country's agricultural output, with both sugarcane and maize playing central roles in ethanol production. While sugarcane was the initial focus, maize has increasingly been used due to its availability and economic viability. The push for ethanol production has encouraged farmers to grow these crops, contributing to agricultural income.

However, this success is not without its challenges. The heavy reliance on food crops such as maize and rice for ethanol production has sparked concerns about food security, particularly during periods of poor harvests or high food inflation. The diversion of maize to ethanol distilleries has contributed to a surge in maize prices, impacting industries that rely on maize, such as poultry feed. As a result, the poultry industry has called for duty-free maize imports to meet its feed demands, highlighting the delicate balance between ethanol production and food supply.

Furthermore, the availability of feedstocks like rice has proven unpredictable. In recent years, erratic rains and government restrictions on rice diversion have affected ethanol production. As climate change intensifies, the volatility of agricultural yields could disrupt the consistent supply of ethanol feedstocks, posing risks to the programme's long-term sustainability.

Environmental Concerns and the Food vs. Fuel Debate

While ethanol is promoted as a cleaner alternative to fossil fuels, its production process has raised environmental concerns. The water-intensive nature of crops like sugarcane and maize poses a significant challenge, especially in regions already suffering from water scarcity. In Maharashtra, for example, sugarcane cultivation has strained water resources, with some areas requiring water deliveries by tanker during droughts. This raises questions about the sustainability of expanding sugarcane production for ethanol, particularly in water-stressed areas.

Another issue lies in the energy required to produce ethanol. The process of growing, harvesting, and converting crops into ethanol requires large amounts of energy, often sourced from non-renewable resources. The use of diesel-powered pumps for irrigation and fertilizers further adds to the carbon footprint of ethanol production. While ethanol reduces emissions from vehicles, the overall lifecycle emissions of ethanol production may diminish some of its environmental benefits.

Moreover, the diversion of food crops for fuel production has reignited the "food vs. fuel" debate. As more maize and rice are directed toward ethanol production, less of these staple foods are available for consumption, potentially leading to food shortages and higher prices during times of poor harvest. In a country like India, where food security remains a critical issue, policymakers must carefully weigh the benefits of ethanol against the risks it poses to the nation's food supply.

Long-Term Sustainability and Solutions

To address the challenges posed by ethanol production, India must explore more sustainable alternatives. One promising solution is the development of second-generation (2G) ethanol, which is produced from non-food sources such as agricultural waste, including paddy stubble and sugarcane bagasse. By using waste materials, 2G ethanol reduces the pressure on food crops and minimises environmental impacts, particularly water and energy use. In addition, the use of agricultural waste for ethanol production could help address the issue of crop residue burning, a major source of air pollution in northern India.

The Indian government has already made efforts to promote 2G ethanol production, with plans to scale up this technology in the coming years. However, technological and financial barriers remain. The process of converting agricultural waste into ethanol is more complex and costly than first-generation methods, requiring significant investment in infrastructure and research. Nevertheless, with the right policies and incentives, 2G ethanol could become a viable solution to the challenges facing India's ethanol sector.

Conclusion

India's Ethanol Blending Programme has achieved remarkable progress in reducing fuel imports, supporting agriculture, and cutting carbon emissions. However, as the country strives to reach its E20 blending target, challenges related to feedstock availability, food security, and environmental sustainability must be addressed. The reliance on food crops like sugarcane and maize raises concerns about the long-term feasibility of ethanol production, particularly in the face of climate change and rising food demands.

The future of ethanol in India will depend on the ability to diversify feedstocks and develop sustainable alternatives like second-generation ethanol. By investing in these technologies and carefully managing the balance between food and fuel, India can continue to harness the benefits of ethanol while minimising its risks. The transition

to a greener and more sustainable energy future is within reach, but it will require careful planning, innovation, and cooperation across sectors.

Partisanship and Pragmatism in India's Neighbourhood First Policy: Navigating Complex Regional Relationships

Introduction

India's Neighbourhood First policy, launched in 2014, is designed to prioritise strong relationships with neighbouring countries, ensuring peace, stability, and mutual development in South Asia. This policy aims to create a secure regional environment that promotes economic growth and cooperation. Traditionally, India's approach has been characterised by partisanship, favouring specific leaders and political parties that aligned with its interests. However, in recent years, India has shifted towards a more pragmatic strategy, recognising the complex geopolitical realities and the growing influence of external powers like China. This essay explores how India's Neighbourhood First policy navigates the tension between partisanship and pragmatism, focusing on how it engages with both friendly and less-friendly regimes to further its strategic goals.

Partisanship: The Traditional Pillar of India's Neighbourhood Policy

Historically, India's Neighbourhood First policy has been guided by a strong preference for working with leaders and political parties that it considers friendly and cooperative. This partisanship stems from India's desire to ensure that its neighbours align with its strategic interests, fostering an environment conducive to bilateral cooperation.

For instance, in Bangladesh, India has maintained close relations with Prime Minister Sheikh Hasina and her Awami League party, which have been supportive of Indian interests, particularly in areas such as counterterrorism and regional security. India's consistent support for pro-India political factions in Nepal, such as the Nepali Congress, is another example of its partisan approach. These relationships are built on shared cultural and historical ties, as well as security concerns, such as managing open borders and mitigating anti-India sentiment in the region.

This preference for working with friendly leaders has allowed India to maintain stability and foster strong diplomatic and economic relationships. However, it has also led to criticism that India is acting as a "big brother," interfering in the domestic affairs of its neighbours. India's decision to cancel a state visit to the Maldives in 2015 when former president Mohamed Nasheed was imprisoned highlighted its strong partisan

stance, as it sought to avoid legitimising the government of Nasheed's successor, whom India viewed as less aligned with its interests.

Pragmatism: A Necessary Shift in Policy

As regional dynamics have evolved, particularly with the rise of China's influence, India has realised the need to adopt a more pragmatic approach in its foreign policy. While partisanship remains a feature of India's engagement with its neighbours, there is a growing recognition that India cannot afford to exclusively rely on friendly governments. This shift has been driven by several key factors.

First, China's increasing presence in South Asia through its Belt and Road Initiative (BRI) has presented a significant challenge to India's traditional influence in the region. China's infrastructure investments in countries like Pakistan, Sri Lanka, and Nepal have prompted India to reconsider its rigid alignment with friendly governments. In response, India has begun engaging with regimes that may not be as supportive of its interests but are crucial for maintaining regional stability and economic partnerships.

