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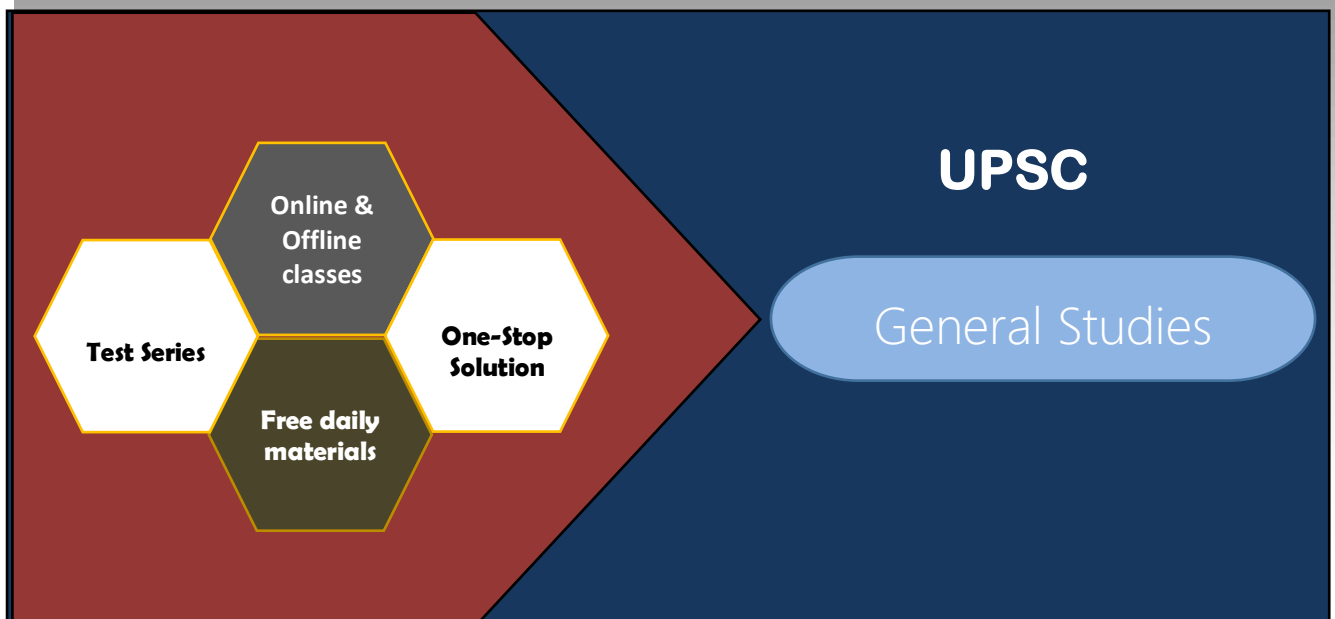
Monthly current affairs magazine

SHIKSHA

A MAGAZINE FOR CIVILSERVICES PREPARATION

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THE HINDU & INDIAN EXPRESS**



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GS 1 : Heritage, culture, Geography of the World and Society

1. Climate Change Threatens Lake Victoria Basin

The Lake Victoria Basin (LVB) in East Africa faces significant threats from heavy rains, wind storms, and floods, leading to adverse consequences for the region's communities and endemic biodiversity. A recent scientific report published in the journal Nature has shed light on the precipitation changes occurring in the LVB and the projected impacts of climate change on this sensitive area.

Threats to the Lake Victoria Basin

The LVB, encompassing East Africa, is particularly vulnerable to heavy rains, wind storms, and floods, posing risks to the survival and water access of the communities residing in the region. These extreme climate events have significant consequences for both the large human populations and the unique biodiversity of the area.

Scientific Report and Precipitation Changes

The scientific report, published in the journal Nature, delves into the precipitation changes in the LVB. It highlights the presence of significant alterations in precipitation patterns and an increasing frequency of extreme climate events in the near future, further exacerbating the challenges faced by the region.

Extent of the Lake Victoria Basin

The LVB covers five countries: Kenya, Uganda, Tanzania, Burundi, and Rwanda. With a population of 40 million, the communities in these countries are heavily affected by extreme weather events, particularly recurring flooding that poses a severe threat to their livelihoods and well-being.

Seasonal Rainfall Patterns

The LVB experiences two main rainy seasons. March to May is the period when the extended rainy season takes place, whereas the shorter rainy season typically spans from October to December. These seasons play a crucial role in the hydrological cycle and water availability in the region.

Role of the Kagera River

The Kagera River, flowing through Rwanda and Burundi before emptying into Lake Victoria, serves as the largest contributor to the lake's water recharge. Regional rainfall, facilitated by the river, plays a vital role in regulating the water levels of Lake Victoria.

Future Precipitation Projections

The report suggests that future precipitation changes in the LVB will occur at the sub-seasonal scale rather than annually or seasonally. Mean daily precipitation intensity is projected to increase by 16 percent by the end of the century. Additionally, in the 2050s, precipitation is expected to increase by approximately five percent relative to the baseline period.

Impacts on Endemic Biodiversity

The LVB's rich biodiversity faces significant threats due to climate change. According to the International Union for Conservation of Nature (IUCN), 76 percent of the lake's endemic biodiversity is at risk of extinction. The changing precipitation patterns and associated ecological disruptions further compound the challenges faced by this unique ecosystem.

2. Understanding Summer Solstice: Longest Day of the Year

- The summer solstice, also known as the longest day of the year, occurs on June 21st for those living north of the Equator.
- This article explores the significance of the summer solstice, the reasons behind its occurrence, and the effects it has on different parts of the world.

Summer Solstice

- The summer solstice is the moment when the Earth's axial tilt is most inclined towards the Sun.
- It occurs annually on or around June 21st in the Northern Hemisphere.
- During the summer solstice, the Sun follows its highest and longest path across the sky.
- This results in an extended duration of daylight hours, making it the longest day of the year.

Factors Influencing the Summer Solstice

- **Earth's Axial Tilt:** The Earth's axis is tilted relative to its orbit around the Sun, at an angle of approximately 23.5 degrees.
- **Tropic of Cancer:** The summer solstice takes place when the Sun is directly over the Tropic of Cancer, located at 23.5 degrees north latitude.
- **Seasonal Variations:** The tilt of the Earth's axis causes different latitudes to receive varying amounts of sunlight throughout the year.

Sunlight Distribution in the Hemispheres

- The Northern Hemisphere receives the maximum amount of sunlight during the summer solstice, typically on June 20, 21, or 22.
- In contrast, the Southern Hemisphere experiences its peak sunlight during the winter solstice, which occurs on December 21, 22, or 23.

Cultural Significance and Celebrations

- The summer solstice holds cultural and religious significance in various civilizations throughout history.
- Festivals and rituals often commemorate this astronomical event, symbolizing the triumph of light and fertility.
- People around the world celebrate the summer solstice through festivals, bonfires, music, dancing, and outdoor activities.
- Notable celebrations include the Summer Solstice Stonehenge Festival in England and the Midnight Sun Festival in Norway.

3. New Collective Quantified Goal (NCQG) in Climate Financing

- The New Collective Quantified Goal (NCQG) has emerged as a significant commitment in global climate financing at the recently-concluded Bonn climate conference in Germany.
- The conference, which sets the stage for the upcoming Conference of Parties-28 (COP28) in Dubai, has exposed significant gaps in funding for climate action.

New Collective Quantified Goal (NCQG)

- The commitment of \$100 billion per year till 2020 to developing nations by developed countries was set at the 2009 COP.
- The cost estimates for addressing climate change indicate that billions, and possibly trillions, of dollars are required.

- The 2015 Paris Climate Agreement emphasized the need for a NCQG for climate financing before 2025.
- The NCGQ aims to account for the needs and priorities of developing nations and has been termed the “most important climate goal.”
- It should reflect scientific evidence, respond to increased funding requirements for Loss and Damage, and involve developed countries increasing their commitments.

Need for NCQG

- Developed countries provided \$83.3 billion in 2020 out of the promised \$100 billion per year.
- However, an analysis by Oxfam suggests that these figures may be inflated by as much as 225% due to misleading and dishonest reporting.
- The \$100 billion target set in 2009 lacked clarity in terms of the definition and source of ‘climate finance.’

Challenges and Concerns

(A) Accessibility and Sustainability of Climate Finance

- While the funds for climate finance have increased, they remain largely inaccessible to developing countries.
- The majority of climate finance comes in the form of loans and equity, burdening developing nations with a debilitating debt crisis.
- Only around 5% of climate finance is provided as grants, which severely limits the capacity of countries in need.

(B) Developed Countries’ Perspective

- Developed countries argue that the NCQG should be seen as a collective goal for all countries.
- This perspective places the burden of mitigation, adaptation, and loss and damage on developing countries.
- Experts raise concerns that developing nations may struggle to bear the costs while also ensuring sustainable infrastructure development.
- Developed countries advocate for mobilizing private-sector investments and loans as a critical component of climate finance.

Future roadmap

- A deadline looms for countries to agree on the NCQG before 2024.
- While there is no official figure yet, estimates suggest that transitioning to a low-carbon economy requires annual investments of \$4 trillion to \$6 trillion.

- Some propose setting separate targets or sub-goals for focus areas like mitigation, adaptation, and loss and damage instead of a single aggregate figure.
- The focus should be on scaling up concessional financing, halting debt creation, and transforming the NCQG into an equitable and people-led transition process.

4. Hindu Kush Himalayas region

Recent reports from the International Centre for Integrated Mountain Development (ICIMOD) suggest that Climate change is severely affecting biodiversity in the **Hindu Kush Himalayas region**.

Hindu Kush Himalayas region:-

- Hindu Kush is a huge mountain system of **Central Asia**.
- It spans across **Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan**.
- It is **one of the great watersheds of Central Asia**.
- It forms a part of the **vast Alpine zone** that stretches across **Eurasia from east to west**.
- It **runs northeast to southwest** and **divides the valley of the Amu Darya** (the ancient Oxus River) to the north from the **Indus River valley to the south**.
- **To the east the Hindu Kush:** lies the **Pamir range** near the point where the borders of China, Pakistani-controlled Kashmir, and Afghanistan meet.
- **On the southwest:** it runs through **Pakistan and into Afghanistan**, finally merging into minor ranges in **western Afghanistan**.
- The **highest peak is Mount Tirich Mir**.
 - It rises near the Pakistan-Afghanistan border to 25,230 feet (7,690 meters).
- **The Third Pole:** the region is called 'The Third Pole' because it stores **more snow and ice than anywhere else in the world outside the polar regions**.
- It contains some of the **world's highest mountains**.
- It is the source of **10 major rivers and forms a formidable global ecological buffer**.
- The region contains 1,106 **Important Bird Areas (IBAs)**, covering about **11% of its total area**.
 - **IBA:** most important sites for the conservation of birds identified using standard scientific criteria.

Significance:-

- **Socioeconomic and cultural diversity:** it is home to many **different ethnic communities** speaking more than 600 languages and many more dialects.
- **Ecology:** It is endowed with **rich natural resources** and contains all or part of **four global biodiversity hotspots**.
 - These include **Himalaya Hotspot, Indo-Burma Hotspot, Mountains of Southwest China and Mountains of Central Asia.**
- **Local Economy:** The mountain resources provide a wide range of **ecosystem services** and the basis for the **livelihoods** of the people living in the region.
- **Originating Rivers:** Many people benefit from the **food and energy produced** in these river basins that have their origin in the mountains.

Impacts of climate change on Hindu Kush Himalayas region:

- **The timing of leaf-fall and fruiting has altered.**
 - This has led to a **decrease in the survival of plants and threatened the vulnerability of species.**
- **Advanced and delayed flowering of Himalayan rhododendron has been observed in Nepal and nearby HKH region.**
- **The change in snowfall patterns due to rise in temperatures has resulted in the shifting of the tree line as well.**
- **Many plant species have shifted upwards at the rate of 11 to 54 meters per decade in the western Himalayan regions of India.**
- **About 90 per cent of the endemic species in the Sikkim Himalayas have displaced at the rate of 27.53 to 22.04 meters per decade.**
- **Many species, found in the northwest Himalayas of eastern Ladakh, have moved upwards by about 150 meters above the plant distribution limit.**
- **5 per cent of 26 invasive plant species will expand while 25 per cent will contract, thereby threatening biodiversity and food security while causing heavy economic losses.**
 - **An invasive or alien species** is an introduced species to an environment that becomes overpopulated and harms its new environment.
- **Declining fauna is observed.**
- **Mammals, insects, microbes, birds, amphibians and fishes are becoming extinct or are experiencing genetic and behavioral changes.**
- **Himalayan musk deer, golden snub-nosed monkeys and Himalayan grey langurs have already experienced range shifts with declining populations.**
- **Monocled and king cobras in the Sikkim Himalayas have moved higher from 1,000 meters to 1,700 meters.**
- **In Pakistan, 14 species of butterflies known to dwell in the Murree hills and neighboring areas are reported to have disappeared.**

International Centre for Integrated Mountain Development (ICIMOD)

- ICIMOD is an **intergovernmental knowledge and learning center**.
- **Established: 1983.**
- **HQ: Lalitpur, Nepal.**
- **Objective:** it develops and **shares research, information, and innovations** to empower people in the eight regional member countries of the Hindu Kush-Himalayan region.
- **Members: Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.**

Functions of ICIMOD:-

- It serve the region through **information and knowledge generation**
- It is involved in sharing to find **innovative solutions to critical mountain problems.**
- It acts as a bridge between the **policies and on-the-ground practices.**
- It provides a **regional platform** where experts, planners, policymakers, and practitioners can **exchange ideas and perspectives** towards the **achievement of sustainable mountain development.**
- It **facilitates knowledge exchange across the region.**
- It helps **customize international knowledge** and tailor it to the region's needs.
- It helps to bring **regional issues to the global stage.**

5. Climate Change: Urgent Action Needed for a Sustainable Future

- The recent reports on the southwest monsoon in India have sparked concerns about the impact of climate change on weather patterns. The adverse consequences of extreme weather events, such as floods, droughts, and crop damage, highlight the urgent need to address the climate crisis. The World Meteorological Organisation's alarming report on global temperatures crossing the 1.5 degrees Celsius mark underscores the severity of the climate emergency.

How the Government Actions are Not Sufficient to Address the Climate Crisis?

- **Insufficient Emissions Reduction Targets:** Many governments have set emissions reduction targets that are insufficient to meet the goals outlined in international agreements such as the Paris Agreement. These targets often fall short of what is required to limit global warming to well below 2 degrees Celsius above pre-industrial levels.

- **Slow Implementation of Renewable Energy Policies:** Governments have been slow to implement and scale up policies and incentives to promote renewable energy sources. The transition to renewable energy is crucial for reducing greenhouse gas emissions, but many governments have not provided adequate support or created an enabling environment for renewable energy development.
- **Reliance on Fossil Fuels:** Governments continue to subsidize and support the fossil fuel industry, which contributes significantly to greenhouse gas emissions. These subsidies impede the transition to cleaner energy sources and perpetuate the use of fossil fuels, despite their detrimental environmental impact.
- **Inadequate Climate Finance:** The provision of climate finance, particularly from wealthier nations to developing countries, has fallen short of what is needed. The quantum of climate finance has not met the estimated requirements for adaptation and mitigation efforts outlined in international agreements like the Paris Agreement. This lack of financial support hinders developing countries' ability to effectively address climate change.
- **Limited Investment in Sustainable Infrastructure:** Governments have been slow to invest in sustainable infrastructure projects that promote low-carbon transportation, energy-efficient buildings, and resilient urban planning. Without substantial investment in sustainable infrastructure, the transition to a low-carbon economy becomes more challenging.
- **Weak Climate Policy Coordination:** There is often a lack of coordination and collaboration between different government departments and agencies responsible for climate policy. This can lead to fragmented approaches and hinder the implementation of effective climate strategies.
- **Insufficient Climate Education and Public Awareness:** Governments have not done enough to educate the public about the severity and urgency of the climate crisis. This lack of awareness can limit public support for climate action and impede the adoption of sustainable behaviours and practices.
- **Inadequate Preparedness for Climate Impacts:** Governments have been slow to invest in measures to adapt to the impacts of climate change, such as building resilient infrastructure, implementing early warning systems, and developing climate-resilient agriculture practices. This leaves communities vulnerable to the adverse effects of climate change.

The Adverse Consequences of Extreme Weather Events Exacerbated by Climate Change

- **Loss of Human Lives:** Extreme weather events, such as hurricanes, floods, heatwaves, and storms, can result in the loss of human lives. These events pose direct threats to individuals through injuries, drowning, and other hazards associated with severe weather conditions.

- **Physical Injuries and Health Impacts:** Extreme weather events often lead to physical injuries, including cuts, fractures, and trauma. Additionally, they can have significant health impacts, such as heat-related illnesses, respiratory problems from air pollution, and waterborne diseases in the aftermath of floods.
- **Displacement and Homelessness:** Severe weather events can displace large numbers of people from their homes. Flooding, hurricanes, and wildfires can destroy or severely damage houses, forcing individuals and communities to evacuate and seek temporary or long-term shelter.
- **Infrastructure Damage:** Extreme weather events can cause substantial damage to infrastructure, including roads, bridges, buildings, and power lines. This damage hampers transportation, communication, and access to essential services, disrupting daily life and impeding recovery efforts.
- **Agricultural and Livelihood Losses:** Droughts, floods, and storms can have devastating effects on agriculture and livelihoods. Crop failures, soil erosion, and livestock losses can result in food shortages, increased food prices, and economic instability for farmers and rural communities.
- **Economic Losses:** Extreme weather events impose significant economic burdens on affected regions. Costs associated with repairing infrastructure, rebuilding homes, and restoring businesses can be substantial. Moreover, disruptions to industries such as tourism, agriculture, and manufacturing can lead to job losses and economic downturns.
- **Ecological Impacts:** Extreme weather events can cause ecological disruptions and harm biodiversity. For example, wildfires destroy habitats, leading to the loss of plant and animal species. Flooding can contaminate water bodies and disrupt aquatic ecosystems.
- **Social and Psychological Impact:** The aftermath of extreme weather events can take a toll on individuals' mental and emotional well-being. Displacement, loss of homes, and the challenges of recovery can lead to stress, anxiety, and trauma, both in the short and long term.

Responsibility of Wealthier Nations in Addressing the Climate Crisis

- **Historical Emissions:** Wealthier nations, particularly industrialized countries, have historically been the largest contributors to global greenhouse gas emissions. Their extensive use of fossil fuels and industrial activities over the years has significantly contributed to the current climate crisis. As such, they bear a responsibility for their historical emissions and the consequent impacts on the climate.

Technological and Financial Capacity: Wealthier nations possess greater technological and financial resources to invest in clean energy technologies, adaptation measures, and climate mitigation strategies. Their capacity to support

research and development, innovation, and the deployment of sustainable technologies can play a crucial role in addressing the climate crisis

- **Climate Finance:** Wealthier nations have an obligation to provide financial support to developing countries that are more vulnerable to climate change impacts but have fewer resources to address them. This includes fulfilling commitments under the United Nations Framework Convention on Climate Change (UNFCCC) to provide climate finance for adaptation and mitigation efforts in developing nations.
- **Net Carbon Imports:** Wealthier nations often rely on imported goods and services produced in countries with lower labor and environmental standards. These nations have a responsibility to account for the carbon emissions associated with their consumption and work towards reducing the carbon footprint of their supply chains.
- **Technology Transfer and Capacity Building:** Wealthier nations can facilitate the transfer of clean and sustainable technologies to developing countries, assisting them in their climate mitigation and adaptation efforts. Capacity building initiatives can empower developing nations to implement effective climate solutions and build resilience.