Second, India has recognised that even friendly administrations may not always further its strategic goals. For example, while India enjoys a strong relationship with Bangladesh under Sheikh Hasina's government, it has had to engage cautiously with the opposition Bangladesh Nationalist Party (BNP). Despite their differences, India has opened channels of dialogue with the BNP to ensure that future transitions in power do not destabilise the bilateral relationship.

This pragmatic approach also reflects India's understanding that public criticism or harsh measures against non-friendly governments could push them further into China's sphere of influence. For example, India's willingness to engage with the Maldives, even during periods of strained relations under pro-China governments, demonstrates its desire to maintain open lines of communication rather than allow geopolitical tensions to escalate.

Economic Leverage and Connectivity as Tools for Building Long-Term Relationships

One of the key elements of India's evolving Neighbourhood First policy is its use of economic leverage and connectivity projects to maintain influence in the region. By investing in infrastructure and development across South Asia, India seeks to create long-term economic dependencies that transcend political changes and foster continued cooperation.

India has prioritised regional connectivity through projects like the Bangladesh-Bhutan-India-Nepal (BBIN) corridor, which enhances trade and transport links

between these countries. Similarly, India has been involved in building cross-border infrastructure, including roads, railways, and energy pipelines in Nepal, Sri Lanka, and Bangladesh. These projects are not only intended to facilitate trade and economic growth but also to strengthen regional ties and counterbalance China's BRI.

India has also extended lines of credit and development assistance to its neighbours, providing low-interest loans to support projects that align with both India's and its neighbours' interests. Between 2015 and 2023, India significantly increased its financial assistance to countries like Bangladesh, Nepal, and the Maldives, helping to fund a variety of infrastructure and development projects. This economic outreach strengthens India's position as a key partner, encouraging regional cooperation even when political relations are strained.

These efforts have proven particularly useful in countering China's influence in the region. While China has focused on large-scale investments that often lead to debt dependence, India's approach is built on sustainable and mutually beneficial partnerships. By investing in infrastructure and development, India ensures that its neighbors continue to see it as a reliable and trustworthy partner.

Challenges and Limitations of Pragmatic Engagement

Despite India's shift toward a more pragmatic Neighbourhood First policy, it continues to face significant challenges in the region. One of the key limitations of this approach is the difficulty of ensuring that non-friendly governments respect India's core interests. For example, governments that have strong ties to China may not always be willing to cooperate with India on security or economic issues, creating friction in bilateral relations.

Moreover, nationalist sentiments and domestic politics in neighbouring countries often complicate India's efforts to engage pragmatically. In Nepal, anti-India rhetoric is sometimes used by political leaders to rally domestic support, particularly in relation to ongoing border disputes. In Sri Lanka, similar nationalist sentiments have led to periodic tensions between the two countries, especially when Sri Lanka's government leans closer to China for economic and military support.

Moreover, partisanship remains a double-edged sword for India. While friendly governments offer stability, relying too heavily on specific leaders or parties can backfire when political power shifts. For instance, India's strong alignment with Sheikh Hasina in Bangladesh has been beneficial, but it leaves India vulnerable if the BNP were to come to power and adopt policies less favourable to India's interests.

Balancing Partisanship and Pragmatism

India can strike a balance between partisanship and pragmatism in its foreign policy by engaging with both friendly and less-friendly governments in the region. Traditionally, India has supported leaders and parties that align with its interests, but as political landscapes shift in neighboring countries, India must remain flexible. By engaging beyond long-time allies, India can ensure its regional influence is not dependent on specific governments. Building relationships based on shared interests—such as trade, security, and infrastructure—allows India to maintain ties with all countries, regardless of political affiliation. This approach ensures that India's influence remains steady even when political power changes hands.

Additionally, India should focus on promoting regional stability and development, which benefits all neighbouring countries, regardless of their internal politics. By investing in cross-border projects, providing disaster relief, and encouraging economic growth, India can foster goodwill across the region. Maintaining strategic independence and leveraging relationships with global powers like the U.S. and Russia will also help India avoid over-reliance on any one partner. These steps will allow India to maintain its influence while adapting to changing political dynamics, ensuring that its foreign policy remains both pragmatic and effective.Top of FormBottom of Form

Conclusion

India's Neighbourhood First policy reflects its ongoing efforts to secure peace, stability, and prosperity in South Asia. While partisanship has traditionally played a significant role in shaping India's relationships with its neighbours, the country has increasingly adopted a more pragmatic approach in response to the complex political landscape of the region. By balancing its engagement with friendly governments and less-friendly regimes, and by leveraging economic ties and connectivity projects, India seeks to maintain its influence and protect its strategic interests. As the geopolitical dynamics of South Asia continue to evolve, India's ability to navigate the delicate balance between partisanship and pragmatism will be critical to the success of its Neighbourhood First policy.

India's Strategic Role in a Changing World: Balancing Amidst U.S.-China Rivalry and Global Challenges

Introduction

The world is experiencing significant changes as China rises to challenge the long-standing dominance of the United States. This rivalry between the U.S. and China is shaping global politics, but unlike the Cold War, today's competition is driven by economic and military power rather than ideology. India, located in the crucial Indo-Pacific region, finds itself in the middle of this power struggle. With strong economic

ties to both countries and a shared border with China, India must navigate these challenges carefully. This essay examines how India carefully manages its relationships with both the United States and China, recognising the need to maintain strong ties with each. However, it also highlights that today's world is more multipolar, with other influential nations like Japan, Russia, and the European Union, alongside global challenges, further complicating international dynamics.

Evolving U.S.-China Rivalry

The competition between the United States and China is different from the Cold War rivalry between the U.S. and the Soviet Union. During the Cold War, the U.S. and the U.S.S.R. were largely separated by an iron curtain and had minimal economic ties. Today, however, the U.S. and China are economically connected in many ways. The U.S. is one of China's largest investors, and China holds significant U.S. debt. Besides, both nations benefit from extensive trade, and millions of Chinese students study in the U.S. This economic interdependence makes their rivalry unique because cutting ties would be harmful to both sides.

China's rise as a global power has been remarkable. It has become the world's top manufacturer and has surpassed the U.S. in areas such as 5G technology and shipbuilding. Additionally, China's military, especially its navy, is expanding rapidly, posing a direct challenge to the U.S. presence in the Indo-Pacific. However, China still lags behind the U.S. in military strength, with experts predicting that it will take until at least 2027 for China to close this gap. Unlike the Cold War, this rivalry is not about spreading ideologies but about gaining influence and control over global affairs.

Indo-Pacific: A Key Region for Rivalry

The Indo-Pacific region has become a central battleground in the U.S.-China rivalry. China is working to develop a blue water navy, which would allow it to project power globally. In response, the U.S. has strengthened its alliances in the region, most notably through the Quad, which includes India, Japan, and Australia. The aim of these alliances is to ensure a free and open Indo-Pacific, preventing China from dominating the region.

India's role in the Indo-Pacific is crucial. Its geographic location and growing economy make it an important counterbalance to China's influence. However, India faces unique challenges that other Quad members do not. India shares a long, contested border with China, which has led to several tensions, including the deadly clash in the Galwan Valley in 2020. These border issues complicate India's position, as it must manage its security concerns while maintaining economic ties with China.

India's Policy of Strategic Autonomy

India has traditionally followed a policy of strategic autonomy, meaning it makes decisions based on its national interests without aligning too closely with any one major power. This policy is especially important in today's complex world. On one hand, China is one of India's largest trading partners, making economic ties between the two nations significant. On the other hand, India has been strengthening its defence and strategic partnerships with the U.S., particularly through the Quad alliance.

Balancing these relationships is not easy. India needs to enhance its military capabilities, especially along its border with China, to protect its security. At the same time, it cannot afford to cut economic ties with China completely because of their deep trade connections. India's ability to maintain this balance—continuing economic engagement with China while improving its military preparedness—is essential for preserving its independence. This balancing act allows India to manage the U.S.-China rivalry without becoming too involved in their conflicts.

India's Opportunities in a Changing World

Despite the challenges, India has many opportunities in this changing global environment. As the U.S. seeks partners to help counter China's growing influence, it has increasingly turned to India. This has led to deeper defence cooperation, such as joint military exercises and the sharing of advanced technologies. India's role in the Quad and other regional partnerships also positions it as a leader in the Indo-Pacific, giving it a chance to shape regional security policies.

India's growing economy further strengthens its position in global trade. As many countries seek to diversify their supply chains and reduce their reliance on China, India is emerging as a key alternative hub for manufacturing and investment. This shift offers India new opportunities to expand its economic influence, attract investment, and develop its industries. By capitalising on these opportunities, India can enhance its role in the global economy.

India's efforts to promote stability and peace in the Indo-Pacific also boost its global standing. As a stabilising force in the region, India can position itself as a responsible global leader that balances competing interests while protecting its own sovereignty. This gives India a significant role in regional diplomacy and makes it an important player on the world stage.

Challenges to India's Strategy

Despite these opportunities, India faces several significant challenges. The most immediate concern is its security along its border with China. Ongoing territorial disputes, combined with China's growing military power, mean that India must continue to invest heavily in its defence. This includes developing new military

technologies, expanding its armed forces, and ensuring that its borders are well-protected.

Another challenge is managing its economic relationship with China while addressing the security risks posed by their border disputes. India cannot afford to completely cut ties with China because of the deep economic links between the two countries. However, it must be cautious in its dealings with China to avoid compromising its security. India will need to carefully balance these competing interests to maintain stability.

Finally, India must navigate its relationships with both the U.S. and China without getting caught in their rivalry. The U.S. sees India as a key partner in its efforts to counter China, but India must ensure that it remains independent in its foreign policy decisions. This requires a delicate balancing act, as India strengthens its ties with the U.S. while maintaining its strategic autonomy from both superpowers.

Is Bipolarity a Useful Concept Today?

Although the rivalry between the U.S. and China dominates global geopolitics, the world today is far more complex than a simple bipolar division. The concept of bipolarity, where two superpowers dominate global affairs, is an oversimplification of the current international system. In today's global order, other influential nations such as India, Japan, Russia, and the European Union play critical roles in shaping international relations. These countries are not passive bystanders in the U.S.-China rivalry; they have their own interests and exert influence on global outcomes. This suggests that today's world is more multipolar than strictly bipolar, with power distributed among multiple actors.

India's position in this multipolar landscape exemplifies the complexity of global power dynamics. Historically, India has maintained strong ties with Russia, particularly in defence technology and energy security. Even though Russia's influence has diminished since the collapse of the Soviet Union, it remains a key strategic partner for India. However, as Russia aligns more closely with China, especially in supporting actions like the invasion of Ukraine, India faces the challenge of balancing its relationships with both the West and Russia.

India's foreign policy demonstrates that the world is not neatly divided between two superpowers. India continues to maintain its strategic autonomy, refusing to align fully with any one global power bloc. This is evident in India's participation in alliances like the Quad (with Japan, Australia, and the U.S.) aimed at countering China's influence in the Indo-Pacific, while simultaneously keeping diplomatic relations with Russia intact. India's ability to manage both relationships reflects the fluidity of modern global politics and highlights the limitations of the bipolarity concept.

Moreover, global challenges such as climate change, cybersecurity, and pandemics transcend national borders and require multilateral cooperation. These issues complicate the notion of a purely bipolar world, as no two countries can dominate global affairs entirely without addressing these shared global challenges. Countries like India, Japan, and the European Union play crucial roles in addressing these issues and are active participants in global forums, further underscoring the multipolar nature of the modern world.

Furthermore, Russia's junior partnership with China and its reduced economic clout complicate the idea of a new U.S.-China-led bipolarity. Russia's economy is significantly smaller than those of other major powers like China or even smaller European countries. Yet, its nuclear arsenal and role in international diplomacy prevent it from being sidelined. This creates a "Two-and-a-Half Power World," where Russia still wields influence, particularly in defence and energy, even as its global power wanes. This complexity underscores that the current global order cannot be reduced to simple U.S.-China dominance, as other nations remain pivotal players.