Scalable Solutions and Renewable Energy for sustainable Future

- **Utility-Scale Solar Power:** Solar energy has become one of the most scalable and cost-effective sources of power. Large-scale solar installations, such as solar farms and solar parks, can generate significant amounts of electricity and contribute to reducing greenhouse gas emissions.
- **Wind Power:** Wind farms, consisting of multiple wind turbines, can generate substantial amounts of electricity, particularly in regions with consistent wind patterns. Advances in wind turbine technology, including larger and more efficient turbines, have increased the capacity and scalability of wind power.
- **Global Growth of Renewable Energy:** Renewable energy sources, including solar, wind, hydropower, and geothermal, have experienced significant global growth in recent years. In 2022, 90 percent of the world's power sector growth came from renewables.
- **Falling Costs of Renewable Energy:** The cost of renewable energy technologies, particularly solar and wind, has been steadily declining. This cost reduction has made renewable energy more economically attractive and scalable, even without subsidies. The decreasing costs of solar panels, wind turbines, and energy storage systems have contributed to the rapid growth of renewable energy installations worldwide.
- **Expansion of Renewable Energy Capacity:** Many countries have reported significant expansions of their renewable energy capacity. By increasing investments in renewable energy infrastructure, such as solar and wind power plants, countries have been able to scale up their clean energy generation and reduce dependence on fossil fuels

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- **Renewable Energy in Developing Countries:** Renewable energy is playing an increasingly important role in providing electricity access to developing countries. Off-grid solar power systems and mini-grids have allowed communities without access to centralized electricity grids to meet their energy needs sustainably. This decentralized approach to renewable energy deployment has facilitated scalability and expanded energy access.

Way Ahead: Opportunities for the Fossil Fuel Industry

- **Expertise in Energy Technology:** The fossil fuel industry possesses significant expertise in energy technology and infrastructure. This expertise can be leveraged to facilitate the development and deployment of renewable energy technologies. Fossil fuel companies can apply their engineering, project management, and operational skills to support the scaling up of renewable energy projects.

Investment in Renewable Energy: Fossil fuel companies have the financial resources to invest in renewable energy projects. By diversifying their portfolios and investing in renewable energy technologies, they can contribute to the growth and scalability of clean energy.○

- **Offshore Capabilities:** The offshore capabilities of the fossil fuel industry, particularly in areas such as offshore drilling and exploration, can be utilized in the development of offshore renewable energy sources. Offshore wind farms, for example, can benefit from the industry's experience in offshore operations and infrastructure, facilitating the growth of this sector.
- **Clean Energy Retail:** Fossil fuel companies can become providers of clean energy to support the growing demand for renewable energy. By incorporating renewable energy sources into their energy portfolios and retailing clean energy, they can play a significant role in accelerating the adoption of renewables and facilitating the energy transition.
- **Carbon Capture and Storage (CCS):** The fossil fuel industry can invest in and develop carbon capture and storage technologies. CCS technologies capture and store carbon dioxide emissions from fossil fuel power plants and industrial processes, reducing their environmental impact. By implementing CCS technologies, the industry can mitigate its carbon emissions while continuing to utilize fossil fuels during the transition period.
- **Hydrogen Production:** Fossil fuel companies can leverage their existing infrastructure and knowledge to participate in the production of clean hydrogen. Hydrogen produced through renewable energy sources, such as electrolysis, can be used as a low-carbon fuel or feedstock, providing an alternative to traditional fossil fuel-based processes.

□ **Energy Transition Workforce:** The fossil fuel industry can support the transition by retraining and transitioning its workforce to work in renewable energy sectors. This can help mitigate the potential negative impacts on jobs and livelihoods associated with the decline of the fossil fuel industry, ensuring a just transition for workers.

Conclusion

- Climate change poses a grave threat to our planet and demands immediate and determined action from governments, corporations, and individuals. The reports of subpar southwest monsoon rains in India serve as a reminder of the increasing variability caused by climate change. The time for transformative change is now, and by adopting a long-term commitment to reducing emissions and investing in sustainable technologies, we can pave the way to a better and more resilient future

6. Adolescent Girls' Nutrition

To unlock the full potential of India's future, we have to prioritise the health and nutrition of its adolescent girls.

Current status of adolescent girls' health in India

- **Data** - According to National Family Health Survey-5 (NFHS-5), 59.1% of adolescent girls are anaemic.
- According to National Family Health Survey-4, over 41.9% of school-going girls are underweight.
- **Ever-growing nutritional concern** - The numbers showcase a worrying trend of adolescent girls' health in India.
- A range of factors from environmental conditions to cultural norms makes adolescent girl nutrition complex.
- Lack of gender-neutral environment within a household affects the nutrition uptake in adolescent girls.
- Irrespective of several successful health initiatives, the current health interventions do not specifically focus on the nutritional statuses of adolescent girls.

Why adolescent girls' health is important?

- Tackling the complex issue of nutrition among adolescent girls is not just a health concern but also an investment in India's future.
- Adolescent girls are particularly vulnerable to undernutrition and anaemia due to the onset of menstruation.
- **Second window of opportunity of growth** - Adolescence is a pivotal period of cognitive development, thus improving access to nutrition.
- Adolescent nutrition compensates for any nutrient deficiencies acquired during early developmental stages in the girl child.
- **Female demographic dividend** - Adolescent health is a significant indicator of women's labour force participation in India in the long term.
- Better nutrition improves every young girl's prospect to participate in productive activities.
- Investing in nutrition interventions in adolescent girls has potential returns in the form of greater and more sustainable economic growth of the nation.

What are the consequences of lack of adolescent girl nutrition?

- Poorly balanced and insufficient diets can lead to cognitive impairments that affect one's academic performance.
- The lower educational attainment can limit opportunities for employment and economic self-sufficiency later in life.
- Undernourished adolescent girls are also at a higher risk of chronic diseases and pregnancy complications.
- A higher health-care burden on families and communities, potentially leads to financial instability and increased poverty.
- Complete female participation in work, politics, or community involvement is affected if girls' health and education is affected.

What could be the government's approach in this sense?

- Investing in girls' nutrition is state's moral as well as economic obligation.
- **Redefine** - Focus shift to redefine interventions in adopting a life-cycle approach leaving no girls behind.
- This approach can help break the intergenerational cycle of poverty.
- Well-nourished girls are more likely to have healthy babies and provide better care for their families.
- **Modify** - A few strategic modifications to existing interventions can significantly expand the scope of its outcomes.
- The convergence of various government initiatives such as the Scheme for Adolescent Girls (SAG) within the umbrella of the POSHAN 2.0 is a step in the right direction.

- However, it could achieve success only if it is implemented effectively.
- Stronger awareness and nutrition education programmes in targeted adolescent-oriented schemes could help beneficiary compliance.
- For Example: Rashtriya Kishor Swasthya Karyakram (RKSK)
- **Social Change** - Targeted and regionally contextualised Social and Behaviour Change Communication (SBCC) efforts around adolescent girls' nutrition.
- **Implementation changes** - Effective convergence and collaborations among all the relevant departments to foster a collective endeavour.
- Routine training of health workers for effective implementation.
- Monitoring of various schemes to adapt with an evolving landscape.
- **Holistic narrative** - Evidence/ data backed narrative effectively appeals to all, even to those outside the technical community.
- The nutrition of adolescent girls' and their mental and physical well-being, individual productivity and overall economic growth of the country should all be brought under one framework.

7. Forecasting cyclone in Arabian Sea

This article discusses the impact of ocean warming on cyclone forecasts.

- The Arabian Sea is experiencing increased heating due to global warming, leading to the formation of stronger cyclones like Biparjoy.
- The IMD forecast for Biparjoy initially indicated that it would not make landfall in Gujarat but later changed to predict its impact on India four days before it hit.
 - In contrast, the recent cyclone Mocha in the Bay of Bengal followed the trajectory predicted by the IMD several days in advance.
- The India Meteorological Department (IMD) has a higher accuracy in forecasting cyclones originating in the Bay of Bengal compared to those in the Arabian Sea.
 - Cyclones in the Bay of Bengal are better understood due to their higher frequency, while Arabian Sea cyclones have historically been fewer and less predictable.

Warming Oceans and Cyclone Formation:

- Accurate forecasting of cyclones is crucial for timely and effective disaster preparedness and response. However, the warming of the oceans, primarily driven by climate change, has presented new challenges in predicting cyclones in the Arabian Sea.
- The Arabian Sea's cyclones are largely influenced by the sea surface temperatures (SSTs) in the region. Warmer ocean temperatures provide the necessary fuel for cyclone formation and intensification.
- As the oceans warm due to climate change, the energy available for cyclone development increases, leading to more frequent and potentially stronger cyclones. This phenomenon has been observed in recent years, with a notable increase in cyclone activity in the Arabian Sea.
- Ocean temperatures play a crucial role in forecasting cyclones. Accurate measurements of SSTs allow meteorologists to identify favourable conditions for cyclone development and track their path.
 - However, as the oceans warm, the existing forecasting models may struggle to accurately capture the changing dynamics. Rising temperatures can lead to the formation of unexpected cyclones, alteration in their tracks, and changes in their intensity.

- While prediction models capture the heat within ocean layers, they often fail to fully capture the wind component, known as steering winds, which influences the direction and recurving of cyclones.
- The Arabian Sea has a unique characteristic with a deeper layer of warm water, up to 40 meters, compared to the Bay of Bengal. These subsurface values are often not accounted for in prediction models, leading to inaccurate forecasts of cyclone strength and speed in advance.

Increased Variability and Uncertainty:

- The warming oceans contribute to increased variability and uncertainty in cyclone forecasting.
- Higher SSTs create an environment with greater moisture availability, which can result in the rapid intensification of cyclones.
- This rapid intensification, combined with unpredictable atmospheric conditions, makes it challenging to anticipate cyclone behaviour accurately.
- Consequently, the forecasting window for predicting cyclone tracks and landfall becomes narrower, reducing the lead time for effective evacuation and disaster preparedness.

8. Prevention of Cruelty (Animal Birth Control) Rules, 2023

The growing population of street dogs has posed increasing challenges for municipalities and cities across the country.

Issue with stray dogs

- Dogs have a unique relationship with man but recently strays act as a public health concern.
- There has been many incidents of stray dogs attacking children as well as adults.
- **Reasons -**
 1. Uncontrolled population of stray dogs.
 2. Becoming aggressive when they perceive a threat.
 3. Neglect, abuse or forcibly relocation.
 4. Illness, hunger, protection of litters.
 5. Territorial behaviour of dogs living as a community.
 6. Irresponsible ownership.

According to 2019 livestock census, India has nearly 1.5 crore stray dog population.

What did the government do for human-dog conflict?

- The government wants to ensure safe society for everyone - humans and dogs alike.
- The Prevention of Cruelty (Animal Birth Control) Rules 2023 rules was notified by the central government to address these challenges.

- The 2023 rules is under Prevention of Cruelty to Animal Act, 1960 and supersedes the Animal Birth Control (Dog) Rules, 2001.
- The Rules gives a humane approach that balances out the welfare of dogs while taking into consideration the concerns of humans.

What does the new 2023 Prevention of Cruelty rules say?

- The 2023 rules attempt to resolve the shortcoming of Animal birth control (ABC) by standardising processes.
- The Rules also provides the guidelines how to deal with the human and stray dog conflicts without relocating the dogs in an area.
- **The onus** - The burden of ABC implementation will fall on the Animal Birth Control Monitoring Committees at the State, district and municipality levels.
- The Municipal Corporations need to implement the ABC and Anti Rabies Program jointly.
- The ABC Programme needs to be carried out by Animal Welfare Board of India (AWBI) recognized organization.
- These organisations should be specifically recognised for Animal Birth Control programme.
- **Maintenance of stray animals** - It is the duty of the local authorities to maintain and control the population of stray animals.
- They will be held responsible for any violation and animal-human conflicts.
- **Euthanasia** - The Rules also suggest euthanasia for 'incurably ill and mortally wounded dogs' as diagnosed and declared by the Local Animal Birth Control Monitoring Committee.
- It should be done in a humane manner by a qualified veterinarian.
- **Complaint Centre** - It also suggests establishment of an Animal Help Centre where complaints about dog or cat bites can be registered.
- **Feed Spots** - The Rules want the Resident Welfare Associations (RWAs) to designate feed spots for dogs which shall be least frequented by children and senior citizens.

Requirements for new ABC program rules

- The rules require the following things for its smooth process.
 1. Updated infrastructure investments for the capture, housing, surgery and release of dogs.
 2. Specific processes to be recorded such as keeping and reporting.
 3. The procedures for responding to conflict situations.
 4. Engagement of organisations to ensure that the standards of ABC are high.

5. Differentiation of street dogs from pet dogs to improve data collection and analysis.

What could be done further?

- Waste management, social marketing and human behaviour change.
- Responsible pet ownership and protection of activists.
- Funding research and create model programmes for dog bite mitigation.
- Improve ABC programme standards through training.
- Adoption of Indian dogs as opposed to feeding the commercial pet trade through animal purchases and it reduces stray dogs.

9. Dowry deaths

- Dowry refers to any kind of gift in the form of cash or goods including ornaments, which is given by the bride's family to the bridegroom's family.
- Dowry Prohibition Act of 1961 defines dowry is any kind of property or valuable security directly or indirectly agreed to be given by one party to another party to the marriage.

Reasons for dowry menace

- **Traditions** - The age old practice is perceived as a quintessential custom in marriage.
- **Matter of reputation** - People still believe that dowry giving or receiving gives a lot of merit in reputation within the society.
- **Illiteracy** - It is the penultimate factor behind the problem of dowry and the lack of understanding legal escapes.
- **Patriarchy** - The patriarchal structure of the society treats women as subordinate and men as superior and women are treated as objects.
- **Groom price** - The qualification of groom is seen as the benchmark of dowry prices.

What is dowry death?

- The section 304-B of Indian penal Code (IPC) defines dowry death and provides for its punishment.

- The death of woman is caused by any burns or bodily injury or occurs otherwise than under normal circumstances within seven years of her marriage in connection with any demand or cruelty or harassment for dowry is considered dowry death.

What are the legal provisions against dowry death?

- **Indian Penal Code, 1860** - Section 304B of the Indian Penal Code defines dowry death and provides for the stringent punishments for the offenders.
- Punishment for dowry death ranges from a minimum sentence of imprisonment for seven years and a maximum sentence extending to imprisonment for life.
- **Code of Criminal Procedure, 1973** - Under Section 41 of CrPC, dowry death is a non-bailable offence.
- The police have the authority to arrest any person without issuing of any warrant along with the authority to carry out the investigation with or without the permission of magistrate of a court.
- **The Dowry Prohibition Act, 1961** - The exclusive act to deal with the dowry system prevalent in India.
- The Act lays down a certain set of preventive and punitive measures.

What are the provisions of Dowry prohibition Act of 1961?

- The Act provides for the wider scope of the term 'dowry' and the scope of punishment.
- Any property or valuable security from one side to another either given or agreed to be given in future directly or indirectly in connection with marriage amounts to dowry.
- Giving or taking of dowry is punishable under this act with a minimum term of 5 years and a fine up to Rs 15,000 or to the extent of the value of dowry whichever is more.
- These offences come under the ambit of non-bailable and cognizable.

What should be done?

- **Society** - Societal change and widespread awareness.
- Keeping women on par with men and making them independent of men.
- **Literacy** - Educating and empowering women.
- Women reservation has to be taken as a source of women empowerment.
- **Fair usage** - Strict adherence to laws against dowry.
- **Avoiding escalation** - Early reporting of domestic violence related to dowry can reduce dowry deaths.

- **Discourage misuse** - The dowry laws should be used to curb the menace and not to be misused to defame or slander one's name.

10. Khap Panchayats

- The Khap leaders are calling for swift action and the arrest of a Minister, who is accused of sexual harassment of wrestlers in order to address the allegations effectively and ensure justice.
- In order to escalate their demands and seek support for their cause, the khap leaders have decided to organize a delegation to meet with President.

Understanding Khaps

- **Khaps are gotra-based and region-based social outfits:** Khaps are social organizations that are primarily based on the gotras (clans tracing paternal lineage) and regions.
- **How are they named?:** They derive their name either from the number of villages/clusters of villages they represent or the gotras they are associated with.

Types of Khaps

1. **Gotra-based Khaps:** They have jurisdiction in villages dominated by the respective gotras they represent.
2. **Region-based Khaps:** They have influence over a specific region comprising a few villages to several hundred villages.

Features of Khaps

- **Traditional dispute resolution:** Historically, khaps served multiple functions, including resolving disputes among families and villages, upholding religious customs, and safeguarding the region from external invasions.
- **Archaic decrees:** However, their role in protection from invasions has become largely irrelevant today, and they primarily focus on dispute resolution and ensuring adherence to social and religious customs.
- **Leadership and succession:** Khaps lack a formal organizational structure when it comes to leadership and succession. While the position of khap president or leader was traditionally hereditary, it is no longer a strict rule.

Functions of Khaps

- **Dispute Resolution:** Khaps have traditionally played a significant role in settling disputes, both within families and between villages. They act as mediators and strive to find resolutions that are acceptable to all parties involved.
- **Maintenance of Social and Religious Customs:** Khaps are responsible for upholding social and religious customs within their communities. They ensure that traditions, rituals, and cultural practices are followed and preserved.
- **Social Governance:** Khaps exercise a form of social governance in their respective areas of influence. They enforce societal norms and standards, promoting social cohesion and harmony within the community.
- **Community Welfare:** Khaps often engage in activities aimed at the welfare of the community. This may include organizing social and cultural events, providing support during crises, and facilitating community development initiatives.
- **Advice and Guidance:** Khaps serve as a source of advice and guidance for community members. Individuals can approach the khap leaders for counsel on various personal, social, or legal matters.
- **Representation and Advocacy:** Khaps act as representative bodies for their communities, advocating for their interests and concerns. They may engage with local authorities, government officials, and other stakeholders to address community-specific issues.
- **Preserving Lineage and Genealogy:** Khaps play a role in preserving the lineage and genealogy of families within their communities. They maintain records and knowledge of ancestral connections, which can be important for social and marital customs.
- **Protection of Community Interests:** Historically, khaps also had a role in protecting the community from external threats, such as invasions. While this function is largely irrelevant today, khaps may still come together to address issues that affect the collective interests of their communities.

Power and Political Influence of Khaps

- **Large associated population:** Khaps draw power from their association with a significant number of individuals who identify with specific gotras or reside within their jurisdiction.
- **Legitimacy through actions:** Khaps gain legitimacy by acting as pressure groups and mobilizing people for political issues. Their ability to rally their members and exert pressure on authorities makes them influential players in politics.
- **Active participation in protests:** Khaps actively participate in protests and movements, amplifying the voices of the aggrieved and adding weight to their demands.

- **Farmer agitation involvement:** Khaps played a significant role in the farmer agitation against contentious farm laws, contributing to the success of the movement.
- **Crucial players in politics:** Khaps have emerged as crucial players in north Indian politics, with political parties seeking their support due to their widespread influence and large support base.
- **Limited individual political success:** While khaps hold political influence collectively, individual khap leaders have varying success in their personal political careers.

Issues with Khaps

- **Regressive social customs:** Khaps impose restrictions on inter-caste and intra-gotra marriages, limiting personal freedom and perpetuating caste-based divisions.
- **Gender inequality:** Khaps often discriminate against women, enforcing patriarchal norms and restricting their rights and choices.
- **Involvements in honour killings:** Khaps have been associated with honor killings, where individuals are killed for marrying against family or community wishes.
- **Lack of legal authority:** Khaps lack legal authority but exert social pressure and impose penalties, violating individual rights.
- **Absence of democratic processes:** Khaps lack transparent leadership selection and decision-making processes, leading to disputes and favoritism.
- **Exclusion and discrimination:** Khaps promote exclusion and discrimination based on caste, gotra, or other social divisions.
- **Interference in legal matters:** Khaps interfere in legal proceedings, challenging the authority of the judicial system.

Relevance of Khap

- **Resolving local disputes:** Khaps are relevant in rural areas for resolving local social disputes and providing a mechanism for conflict resolution.
- **Upholding customs and traditions:** Khaps maintain the relevance of social and cultural customs, contributing to the preservation of cultural identity.
- **Community cohesion and solidarity:** Khaps foster community cohesion and provide a platform for collective action and addressing shared concerns.
- **Advisory and guidance role:** Khaps offer advice and guidance to community members on personal, social, or legal matters.
- **Advocacy for community interests:** Khaps advocate for the needs and aspirations of their communities, ensuring their voices are heard.
- **Sense of identity and belonging:** Khaps contribute to a sense of identity and belonging by connecting individuals to their ancestral lineage.