Moreover, China's ambitions to dominate the Indo-Pacific region are met with resistance from multiple nations, not just the U.S. The Quad alliance, which includes India, plays a significant role in countering China's maritime ambitions. However, India is distinct among Quad members because it faces a direct land threat from China along its contested borders. This unique geopolitical reality complicates the notion of bipolarity, as India's security concerns differ significantly from those of its Quad partners. India's strategic autonomy and its need to engage with China economically, while bolstering military deterrence, demonstrate that its role in the U.S.-China rivalry is far more nuanced than simply choosing sides. India navigates its own path, maintaining relationships with multiple powers and addressing global issues on its terms, further challenging the idea that the world is reverting to a strict bipolar order.

Conclusion

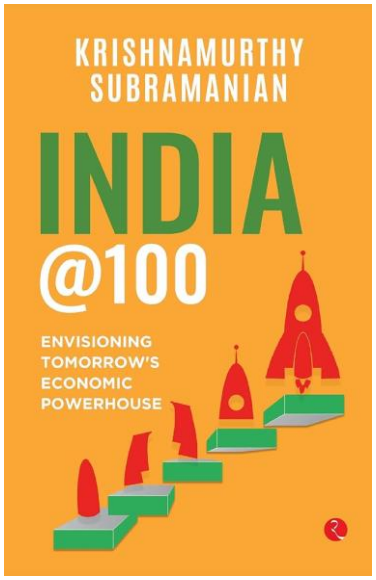
As global dynamics shift and grow more intricate, India must carefully steer through a rapidly changing international landscape. The competition between the U.S. and China offers both challenges and opportunities for India, but its future will depend on how well it can balance its economic and security interests while maintaining strategic autonomy. By playing a key role in the Indo-Pacific and resisting alignment with any one global power, India positions itself as an independent actor.

It is essential for India to avoid being reduced to a pawn in the broader rivalry between the U.S. and China. India's ability to assert its sovereignty, pursue its national interests, and engage with both powers on its own terms will be critical in shaping its future. The concept of a strictly bipolar world no longer fully applies to today's global order. Instead, India must manage its relationships with multiple influential nations, such as Russia, Japan, and the European Union, while addressing global challenges

like climate change and cybersecurity. In this multipolar system, India has the opportunity to shape its path without being drawn into the power struggles of superpowers. Its success will depend on maintaining this delicate balance, ensuring that it remains a significant, autonomous player in shaping the future of global politics .

Book Review:

India@100: Envisioning Tomorrow's Economic Powerhouse



India will complete its 100 years of independence in 2047. Since the call to be a **Viksit Bharat** has been given, it becomes necessary to make strides towards the same. For this, **former Chief Economic Advisor Krishnamurthy Subramanian** has come up with the book titled "***India@100: Envisioning Tomorrow's Economic Powerhouse***". The book sets the stage with four pillars of progress, including a macroeconomic focus on growth, inclusive growth, ethical wealth creation, and a virtuous cycle ignited by private investment.

In the initial section, the book sets the tone of what kind of economic policies have been adopted from time to time. This also includes the policies adopted by the governments of other countries, including the protectionist laws during the **Industrial Revolution**. Today, we know these countries as **advanced economies**. The author recommends that rather than simply copy-pasting such policies, the government should accordingly tailor them to the needs of Indian society.

The section moves further by discussing some of the core principles that display the lag between the investment and growth rate witnessed through such investment in due course of time. It also stresses the importance of capital expenditure ("***capex***"), which has 3-fold benefits. ***Firstly***, it increases demand and supply, unlike revenue expenditure ("***revex***") which merely enhances demand. ***Secondly***, capex allows "***crowding in***" of private investment, unlike revex, which leads to "***crowding out***" of private investment. ***Thirdly***, capex provides a farsighted policy.

Thus, regarding capex promotion in the country, the book addresses the issue of the **middle-income trap** by discussing its three major root causes (sectors that got groomed due to government subsidies, neck-around to continue such policies, neglecting knowledge and

innovation, and institutions not keeping pace with increasingly complex economies). Accordingly, the author recommends **greater integration with global value chains** (**GVCs**), **the promotion of higher education and research ecosystems**, and **faster transformation of industries**.

When it comes to macroeconomic focus on growth, the author provides a detailed distinction between poverty and inequality, thus setting up various metrics that display their impact on other socio-economic indicators. For this, the author also takes the aspect of debt and its sustainability. Here, in the book, the author showcases in terms of the Indian perspective that low growth can lead to high debt, which can create a vicious cycle of debt trap, but high debt cannot lead to low growth. This is because of the **interest rate growth rate differentials** (**IRGD**). In addition to this, the author also focuses towards judicial and civil services reforms that will ensure access to justice and reduce corruption in bureaucracy, two of the major hiccups that have led to inequality in society.

On the front of socio-economic inclusion, the author first considers the aspect of dwarfism in the economy, i.e., small firms that have not been able to grow despite being in the business for long periods. For this, the author displays the difference between dwarf firms in India and compares it with those in the **United States** and **Mexico**. The metrics that have been used are the growth in the **number of employees**, **productivity**, etc. Therefore, the author recommends that policymakers should restrain themselves from helping out such dwarf organisations by placing a sunset clause on size-based incentives. Additionally, the author again brings the focus towards exports-led growth, thus stressing the importance of **global value chains**.

Since such integration requires advanced technologies, striding efforts are needed to build a digital economy ecosystem in the country. India has already become a giant in terms of building **Digital Public Infrastructure** (**DPI**). The **JAM** (Jandhan, Aadhaar, Mobile) **trinity** has led to a reduction in subsidy payment and revenue expenditure by 1.14% of GDP, as per the reports of the **Prime Minister's Economic Advisory Council** (**PM-EAC**). To make it more inclusive, the digital economy needs to be penetrated more into sectors like **agriculture**, **healthcare**, and **education**. Thus, somewhere through data-driven governance, the author talks about the need for an **Agrarian Renaissance** in the country.

As the **former Vice President of India**, **Venkaiah Naidu**, stated, "***Sustainability is not just a buzzword but a need of the hour***". This statement gains even more significance given the evidence of climate injustice. The book has provided instances of climate-induced disasters that are coming heavily to **Asia** and **Africa**. The author discusses the economic cost of such disasters, especially that of floods (**around 49% of all-natural disasters in the country**), which have led to more than **60% of all economic losses**. The book then dives into the health impact of climate change, echoing some of the points raised by **Jeff Goodell**'s book "***The Heat Will Kill You First***".

Next, the necessity of **creating ethical wealth** comes into discussion, which is one of the crucial pillars and a cornerstone of India's economic future. The author argues that for

India to become a **$55 trillion economy** by **2047**, it must embrace wealth creation not merely as a means to an end but as a noble pursuit rooted in India's rich traditions, including insights from historical texts like **Kautilya**'s ***Arthashastra*** and **Thiruvalluvar**'s ***Thirukkural***. The book posits that ethical wealth creation is essential because it fosters **trust**, **stability**, and **long-term growth**, which are crucial for sustainable economic development. Subramanian contends that unethical practices can lead to societal discord and economic inefficiencies, undermining the very foundations of prosperity.

He further outlines several recommendations for creating ethical wealth, including **reducing information asymmetry**, **decentralising communication**, and **enhancing the quality of supervision**. However, he also takes the aspect of **minimising needless government intervention**. He stresses the importance of creating a virtuous cycle driven by private investment, where government policies facilitate rather than hinder entrepreneurial activities. This includes reducing unnecessary regulations and promoting infrastructure development to attract private capital. For this, the author cites the examples of **China** and **other East Asian economies** that have witnessed a surge in private investment. To promote it more effectively, the author recommends demographic-friendly policies, given that we need to reap the benefits of demographic dividend as the working-age population will be three-fifths of the population by **2041**. The author brings up the aspect of demographics because it is the working-age population that will provide the bigger chunk of the private investment, also cited by economists like **Bosworth** and **Chodorow-Reich**. Apart from this, banking and financial sectors will be other major domains that will nudge investment.

In a nutshell, the book clearly indicates that it is the continuation of the Economic Surveys of **2018-19**, **2019-20**, and **2020-21**. The language of the book at places can be complex but provides a comprehensive and nuanced view of India's economic landscape, offering a vision for transforming the country into a global economic powerhouse by 2047 in a better way .

William Dalrymple’s The Golden Road

William Dalrymple’s *The Golden Road: How Ancient India Transformed the World* (Bloomsbury, 2024) is a monumental exploration of India’s overlooked contributions to world history, particularly its intellectual, cultural, and economic influence that spanned centuries and continents. Known for his vivid narratives about India’s colonial past, Dalrymple here steps into the broader landscape of global history, examining how ancient India, through its ideas, philosophies, and trade, shaped civilisations across Asia, the Middle East, and Europe. This review explores the scope and key themes of the book, focusing particularly on its contributions to the valorisation of the Indian Knowledge System (IKS). It also unravels how *The Golden Road* reinforces contemporary efforts to reclaim India’s intellectual and scientific heritage and demonstrate how Dalrymple’s work aligns with these initiatives.

The Indosphere: India’s Cultural and Intellectual Highway

Dalrymple introduces the concept of the "Indosphere," a cultural, intellectual, and economic sphere that stretched across Central Asia, Southeast Asia, and even into Europe. This idea is central to *The Golden Road*, as it provides a framework for understanding how India's influence extended far beyond its borders. In contrast to the popular narrative of the Silk Road, which often centres China as the dominant force in ancient global trade, Dalrymple argues that it was the maritime routes—the "Golden Road"—that connected India to the rest of the world, facilitating the exchange of goods, ideas, and knowledge.

India's geographical location, with its long coastlines and the reliable patterns of the monsoon winds, made it a hub of commerce and cultural exchange. Dalrymple illustrates how Indian merchants, scholars, and religious figures travelled across the seas, spreading not only luxury goods like spices, textiles, and gems but also religious ideas, scientific knowledge, and philosophical concepts. The Indosphere is a powerful image of a network in which India played a central, formative role in the development of civilisations across Asia and beyond.

This concept strongly aligns with the recent emphasis on the Indian Knowledge System, which seeks to bring greater awareness to India's contributions to global intellectual traditions. India's influence was not merely confined to its borders; rather, it radiated outwards, shaping the cultures, religions, and economies of a vast region. Dalrymple's work provides a detailed and compelling narrative of how India's soft power—its ability to influence through ideas and knowledge—created lasting cultural and intellectual ties that still resonate today.

India's Intellectual Legacy: Pioneers of Mathematics and Astronomy

One of the most significant aspects of *The Golden Road* is its focus on India's intellectual contributions, particularly in the fields of mathematics and astronomy. Dalrymple meticulously traces the journey of Indian scientific knowledge as it travelled to the Islamic world, where it was translated into Arabic, and then on to Europe, where it played a pivotal role in the development of modern science.

Figures such as Aryabhata and Brahmagupta are central to this narrative. Aryabhata's pioneering work in mathematics and astronomy, including his contributions to the concept of zero and the calculation of pi, had far-reaching consequences for the development of these fields across the world. Similarly, Brahmagupta's astronomical texts, such as the *Sindhind*, were translated into Arabic and became foundational works for Islamic scholars. From there, this knowledge travelled to Europe, influencing scholars like Fibonacci and laying the groundwork for the development of algebra and calculus.

This intellectual journey mirrors the principles of IKS, which aims to restore India's rightful place as a leader in global scientific and mathematical innovation. Modern appreciation for these contributions often stops at superficial acknowledgments, such as India's association with yoga, while its more profound scientific and mathematical achievements are often overlooked. Dalrymple, through his comprehensive analysis,

addresses this imbalance, presenting India as an intellectual powerhouse whose contributions to global knowledge are undeniable and far-reaching.

Moreover, the book touches on the broader implications of these intellectual exchanges. By exploring the cultural and philosophical ideas that accompanied scientific knowledge, Dalrymple illustrates how India's intellectual legacy was not limited to technical fields but also shaped the philosophical and religious landscapes of the regions it influenced. This dual focus on both science and philosophy underscores the holistic nature of the Indian Knowledge System, where knowledge is viewed as an integrated whole, encompassing both the material and the metaphysical.

Cultural and Religious Exports: India's Influence Across Asia

Another major theme in *The Golden Road* is India's cultural and religious exports, particularly the spread of Buddhism, Hinduism, and Sanskrit literature across Asia. Dalrymple provides a vivid account of how these religious and cultural traditions were embraced by rulers in Southeast Asia, China, and Japan, transforming the intellectual and spiritual landscapes of these regions.