- **Social welfare and support:** Khaps engage in activities for social welfare and community development.
- **Political influence:** Khaps hold political influence, with parties seeking their support due to their large support base and mobilization capabilities.

Conclusion

- Overall, a nuanced approach is necessary to recognize and respect the positive aspects of Khaps while addressing their shortcomings and ensuring a more inclusive and equitable society.

11 . Groundwater Extraction Shifts Earth's Tilt Axis

- A recent study conducted by scientists at Seoul National University has revealed that the extraction of groundwater from the earth has caused a shift in the planet's axis, tilting it nearly 80 cm to the east.
- This phenomenon, along with the movement of water through melting ice caps and glaciers, has implications for both the earth's rotation, sea-level rise, and the distribution of water resources.

Earth's Axis and Rotation

- The Earth's axis and rotation play significant roles in shaping our planet's climate, seasons, and day-night cycles.
- Here are some key points about Earth's axis and rotation:
 1. **Axis:** The axis is an imaginary line that extends between the North Pole and the South Pole and is tilted at an angle of approximately 23.5 degrees relative to its orbital plane around the Sun. This tilt is responsible for Earth's seasons.
 2. **Rotation:** Earth rotates on its axis from west to east, completing one full rotation in approximately 24 hours. This rotation is what gives us the cycle of day and night. The side of the Earth facing the Sun experiences daylight, while the opposite side experiences darkness, resulting in day and night.
 3. **Polar Regions:** The axis of the Earth is inclined with respect to its orbital plane. This inclination causes the Polar Regions to experience variations in daylight throughout the year. During the summer solstice (around June 21), the North Pole is tilted towards the Sun, resulting in 24 hours of continuous daylight in the Arctic Circle and 24 hours of darkness in the Antarctic Circle. The opposite occurs during the winter solstice (around December 21).
 4. **Equator:** The equator is an imaginary line equidistant from the poles and divides the Earth into the Northern Hemisphere and the Southern Hemisphere. The equator experiences relatively consistent day and night lengths throughout the year, with two equinoxes occurring when the Sun is

directly above the equator. During the equinoxes (around March 21 and September 21), day and night are approximately equal in length worldwide.

5. **Precession (Cyclic Wobble):** In addition to its axial tilt, Earth experiences a slow, cyclic wobble called precession. This wobble causes the orientation of Earth's axis to change slightly over a period of approximately 26,000 years. Precession does not affect the tilt or the length of the seasons but does influence the positions of the celestial poles and the timing of Earth's closest approach to the Sun (perihelion) and farthest point (aphelion).
- Unlike a stable rotating globe, the earth's axis experiences a wobble due to various factors such as weather, seasonal changes, the molten core, and natural events like hurricanes.
 - Scientists track this motion relative to astronomical phenomena, but the role of water movement, including groundwater extraction, had not been fully considered until now.
 - The earth's axis wobbles in a circular pattern several meters wide every year.

Study Findings

- Researchers at Seoul National University built a climate model linking the earth's axis shift with water movement, including the melting of ice caps and glaciers.
- Initially, the model did not match the observed drift of the axis until groundwater extraction was added to the equation.
- Groundwater pumping accounted for the unexplained cause of the rotation pole drift.
- The shift in the earth's axis due to groundwater extraction was measured at nearly *80 cm tilt to the east*.

Implications for Sea-Level Rise

- The study revealed that approximately 2,150 billion tonnes of groundwater were pumped and drained into the oceans between 1993 and 2010, contributing to a sea-level rise of 6.24 mm.
- Groundwater depletion plays a significant role in the location and magnitude of the axis drift.
- Mid-latitude regions, particularly northwest India and western North America, showed the most significant groundwater redistribution effects.

Impact on Water Resources

- Groundwater extraction for human activities, including irrigation, is affecting the distribution and availability of water resources.

- Excessive groundwater pumping has led to a significant redistribution of water, altering the balance between surface water and groundwater reserves.

GS 2 : Polity, Governance, International Relations

1. Women in Judiciary

Ratio of women judges in Indian courts

- **Supreme Court** - The apex court currently has only 3 women judges: Justices B V Nagarathna, Hima Kohli and Bela M Trivedi
- The Supreme Court now has a working strength of 27 judges, against a sanctioned strength of 34 (including CJI) out of which only 3 are women.
- Out of a total of 37 women candidates recommended by the Supreme Court Collegium for appointment as high court judges, only 17 were appointed so far.
- **High Courts** - Out of 192 candidates recommended for the High Courts, only 37 were women.
- Women judges make up 9.5% of the total strength of high courts, according to Bar Council of India (BCI).
- Sikkim High Court, with a total strength of just three judges, has the highest national average at 33.3% of women judges.
- There is no woman chief justice at any high courts of the country.
- **District-level Courts** - There are more women judges at the district court level than at the High Court level.
- The India Justice Report (IJR) 2022 has revealed that the representation of women judges is steadily rising in subordinate courts, but in High Courts, the share of women judges remains low.
- Goa with 70%, has the highest percentage of women judges at subordinate courts, followed by Meghalaya and Nagaland at 63% each.

- **Advocates** - Supreme Court has till date, conferred the senior designation to over 488 advocates, and of which only 19 are women.

Issues for women in judiciary

- The legal profession still remains male dominated.
- Despite of acquiring sufficient skills and knowledge, women are severely under-represented in judiciary.
- There is no reservation of girls in legal education.
- The share of women judges remains uneven across States.
- Rajasthan and Uttar Pradesh have a very low proportion of women in legal aid.
- Caste-based reservations of judges at district-court level could not fully meet all its Scheduled Castes, Scheduled Tribes, and Other Backward Classes quotas.

What are the positive impacts of having women in judiciary?

- The presence of women as judges and lawyers, will substantially improve the justice delivery system.
- Women judges bring diverse perspectives, experiences, and skills to the bench.
- They have nuanced understanding of the differing impacts that certain laws may have on men and women.
- Women in judiciary enriches the judicial process and contributing to better decision-making.
- Women's leadership in justice can enhance public trust and confidence, and make the court environment accessible to the marginalized.

What needs to be done?

- To enrich the pool of talent among girls, the reservation of girls in legal education.
- Horizontal reservation of women in higher judiciary similar to the one in few subordinate courts.
- More transparency in collegium system in appointment of judges especially women judges.
- Create awareness and mobilise political will among women.
- Encourage women to take up legal profession.

2. Addressing Antimicrobial Resistance (AMR) in the Pandemic Treaty

- **Pandemic Treaty:** The latest version of the draft Pandemic Instrument, also known as the “pandemic treaty,” was shared with Member States at the World Health Assembly.
- **Removal of AMR Mentions:** It became apparent that all mentions of addressing antimicrobial resistance in the Pandemic Instrument were at risk of removal.

AMR

- Antimicrobial resistance (AMR) is the development of resistance in microorganisms to drugs that were once effective against them.
- Microorganisms, including bacteria, fungi, viruses, and parasites, can become “immune” to medications used to kill or control them.
- Misuse or overuse of antibiotics can contribute to the development of AMR.

Pandemic Treaty

- **Initiation of Work:** Work on the Pandemic Instrument began in December 2021.
- **Objective:** The instrument aims to protect nations and communities from future pandemic emergencies under the WHO’s Constitution.

Importance of Addressing Antimicrobial Resistance (AMR)

- **Calls for Inclusion:** Civil society and experts, including the Global Leaders Group on Antimicrobial Resistance, have emphasized the inclusion of AMR in the Pandemic Instrument.
- **Not Limited to Viruses:** Not all pandemics in the past or future are caused by viruses, with bacterial pandemics like plague and cholera being devastating examples.
- **Impact of Bacterial Infections:** Bacterial infections cause one in eight deaths globally and contribute to the rise of drug-resistant infections.

Need for Comprehensive Pandemic Preparedness

- **Wider Range of Threats:** Planning and developing effective tools to respond to a broader range of pandemic threats, beyond viruses, is crucial.
- **Secondary Bacterial Infections:** Even in viral pandemics like COVID-19, secondary bacterial infections become a serious issue, requiring effective antibiotics.

Concerns over Potential Removal of AMR Measures

- **Risk to Future Pandemics:** The removal of AMR measures from the Pandemic Instrument could hinder efforts to protect people from future pandemics.
- **At-Risk Measures:** Measures at risk of removal include better access to safe water, infection prevention and control, integrated surveillance, and antimicrobial stewardship.

Strengthening the Pandemic Instrument to Address AMR

- **Inclusion of AMR Measures:** Measures to address AMR can be easily incorporated into the Pandemic Instrument.
- **Recommendations for Inclusion:** Recommendations include addressing bacterial pathogens, tracking viral and bacterial threats, and harmonizing AMR stewardship rules.

Efforts to Highlight AMR in the Pandemic Instrument

- **Involvement of Specialized Organizations:** Civil society and research organizations participated in the WHO's Intergovernmental Negotiating Body, providing analysis on AMR in the draft.
- **Publication of Special Edition:** Leading academic researchers and experts published a special edition outlining the importance of addressing AMR in the Pandemic Instrument.

Current State and Next Steps

- **Concerns over Removal:** Insertions related to AMR are at risk of removal after closed-door negotiations by Member States.
- **Importance of the Pandemic Instrument:** The instrument is vital for mitigating AMR and safeguarding antimicrobials for treating secondary infections in pandemics.
- **Global Political Action:** Collaboration and collective efforts are needed to address AMR and support the conservation and equitable distribution of safe and effective antimicrobials.

Safeguarding Antimicrobials for Future Pandemic Response

- **Undermining Goals:** Missing the opportunity to address AMR in the Pandemic Instrument undermines its broader goals of protecting nations and communities.
- **Core Role of Antimicrobials:** Antimicrobials are essential resources for responding to pandemics and must be protected.

- **Call for Strengthened Measures:** Member States should strengthen measures to safeguard antimicrobials and support actions for conserving their effectiveness within the instrument.

3. Model Prisons Act 2023

The Ministry of Home Affairs (MHA) finalized the preparation of the Model Prisons Act, 2023 which aims to replace the colonial-era prison laws.

Model Prisons Act 2023

- Increasing spate of killings and gang violence within prisons.
- Existence of criminal nexus operating from inside prisons in Delhi, Punjab, Haryana, and Rajasthan.
- The law is too old and there is need for the changing times.
- India's incarceration system being prone to abuse since it was set up by the British to subjugate political prisoners.
- New perspectives evolving on prisons and prison inmates globally in the last few decades.
- In recent years prisons are not seen as places of retributive deterrence but instead as reformatory and correctional institutions.
- Existing Prisons Act 1894 has several lacunae.

Prisons Act 1894, focused on keeping criminals in custody and enforcing discipline and order in prisons, leaving no provision for reform and rehabilitation of prisoners.

Key features of Model Prisons Act 2023

- **Security assessment and segregation of prisoners** - Security assessment of all prisoners to determine their risk level.
- Prisoners who are considered to be a threat to themselves or others will be segregated from the general population.
- **Individual sentence plan** - Outlines their rehabilitation goals.
- The plan will be developed in consultation with the prisoner, their family, and the prison staff.
- **Grievance redressal mechanism** - For prisoners to file complaints about their treatment in prison.
- **Prison development board** - To oversee the implementation of the Act and to make recommendations for improvements to the prison system.

- **Separate accommodation** - For women prisoners and transgender and prisoners with disabilities.
- **Technology in prison administration** - The Act allows for the use of technology in prison administration such as video conferencing with courts and electronic monitoring of prisoners.
- **Different types of jails** - To establish and manage different types of jails, such as high security jails, open jails, and semi-open jails.
- **Legal aid** - To prisoners who cannot afford to hire a lawyer.
- **Awards inmates with good conduct** - Provides for parole, furlough, and premature release to prisoners who have demonstrated good conduct.
- **Reintegration into society** - The Act emphasizes the need for vocational training and skill development for prisoners to help them reintegrate into society after they are released from prison.
- **Humane environment** - Act will help to create a more humane and effective prison system that will help to reduce recidivism.
- **Guiding document** - Act may serve as a guiding document for the States so that they may benefit from its adoption in their jurisdictions.

The Model Prisons Act, 2023 is a comprehensive law that aims to reform the prison system in India.

The Act has been designed to address the shortcomings of the existing Prisons Act of 1894, which is over 130 years old.

What are the shortfalls of modern prison act 2023?

- The subject of prison falls on the state subject so the act is just a framework and non-binding on states.
- Does not address the issue of overcrowding in prisons.
- Does not address the issue of lack of resources in prisons and shortage of prison staffs.
- Does not address the issue of discrimination in prisons.

Despite these shortfalls, the Model Prisons Act, 2023 is a significant step forward in the reform of the Indian prison system.

It is hoped that the Act will be implemented effectively and will help to improve the lives of prisoners in India.

4. City Investments to Innovate, Integrate and Sustain (CITIIS) Project

- The Union government has approved the second phase of the City Investments to Innovate, Integrate, and Sustain (CITIIS) project.

CITIIS 2.0

- It is a part of the Smart Cities Mission and aims to promote integrated waste management and climate-oriented reform actions.
- The project will be implemented in 18 cities selected through a competition process.
- The project will span over a period of four years, from 2023 to 2027.

Objectives of the project

- CITIIS 2.0 supports competitively selected projects focusing on circular economy and integrated waste management at the city level.
- It also emphasizes climate-oriented reform actions at the State level and aims to strengthen institutions and disseminate knowledge at the national level.

Implementation Partners

- The project is implemented in partnership with the French Development Agency (AFD), Kreditanstalt für Wiederaufbau (KfW), the European Union (EU), and the National Institute of Urban Affairs (NIUA).

Components

The project consists of three major components:

1. Financial and technical support for developing climate-resilient projects in up to 18 smart cities.
2. Interventions at the center, state, and city levels to enhance climate governance.
3. Promotion of climate adaptation and mitigation measures.

5. The Next Pandemic

The WHO Director-general at the 76th world health assembly has cautioned against the threat of emerging pathogens.

Pandemic

- A pandemic is a disease outbreak that spreads across countries or continents.
- COVID-19 is one such pandemic in recent years, which led to waves of infections and deaths in all countries.
- The World Health Organisation (WHO) declared that COVID-19 was no longer a Public Health Emergency of International Concern.

- The virus continues to have reservoirs in animals, but the likelihood to turn into a pandemic or public health threat is small.

How do pandemics happen?

- **Air travel** - Ease of travel makes it likely for infections to spread to a large number of populations and countries.
- **Urbanisation** - Large number of people living in close proximity.
- Travel and density of population has played a role in previous pandemics as well.
- The Spanish Flu of 1918 happened towards the end of World War I and spread through congested and overcrowded camps.
- The deadliest pandemic Black Death is also thought to have come to Europe with rats that were aboard trading ships.

How has climate change impacted outbreaks and pandemics?

- Climate plays several roles in outbreaks and pandemics.
- Deforestation and encroachment of habitats of other animals has brought the humans and animals closer.
- This increased human-animal interactions has led to more zoonotic transfer of diseases.
- The climate itself may change the habitats of the disease-carrying vectors.
- For example: The geographical range of dengue in the country expanded to hilly and colder regions.
- Climate change also leads to extreme weather events that can displace people and force them to live in poor hygienic conditions.
- Climate change may increase the risk of 'viral spillover' in some regions that could cause new pandemics.

What are pandemic potential pathogens?

- **Pandemic potential pathogens** - The bacteria, viruses, or microorganisms that are highly transmissible capable of spreading unchecked amongst humans and highly virulent capable of causing severe disease and death.
- Coronaviruses are one such pathogens that has pandemic potential.
- **Priority List** - The WHO has a priority list of pathogens that are pandemic potential and don't have adequate drugs and vaccines against them.
- This list acts as the basis for prioritising research for developing diagnostics, drugs, and vaccines for these diseases.
- The list includes -

- The list also includes ‘Disease X’ which represents a serious international epidemic could be caused by a pathogen currently unknown to cause human disease.

What is the way forward?

- The countries and healthcare systems are required to prepare for such future pandemics.
- A one-health surveillance that can track outbreaks in both human and animal population.
- Recently, the WHO has launched the International Pathogen Surveillance Network (IPSN).
- Government should ensure sanitation and hygiene to reduce infection risks.
- There is a need to keep the health systems ready for a health emergency including systems to quickly come up with diagnostics, drugs, or vaccines.

6. Swachh Jal Se Suraksha Campaign Report

The Union Minister for Jal Shakti recently unveiled the report detailing the advancements made during the Jal Jeevan Mission: Swachh Jal se Suraksha (SJSS) Campaign. The campaign took place between 2nd October, 2022, and 31st March, 2023, with the primary objective of urging the States and Union Territories (UTs) to prioritize and actively engage in water quality monitoring and surveillance endeavors.

Key Considerations under JJM

The Jal Jeevan Mission (JJM) focused on the crucial aspect of providing a safe water supply. The key considerations under JJM revolved around the “Supply of Safe Water.” This underscored the importance of ensuring that every household receives water that is free from contamination and meets the prescribed quality standards.

Water Quality Testing in Villages

One of the significant achievements of the SJSS Campaign was the extensive water quality testing conducted in villages. A remarkable 5.39 lakh villages, accounting for 89.69% of the total, reported testing for chemical parameters, while 4.47 lakh villages (74.46%) underwent testing for bacteriological contamination, particularly post monsoon.

Drinking Water Samples Testing in Schools and Anganwadi Centres

In an effort to promote safe water consumption among children, the SJSS Campaign emphasized the testing of drinking water samples in schools and anganwadi centres. A total of 6.58 lakh schools (67.63%) and 7.16 lakh anganwadi centres (67.43%) had their water samples tested, ensuring the provision of safe drinking water to young learners.

Training of Women for Water Quality Testing

Empowering women as change agents, the campaign focused on training them for water quality testing. A staggering 21.80 lakh women were trained from 4.59 lakh villages (76.41%) to use Field Testing Kits (FTKs) effectively. This initiative aimed to enhance the participation of women in monitoring and ensuring the quality of water supply.

Remedial Action and Best Performing States

An impressive 90.34% of the contaminated samples reported during the campaign underwent remedial action, reflecting the commitment of stakeholders to address water quality issues promptly.

The performance of states and Union Territories (UTs) was also assessed during the campaign. Tamil Nadu, Andhra Pradesh, Karnataka, and Madhya Pradesh emerged as the best performing states, showcasing their dedication and effectiveness in implementing the SJSS Campaign.

7. How has Dhaka reacted to the U.S. threat on visas?

The Secretary of State of the U.S. notified a “new visa policy” on 24th of May 2023, which threatens to limit visas to Bangladeshis who undermine the democratic election process at home.

Details about the notification

- The new policy specifies that the restriction on visas would apply to existing as well as former officials from Bangladesh, members of pro-government and opposition political parties, members of law enforcement agencies, the judiciary and security services who have undermined the democratic election process in Bangladesh.
- According to the notification “actions that undermine the democratic election process” include actions such as rigging, the use of violence to prevent people

from exercising voting and their right to freedom of association and peaceful assembly, the use of force to restrict political parties, civil society, or the media from disseminating their views.

Response from Bangladesh

- Various reports have accused the government of Prime Minister Sheikh Hasina of rigging elections held in 2014 and 2018. However, the government has denied all such claims.
- The U.S. has been one of the largest foreign direct investors (FDI) in Bangladesh and the Bangladesh government has immediately responded to the new policy of the U.S. by saying that the country would take appropriate steps to prevent foreign interference in domestic elections.

About the trends in U.S. and Bangladesh bilateral ties

- The U.S. and Bangladesh have enjoyed a strong economic bond despite various tensions in their political relations due to legacy reasons.
- The U.S. is said to be the third largest trading partner of Bangladesh and is also the largest importer of the garments produced in Bangladesh.
- In recent times, the U.S. has acknowledged the fact that there is a need to strengthen bilateral ties beyond trade as China has shown keen interest in Bangladesh.
 - The importance of the Indo-Pacific strategy also makes Bangladesh politically significant for the U.S.