The spread of Buddhism, in particular, is a key focus of the book. Dalrymple highlights the role of Emperor Ashoka, who, after his conversion to Buddhism, sent emissaries to spread the teachings of the Buddha across the Indian subcontinent and beyond. From Sri Lanka to China, Buddhism became a dominant spiritual force, shaping the cultures of many Asian countries. Figures such as Xuanzang, the Chinese monk who travelled to India to study at Nalanda, are emblematic of the intellectual and spiritual exchanges that took place during this period.

The influence of Hinduism and Sanskrit literature is also explored in depth. Dalrymple details how the *Mahabharata* and *Ramayana* were adopted by Southeast Asian rulers, who saw in these texts a source of legitimacy and spiritual authority. The construction of magnificent Hindu and Buddhist temples, such as Borobodur in Java and Angkor Wat in Cambodia, serves as a testament to the enduring legacy of Indian culture in the region.

Dalrymple's exploration of these cultural exchanges highlights the profound impact of India's religious and philosophical traditions on the world. This emphasis on the spread of ideas through peaceful means aligns closely with the goals of the Indian Knowledge System, which seeks to promote India's role as a global cultural and intellectual leader. India's soft power was instrumental in shaping the spiritual and intellectual frameworks of many civilisations.

India as a Global Economic and Intellectual Powerhouse

The Golden Road highlights India's role as both an economic and intellectual giant in the ancient world, with particular focus on its global trade dominance and the transmission of knowledge. Dalrymple provides a detailed account of India's vibrant trade with the Roman Empire, showcasing how the subcontinent's luxury goods—spices, textiles, and gems—were highly sought after by Roman elites. Pliny the Elder's

complaint that India had become the "sink of the world's most precious metals" vividly illustrates the immense wealth that flowed into India due to this flourishing trade. Dalrymple emphasises that India's maritime trade, facilitated by the monsoon winds, was far more significant than the Silk Road in terms of both volume and value. The sea routes connected India with the Middle East, Africa, Southeast Asia, and Europe, enabling not only the exchange of goods but also of ideas and knowledge. This challenges traditional narratives that have often downplayed India's pivotal role in global commerce.

Dalrymple's portrayal of India's economic might complements the Indian Knowledge System (IKS) movement's focus on recognising India's contributions beyond the intellectual and spiritual realms. By highlighting India's prosperity and its ability to invest in cultural, scientific, and religious institutions, Dalrymple reinforces India's stature as a global leader in commerce and wealth creation. This economic success further solidified India's role as a centre of learning and innovation.

In addition to economic exchanges, *The Golden Road* delves into the transmission of Indian knowledge, particularly to the Islamic world through the Abbasid Caliphate's House of Wisdom in Baghdad. Indian mathematical and astronomical texts, translated into Arabic, became foundational works for Islamic scholars, who later transmitted this knowledge to Europe. The Barmakid family, originally from India, played a pivotal role in facilitating these translations, helping to integrate Indian scientific ideas into the Islamic intellectual tradition. This cross-cultural exchange underscores the interconnectedness of ancient civilizations and highlights India's crucial role in shaping global intellectual traditions.

Dalrymple's focus on the transmission of knowledge, particularly through the Islamic world, reinforces the global nature of India's contributions to science, mathematics, and philosophy. This aligns with the goals of the Indian Knowledge System, which seeks to promote a more holistic understanding of India's far-reaching influence on world history. Through both economic and intellectual exchanges, India emerged as a powerhouse whose legacy continues to resonate globally.

A Holistic View of India's Knowledge System

Perhaps one of the most significant contributions of *The Golden Road* to the discourse on the Indian Knowledge System is its holistic approach to India's intellectual and cultural legacy. Dalrymple does not confine his analysis to a single aspect of Indian civilisation; instead, he presents a comprehensive picture of how India's scientific, mathematical, philosophical, and religious ideas were all interconnected and mutually reinforcing.

This approach mirrors the principles of IKS, which views knowledge as an integrated whole, rather than as a series of isolated disciplines. Dalrymple's interdisciplinary approach—drawing on archaeology, epigraphy, literature, and oral traditions—reinforces this holistic view. By highlighting the ways in which India's intellectual and cultural traditions were transmitted across time and space, Dalrymple provides a nuanced and detailed account of India's role in shaping global history.

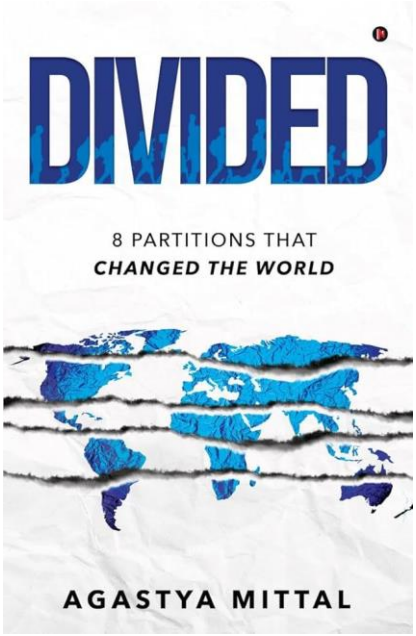
A Timely and Significant Contribution

In conclusion, *The Golden Road: How Ancient India Transformed the World* is a monumental work that makes a significant contribution to the valorisation of the Indian Knowledge System. By reclaiming India's intellectual, cultural, and economic heritage, Dalrymple's work challenges traditional Eurocentric and Sinocentric narratives and offers a more balanced view of India's place in world history.

The book's emphasis on India's soft power, intellectual achievements, and economic influence resonates with the goals of the IKS movement, which seeks to promote India's indigenous knowledge traditions. While there are areas where further depth could have been beneficial, particularly in exploring the complexities of cultural exchange and resistance, *The Golden Road* stands as a remarkable achievement that invites readers to reconsider India's central role in shaping global civilisation. Through its comprehensive and interdisciplinary approach, Dalrymple's work ensures that India's contributions to world history are finally given the recognition they deserve.

Divided: 8 Partitions That Changed the World

Agastya Mittal's book "***Divided: 8 Partitions That Changed the World***" offers a profound examination of eight significant partitions throughout history that have reshaped nations and cultures. This review will delve into the dimensions of each partition discussed in the book, exploring how they occurred and the underlying Western interests that often influenced these divisions.