Key hurdles

- Washington under then President Nixon was not in favour of the liberation of Bangladesh (earlier known as East Pakistan) from Pakistan.
 - This has been one of the key hurdles for furthering the U.S.-Bangladesh ties as the current government in Bangladesh has modelled itself as the defender of the spirit of 1971 and treats those who opposed the creation of Bangladesh as opponents.
 - The current Bangladeshi government has thus maintained a distinction between economic and political relations between the two countries.
- Prime Minister Sheikh Hasina after being sworn into power in 2009 has followed a “zero tolerance” policy against terrorism and extremism.
 - The government under her leadership has undertaken some stringent actions against insurgents and radical groups.
 - However, such actions have attracted criticism from the U.S. and concerns have been raised about human rights violations.

- Furthermore, Bangladesh has maintained a neutral policy on the Russia-Ukraine war with Prime Minister Sheikh Hasina repeatedly raising concerns over the interference in the affairs of sovereign countries.
 - This stance of the Bangladeshi government has also acted as a key hurdle in dithering its relations with the U.S.

Path ahead

- Prime Minister Sheikh Hasina has now emerged as a key regional leader on account of her strong connection with India.
- Despite Bangladesh being the largest trade and security partner of India in South Asia, the Indian government has still not responded to the new policy of the U.S.
- In April 2023, Bangladesh had shown interest to soften its attitude to the U.S. through its declaration of the Indo-Pacific Outlook (IPO).
 - However, the latest move by the U.S. would mean that the Bangladesh government would not consider a stronger strategic alignment with the U.S.

8. U.S. - China Relations: Decoupling to De-Risking

The Trump-era focus of the U.S. to decouple from China is being phased out by a new concept called 'de-risking'.

- The Trump-era U.S. focused on decoupling from China.
- The U.S. is shifting its policy on China from decoupling to de-risking.
- The EU has declared that its approach to China will be based on de-risking, ensuring it through its Leader's Communique at G7 Summit.

Diplomatic ties between the U.S. and China so far

- The diplomatic ties between the U.S. and China establishment in 1979.
- Both the countries embarked on a path of increasing economic interdependence.
- China gained immensely from this relationship and its economic and military power grew, to challenge the primacy of the U.S.
- **Trump Era** - The Trump administration made it a point to attack the gargantuan bilateral trade imbalance in favour of China.
- The U.S.-China 'trade war' started and the US started following 'Decoupling' policy.
- **Biden Era** - Over time, the Biden administration added its own features into the China policy inherited from Trump changing it in to 'de-risking'.

Decoupling is a term used to refer to the unwinding of deep economic and commercial ties between two nations, whereas de-risking means removing or avoiding risks rather than managing it.

'De-risking'

- **De-risking** - It means having resilient, effective supply chains and ensuring the economy cannot be subjected to the coercion of any other country.
- De-risking aims to limit such an enmeshed effect only in areas where it challenges the U.S. national security and industrial competence.
- **The U.S.'s de-risking activities** - Recent legislations such as the Bipartisan Infrastructure Law, CHIPS and Science Act as well as the Inflation Reduction Act reflects this new approach.
- The U.S.'s geo-economic initiatives also reflects the spirit of de-risking such as,
 - Partnership for Global Infrastructure and Investment (PGII)
 - Indo-Pacific Economic Framework for Prosperity (IPEF)

Why U.S. is de-risking?

- The policy change has been announced in the wake of several events of high geopolitical significance.
- The global economy is trying to rebound from the disruptive years after pandemic.
- The U.S.-China rivalry had peaked due to the tension across the Taiwan Strait and the spy balloon.
- The ongoing Russia-Ukraine conflict and the Chinese President Xi Jinping's visit to Russia proposing a peace plan.
- Xi Jinping's 'peacemaking diplomacy' is extended to West Asia.
- These recent developments have made U.S. to reconsider its earlier approach towards China.

Geopolitical implications of de-risking

- The U.S. adopting the path of de-risking will keep its allies closer in its geopolitical rivalry against China.
- It has already won a significant victory in Japan at the G-7 summit.
- On the other hand, China has expressed its disapproval in painting China as the actor responsible for heightening geopolitical risks.
- De-risking helps the West's moves to counter China's rise much more sustainable by facilitating a united front among allies.
- Countries like India will benefit from de-risking by leveraging its benefits like attracting supply chains.

9. Manipur: The Demand for Separate Administration and the Challenges Ahead

- The recent demand for a separate administration in Manipur has sparked widespread discussions on the sanctity of borders and the territorial integrity of the state. The demand, supported by various Kuki-Zo legislators highlights the alleged tacit support of the Manipur government towards violence against the Chin-Kuki-Mizo-Zomi hill tribals. The counter-response from Meitei groups advocating for the protection of the state's territorial integrity further complicates the situation.

Causes of the riots in Manipur

- The principal cause of the riots in Manipur is the failure of the state government to recognize and accommodate the territorial rights and identities of the different communities in the state.
- The state's aggressive integrationist project, which seeks to dissolve tribal land rights in the valley areas, has been a major source of tension between the Meitei and tribal communities.
- Additionally, in April 2023, The Manipur High Court's order to expedite the recommendation for granting ST status to the Meiteis further inflamed the tribal sentiments and led to the massive protest on May 3.

Factors contributing to the increasing demand for a separate administration in Manipur

- **Ethnic Tensions and Divisions:** Manipur is home to diverse ethnic communities, including the Kuki-Zo and Meitei groups. Ethnic tensions and historical divisions have persisted for years, leading to a sense of marginalization and a desire for separate administrative arrangements.
- **Failure of Previous Arrangements:** Previous attempts to address the concerns of tribal communities, such as the proposal for a Union Territory or inclusion in the Sixth Schedule, have been perceived as inadequate or non-serious. The lack of tangible progress has intensified the demand for a more comprehensive and separate administrative setup.
- **Demographic Changes and Displacement:** The extensive violence, displacement of populations, destruction of property, and loss of lives in recent times have significantly altered the demographic landscape of Manipur. These changes have deepened the divide between different communities and created a sense of irreparable separation.
- **Economic Considerations:** The Kuki-Zo-dominated districts of Manipur, such as Pherzawl and Churachandpur, possess valuable natural resources and strategic gateways to Southeast Asia. Proponents of a separate administration argue that harnessing these resources and leveraging the

region's economic potential would be better served under a distinct administrative framework.

- **Lack of Trust in the Current System:** The demand for a separate administration reflects a deep-seated mistrust in the existing political and administrative structures. Some communities believe that their interests and concerns are not adequately represented or addressed within the current system, leading to a call for a separate administrative entity.
- **Popular Support and Mobilization:** The current demand for a separate administration enjoys unprecedented popular support among the Kuki-Zo groups. This widespread backing has galvanized community members and fueled a sustained mobilization effort, making the demand a significant force in Manipur's political landscape.
- **Alleged Government Support for Violence:** The demand stems from allegations that the Manipur government has tacitly supported violence against the Chin-Kuki-Mizo-Zomi hill tribals. The perception of government inaction or indifference has fuelled discontent among the affected communities.

Constitutional Challenges for the implementation of a separate administration in Manipur

- **Article 3 of the Constitution:** The power to effect changes in a state's border lies with the central government, as outlined in Article 3 of the Constitution. This provision grants unilateral power to the center to alter state boundaries.
- **Opposition from Naga Groups:** Granting a separate administration for Kuki-Zo in Manipur's hill areas could face opposition from certain Naga groups. These groups may be reluctant to compromise on their territorial aspirations, particularly concerning the Naga's demand for a sovereign 'Nagalim.' Finding a resolution that satisfies the demands of both communities is a significant challenge.
- **Resistance from the State Government and Meitei Groups:** The Manipur state government and Meitei groups may staunchly oppose the demand for a separate administration. They might advocate for maintaining the territorial integrity of Manipur and resist any attempts to alter the administrative setup.
- **Revisiting Constitutional Arrangements:** Establishing a separate administration in Manipur would necessitate revisiting and potentially amending the existing constitutional arrangements. This could involve dissolving sub-state constitutional asymmetrical arrangements, such as Article 371C, district councils, and tribal land rights.
- **Overlapping Ethnic Boundaries:** Manipur's ethnic dynamics present a challenge when determining the territorial boundaries of a separate administration. Some districts, such as Chandel, Kamjong, and Tengnoupal, have mixed populations and historical territorial disputes between the Kukis

and Nagas. Resolving these territorial complexities and addressing the concerns of all communities is a delicate task.

- **Economic Viability:** Critics may raise concerns about the financial sustainability and resource allocation for the proposed administrative entity. Demonstrating the economic potential and strategic advantages of a separate administration is crucial to counter these arguments.

10. Why is India rethinking its anaemia policy?

- The National Family Health Survey (NFHS-6) will begin on 6 July 2023.
- The questions related to anaemia will be dropped from the survey as several experts have challenged the efficacy of the method being used.

Details about Anaemia:

- World Health Organization (WHO) defines anaemia as a situation in which the number of red blood cells or the haemoglobin concentration within them is lower than normal.
- It causes fatigue, weakness, dizziness, and shortness of breath.
- Anaemia is caused by several factors, the major being the iron deficiency.
- According to NFHS-5 (2019-21), India's anaemia burden is considerably high.
 - It is found that 57% of women in the age group 15-49 and 67% of children between 6 and 59 months are anaemic.
- The Health Ministry noted that Anaemia is a public health challenge. It has thus shifted its assessment to new Diet and Biomarkers Survey in India (DABS-I).
 - DABS-I was launched in 2022 to map diet, nutrition, and health status.
 - It will provide the correct estimate of the disease among the rural and urban population.

New Changes in the Survey:

- Researchers argue that anaemia in India is being over-diagnosed as WHO cut-offs for haemoglobin are being followed. The cutoffs might not be suited to India, as it depends on several factors like age, gender, physiological status, and altitude.
- According to WHO, a person is anaemic if she meets one of the following situations:
 - Haemoglobin concentration is <110 g/L at sea level for children aged under five years and pregnant women.
 - Haemoglobin concentration <120 g/L for non-pregnant women.
- Indian researchers have also objected to the differences in the way blood is drawn for sampling in NFHS.

- The survey measures it through a drop of capillary blood that oozes from a finger prick. However, it might give a false value.
- The venous blood sampling method should be used as it gives a more accurate value.

Dietary Survey DABS-I:

- DABS-I is a comprehensive national-level dietary survey.
- It will collect individual dietary intake data of different age groups and will then define food and nutrient adequacy.
- Significance of Anaemia survey:
 - Anaemia data is important for monitoring public health and devising new policies as it is associated with morbidity and mortality of vulnerable sections (pregnant women and children).
 - It is also significant to monitor the progress of reproductive health.
 - Iron-deficiency anemia reduces work productivity and hampers the economy and national development.
 - It will help in evidence-based policy-making and targeted interventions.

11. Shangri La Dialogue

20th Shangri-La Dialogue in Singapore

- The International Institute for Strategic Studies (IISS) Shangri-La Dialogue is Asia's premier defence summit.
- It's a unique meeting where ministers debate the region's most pressing security challenges, engage in important bilateral talks and come up with fresh approaches together.
- The 2023 event is taking place in Singapore on 2-4 June.

Peace plan by Indonesia:

- Indonesia proposed a plan to end the war between Russia and Ukraine.
- Indonesia called for an immediate cessation of hostilities and suggested a ceasefire at present positions, demilitarised zones guaranteed by observers and UN peacekeeping forces, and a unorganised referendum in disputed areas.
- However, the initiative faced swift criticism from attendees.
- Indonesia, known for non-aligned diplomacy, previously attempted peace mediation.

- Indonesian President Joko Widodo travelled to Kyiv and Moscow and met the nations' leaders in 2022 while chairing G20.

Australia on US-China relations:

- Australian Prime Minister Anthony Albanese delivered a keynote speech urging the United States and China to resume high-level communication channels and establish safeguards to prevent the deteriorating relations from escalating into conflict.
- He emphasised that the potential repercussions of a breakdown in the Taiwan Strait or any other conflict would extend beyond the major powers and have devastating global consequences.
- Therefore, leaders in the Indo-Pacific region must exert all efforts to promote dialogue and prevent conflict, as the possibility of conflict in the region is not inevitable.

12. Parliamentary democracy in present India

The controversies around the inauguration of new Parliament building overlooked in India's 'parliamentary democracy.'

Existing issues with Indian Parliament

- There is an increasing subordination of the 'Parliament' in the 'Parliamentary democracy' of India.
- Bills are passed with minimal or no deliberation.
- Parliament sits for fewer and fewer days in a year, and parliamentary sessions are often adjourned.
- The presidential ordinances have become a parallel if not dominant form of law-making.
- The executive power of India is great that resembles presidential system, but without the checks and balances and veto points that those systems have these as well are ineffective.

How the constitutional design of the Parliament limits its functioning?

- The Indian Constitution, by its very structure, facilitates and enables the marginalisation of Parliament.
- It enables the concentration of power within a dominant executive.
- **Intra-party Dissent** - In order to enact its agenda, the executive must command a majority in Parliament.

- This gives space for intra-party dissent and for the non-cabinet parliamentarians to exercise a check over the executive.
- **Opposition** - The Opposition itself is granted certain rights in Parliament, in order to publicly hold the executive to account.
- The Opposition has certain limited control over parliamentary proceedings.
- **Speaker** - The interests of Parliament against the executive are meant to be represented by the Speaker, a neutral and independent authority.
- **Bicameralism** - A second 'Upper House' that acts as a revising chamber, where interests other than those of the majority are represented.
- In India's case, 'Rajya Sabha' is the second upper house.

How India dilutes this Constitutional design?

- In India, however, each of these features has been diluted or erased over the years.
- **Intra-party Dissent** - The possibility of intra-party dissent within Parliament has been stamped out by virtue of the Tenth Schedule to the Constitution (anti-defection law).
- The Tenth Schedule has failed to fulfil the purpose for which it was enacted, but it strengthened the hand of the party leadership.
- **Opposition** - The Indian Constitution did not carve out any specific space for the political Opposition in the House, right from the beginning.
- The manner of proceedings in Parliament has no real constitutional checks upon how that control is exercised.
- **Speaker** - The Speaker, in our system, is not independent.
- The Speaker is not required to give up membership of their political party, and is not constitutionally obligated to act impartially.
- Speakers acting in a blatantly partisan manner in order to advance the interests of the executive over the interests of the House.
- This affects the quality of the deliberations in the lower house.
- It also negates the scrutiny of Rajya Sabha. For example, classifying a bill as 'money bill'.
- **Upper House** - The role of the Upper House is undercut by the constitutionally-sanctioned ordinance making power.
- It is used as a parallel process of law-making, especially to bypass the Upper House altogether.

In the case of the Aadhaar Act, where Rajya Sabha scrutiny was avoided by simply classifying the Bill as a 'money bill' by the Lok Sabha Speaker.

Is an actual check upon executives possible?

- When there is a single, majority ruling party, the above dilution of checks and balances is diluted and Parliament can do very little.
- The only effective check upon the executive is when the ruling party is forced to govern in a coalition with allies with different opinions.
- Only in such scenario, the coalition partners can exercise something of a check upon the executive in Parliament.
- The morphed executive democracy of India would require constitutional changes and reforms to return to parliamentarianism.

13. India and Graphene

India needs to catch up in the area of graphene to be among the leaders in AI and a potential challenger in quantum computing.

Graphene

- Graphene is an allotrope of carbon consisting of a single layer of atoms arranged in a hexagonal lattice nanostructure.
- Graphene was discovered in 2004 for which the scientists received the Nobel Prize in Physics in 2010.
- It is the world's thinnest, strongest, and most conductive material of both electricity and heat.
- **Properties** - It is 200 times stronger than steel but 6 times lighter.
- It is almost perfectly transparent as it absorbs only 2% of light.
- It is impermeable to gases, even those as light as hydrogen and helium.
- It has the potential to absorb and dissipate electromagnetic waves.
- It is highly sensitive to environmental changes.

Applications of Graphene

- Graphene in itself has huge potential to revolutionise electricity, conductivity, energy generation, batteries, sensors and more.
- Graphene composites are used in aerospace, automotive, sports equipment and construction.
- It is used for high-performance batteries and super-capacitors, touchscreens, and conductive inks.
- Graphene-based sensors are used for environmental monitoring, healthcare and wearable devices.
- Graphene oxide membranes are used for water purification and desalination.
- Graphene has an attractive potential in defence and aerospace as a promising material for armour and ballistic protection due to its exceptional strength.

Global trends towards graphene

- It was difficult to produce high-grade large-scale graphene at the time of its discovery.
- Now over 300 companies are producing graphene or its derivatives.

As per a report, at least one graphene-enhanced product was launched every week in 2022.

- China and Brazil are global leaders in the commercial production of graphene.
- China, the U.S., the U.K., Japan, South Korea, Russia, and Singapore are among the leading countries in graphene research.
- Beijing Graphene Institute was set up in 2018, where several companies produce industry-grade graphene products.
- China declared graphene a priority in its 13th Plan.
- Europe has set up the Graphene Flagship, with a budget of 1 billion Euro in 2013.
- In 2018, China filed 218 graphene-related patent while the other leading countries together filed 79.
- India had eight graphene-related patent filings.

How is India's progress in graphene industry?

- India's progress has been better than many nations towards graphene.
- India produces about one-twentieth of graphene products compared to China and one-third compared to Brazil.
- Some start-ups and foreign subsidiaries have started graphene or graphene derivatives in India.
- The India Innovation Centre for Graphene in Kerala is being setup and implemented by the Digital University Kerala in partnership with Tata Steel.
- India's niche is going to be innovation using graphene.
- It figured out how graphene oxide-based wrappers loaded with preservatives can increase the shelf life of fruits and vegetables.
- Indian companies have patented for a technology for graphene-based ultra-capacitors and developed applications of graphene-based nanotubes.

What should India do to progress in graphene industry?

- India missed the semiconductor bus in the mid-1990s, now it has to step on the graphene.
- Like other countries, Centre needs to become the nodal point to spur large-scale innovation activity around graphene.
- A nodal Ministry needs to be entrusted with the responsibility of 'National Graphene Mission'.

- India needs to be among the leaders in graphene to get benefitted the most from the industry and to excel in AI and quantum computing.

14. International trade has a carbon problem

The talks on the Carbon Border Adjustment Mechanism (CBAM) at the WTO's dispute settlement body has brought to the forefront the inter-linkages between trade and the environment.

CBAM

- The Carbon Border Adjustment Mechanism (CBAM) is an initiative of European Union (EU) to prevent carbon leakage from extremely carbon intensive imports.
- Under CBAM, duties will be imposed on imported goods based on the carbon expended in producing them.
- The duty imposed is an equivalent cost on imports to level the playing field between foreign and domestic producers.

Why EU wants CBAM?

- The EU has stringent emission control mechanisms like Emissions Trading System (ETS) for its domestic industries.
- The EU's concern is that emissions embedded in products imported from other countries is not be priced in a similar way and would put its industries at a disadvantage.
- To tackle this, the impacted industries in the EU had so far been receiving free allowances or permits under the ETS.
- The EU also apprehends the phenomenon of 'carbon leakage' due to the application of ETS.
- European firms operating in carbon-intensive sectors might possibly shift to those countries that have less stringent GHG emission norms.
- CBAM is aimed at levelling the playing field for the EU industries.

Cement, iron and steel, electricity, fertilizers, aluminium, and hydrogen are few carbon-intensive sectors to be covered under CBAM.

How does CBAM work?

- Under the CBAM, imports of certain carbon-intensive products, will have to bear the same economic costs borne by EU producers under the ETS.

- The price to be paid will be linked to the weekly average of the emissions priced under the ETS.
- However, where a carbon price has been explicitly paid for the imported products in their country of origin, a reduction can be claimed.

Why CBAM is not in line with WTO principles?