Overview of the Book:

In "Divided", Mittal presents a detailed narrative of partitions that have not only altered geographical boundaries but also had lasting impacts on the social, political, and economic landscapes of the affected regions. The author meticulously outlines the historical contexts of these partitions, providing readers with a comprehensive understanding of the events leading to these divisions. The book is structured to highlight each partition individually, allowing for an in-depth exploration of their causes and consequences. For convenience, it is set in chronological order here.

What is Igbo Nationalism?

Igbo nationalism is an **ethnic nationalist ideology** among the Igbo people of southeastern Nigeria that encompasses preserving Igbo culture, developing Igboland, asserting Igbo political interests, and advocating for an independent Igbo state. It emerged during the colonial era as Igbo intellectuals and elites sought to achieve their interests within the struggle for **Nigerian independence**. After Nigeria's independence in 1960, Igbo nationalism intensified due to the perceived exclusion and marginalisation of Igbo politicians from high political offices.

The most significant manifestation of Igbo nationalism was the attempted secession of the eastern region to form the independent **Republic of Biafra** in 1967, leading to the **Nigerian Civil War** (**1967-1970**). The war highlighted challenges within **pan-Africanism** during the early stages of African independence from colonial rule, suggesting that the diverse nature of African peoples may present obstacles to achieving common unity. It also sheds light on initial shortcomings within the **Organisation of African Unity**.

The war resulted in the destruction of the eastern region, the death of millions of Biafrans, and the political marginalisation of the Igbo people, as Nigeria has not had another Igbo president since the end of the war. This has led some Igbo people to believe they are being ***unfairly punished for the war***.

The Partition of Africa (1884-1914):

The partition of Africa during the late **19th** and early **20th centuries**, often referred to as the "***Scramble for Africa***," involved European powers dividing the continent among themselves without regard for existing ethnic and cultural boundaries. To avoid clashes, the **Berlin Conference** was organised to curb the import of weapons onto African soil and keep the continent away from any kind of European conflict. This partitioning led to the establishment of **arbitrary borders** that have had lasting effects on African nations. For this, the author discusses **Igbo nationalism** and how it affected peace and stability in the entire continent.

Mittal explores how Western powers' interests in **resources** and **strategic territories** drove this partition, resulting in **colonial exploitation** and the **suppression of local cultures.** The author emphasises the long-term consequences of these divisions, including ongoing conflicts and struggles for identity in post-colonial Africa.

To read about the oppression of local culture in detail, you can refer to "***The Cobalt Red: How the Blood of the Congo Powers Our Lives***" by **Siddharth Kara**.

The Partition of Ireland (1921):

The partition of Ireland created two distinct entities: Northern Ireland, which remained part of the **United Kingdom**, and the **Irish Free** State. This division was rooted in historical grievances, religious differences, and national identity. The British government's policies and actions played a significant role in shaping the partition, as they sought to maintain control over the predominantly Protestant Northern Ireland while allowing the Catholic-majority south to gain independence.

Mittal explores the long-term effects of this partition, including sectarian violence and political strife, culminating in the **Troubles** of the late 20th century. The author highlights how Western interests in maintaining stability and control in the region influenced the partition process.

From the Irish Home Rule Movement to Destabilisation of the United Kingdom:

The partition of Ireland in 1921 was directly related to the **Irish Home Rule movement**, which had long campaigned for Ireland to have **self-government** while remaining part of the United Kingdom. However, Protestant unionists in **Ulster** opposed **Home Rule**, fearing religious persecution and economic decline under a **Catholic-dominated Irish government**. The partition was designed to create two separate Home Rule territories, with **Northern Ireland** remaining in the UK and the remaining twenty-six counties becoming the **Irish Free State**.

The partition exacerbated tensions between **Irish nationalists** and **unionists**, leading to the **Irish War of Independence** and the **Anglo-Irish Treaty** of **1921**. It also raised questions about the status of **Wales** and **Scotland** within the **UK**, as they, too, had **distinct national identities** and **aspirations**. In **Northern Ireland**, partition entrenched divisions between the Protestant Unionist majority and the Catholic nationalist minority, fueling resentment and leading to the outbreak of the Troubles in the late 1960s.

The legacy of partition continues to shape the political landscape of the United Kingdom. The **Good Friday Agreement** of 1998 sought to address the issues underlying the **Troubles**, but tensions between unionists and nationalists in Northern Ireland remain. The possibility of a united Ireland has been raised again in recent years, particularly in the context of Brexit and its impact on the Irish border.

The Partition of India (1947):

The partition of India was one of the most significant events in the 20th century, leading to the creation of two independent nations: India and Pakistan. This division was largely driven by religious differences, with Hindus and Muslims being the primary communities involved. The British colonial rule played a pivotal role in exacerbating these divisions, as they employed a strategy of "***divide and rule***" to maintain control over the subcontinent.

The aftermath of the partition was **catastrophic**, resulting in widespread violence, the displacement of millions, and a deep-rooted animosity between the two nations that persists to this day. The author emphasises that the partition was not merely a product of local tensions but was significantly influenced by Western powers, particularly Britain, which had vested interests in maintaining control over the region.

To read about the impact of partition in India in detail, you can refer to "***Freedom at Midnight***" by **Dominique Lapierre** and **Larry Collins**.

The Partition of Palestine (1948):

The establishment of Israel in 1948 marked another critical partition that has had enduring ramifications. The conflict arose from competing national aspirations between Jewish and Arab populations in the region. The Western powers, particularly the United States and Britain, played crucial roles in supporting the establishment of Israel, often sidelining the rights and claims of the Palestinian people.

This partition has led to **ongoing conflicts** and **humanitarian crises** to date (**Israel-Hamas War**), illustrating the complexities of national identity and territorial claims. The author argues that the Western powers' regional interests, including geopolitical strategy and resource access, significantly influenced the partition's outcome.

To read about the **Israel - Palestine conflict**, you can follow our **GS Manthan Session**. YouTube Link: GS Manthan | How GS Travelled This Week | 21st -26th April 2024 Edition (https://www.youtube.com/watch?v=oPLIjoX1Ta8&list=PL76WgKLBbpJQaYD7GfMEksqHshPZds55s&index=8)

How did the disintegration of Yugoslavia lead to the Bosnian Civil War and further demand for Kosovo?