- Non-discrimination is a cornerstone principle of WTO law. Countries are required to accord equal treatment
 - To 'like' products irrespective of their country of origin (MFN treatment) and
 - To treat foreign-made 'like' products as they treat domestic ones (national treatment principle).
- **Inconsistency** - The CBAM violates WTO law for discriminating between EU and foreign products covered by CBAM based on the embedded emissions.
- Also the question of whether carbon-intensive products to which the CBAM applies are 'like' arises.
- For example, the process by which electric arc furnaces produce steel is less carbon-intensive than the steel produced in blast furnaces.
- The CBAM does not consider 'implicit' carbon borne by products originating in certain countries.
- **Way out** - The discrimination of CBAM could be justified under the General Exceptions clause given in Article XX of the General Agreement on Tariffs and Trade (GATT).
- Under Article XX, measures taken by countries that otherwise violate GATT obligations are permitted if,
 - They fall under one of the listed policy grounds, and
 - They satisfy the requirements of the introductory clause of Article XX, known as the chapeau.
- CBAM would fall under the 'conservation of exhaustible natural resources', one of the listed policy grounds in Article XX.

What are India's concern towards CBAM?

- India has criticized CBAM as being protectionist and discriminatory policy.
- The EU's Carbon Border Adjustment Mechanism (CBAM), has spooked India that it will cripple the export of its carbon-intensive products to the EU.
- CBAM is an important issue in the ongoing India-EU free trade agreement negotiations.

What should India do with CABM?

- India should work with the EU to secure gains on CBAM.

- India ensure smooth onboarding for Indian exporters to maximise the benefits of a bilateral deal.
- India can also consider the possibility of a WTO challenge as it remains open.

15. Adverse Possession

Adverse possession is a legal concept that refers to the hostile possession of property. It has been a subject of discussion and debate among legal experts, with differing opinions on its justification and impact.

The Concept of Adverse Possession

Adverse possession originates from the notion that it is important for land to be actively utilized rather than being left unoccupied. It involves the hostile possession of property that is continuous, uninterrupted, and peaceful. The rationale behind adverse possession stems from the idea that the title to land should not be in doubt for an extended period. Additionally, it allows for the utilization of idle land and offers protection to individuals who come to regard the occupant as the owner.

The Law Commission's Report

The recent report by the 22nd Law Commission stated that there is no justification for introducing changes to the law relating to adverse possession. The commission emphasized that the period of limitation should not be increased, asserting that the existing provisions offer sufficient protection to the true owner. However, two members of this commission expressed their disagreement by submitting a dissenting note, arguing that the law encourages deceptive assertions masked as adverse possession.

Provisions of the Limitation Act, 1963

The Limitation Act, 1963, brought significant changes to the law on adverse possession. It shifted the burden of proof to the person claiming adverse possession and established specific time limits for the possession of private and government land. Article 65 of the Act specifies that adverse possession must be continuous and uninterrupted for twelve years to acquire title.

Ingredients of Adverse Possession

According to a 2004 Apex Court ruling, several elements contribute to adverse possession. These include the date of possession, nature of possession, knowledge of the other party, duration of possession, and the requirement for possession to be open and undisturbed. These factors play a crucial role in determining the validity of an adverse possession claim.

Supreme Court's Perspective

The Supreme Court suggested changes to the law on adverse possession due to its perceived irrationality, illogicality, and harshness towards the true owner. The court noted that the existing law places a premium on dishonesty and advocated for a fresh look at the subject. The court recommended that the government seriously consider making suitable amendments to the law.

16. Addressing Street Dog Overpopulation: Embracing Animal Birth Control for a Safer Society

- Dogs have always stirred up a range of emotions in people, making it impossible to ignore their presence in our lives. However, the growing population of street dogs in recent decades has presented numerous challenges for cities and municipalities across the country. Unfortunately, some critics have dismissed animal birth control initiatives as failures, demonstrating cynicism that is both mischievous and misguided.

Stray Dog Attacks in India

- Cities have witnessed a sharp increase in the stray dog population, which as per the official 2019 livestock census stood at 1.5 crore.
- However, independent estimates peg the number to be around 6.2 crore.
- The number of dog bites has simultaneously doubled between 2012 and 2020.
- Experts agree there may be a correlation between urbanisation and solid waste production, made visible due to the mismanagement of waste disposal.
- Tepid animal birth control programmes and insufficient rescue centres, in conjunction with poor waste management, result in a proliferation of street animals in India.

Reasons behind

- **Poor waste management:** Inadequate waste disposal facilities and the mismanagement of solid waste often lead to the congregation of stray dogs around garbage dumps and landfills, where they scavenge for food.
- **Unplanned urbanization:** The population boom in Indian cities has led to a sharp increase in the stray dog population. Rapid urbanization has led to the creation of slums and unmanaged solid waste, which attract dogs.
- **Lack of food and shelter:** The availability of food and shelter determines the carrying capacity of a city. In the absence of these facilities, free-ranging dogs become scavengers that forage around for food, eventually gravitating towards exposed garbage dumping sites.

- **Territoriality:** Stray dogs often become territorial and aggressive about public spaces where they are fed, leading to increased attacks on humans.
- **Improper sterilization and rescue centres:** Tepid animal birth control programmes and insufficient rescue centres, in conjunction with poor waste management, result in a proliferation of street animals in India.

Shortcomings of animal birth control

- **Inconsistent Implementation:** One of the main challenges is the inconsistent implementation of animal birth control programs across different regions. The effectiveness of these programs can vary depending on the commitment and resources allocated by local authorities.
- **Limited Coverage:** Animal birth control programs may not cover all areas affected by street dog overpopulation. Some regions may have inadequate resources or insufficient awareness about the benefits of sterilization programs.
- **Funding Constraints:** Insufficient funding can hinder the implementation and sustainability of animal birth control programs. Limited financial resources may result in a shortage of trained personnel, inadequate infrastructure, and reduced outreach efforts.
- **Resistance from Communities:** Some communities may resist animal birth control initiatives due to misconceptions, cultural beliefs, or lack of awareness. Overcoming these barriers requires targeted community engagement, education, and dispelling myths surrounding sterilization programs.
- **Behavioral Challenges:** Animal birth control programs often face challenges related to capturing street dogs, performing surgeries, and post-operative care. Behavioral issues, such as fear or aggression, can make the process more challenging.
- **Long-term Sustainability:** Ensuring the long-term sustainability of animal birth control programs is crucial. These programs require continued investment, monitoring, and evaluation to maintain their effectiveness.

Misconceptions surrounding Animal Birth Control (ABC) programs

- **Ineffectiveness of Sterilization:** Some people believe that sterilization does not effectively control street dog populations. They may argue that sterilized dogs can still reproduce or that the impact of sterilization is minimal. However, numerous studies and successful implementation of ABC programs worldwide have shown that sterilization is a proven method.
- **Cruelty or Harm to Animals:** There is a misconception that sterilization surgeries are cruel and cause unnecessary harm to animals. However, ABC programs prioritize the health and welfare of animals, and sterilization is a

safe and humane procedure performed under anesthesia by trained veterinarians.

- **Abandonment of Dogs:** Some people believe that sterilized dogs are more likely to be abandoned by their owners or that sterilization leads to behavioral changes that make dogs less desirable as pets. However, sterilization has no negative impact on a dog's behavior or loyalty.
- **Cost Inefficiency:** It is sometimes claimed that sterilization programs are expensive and not cost-effective. However, the long-term benefits of ABC programs, such as reduced costs associated with managing stray dogs, decreased risks of dog bites, and improved public health, outweigh the initial investment.
- **Neglect of Other Issues:** Some individuals argue that focusing on animal birth control diverts attention and resources from other pressing issues, such as poverty or healthcare. However, addressing street dog overpopulation through ABC programs is not mutually exclusive with addressing societal challenges.

Way ahead: A call for change

- **Strengthen Implementation:** Efforts should be made to strengthen the implementation of Animal Birth Control (ABC) programs across all regions. This includes standardizing processes, improving infrastructure, and ensuring uniformity in the application of ABC rules and guidelines.
- **Increase Awareness and Education:** Public awareness campaigns should be conducted to educate communities about responsible pet ownership, the benefits of sterilization, and how to coexist peacefully with street dogs.
- **Community Engagement:** Engaging with local communities is vital to garner support and address concerns surrounding street dogs. Building trust, involving community leaders, and working collaboratively to develop solutions can help foster positive relationships and encourage responsible pet ownership practices.
- **Research and Data Collection:** Continued research and data collection are essential to evaluate the impact of ABC programs, track population trends, and understand the dynamics of street dog issues. This data can inform evidence-based decision-making, facilitate targeted interventions, and support the refinement of strategies.
- **Strengthen Legislation and Policies:** Reviewing and updating existing legislation related to animal welfare and responsible pet ownership can help create a more conducive environment for effective street dog management.
- **Strengthen Collaboration and Partnerships:** Collaboration among government bodies, animal welfare organizations, veterinary professionals,

and community stakeholders is crucial. Partnerships can help pool resources, expertise, and funding, leading to more impactful interventions and sustainable outcomes.

- **Long-Term Sustainability:** Ensuring the long-term sustainability of street dog management programs requires continued funding, monitoring, and evaluation. Governments, philanthropic organizations, and individuals should allocate resources and support initiatives that prioritize the welfare of both humans and animals.
- **International Best Practices:** Learning from successful street dog management programs implemented in other countries can provide valuable insights and guidance. Adopting international best practices, adapting them to local contexts, and sharing knowledge and experiences can contribute to more effective strategies.

Conclusion

- Addressing street dog overpopulation requires a comprehensive approach that includes animal birth control as a key component. Instead of dismissing it as ineffective, we should embrace continuous policy reforms and resource investments. Let us work together to eliminate the suffering and public health risks associated with outdated methods, and strive to achieve our noble goal through the implementation of the new rules.

17. Sedition Law: A Threat to Freedom of Expression in India

- In its 279th Report, the Law Commission of India has recommended the retention of Section 124A of the Indian Penal Code, commonly known as the Law of Sedition, along with enhanced punishment for the offense in the name of national security.

Sedition

The Section 124A defines sedition as:

- An offence committed when “any person by words, either spoken or written, or by signs, or by visible representation, or otherwise, brings or attempts to bring into hatred or contempt, or excites or attempts to excite disaffection towards the government established by law in India”.
- Disaffection includes disloyalty and all feelings of enmity.
- However, comments without exciting or attempting to excite hatred, contempt or disaffection, will not constitute an offense.
- Sedition is a non-bailable offense.

- Punishment under Section 124A ranges from imprisonment up to three years to a life term with/without a fine

Historical Perspective

- Section 124A of the IPC was introduced during the British Raj in 1870 to suppress dissent and protest against the colonial government.
- The then British government in India feared that religious preachers on the Indian subcontinent would wage a war against the government.
- Particularly after the successful suppression of the Wahabi/Waliullah Movement by the British, the need was felt for such law.
- Throughout the Raj, this section was used to suppress activists in favor of national independence, including Tilak and Mahatma Gandhi, both of whom were found guilty and imprisoned.

Two notable interpretations which added to the ambiguity surrounding the sedition law

1. Queen Empress vs Bal Gangadhar Tilak (1897)

- In this case, Bal Gangadhar Tilak, a prominent freedom fighter, was charged with sedition for writing articles in a Marathi weekly called Kesari that invoked Shivaji and were seen as inciting disaffection towards the British government.
- The court held that sedition encompassed the act of exciting disaffection towards the government, even if it did not incite rebellion or violence.
- This interpretation broadened the scope of the offense to include political hatred of the government.

2. Niharendu Dutt Majumdar And Ors. vs Emperor (1942): Federal Court.

- The court acquitted the accused, and Chief Justice Sir Maurice Gwyer explained that the essence of sedition lies in public disorder or the reasonable anticipation thereof.
- According to this interpretation, sedition would be committed only when there is incitement to violence or disorder.

Constitutionality of Sedition

- **Violation of Freedom of Speech and Expression:** The sedition law, as defined in Section 124A of the Indian Penal Code, infringes upon the fundamental right to freedom of speech and expression guaranteed under Article 19(1)(a) of the Indian Constitution. It criminalizes acts that bring

hatred, contempt, or disaffection towards the government, which curtails the citizens' ability to express their political dissent and discontent.

- **Democratic Principles:** Disaffection towards a government, which is subject to change through the electoral process, cannot be treated as a criminal offense. The sedition law restricts the democratic principles of public debate, dissent, and accountability.
- **Omission from the Constitution:** During the drafting of the Indian Constitution, the Constituent Assembly deliberately excluded sedition as a reasonable restriction on the freedom of speech and expression. This omission signifies the Assembly's intent to safeguard the citizens' right to express their opinions, including dissenting views on the government.
- **Ambiguity and Misuse:** The broad wording and lack of precise definition allow for arbitrary interpretations, leading to the stifling of legitimate dissent and the targeting of individuals or groups critical of the government. This misuse undermines the rule of law and constitutional protections.
- **Chilling Effect on Free Speech:** The existence of a sedition law creates a chilling effect on free speech and expression. The fear of potential sedition charges discourages individuals from openly expressing their opinions and engaging in robust public discourse, inhibiting the free flow of ideas and opinions necessary for a healthy democracy.
- **Conflict with International Standards:** International bodies such as the United Nations Human Rights Committee have consistently expressed concerns about the misuse of sedition laws and called for their repeal or amendment to align with international human rights standards.

Inconsistencies regarding the sedition law in India

- **Interpretational Inconsistencies:** The Tilak case (1897) interpreted sedition as exciting disaffection towards the government, even without inciting violence or rebellion. However, the Majumdar case (1942) acquitted the accused by emphasizing that sedition requires a tendency to incite violence or disorder.
- **Varying Judicial Approaches:** The Supreme Court's approach in the Kedarnath case (1962) further adds to the inconsistencies. While the Court upheld the constitutionality of the sedition law, it narrowed its application to only acts that incite violence. The Court's attempt to retain sedition despite acknowledging its exclusion from the draft Constitution and concerns over its severity creates a contradictory stance.
- **Lack of Clarity in Statutory Language:** The language of Section 124A of the Indian Penal Code, which defines sedition, lacks precision and clarity. The vague terms such as hatred, contempt, and disaffection make it susceptible to subjective interpretations and misuse by law enforcement authorities. This lack of clarity contributes to the inconsistent application of the sedition law.

- **Conflict with Constitutional Principles:** The sedition law, as it stands, conflicts with constitutional principles, particularly the fundamental right to freedom of speech and expression guaranteed under Article 19(1)(a) of the Indian Constitution. The broad interpretation of sedition and its criminalization of political dissent and disaffection towards the government infringe upon citizens' constitutional rights.
- **Disparity with International Standards:** International bodies, including the United Nations Human Rights Committee, have expressed concerns about the misuse of sedition laws and recommended their repeal or amendment to align with international human rights norms. This disparity highlights the inconsistencies between the sedition law in India and global standards.

Way ahead: Recommendations to strike a balance

- **Repeal or Substantial Reform:** Given the inconsistencies, ambiguity, and potential for misuse, there is a strong case for the repeal or substantial reform of the sedition law. This could involve narrowing the scope of the offense, clarifying the language, and aligning it with constitutional principles and international human rights standards.
- **Precise Definition:** The sedition law should be defined more precisely to avoid ambiguity and subjective interpretations. A clear and specific definition would help establish the boundaries of the offense, ensuring that it is not misused to suppress legitimate dissent or criticism.
- **Balancing National Security and Freedom of Expression:** Any reform or amendment to the sedition law should strike a balance between protecting national security and safeguarding freedom of expression. This can be achieved by focusing on acts that pose a genuine threat to public order, incite violence, or endanger the integrity of the state while ensuring that peaceful dissent and criticism are not stifled.
- **Judicial Clarity:** The judiciary should provide consistent and well-defined guidelines for the interpretation and application of the sedition law. Clear guidelines would help prevent arbitrary enforcement and provide greater clarity on the limits of the offense.
- **Safeguards and Procedural Reforms:** Implementing safeguards and procedural reforms can help prevent the misuse of the sedition law. This may include requiring higher standards of evidence, ensuring transparency and accountability in investigations and prosecutions, and providing avenues for redress in cases of wrongful or frivolous charges.
- **Public Awareness and Sensitization:** There is a need for public awareness campaigns and sensitization programs to educate citizens, law enforcement authorities, and the judiciary about the nuances of freedom of expression and the potential pitfalls of the sedition law.

- **International Dialogue and Learning:** Engaging in international dialogue and learning from best practices can provide valuable insights for reforming the sedition law. Studying the experiences of other democratic countries and considering international human rights standards can help shape more effective and rights-respecting legislation.

Conclusion

- The interpretation and application of Section 124A have been inconsistent, leading to misuses and abuses by law enforcement authorities. The Law Commission's recent recommendations for enhancing punishment and incorporating the tendency to incite disorder fail to address the core issue of the law's unconstitutionality. It is imperative to reevaluate and repeal the sedition law to protect and uphold the democratic values of free speech and expression in India.

18. Kosovo-Serbia Conflict

The tensions between Kosovo and Serbia escalates and clashes broke out between Serbs protesting in North Kosovo and the NATO-led Kosovo Force (KFor).



Kosovo-Serbia conflicts

- Both Kosovo and Serbia are countries that lie in the Balkan region of Europe.
- Kosovo is a former province of Serbia.
- Kosovo unilaterally declared Independence in 2008 and is recognised as a country by about 100 nations including the U.S. and several EU- countries.
- However, Serbia does not recognise Kosovo's sovereignty and continues to consider it as a part of it.

Roots of the conflict

- **Historic Significance** - The Serbian Empire had gained control of Kosovo in the 12th century.
- Kosovo become the heart of the kingdom with several significant Serb Orthodox Christian churches and monasteries.

- **Ethnic Shift** - In the 1389 Battle of Kosovo, Serbia lost Kosovo to the Ottoman Empire for 500 years.
- During Ottoman rule, there was a shift in ethnic and religious balance in Kosovo, it became a region with majority of ethnic Albanian Muslims.
- **Made a province** - Kosovo became part of Serbia in the early 20th century.
- Post the Second World War, it was eventually made a province (with autonomy) of Serbia.
- **Ethnic rift** - At this point, Kosovo had ethnic Albanian as 90% of its population and they felt the reunion unfair.
- In the 1980s, Kosovo Albanians sought separation from Serbia.
- **Conflict** - In the late 1990s, the Kosovo Liberation Army (KLA), consisting mainly Kosovo Albanians, led an insurgency against the Serbian rule of Kosovo.
- Serbia cracked down on the rebellion by deploying heavy forces in 1998 and 1999.
- **NATO and UNSC** - In 1999, NATO intervened to pull out Kosovo and subsequently, NATO deployed peacekeepers.
- Through the UN Security Council (UNSC) Resolution 1244, a transitional UN-led administration began to head Kosovo.
- **Independence** - In 2008, Kosovo declared independence from Serbia.
- Serbia challenged Kosovo's actions before the International Court of Justice (ICJ).
- The ICJ was of the opinion that Kosovo's declaration was not against international law.

What has happened since 2008?

- An ethnic Serb minority resides in Kosovo makes up to 5.3% of its population.
- The Kosovo Serbs do not recognise Kosovo state institutions.
- The Kosovo Serbs receive pay and benefits from Serbia's budget but do not pay taxes to neither of the governments.
- Since 2008, clashes have broken out on and off in Kosovo's northern region.
- In 2013, both Serbia and Kosovo reached the **Brussels Agreement** brokered by the EU.
- But the agreement was not fully implemented on the ground.
- In July 2022, violent clashes broke out in the northern region over the issue of changing Serbian number plates of vehicles while in Kosovo.
- The ethnic Serbs in the north in protest put up blockades at the 2 border entry points between Serbia and Kosovo, only through which Kosovo citizens can travel to Western Europe.

Why have tensions flared again?