The dissolution of **Yugoslavia** in the early 1990s, particularly the breakup of **Bosnia** and **Herzegovina**, was a major catalyst for the **Bosnian Civil War** and the subsequent demand for Kosovo's independence. As Yugoslavia disintegrated, nationalist sentiments among the various ethnic groups within Bosnia, including **Bosniaks**, **Croats**, and **Serbs**, intensified. These groups vied for control over territory and political power, leading to a brutal conflict that lasted from 1992 to 1995.

The **Bosnian Serb faction**, led by **Radovan Karadžić**, sought to link the disjointed parts of territories populated by Serbs and areas claimed by Serbs. To achieve this goal, they pursued an agenda of systematic ethnic cleansing, primarily against Bosniaks through massacre and forced removal of populations. The conflict was characterised by the years-long **Siege of Sarajevo** and the **Srebrenica genocide**, in which over 8,000 Bosniaks were killed by Serb forces in 1995. The Bosnian War resulted in the deaths of over 100,000 people and the displacement of millions, leaving a legacy of ethnic tensions and mistrust.

The aftermath of the Bosnian War set the stage for further demands for independence, particularly in Kosovo, where ethnic Albanians sought to break away from Serbian control. The lessons learned from the violent dissolution of Yugoslavia influenced the Kosovo Liberation Army's push for independence, culminating in the 1999 NATO intervention and Kosovo's eventual declaration of independence from **Serbia** in 2008.

The Partition of Yugoslavia (1990s):

The breakup of Yugoslavia in the 1990s resulted in a series of violent conflicts and the emergence of several independent nations. **Ethnic tensions**, fueled by **historical animosities** and nationalist sentiments, led to brutal wars and atrocities, particularly in **Bosnia** and **Kosovo**.

Mittal examines how the role of Western powers, including **NATO intervention**, shaped the outcomes of these conflicts. The author argues that the partition was not merely a local phenomenon but was significantly influenced by international politics and the interests of Western nations in the **Balkans**.

The Partition of Czechoslovakia (1993):

The peaceful split of Czechoslovakia into the **Czech Republic** and **Slovakia** is often called the "***Velvet Divorce***". This partition was largely driven by national identity and cultural differences between the Czech and Slovak populations. Unlike other partitions marked by violence, this division was negotiated and executed with relative calm.

Mittal discusses how the **dissolution** was influenced by broader **European dynamics** and the **fall of communism**, highlighting the role of Western ideas of **self-determination** and **nationalism**. The author notes that while the split was peaceful, it still reflects the complexities of national identity and the impact of historical grievances.

The Partition of Iraq (2003):

The **Baghdad Pact**, signed in **1955**, was a mutual security agreement among **Iraq**, **Turkey**, **Iran**, **Pakistan**, and **Great Britain**, aimed primarily at **countering Soviet influence** in the Middle East. However, this pact sowed the seeds for the eventual partition of Iraq and

contributed to regional instability. The pact was met with resistance from other Arab nations, which viewed it as a threat to Arab unity and a violation of the Arab League's principles. This division created a rift within the region, undermining cooperation among Arab states and fostering an environment of distrust.

Iraq's 1959 withdrawal from the **Baghdad Pact** led the **Baath Party** to establish a dictatorship in Iraq by removing **King Faisal II** in 1958, which marked a significant shift in the country's political landscape. The coup d'état, led by military officers who were members of the Baath Party, was motivated by a desire to **eliminate the monarchy** and introduce a republican regime based on **Arab nationalism** and **socialism**. Following the coup, the Baathists consolidated power by systematically eliminating **political rivals** and **dissenters**, which laid the groundwork for a **totalitarian state under Saddam Hussein**. The party's ideology emphasised Arab unity and anti-imperialism, but in practice, it resulted in a regime characterised by repression, extrajudicial killings, and widespread human rights abuses.

The new Republican regime rejected the pact, leading to a shift in alliances and further destabilising the region. The fallout from the Baghdad Pact and Iraq's subsequent withdrawal contributed to a series of conflicts and power struggles in the Middle East, which had lasting effects on the entire region.

Mittal discusses how Western interests in **controlling oil resources** and establishing a **foothold** in the **Middle East** influenced the partitioning of Iraq. The author highlights the chaos that ensued post-invasion, leading to the rise of extremist groups and ongoing conflict.

The Partition of Sudan (2011):

Sudan's partition into two independent states, Sudan and South Sudan, was the result of decades of civil war and conflict driven by ethnic, religious, and economic disparities. The North, predominantly **Arab** and **Muslim**, and the South, primarily **African** and **Christian**, faced deep-rooted tensions exacerbated by historical injustices and exploitation. This division was further deepened by policies that favoured the North in terms of development and governance, leading to significant disparities in resources and political power.

Self-Interest Governance and Oil is the Product of Partition:

In her analysis of Sudan's partition, **Iris Seri-Hersch** argues that the British approach to governance perpetuated divisions that would later fuel conflict between the two regions.

The subsequent independence of Sudan in 1956 failed to address these underlying tensions. The central government, dominated by northern elites, marginalised the southern population, leading to the **First Sudanese Civil War** (**1955-1972**) and the **Second Sudanese Civil War** (**1983-2005**). These conflicts were characterised by violent repression of southern dissent and a struggle for autonomy, as highlighted by **Alex Cooke**, who notes that the southern Sudanese felt increasingly isolated and oppressed under northern rule. The discovery of oil in southern Sudan further exacerbated tensions as both regions vied for control over these valuable resources.

The author explains how Western powers' involvement, particularly in the context of **oil interests**, contributed to the **eventual partition**. The book details the struggles faced by South Sudan following its independence, including ongoing conflict and humanitarian crises, underscoring the complexities of partitioning based on ethnic and cultural lines.

Conclusion:

In "***Divided: 8 Partitions That Changed the World***", Agastya Mittal provides a compelling analysis of how partitions have shaped the modern world. Each partition discussed in the book reveals the complex interplay of local dynamics and Western interests, highlighting the often painful legacies of these divisions. Mittal's work serves as a reminder of the importance of understanding history to comprehend the present and future challenges nations worldwide face. Thus, it displays how the "***White Man's Burden***" converted into "***White Man is a Burden***" that affected almost every region globally. Through clear and engaging prose, the author invites readers to reflect on the consequences of these partitions, urging a deeper understanding of the forces that have shaped our world.