- Kosovo held mayoral elections in municipalities in April 2023.
- These ethnic Serbs boycotted the elections to northern municipalities.
- As a result of low turnout, ethnic Albanian mayors got elected in these municipalities.
- In protest, ethnic Serb mayors in northern municipalities, local judges and police officers had resigned and also opposed fresh elections to their posts.
- The ethnic Albanian mayors took office in northern Kosovo's Serb-majority area.
- These moves faced protests by Serbs and the U.S. and its allies to rebuked Kosovo.
- These triggered violent clashes between NATO soldiers and Serb protesters.

Where do the resolution talks stand?

- Since late 2015, there has been little progress in reaching new agreements or implementing existing ones.
- In 2018, the then Presidents of Kosovo and Serbia had proposed redrawing borders and swapping some territories between the 2 countries to normalise ties but the EU rejected it.
- **EU plan** - In February 2023, the EU proposed a plan to which both Serbia and Kosovo tentatively agreed to. It states -
- Serbia would stop lobbying against Kosovo's candidature in international organisations including the United Nations.
- In turn, Kosovo was to form an association of Serb-majority municipalities.
- However, the two parties walked out of signing the deal as a result of opposition against it from their own countries.
- Now, the talks have also stalled doubting the EU's seriousness.
- **Russian factor** - Serbia has strong historic and military ties with Russia and Russia also supports Serbia's claim.
- Kosovo does not want the spillover of Ukraine conflict in the Balkan region.

What lies ahead?

- Kosovo has indicated that a solution for de-escalation is close.
- It is open to holding fresh elections in Serb dominant municipalities, provided they are held in a free and fair manner.
- Kosovo wants the election to be held without Serbia pressuring ethnic Serbs to boycott the vote.

19. Civil Services Conduct Rules

Being a civil servant comes with many perks and benefits, but it also brings with it its own limitations and various rules surrounding an officer's conduct.

Civil services

- The civil services recruited by Union Public Service Commission (UPSC) are categorised into two types.
- **All India Services** - the Indian Administrative Service, the Indian Police Service and the Indian Forest Service.
- All India Services are governed by Article 312 of the Constitution of India.
- These services are selected by the central government with officers allotted to various state cadres.
- The bureaucrats who work directly for the Centre are from each state on central deputation.
- **Central Civil Services** - Indian Foreign Service, the Indian Revenue Service, Customs and Central Excise Service and several others.
- These services are under the central government itself with no state cadre system.

What are the rules for civil servants?

Conduct rules for civil servants are the set of rules for the standards of behaviour of people working in the civil services.

- Civil servants are governed under two sets of rules for the two types of services. They are
 - The All India Services (AIS) Conduct Rules, 1968
 - Central Civil Services (CCS) Conduct Rules, 1964
- These rules were framed based on recommendations of the Committee on Prevention of Corruption, headed by K.Santhanam.
- The committee was constituted by then Minister of Home Affairs Lal Bahadur Shastri in 1962.

What are the restrictions for civil servants under these rules?

- **Vague** - The Conduct Rules cover a wide range of issues, some rules are vague and some rules are more specific.
- Rule 3(1) states 'shall do nothing which is unbecoming of a member of the Service' and gives the ambiguous idea of personal integrity.
- **Political neutrality** - Rule 5(1) states civil servants are not allowed to be part of or assist political parties.

- While members can hold personal political beliefs, these rules restrict the degree to which they can act on them.
- **Personal opinion** - Expressing personal opinions also has similar restrictions.
- Rule 7 of AIS Rules restricts expressing personal opinion over public media in any form which has adverse criticism on government activities is restricted.
- **Dowry** - Both giving and receiving dowry is strictly prohibited under rule 11 (1-A) of the AIS Rules on 'Giving or taking of dowry'.
- **Gifts** - Rule 11(1) deals with the receiving of gifts under certain conditions.
- Any gift whose value exceeds Rs.25, 000 by a civil servant needs to be reported to the Government.

What are the newly added rules?

- Though the conduct rules are from the 1960s, the rules are amended and added from time to time.
- In 1979, the government added that, 'The direction of the official superior shall ordinarily be in writing.'
- In 1998, the government added that 'No member of the Service shall employ to work any child below the age of 14 years.'
- In 2014, few sub-rules were added to the Conduct Rules.
- Every member of the Service shall maintain -
 - High ethical standards
 - Political neutrality
 - Integrity and honesty
 - Accountability and transparency
 - Responsiveness to the public
 - Courtesy and good behaviour with the public.
- The threshold of Rs 25,000 for receiving gifts was last fixed in 2015.

How about the coverage of the rules and the penalty?

- **Coverage** - Officers are covered under the rules as soon they join training.
- Certain rules continue to apply post retirement as well.
- **Penalty** - Failing to comply by the rules invite penalties.
- Transgressions can attract two kinds of penalties - major and minor.
- Major penalties can include 'dismissal' from the service as well.

20. India and China: Demographic dividend

Last March, the World Population Review claimed India's and China's populations stood at 1.428 billion and 1.425 billion respectively and both are clueless as to how to solve soaring youth unemployment.

'Demographic dividend'

- Demographic dividend refers to the growth in an economy that is the result of a change in the age structure of a country's population.
- It occurs when the proportion of working people in the total population is high.
- India and China the most populous countries in the world with good demographic dividend is also facing unemployment issues.

A recent Pew survey estimates the current median Indian age at 28, as compared to China's 39, suggesting India will continue to enjoy its demographic advantage up to the end of this century.

Status of Unemployment in China

- The World Population Review announced China's youth population was declining and the ageing population was rising.
- In China, a high level of youth joblessness has generated a great deal of attention and discontent.
- China is facing a new kind of epidemic: joblessness.

As per the report in a popular Chinese online journal, 'one out of every five young urbanites are without work'.

Reasons

- Supply-demand contradiction due to pandemic hit years.
- China's education sector.
- China's economic growth focus shifting from quantitative to qualitative growth.
- China's vocational education stream is perceived as unattractive, compared with regular schools that lead to academic careers.

What is the scene in India?

- India too face the problem of unemployment similar to China and has reasons different from China.
- India face a shortage of skilled personnel and many hands-on specialties.
- India's challenges ranges from numbers of school leavers to liberal arts graduates from universities and engineers from low-grade colleges who cannot find jobs.

What are the issues in skilling in India?

- **Short term courses** - Entities such as the National Skill Development Corporation (NSDC) focused on short courses which is insufficient for real skill acquisition.
- **Autonomy** - Industrial Training Institutes (ITIs) established after the 1960s are run by state governments and they resist transferring full control to their industrial partners.
- **Inadequate training** - Many engineering colleges give inadequate training and the mushrooming private skilling institutes partly fills the gap.
- Segmenting the school stream in the 'middle school' level requires for the real shift to skilling.
- **Lack of vocation focused schools** - NEP 2020 aims to introduce vocational training in middle school but there are no vocation-focused schools to continue at secondary level.

Differences between Indian and China?

- **Similarities** - Both the countries consider vocational courses as secondary and focus on academic careers.
- **Differences** - The Indian youth do nothing remotely resembling China's 'lie flat' phenomenon.

'Lying flat' (tang ping in Chinese) means taking a break from relentless work, a movement that took off during 2021 in China.

- Indian youth chase varied options like pursuing the dream of prosperous foreign lands.
- Their targets range from the US, the UK, the Gulf region, Europe, Africa and unexpected places like Malta and Japan.

What are the solutions?

- **Job creation** has to be the topmost priority in both the countries.
- **Skilling**, to effective outcome levels, should be our constant goal.
- **MSMEs** the major employment creators should be boosted enough.
- **IT capabilities** which are India's innate asset must be valorised.
- **Manufacturing sector** should also be given focus at the same time without any neglectation.

21. India's G20 Presidency: Embracing Inclusivity, Ambition, and Action

- India's G20 presidency, characterized by the keywords "inclusive, ambitious, and action-oriented," has made substantial progress in delivering on its promise of inclusivity. By prioritizing the basic necessities of life for every citizen, India has exhibited a strong commitment to social security support and people-centric development.

Inclusive Development Initiatives during India's G20 presidency

- **Digital Public Infrastructure:** India's robust digital infrastructure has played a crucial role in delivering the benefits of development directly to citizens across the country. This transparent and corruption-free system has ensured that developmental programs reach every corner of the nation, bridging the digital divide and empowering citizens.
- **Access to Basic Necessities:** The government has prioritized providing every citizen with access to basic necessities. For example, around 110 million rural households have been provided with access to clean drinking water at their homes. Additionally, more than 110 million sanitation facilities have been constructed across the country, improving public health and hygiene.
- **Pradhan Mantri Jan Dhan Yojana:** This flagship financial inclusion program has been instrumental in providing banking services to previously unbanked sections of society. With a focus on women-led development, the scheme has witnessed significant participation, with 56% of Jan Dhan account holders being women, especially in rural and semi-urban areas.
- **Women-Led Development:** Recognizing the pivotal role of women in driving development, India's G20 presidency has prioritized women's empowerment. Policies and initiatives have been designed to foster gender equality, enhance women's participation in various sectors, and promote their overall well-being.

How India's Foreign Policy consistently prioritized working for the global public good?

- **Humanitarian Assistance and Disaster Relief:** India has a long-standing tradition of providing humanitarian assistance and disaster relief to countries in need. In times of crises India has extended its support by offering medical aid and supplies. For example, during the COVID-19 pandemic, India provided essential medical supplies to over 190 countries and shared vaccines through the Vaccine Maitri program with more than 150 countries.
- **Development Cooperation:** Through programs such as the Indian Technical and Economic Cooperation (ITEC) and the Indian Development and Economic Assistance Scheme (IDEAS), India has offered capacity building,

technical assistance, and development projects in various sectors such as agriculture, healthcare, education, and infrastructure.

- **Multilateral Engagements:** India actively collaborates with other nations to find collective solutions to issues like climate change, sustainable development, peacekeeping, and poverty eradication. India's engagement in forums such as the United Nations, G20, BRICS, and regional organizations like SAARC and ASEAN reflects its commitment to multilateralism and working towards common goals.
- **Peacekeeping Operations:** India has consistently been one of the largest contributors to UN peacekeeping missions. Indian peacekeepers have played a crucial role in maintaining peace and stability in conflict-affected regions around the world.
- **South-South Cooperation:** India actively engages in South-South cooperation, which involves sharing knowledge, experiences, and resources among developing countries. India has partnered with other developing nations to address common challenges, share best practices, and promote mutual growth and development.

Pro-Planet People's Movement

- Prime Minister Modi's call for a "pro-planet people's movement" to combat climate change epitomizes inclusivity in its true essence.
- Aligned with this year's G20 theme of Vasudhaiva Kutumbakam or One Earth, One Family, One Future, India demonstrates its holistic worldview, emphasizing collective efforts for global good.
- Derived from the ancient Sanskrit text, the Maha Upanishad, this theme underscores the interconnectedness and value of all life forms, emphasizing the planet Earth's broader universe

Inclusivity at the Core of India's G20 Presidency

- **Geographic Representation:** India has taken steps to ensure geographic inclusivity by holding G20 meetings in different locations across the country, covering all states and Union Territories.
- **African Representation:** India has actively invited African nations to participate in its G20 Presidency, demonstrating a commitment to inclusivity and engagement with the African continent. Countries such as South Africa, Comoros (African Union Chair), Nigeria, Egypt, and Mauritius have been invited, giving a strong voice to Africa within the G20 discussions.
- **Engagement of Non-G20 Members:** India has extended invitations to non-G20 member countries, regional organizations, and international organizations for specific G20 meetings. This initiative enriches the discussions by incorporating perspectives and expertise from a wider range

of stakeholders. For example, Norway, known for its expertise in the blue economy, has been invited to contribute to the G20 meeting on ocean health.

- **Regional and International Organizations:** In line with the inclusive approach, India has invited regional and international organizations to participate in specific G20 meetings. This facilitates dialogue and collaboration with organizations such as the United Nations, World Bank, IMF, and other relevant institutions.
- **People-Oriented Approach:** India's G20 Presidency adopts a people-oriented approach, encouraging the active participation and engagement of citizens. Various events, including seminars, conferences, and festivals, have been designed to involve the public and make them stakeholders in India's G20 Presidency.

22. Central Asia's Multi-Vectored Foreign Policy: Lessons for Post-Soviet

States

China recently hosted the inaugural C+C5 summit in Xi'an, which brought together the leaders of five Central Asian countries. The summit resulted in the signing of the 'Xi'an Declaration' and emphasized the Belt and Road cooperation as a new starting point for China-Central Asia relations. However, the central Asian countries have successfully implemented a multi-vectored foreign policy, balancing their engagements with various regional and international powers.

C+C5 summit

- The C+C5 stands for China plus Central Asia, indicating the participation of both China and the five Central Asian nations, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.
- The purpose of the C+C5 summit is to strengthen the relations and cooperation between China and these Central Asian countries.
- The first C+C5 summit took place in Xi'an, China, and resulted in the signing of the 'Xi'an Declaration,' which outlines the shared vision and goals for China-Central Asia cooperation.

Complex Regional Dynamics of Central Asian countries

- **Geopolitical Competition:** China's growing influence in Central Asia can be seen as a challenge to Russia's historical dominance in the region. This geopolitical competition between the two powers shapes the dynamics of China-Central Asia relations.

- **Multi-vector Engagements:** Central Asian countries pursue multi-vector foreign policies, engaging with various regional and international powers. This approach allows them to maintain balanced relations and leverage different partnerships to their advantage.

- **Regional Cooperation Organizations:** Central Asian countries are members of various regional cooperation organizations such as the Shanghai Cooperation Organization (SCO) and the Collective Security Treaty Organization (CSTO). These organizations influence the dynamics of regional interactions and shape cooperation initiatives.
 - **Economic Interests:** China's economic investments and infrastructure projects in Central Asia, driven by the Belt and Road initiative, have both positive and complex implications for the region. Balancing economic benefits with potential dependencies and competition is crucial for the Central Asian countries.
 - **Historical and Cultural Connections:** Central Asia shares historical and cultural ties with both China and Russia. These historical connections influence the perceptions, interactions, and priorities of the countries involved, impacting regional dynamics.
 - **Balancing Global Engagements:** Central Asian countries navigate their relationships with major global powers, including the European Union, the United States, and regional actors such as Turkey. Balancing these engagements is necessary to safeguard their interests and maintain stability in the region.
- Afghanistan's Impact:** The situation in Afghanistan has implications for regional dynamics in Central Asia. Stability and security concerns in Afghanistan directly affect neighboring countries and influence their interactions with external powers.

Significance of C+C5: Strengthening China-Central Asia Relations

- **'Xi'an Declaration:** The C+C5 summit held in Xi'an, China, served as a platform for leaders from China and the Central Asian countries to discuss and strengthen their bilateral relations. The summit resulted in the signing of the 'Xi'an Declaration,' which laid out a blueprint for future cooperation.

Belt and Road Cooperation: The summit focused on the 10th anniversary of the Belt and Road initiative, emphasizing its role as a new starting point for China-Central Asia cooperation. The Belt and Road initiative aims to enhance connectivity and promote economic development through infrastructure projects.

- **Cultural Silk Road Program:** The 'Cultural Silk Road' program was discussed during the summit, which aims to enhance cultural cooperation, preserve shared heritage, and promote cultural exchange between China and Central Asian countries.

□ **China-Central Asia Summit Mechanism:** The establishment of the China-Central Asia Summit mechanism during the summit paves the way for future biennial summits between the participating countries. This institutional framework ensures regular high-level engagement and facilitates ongoing cooperation.

Successes of a Multi-Vectored Foreign Policy

- **Diversified Economic Ties:** Central Asian countries have successfully diversified their economic ties through a multi-vectored foreign policy. By engaging with multiple regional and international partners, they have expanded trade relations, attracted foreign investments, and accessed various markets.

□ **Enhanced Diplomatic Influence:** A multi-vectored foreign policy allows Central Asian countries to expand their diplomatic influence. By cultivating relationships with different actors, they can assert their interests, advocate for regional stability, and participate actively in international forums.

□ **Balancing Regional Security:** Central Asian countries have effectively balanced regional security concerns through multi-vectored foreign policies. By cooperating with different security organizations and partners, such as the Shanghai Cooperation Organization (SCO), Collective Security Treaty Organization (CSTO), and Russia, they have successfully managed common security challenges, including terrorism, extremism, and drug trafficking. **Preserving Sovereignty:** Pursuing a multi-vectored foreign policy allows Central Asian countries to maintain their sovereignty and independence. By engaging with multiple actors, they prevent overreliance on any single power and safeguard their decision-making autonomy in international affairs.

□ **Regional Cooperation Initiatives:** Central Asian countries have actively participated in regional cooperation initiatives and organizations, such as the SCO and the Central Asia Regional Economic Cooperation (CAREC) program.

□ **Improved Resilience and Flexibility:** Central Asian countries' multi-vectored foreign policy has made them more resilient and adaptable in the face of changing geopolitical dynamics. By diversifying their partnerships, they can navigate shifting regional dynamics and respond effectively to evolving challenges and opportunities. **Peaceful Coexistence:** The success of a multi-vectored foreign policy in Central Asia highlights the region's ability to maintain peaceful coexistence among major regional and global powers. By pursuing balanced engagements, Central Asian countries contribute to stability, reduce tensions, and promote cooperation between different actors.

Conclusion

- The C+C5 summit and the successful implementation of a multi-vectored foreign policy by Central Asian countries highlight the importance of balanced regional engagements. As Georgia and Moldova strive for EU/NATO membership, they should embrace a multi-vectored approach to ensure regional stability and security. Only through this pragmatic path can lasting peace be achieved, despite existing challenges and geopolitical complexities.

23. Political Clearance

Delhi Education Minister who was invited by Cambridge University to speak at a conference, has been cleared by the Centre to travel to the UK.

Political clearance

- The *Ministry of External Affairs* (MEA) issues political clearance.
- It is required for *any government servant* including public servants who is seeking to go abroad.
- Without this clearance, no public servant can travel overseas.

What is the process?

- The government servants apply for political clearance to Ministry of External Affairs (MEA).
- Since 2016, applications can be made on the portal epolclearance.gov.in.
- Applications are processed and cleared after coordination among various divisions of the Ministry.
- **Decision** - The decision on political clearance is taken based on several factors, including
 - The nature of the event.
 - Level of participation from other countries.
 - Nature of the invitation.
 - India's relations with the host country.
- **Rejection** - The requests by CMs (and ministers) for political clearance can be denied based on above such factors by the MEA.
- **Issues** - Dilatory system of MEA
- MEA's sole right to decide on the suitability, desirability, and level of participation of Indian officials in engagements abroad.

Who needs political clearance?

- **Public Servants** - All Chief Ministers and Ministers of states and Union Territories are required to obtain political clearance from the Centre before their travel abroad.
- Prior political clearance and FCRA (Foreign Contribution Regulation Act) clearance are mandatory for them.
- The Cabinet Secretariat and the Ministry of External Affairs should be kept informed of their proposed *official and private* foreign visit.
- A copy of the application must be sent to the Secretary, Department of Economic Affairs (DEA).
- **Judges** - For official visits, a judge of the Supreme Court or a state High Court has to obtain clearance *from the Chief Justice of India*.
- Then the proposal is sent to the *Department of Justice (DoJ)* in the Union Ministry of Law and Justice.
- The DoJ issues approval after taking
 - Political clearance from the MEA and
 - In some cases FCRA clearance from the Home Ministry (where FCRA is involved).
- However, the personal travel of judges of the higher judiciary do not require such clearances.

The MEA issued an office memorandum that required Supreme Court and high court judges to seek political permission for private visits abroad in 2021. The court quashed the office memorandum in 2022.

Do government servants need any additional clearances?

- **Ministers** - Union ministers need clearance from the Prime Minister's Office in addition to the political clearance from the MEA for both official and personal trips.
- **Non-executive MPs** - Only for the *official trips*
 - Members of Lok Sabha need clearance from the Speaker
 - Rajya Sabha need clearance from the Chairperson (Vice President of India)
- **Bureaucrats** - For government employees, all foreign trips, official or personal, need approval.
- For officers up to the rank of Joint Secretary, clearance is given by the Minister concerned, after the MEA's political clearance.
- For officers above that rank, the proposal is approved by a screening committee of secretaries.
- **FCRA** - Rules for clearance vary according to the duration of the visit, the country being visited, and the number of members in the delegation.

- If the visiting Indian official is hosted by organisations other than those of the United Nations, Foreign Contribution Regulation Act (FCRA) clearance is needed from the Home Ministry.

24. Global Nuclear Arsenal Expansion Race

- **China's nuclear arsenal:** China increased its nuclear arsenal from 350 warheads in January 2022 to 410 warheads in January 2023, according to SIPRI.
- **Potential ICBM parity:** SIPRI suggests that depending on how China structures its forces, it could have a comparable number of intercontinental ballistic missiles (ICBMs) to the U.S. or Russia by the end of the decade.
- **Concerns over stated aim:** SIPRI's Weapons of Mass Destruction Programme questions the alignment between China's expanding nuclear arsenal and its declared goal of maintaining minimum nuclear forces for national security.

India and Pakistan's Nuclear Arsenal Growth

- **India's nuclear arsenal:** SIPRI estimates indicate that India's nuclear arsenal grew from 160 warheads in 2022 to 164 warheads in 2023.
- **Pakistan's nuclear arsenal:** SIPRI estimates that Pakistan's nuclear arsenal increased from 165 warheads in 2022 to 170 warheads in 2023.
- **Emphasis on longer-range weapons:** India seems to be placing growing importance on longer-range weapons capable of reaching targets across China, while Pakistan remains the primary focus of India's nuclear deterrent.

Global Nuclear Weapons Inventory

- **Total global inventory:** As of January 2023, the global inventory of warheads reached 12,512.
- **Warheads in military stockpiles:** Approximately 9,576 warheads were held in military stockpiles for potential use, representing an increase of 86 warheads compared to January 2022.
- **Dominance of Russia and the U.S.:** Russia and the U.S. collectively possess nearly 90% of all nuclear weapons.
- **Stability in nuclear arsenals:** The size of Russia's and the U.S.' nuclear arsenals remained relatively stable in 2022, although transparency regarding nuclear forces declined due to the Ukraine conflict, as noted by SIPRI.

Reasons for increased stockpile

- **Shifting power dynamics:** China's significant expansion of its nuclear arsenal has implications for global power dynamics, potentially challenging the traditional dominance of the U.S. and Russia in the nuclear arena.
- **Regional security concerns:** China's increased nuclear capabilities raise concerns among neighboring countries, particularly those involved in territorial disputes or security rivalries in the Asia-Pacific region.
- **Global arms race:** China's nuclear arsenal growth may fuel an arms race in the region, leading to increased tensions and instability.

Nuclear Dynamics in South Asia

- **Strategic rivalry between India and Pakistan:** The nuclear arsenals of India and Pakistan continue to expand, reflecting the ongoing strategic competition and deterrence dynamics between the two countries.
- **Escalation risks:** The increase in nuclear capabilities in South Asia raises the potential for miscalculation and escalation, heightening the risk of a nuclear conflict in the region.
- **Implications for regional stability:** The growth of nuclear arsenals in India and Pakistan has wider implications for regional stability and the effectiveness of non-proliferation efforts.

Challenges to the Global Disarmament ideals

- **Declining transparency:** The decline in transparency regarding nuclear forces in Russia and the U.S., coupled with the overall increase in global warhead stockpiles, poses challenges to nuclear arms control and disarmament efforts.
- **Erosion of trust:** The lack of transparency and increased stockpiles undermine trust between nuclear-armed states, making it more difficult to achieve meaningful progress in disarmament negotiations.
- **Need for renewed dialogue:** The growing nuclear arsenals underscore the importance of revitalizing international dialogue on disarmament and strengthening existing arms control agreements.

Legacy issues

- **Notion of Nuclear 'Haves' and 'Have-Nots':** The proponents of disarmaments are themselves nuclear armed countries thus creating a nuclear monopoly.
- **Concept of Peaceful Nuclear Explosion (PNE):** conducted for non-military purposes such as mining.

India's commitment for de-nuclearization

- **Universal commitment and non-discriminatory framework:** India advocates for nuclear disarmament based on principles of equality, non-discrimination, and global security.
- **Working paper on Nuclear Disarmament:** India submitted a working paper on Nuclear Disarmament to the UN General Assembly in 2006, presenting its perspectives and proposals for achieving global disarmament.
- **Participation in Nuclear Security Initiatives:** India actively engages in the Nuclear Security Summit process and supports efforts to enhance global nuclear security through participation in international conferences organized by the IAEA.
- **Membership in the Nuclear Security Contact Group:** India is a member of the Nuclear Security Contact Group, contributing to discussions and initiatives aimed at strengthening international cooperation on nuclear security.
- **Support for Fissile Material Cut-off Treaty (FMCT):** India expresses readiness to support negotiations on a Fissile Material Cut-off Treaty, considering it an important step towards disarmament by banning the production of fissile material for nuclear weapons.
- **Concerns regarding the Comprehensive Nuclear-Test-Ban Treaty (CTBT):** India has not joined the CTBT due to several concerns, but it remains open to addressing these concerns and exploring possibilities for future accession to the treaty.
- **Leadership in Preventing Weapons of Mass Destruction (WMD) Proliferation:** India actively leads efforts to prevent terrorists from acquiring WMDs, piloting an annual UNGA Resolution on “Measures to Prevent Terrorists from Acquiring Weapons of Mass Destruction” since 2002, which receives consensus adoption.

Way forward

- **Strengthening non-proliferation efforts:** The expansion of nuclear arsenals highlights the need for robust non-proliferation mechanisms and adherence to international agreements such as the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).
- **Managing nuclear risks:** As the number of nuclear-armed states increases, effective risk management and confidence-building measures become crucial to prevent accidental or intentional use of nuclear weapons.
- **Balancing deterrence and disarmament:** The international community faces the challenge of striking a balance between maintaining credible deterrence and pursuing disarmament goals to ensure global security.

25. Indo-US cooperation in agriculture

Prime Minister Narendra Modi is visiting the US for strengthening the 'global strategic partnership' between the two countries.

India-U.S. Global Partnership all about

- India-U.S. bilateral relations have developed into a "global strategic partnership", based on shared democratic values and increasing convergence of interests on bilateral, regional and global issues.
- The emphasis placed by the Government in India on development and good governance has created opportunity to reinvigorate bilateral ties and enhance cooperation.
- The summit level joint statement issued in June 2016 called the India-U.S. relationship an "Enduring Global Partners in the 21st Century".

How did the U.S. help India in the past?

- The United States played a vital role in India's agricultural development during the 1950s and 1960s.
- While the Soviet Union drove its industrialisation in the 1950s and 1960s, the US paved the way for India's Green Revolution.
- Through the establishment of agricultural universities and the Green Revolution US involved in the agricultural development of India.

How did the US help with India's agricultural universities?

- **Indian Universities** - The agricultural and veterinary colleges in India merely taught and produced graduates.
- Research and extension (training farmers in adopting scientific cultivation practices) was largely left to the state agricultural departments.
- **American Universities** - In 1950, Major H.S. Sandhu and the Uttar Pradesh's Chief Secretary A.N. Jha saw the land-grant universities during their US visit.
- **Land-grant University** - These institutions, set up on public land, integrated teaching, research and extension activities.
- **Transformation** - On their return, the two officials recommended US land-grant model agricultural university to be established in the Tarai region of the Himalayan foothills to the then Chief Minister of UP G.B. Pant.
- H.W. Hannah, Associate Dean of the University of Illinois, prepared a 'Blueprint for a Rural University in India'.

- **First Agri University** - Based on the blueprint, the UP government made available 14,255 acres of land and passed the UP Agricultural University Act of 1958.
- The UP Agricultural University (later renamed as G.B. Pant University of Agriculture & Technology) was inaugurated in 1960.

How the U.S. helped in establishing land-grant universities in India?

- The Indian Council of Agricultural Research (ICAR) published the blueprint and circulated to interested state governments.
- It led to as many as 8 agricultural universities coming up within eight years.
- **US Association** - All the 8 universities received the US Agency for International Development's assistance for training of faculty and provision of equipment and books.
- Specialists from the linked US land-grant institution were involved in curriculum design and putting in place research and extension systems in the new universities.
- The universities were to have their own research farms, regional stations and sub-stations, and seed production facilities.

G.B. Pant University, from 1969, also began marketing its seeds under the 'Pantnagar' brand.

How the U.S helped India's Green Revolution?

- **Traditional variety** - Traditional wheat and rice varieties were tall and slender.
- They grew vertically on application of fertilizers and water, when their ear-heads were heavy with well-filled grains they "lodge" (bending over or even falling).
- **Dwarf varieties** - The Green Revolution entailed breeding semi-dwarf varieties with strong stems that didn't lodge.
- **Properties** - Can tolerate high fertilizer application.
- More output (grain) is produced, when more inputs (nutrients and water) are given.
- Do not lodge when they are filled with grains.

- An American biologist S.C. Salmon identified 'Norin-10', a Japanese wheat variety which grew to only 2-2.5 feet.

- Norman Borlaug crossed this with the spring wheats grown in Mexico and released many varieties of spring wheat with Norin-10 dwarfing genes.
- M.S. Swaminathan got in touch with Borlaug and requested spring wheat seeds containing the dwarfing genes.
- Borlaug sent the seeds of four Mexican wheat varieties bred by him, which were first sown in the trial fields.
- By 1966-67, farmers were planting these dwarf varieties in large scale.
- India, from being an importer, turned self-sufficient in wheat.

M.S. Swaminathan - Father of Indian green Revolution; Norman Borlaug - Father of Green Revolution

Why did the US help India?

- **Cold War** - The Cold War geopolitics and great-power rivalry in the 60's resulted in competition to do-good between the cold-war nations.
- **The USSR** - The Soviet Union promoted its industrialization in India at that time through supply of capital equipment and technology.
- **The US** - Extending to 'fighting world hunger' and sharing of knowledge and plant genetic material were viewed as 'global public goods'.
- The U.S. took this route along with Rockefeller and Ford Foundations.
- The idea of an MSP and a market at closer proximity was first pushed by a Ford Foundation team's report of 1959.
- The strategy of "non-alignment" of India paid off and by the 70s and early-80s, India had built a robust indigenous crop breeding programme.

26. CoWIN data leak

In one of the largest data breaches in India, data of several Indians vaccinated against Covid-19 was leaked on a Telegram bot.

Background of the issue

- **Data leak** - The leak was of data stored on the CoWIN portal.
- The portal is a government-funded online platform that was created to record personally identifiable information about those vaccinated against Covid-19.
- **Personal info** - It includes name, gender & birth details, as well as Aadhaar numbers, PAN cards, passport numbers, voter ids, and details of the vaccination centre in which a person was immunised.

- The data bot was offered by a Telegram channel called hak4learn, which frequently provides hacking tutorials.
- However, the telegram bot has now been taken down.

Data protection

- **Data protection** - It is the process of safeguarding important information from corruption, compromise or loss.
- The importance of data protection increases as the amount of data created and stored continues to grow at unprecedented rates.
- There is also little tolerance for downtime that can make it impossible to access important information.
- Consequently, a large part of a data protection strategy is ensuring that data can be restored quickly after any corruption or loss.

What is the difference between personal data & non-personal data?

Personal Data	Non-Personal Data
<ul style="list-style-type: none"> • Personal data is any information that relates to an identified or identifiable living individual. • Different pieces of information, which collected together can lead to the identification of a particular person, also constitute personal data. 	<ul style="list-style-type: none"> • In its most basic form, non-personal data is any set of data which does not contain personally identifiable information. • This in essence means that no individual or living person can be identified by looking at such data.

CoWIN

- **eVIN** - India has been using a vaccine intelligence system called eVIN, which provides real-time feedback of vaccine stocks, power outages, temperature fluctuations etc.
- **Covid vaccination** - CoWIN is essentially an extension of eVIN and is a cloud-based IT solution for planning, implementation, monitoring, and evaluation of Covid-19 vaccination in India.
- It displays booking slots of COVID-19 vaccine available in the nearby areas and can be booked on the website.

Was there a really a data breach?

- The Ministry of Electronics and Information Technology has not explicitly clarified whether or not the CoWIN database was breached recently or in the past.
- While the Ministry said that it has adequate security measures to protect CoWIN's database, at no point has it said the database itself has not been impacted.
- This only leaves the possibility that the Telegram bot was not scraping data from CoWIN in real time.

What is the Centre's defence?

- **Data access** - The Ministry of Health press release first lays out the three ways in which data on CoWIN can be accessed:
 1. A user can access their data on the portal through a onetime password (OTP) sent to their mobile number.
 2. A vaccinator can access data of a person, and the CoWIN system tracks and records each time an authorised user accesses the system.
 3. Third party applications that have been provided authorised access of CoWIN APIs can access personal level data of vaccinated people after OTP authentication.
- Then it claims that without an OTP, data cannot be shared with the Telegram bot.
- However, there is one API that has a feature of sharing the data by using just a mobile number.

API stands for Application Programming Interface and it refers to any software with a distinct function.

- This API only accepts requests from a trusted API that has been whitelisted by the CoWIN system.
- Hence, there is no clarity on what this trusted API does and why it has been afforded the privilege of bypassing the entire OTP mechanism.

What are the implications of the breach?

- The Health Ministry has asked CERT-In to look into this issue and submit a final report.
- The Ministry is yet to receive a final report on the incident from CERT-In on the issue.
- As such, it would be premature to disprove a breach until CERT-In explicitly states that in its report.

National Data Governance policy has been finalised that will create a common framework of data storage, access and security standards across all of the government.

What are current legal provisions for privacy and data leaks?

- The data protection bill remains in draft stage.
- Every draft is more diluted than the previous one and gives more relaxation to the state.
- The state needs to gain the trust of users. And it is failing miserably there.

What is the way forward?

- The problem is that the level of awareness about all this is very low in India and there is so much potential for misuse.
- The government is trying to project itself as a big player in digital technology.
- However, it does not have the capacity or competence at this point of time to protect its own database.
- If there is no protection provided to users, we will continue to see such data leaks.

27. Strengthening the ICDS Scheme

The high prevalence of stunting, wasting, and anaemia continues to pose public health risks for children and women in India.

Integrated Child Development Service (ICDS) Scheme

- The ICDS Scheme providing for supplementary nutrition, immunization and pre-school education to the children is a popular flagship programme of the government.
- Launched in 1975, it is one of the world's largest programmes providing for an integrated package of services for the holistic development of the child.
- ICDS is a *centrally sponsored scheme* implemented by state governments and union territories.
- The *scheme is universal* covering all the districts of the country.
- The ICDS targets children aged 0-6 years, pregnant women, and lactating mothers.
- It also addresses non-formal pre-school education and breaks the cycle of malnutrition, morbidity, and mortality.

- The Scheme has been renamed as Anganwadi Services and the services are now offered as part of the Saksham Anganwadi and Poshan 2.0.

Findings from recent studies on ICDS scheme

- **Positive impact** - The ICDS's has positive impact on cognitive achievements, especially among girls from economically disadvantaged families.
- **Completed more grades** - The children who were exposed to ICDS during the first three years of life completed 0.1-0.3 more grades of schooling than those who were not.
- **Increased school enrolment** - The adolescents aged 13-18, who born in villages with proper ICDS implementation, showed a 7.8% increased likelihood of school enrolment.

Status of Anganwadi works in ICDS scheme

- Even after 4 decades of relentless efforts, the ICDS still faces the herculean task of providing the nutritional and health outcomes for children aged 0-6 years.
- **Empower Anganwadi workers** - A significant first step towards fortifying the programme is to empower Anganwadi workers.
- Though the cornerstone of the ICDS, they are frequently stretched beyond their limits.
- As principal operatives in the Poshan 2.0 initiative, these workers bear the onus of advancing child nutrition, health, and education in their communities.
- **Roles** - It varies widely from employing modern technology, to practical tasks such as delivering health education, managing feeding programmes, and liaising with healthcare professionals.

Why empowering Anganwadi workers is the need of the hour?

- Adding additional Anganwadi worker could yield at few advantages.
 1. It would lead to better health and educational outcomes.
 2. Double the net preschool instructional time, which led to improvements in math and language test score for children.
 3. Children who remained enrolled also exhibited reduced rates of child stunting and severe malnutrition.
 4. The cost of a nationwide roll-out of this model is relatively insignificant in comparison to the potential advantages it offers.
 5. The new Anganwadi worker can be given the responsibility of concentrating only on preschool and early childhood education.

6. Apart from improving the well-being of rural communities, this would create job opportunities for local residents, particularly women.
7. It would lead to the creation of 1.3 million new jobs for women across India.

What are the implications?

- The operationalisation of the Saksham Anganwadi and Poshan 2.0 proposal hinges on its status as a Centrally Sponsored Scheme.
- **Scheme overseen** - State governments oversee its execution, including administration, management, and monitoring.
- **Recruitment** - Consequently, Anganwadi worker recruitment falls under their jurisdiction, guided by regulations and region-specific criteria.
- This decentralised approach promotes tailored, efficient implementation.
- The Government of India provides funds for Anganwadi workers' and helpers' honorariums on a cost-sharing basis.

What is the way forward?

- The urgent need for infrastructural improvement in India's Anganwadi centers cannot be overstated.
- The 2.5 lakh Anganwadi centres operate without functional sanitation facilities and 1.5 lakh centres lack access to potable water.
- Approximately 4.15 lakh Anganwadi centers do not possess their own pucca building.
- To unlock the ICDS' full potential and address persistent issues, it is essential to revisit and re-evaluate its strategies and implementation.
- Empowering Anganwadi workers is just a start.

28. Ladakh's Demand for Sixth Schedule

The Ministry of Home Affairs (MHA) will meet civil society leaders from Ladakh amid persistent demands and protests in the Union Territory for statehood and constitutional safeguards under the sixth schedule of the Constitution.

Ladakh

- Ladakh is a region in the northernmost part of India, bordering China and Pakistan.
- The region is home to several ethnic groups, including the Ladakhi people, who are predominantly Buddhist.

Demand for Sixth Schedule in Ladakh

- There has been a demand from the local tribal communities in Ladakh to extend the provisions of the Sixth Schedule to the region.
- The demand has been primarily driven by concerns over the protection of tribal rights and the preservation of the unique cultural identity of the local communities.

Current administration in Ladakh

- Ladakh was granted Union Territory status in 2019, following the bifurcation of the state of Jammu and Kashmir into two separate Union Territories.
- The administration of Ladakh is currently governed by the Lieutenant Governor of Ladakh and an elected Ladakh Autonomous Hill Development Council (LAHDC).

Benefits of Sixth Schedule in Ladakh

- **Meeting tribal aspiration:** The Parliamentary standing committee recommended including of Ladakh in the Sixth Schedule because its tribal communities account for 79.61% of its total population.
- **Autonomy and self-governance:** The extension of the Sixth Schedule to Ladakh could provide greater autonomy and self-governance to the local tribal communities.
- **Cultural preservation:** It could also help to protect the unique cultural identity of the local communities and preserve their traditional practices and customs.

Challenges to this demand

- **No further fragmentation:** The demand to extend the Sixth Schedule to Ladakh has faced some opposition from certain quarters, who argue that it could lead to further fragmentation of the region and create new administrative challenges.
- **Losing political capital:** There are also concerns over the potential impact of the demand on the political and administrative structure of the region.

Conclusion

- Overall, the demand to extend the provisions of the Sixth Schedule to Ladakh is a complex issue that requires careful consideration of the needs and aspirations of the local tribal communities, as well as the broader political and administrative context of the region.

29. COVID's impact on Child Labour

The economic downturn and huge health costs triggered by the pandemic have increased the number of child labours across the country.

Child labour in India

- The Child Labour (Prohibition and Regulation) Act of 1986 defines 'child' as any person below the age of 14.
- Child labour is the employment of a Child in any employment including as a domestic help.
- It does not include helping own family in non-hazardous occupations.

Government initiatives to prevent child labour

- **Constitutional provision - Article 21A** of the Indian Constitution was added to prevent child labour and provide free education to them.
- It mandates that the State shall provide free and compulsory education to all children of the ages of 6-14 years in the manner prescribed by the State.
- **Legal Provision - The Right of Children to Free and Compulsory Education (RTE) Act of 2009**, gave affect to this constitutional provision.
- 'Compulsory Education' casts an obligation on the appropriate authorities to ensure admission and sustenance of compulsory elementary education for such children.

How Covid-19 has impacted the vulnerable sections of India?

- The Covid-19 pandemic has brought the world to its knees.
- The pandemic exposed multiple fault-lines in the healthcare, education, economic, and job-related sectors.
- The effect of the pandemic has been deep and long lasting among the marginalised sections of society, especially women and children.
- **Effects** - Households in poor economic conditions were pushed to the brink of poverty.
- These conditions have exacerbated the social inequities.
- These conditions have exposed women and children to abuse, violence and lack of security.

How Covid-19 has impacted child labour in India?

A 2022 report by UNICEF and ILO said that as COVID has put children at risk of child labour globally.

Child Labours in India pre and post pandemic

According to 2011 Census data, there were 10.1 million child labourers in India.

- As per the National Crime Bureau Report 2022, in 2021, around 982 cases were registered under the Child Labour (Prohibition and Regulation) Act, 1986.
- The highest number of cases were registered in Telangana, followed by Assam.
- The figures saw a significant increase from 476 cases registered under the Act in 2020.

- **Adolescents** - The RTE Act leaves the children between the ages of 14-18 years (adolescents) out of its purview.
- Moreover, the Child Labour Act allows adolescents to engage in work if it does not qualify under hazardous occupations.
- This section of the children become most prone to the perils of child labour.
- **Breadwinners** - The pandemic triggered economic downturn has put excessive pressure on children to be income earners for the family.
- **Reasons**
 - Adult family members have lost their jobs
 - Adult family members have not survived the pandemic.
 - Catastrophic health costs associated with the pandemic
- **Hazardous occupations** - The above reasons has driven children to take up work in exploitative and hazardous circumstances.
- Closure of schools globally has also led to a surge in child labour around the world.

What should be done to the rescued child labours?

- **Post-rescue Rehabilitation** - Children after rescued from the jobs where they were employed illegally should be given rehabilitation.
- Rehab ensuring that they do not once again get trapped in that cycle of exploitation.
- The children after rescue from labour should be integrated and assimilated into the education system to build a better future for them.
- District and local administrations have to take proactive steps to ensure this part.

- **Implementation of RTE** - A stronger implementation of RTE, in terms of mobilisation of resources and all the actors in the ecosystem along with a robust infrastructure.
- **Awareness at hotspots** - Literacy awareness programmes targeting primary education for children must be undertaken by local authorities, especially in regions where the number of child labourers is high.
- **Including adolescents** - These rehab and awareness programmes must also consider adolescents who are not covered by RTE and are forced to work in hazardous environments.
- **Synergy of policies** - Policies amplifying the spread of education and curtailing child labour should be cohesive and complementary in nature.
- **Mental health** - The special care and protection for these children should be extended taking their mental and physical immaturity into account.

30. Railway safety- Listen to the voices from Below

This article discusses the “Railways safety system” in India in the context of the recent major rail accident of 2nd June 2023.

- The recent rail accident in Odisha, which claimed the lives of many, has started a discussion in the country as to why and how it happened, who exactly is responsible for this and how it can be prevented in the future.
- An inquiry commission was set up by the Commission of Railway Safety to look into the matter but this inquiry was assigned to the CBI later on.

What needs to be done?

- Since the railway system operates over a huge geographical area, it requires perfect coordination among all its departments.
- Regular field inspections by the concerned authorities play a crucial role in this regard.
- These types of incidents also highlight the need for trust between the higher management and lower levels. It has also been quoted in the Confidential Incident Reporting and Analysis System (CIRAS) – a system developed by a British university in the 1990s.
- We should keep in mind that in spite of a significant increase in freight load and passenger traffic in India, the number of such accidents and derailments has declined from around 350 per year to around 22 over the last two decades. It clearly shows that the overall safety performance of the railways has improved.
- It also proves that the use of advanced technology has been beneficial and we should enhance it more.

Way Forward:

- Government should work on policies and measures to take the number of such incidents to zero by enhancing safety regulations and standards for railway infrastructure, rolling stock, signalling systems, and operational procedures.
- The management needs to change the attitude from “fault-finding” to “shared-commitment” by developing better communication and coordination between different departments and levels of management within the railway system.
 - Promote a culture of reporting and sharing information on potential safety hazards.

31. QUAD Leaders' Summit 2023

Prime Minister of India participated in the third in-person Quad Leaders' Summit in Hiroshima, Japan held in May 2023.

QUAD

- The Quadrilateral Group consisting of India, Australia, Japan and the U.S. was formed in 2017.
- It aims to strengthen the defence and security cooperation amongst the four countries.
- It was proposed by the former Japan's Prime Minister, Shinzo Abe in 2007 to check China's growing influence and assertiveness in the Indo-Pacific region.
- It has a shared objective to ensure and support a "free, open and prosperous" Indo-Pacific region.



QUAD 2023 Summit

- The Leaders of the QUAD countries participated in person in the Summit held at Tokyo, Japan.
- The Summit demonstrated the QUAD'S solidarity and commitment to the common vision of Free, Open, and Inclusive Indo-Pacific (FOIP) and an international order based on the rule of law.
- A joint statement on all important issues discussed at the Summit was issued.
- Announced six initiatives to strengthen the resilience and prosperity of the Indo-Pacific region.

Outcomes of Tokyo QUAD Summit

- The initiatives announced in the Summit complements the development priorities of the Indo-pacific region.
1. **Clean Energy Supply Chains Initiative** to facilitate research and development and support the Indo-Pacific's energy transition.

- The Quad Principles of Clean Energy Supply Chains were approved to guide engagement with the region on clean energy supply chain development.
- 2. **'Quad Infrastructure Fellowships Programme'** to support policy makers and practitioners in the region to design, build and manage sustainable and viable infrastructure in their countries.
- 3. **'Partnership for Cable Connectivity and Resilience'** to leverage QUAD's collective expertise in undersea cables to secure and diversify these critical networks.
- 4. QUAD support for a **small-scale ORAN** deployment in Palau, the first in the Pacific region.
- They also released the ORAN Security Report to support industry investment in open, interoperable and secure telecom platforms.
- 5. **QUAD Investors' Network (QUIN)** has been launched as a private sector led platform to facilitate investments in strategic technologies.
- 6. The **Indo-Pacific Partnership for Maritime Domain Awareness**, announced at 2022 Summit had notable progress.
- Data sharing with partners in South East and the Pacific under this programme is underway and would soon include partners in the Indian Ocean Region.

Concerns expressed in 2023 summit

- **Russia-Ukraine war** - In a joint statement the QUAD countries express their deep concern over the Ukraine war.
- However, in the joint statement, they did not condemn or criticise Russia for its invasion of Ukraine.
- **Stand of Countries** - India has so far refrained from condemning or criticising Russia for its invasion while other 3 countries have regularly condemned Russia.
- With strong ties with Russia in defence and energy, India had earlier resisted any strong language in Quad joint statements.
- **Consistency** - All the 4 countries stood for adherence to international law, respect for territorial integrity and UN principles.
- The quad particularly emphasised the UN Convention on the Law of the Sea (UNCLOS), and the maintenance of freedom of navigation and overflight, especially in the East and South China Seas.
- **Implicit reference to China** - The statement did not mention China by name but gave implicit reference to China for its dominance in Indo-Pacific.

- The 4 countries strongly opposed destabilising or unilateral actions that seek to change the status quo by force or coercion in the Indo-Pacific region.
- **Indo-Pacific** - The Quad asserted and called for peace and stability in the Indo-Pacific where no country dominates and no country is dominated.
- **Anti-terrorism** - The Quad strongly condemned the acts of terrorism including the 26/11 attacks in Mumbai and Pathankot.

Future ideas and actions of QUAD

- **Shared Values** - Quad was moving forward with a constructive agenda based on shared democratic values.
- Through shared efforts, the QUAD countries are giving a practical dimension to their vision for a free, open, and inclusive Indo-Pacific.
- **Designation of terrorists** - The countries stressed their commitment to pursuing designations of terrorists, as appropriated by the UNSC 1267 Sanctions Committee.
- **Continuation** - Ensuring that the Quad will continue to support access to quality, sustainable and climate-resilient infrastructure investments in the region as indicated at the 2022 Quad Leaders' Summit.

32. BIMSTEC to adopt Bangkok Vision 2030

- The upcoming Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) summit, scheduled to be held at the end of this year, is set to adopt the Bangkok Vision 2030.
- This comprehensive document will provide direction to the organization and guide the eminent person group.
- Additionally, the summit is expected to conclude a marine transport cooperation agreement.

Bangkok Vision 2030?

- The Bangkok Vision 2030, proposed by Thailand, aims to propel BIMSTEC towards a prosperous, resilient, and open region, fostering sustainable and balanced growth.
- The vision seeks to advance BIMSTEC as a prosperous, resilient, and open region.
- It emphasizes sustainable and balanced growth, adapting to rapid changes in the regional and global architecture.

Key agenda of the vision document

(1) Synergizing economy and connectivity

- Thailand, as the lead country in connectivity, aims to create a seamless network of interconnectedness.
- The 10-year master plan covers various sectors, including roads, railways, civil aviation, maritime transport, and multi-modal infrastructure.
- The recent agreement on maritime transport cooperation marks a significant milestone.

(2) Synergy with ASEAN

- Thailand emphasizes the need for synergy between the master plans of BIMSTEC and the Association of Southeast Asian Nations (ASEAN).
- This collaboration aims to promote the growth and development of the entire region.

Understanding BIMSTEC

- BIMSTEC consists of seven member countries, including Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand.
- Its geographical scope covers the littoral and adjacent areas of the Bay of Bengal, creating a contiguous regional unity.
- BIMSTEC acts as a bridge between South and Southeast Asia, linking the ecologies of the Great Himalayas and the Bay of Bengal.
- The organization focuses on creating an enabling environment for rapid economic development, accelerating social progress, and fostering collaboration on common interests.

Evolution and Expansion of BIMSTEC

- BIMSTEC was established in 1997 through the Bangkok Declaration with four member states: Bangladesh, India, Sri Lanka, and Thailand (BIST-EC).
- The inclusion of Myanmar in 1997 led to the renaming of the organization as BIMST-EC.
- Nepal and Bhutan became members in 2004, resulting in the current name, the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).

Institutional Mechanisms of BIMSTEC

- **BIMSTEC Summit:** The highest policymaking body, comprising heads of state/government of member states.
- **Ministerial Meeting:** The second apex policy-making forum attended by External/Foreign Ministers.
- **Senior Officials' Meeting:** Representatives from foreign ministries of member states.

- **BIMSTEC Working Group:** Monthly meetings attended by ambassadors or representatives at the BIMSTEC Secretariat in Dhaka.
- **Business Forum & Economic Forum:** Forums encouraging private sector participation.

Potential of BIMSTEC

- **Reinforcement of Relations:** BIMSTEC strengthens relationships between countries in South and Southeast Asia, fostering increased trade, investment, and cultural exchanges.
- **Indo-Pacific Epicenter:** The Bay of Bengal region has the potential to become the epicentre of the Indo-Pacific idea, facilitating dialogue and engagement among major powers from East and South Asia.
- **Intra-Regional Cooperation:** BIMSTEC acts as a bridge between SAARC and ASEAN, providing a platform for member countries to collaborate, promote economic integration, and develop shared goals.
- **Engine of Economic Growth:** BIMSTEC's significant population (1.5 billion) and combined GDP of USD 3.8 trillion make it a driving force for economic growth and cooperation.
- **Facilitating Global Trade:** The Bay of Bengal region, facilitated by BIMSTEC, plays a crucial role in global trade, with approximately one-fourth of the world's traded goods passing through the region.
- **Key Connectivity Projects:** BIMSTEC actively participates in projects like the Kaladan Multimodal Project, Asian Trilateral Highway, and BBIN Motor Vehicles Agreement to improve connectivity and promote trade within the region.

Significance of BIMSTEC for India

- **Alignment with Core Policies:** BIMSTEC aligns with India's policies of prioritizing neighboring countries, expanding engagement with Southeast Asia, and promoting the development of northeastern states.
- **Countering China's Influence:** BIMSTEC provides India with a platform to counterbalance China's growing influence in the Bay of Bengal region, ensuring a more balanced regional order.
- **Alternative Engagement Platform:** BIMSTEC serves as an alternative platform for India to engage with South Asian countries when progress in SAARC is hindered, fostering regional cooperation and development.

Key challenges with BIMSTEC

- **Very few meetings:** Limited progress due to infrequent summits and ministerial meetings.

- **No key player:** Varying levels of commitment among member states, with some countries focusing more on ASEAN than BIMSTEC.
- **No specific goal:** Balancing cooperation across 14 areas of collaboration and maintaining efficiency in specific focus areas.
- **Individual differences:** Addressing conflicts and crises between member nations, such as the Rohingya crisis and border conflicts.
- **Parallel initiatives:** Navigating the presence of the Bangladesh-China-India-Myanmar (BCIM) Forum, which raises doubts about BIMSTEC's exclusive potential.
- **Deadlock over geo-economics:** Challenges in achieving a comprehensive Free Trade Agreement (FTA) and unfinished projects hinder economic cooperation.

Way forward

- **Effective Implementation:** Ensure the effective implementation of the Bangkok Vision 2030, aligning national development plans and establishing monitoring mechanisms to track progress and address challenges.
- **Strengthening Connectivity Initiatives:** Prioritize the completion of ongoing connectivity projects like the Kaladan Multimodal Project, Asian Trilateral Highway, and BBIN Motor Vehicles Agreement to enhance regional connectivity.
- **Promoting Trade and Economic Cooperation:** Foster a conducive environment for trade, remove barriers, and promote seamless movement of goods and services to facilitate trade and economic cooperation within BIMSTEC.
- **Collaboration on Sustainable Development Goals (SDGs):** Align the Bangkok Vision 2030 with the SDGs, identify priority areas, and share best practices to promote sustainable and inclusive growth.
- **Strengthening Institutional Mechanisms:** Enhance the functioning of BIMSTEC's institutional mechanisms, regularize scheduling, and strengthen the role of the BIMSTEC Secretariat.
- **Collaboration with External Partners:** Explore partnerships with external partners, regional organizations, and international development agencies to leverage resources and technical assistance for priority projects.

33. UK launches Developing Countries Trading Scheme (DCTS)

launch of the Developing Countries Trading Scheme (DCTS) by the United Kingdom presents a significant opportunity for India and 65 other poor and developing nations.

Developing Countries Trading Scheme (DCTS)

- The DCTS is a preferential trading program introduced by the United Kingdom.
- It replaces similar arrangements that were in place during the UK's membership in the European Union.
- The scheme aims to support trade and economic growth for 65 poor and developing countries.

Key Features:

- **Tariff Reduction:** DCTS removes or reduces tariffs on imports from eligible countries.
- **Simplified Trading Rules:** The scheme simplifies trade procedures to facilitate smoother transactions.
- **Enhanced Market Access:** It provides improved market access for participating countries' products.
- **Favorable Terms:** UK businesses can save costs through reduced or eliminated tariffs on imports.
- **Product Coverage:** The scheme covers various goods, including clothing, food, and children's toys.

Focus on Sustainability and Good Governance

- **Responsible Trade Practices:** Participating countries are expected to adhere to international conventions related to human rights, labor standards, anti-corruption measures, climate change, and environmental protection.
- **Mutual Benefits:** The scheme promotes sustainable development and creates a mutually beneficial partnership between the UK and developing countries.

Benefits for Participating Countries

- **Trade Opportunities:** DCTS creates opportunities for businesses and supports livelihoods.
- **Job Creation:** The scheme aims to generate employment by diversifying local and international supply chains.
- **Economic Growth:** It contributes to sustained economic growth in participating countries.
- **Market Expansion:** DCTS helps countries access the UK market and expand their export capacities.

Impact on India

- **Trade Opportunities for India:** The DCTS presents significant trade opportunities for India.
- **Labour-Intensive Sectors:** Indian exporters in sectors like textiles, leather goods, and metals can benefit.
- **Market Access:** The scheme reduces trade barriers and expands market access to the UK for Indian goods.
- **Interim Measure:** DCTS serves as an interim measure while negotiations for a comprehensive Free Trade Agreement (FTA) between the UK and India continue.
- **Future Potential:** The DCTS sets the stage for deeper economic ties and a future FTA between the UK and India.

34. What is the massive grain storage plan the govt has unveiled, how it'll help farmers

The Union Cabinet has recently approved the **constitution** of an **Inter-Ministerial Committee (IMC)** to facilitate the “**world’s largest grain storage plan in the cooperative sector**”.

Why does India need a grain storage plan?

- India is the most populous country in the world of over **18%** (1.4 billion) of the global population.
- India accounts for only **11%** (160 million hectare) of the **arable land** (1,380 million hectare) in the world.
- India runs the **world’s largest** food programme under the **National Food Security Act, 2013**, that covers about **81 crore people**.
- To ensure **food security** of huge population, a robust network of **foodgrain storage facilities** becomes essential.
- At present, India has a **foodgrain storage capacity** of **145 million metric tonnes (MMT)** against the **total food production** of **311 MMT**.

- In the **absence** of sufficient storage facilities, **foodgrains** are sometimes stored in the **open**, which results in foodgrain damage.
- USA, Brazil, Russia, Argentina, Ukraine, China, France, and Canada are among other countries with the **capacity to store more food grains** than they **produce**.
 - India has a storage capacity of **47%** of its **total food grains production**.
- At the **regional** level, only a few **southern states** have the storage capacity of 90% and above.
- In **northern** states like **Uttar Pradesh** and **Bihar**, it is below 50%.
- At present, multiple government agencies, like the Food Corporation of India (FCI), Central Warehouse Corporation, Warehouse Development Regulatory Authority, among others are involved in **grain management**.

What is the 'world's largest grain storage plan in the cooperative sector'?

- Under the new scheme, the Ministry of Cooperation will set up a network of **integrated grain storage** facilities through **Primary Agricultural Credit Societies (PACS)** across the country.
- There are more than **1,00,000 PACS** spread across the country with members of more than **13 crore farmers**.
 - This is one of the reasons why the PACS network was chosen for the new scheme.

Who is in the IMC and what are its functions?

- The IMC for the scheme will be constituted under the Chairmanship of Minister of Cooperation.
- Three other ministers as members of the committee are- Minister of Agriculture and Farmers Welfare, Minister of Consumer Affairs, Food and Public Distribution and Minister of Food Processing Industries.
- The IMC will **modify guideline or** implementation methodologies of the schemes, within the prescribed goals.
- The IMC will provide guidelines for facilitation of the scheme such as creation of **infrastructure** such as godowns, etc. for **Agriculture** and Allied purposes, at selected 'viable' Primary Agricultural Credit Societies (**PACS**).

What is the budgetary allocation?

- The plan does **not** have a separate allocation as it will be implemented by the convergence of **8 schemes**.
- Convergence of **8 schemes** includes- Agriculture Infrastructure Fund (AIF), Agricultural Marketing Infrastructure Scheme (AMI), Mission for Integrated Development of Horticulture (MIDH), and Sub Mission on Agricultural

Mechanisation (SMAM) under the Ministry of Agriculture and Farmers Welfare.

- It includes **two schemes** of the **Ministry of Food Processing Industries**: Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme (PMFME), and Pradhan Mantri Kisan Sampada Yojana (PMKSY).
- The plan also includes **two schemes** of the **Ministry of Consumer Affairs, Food and Public Distribution**: allocation of food grains under the National Food Security Act, and Procurement operations at Minimum Support Price.

What are the benefits of the plan?

- The plan is multi-pronged that will address the **shortage of agricultural storage infrastructure** in the country by facilitating establishment of **godowns** at the level of **PACS**.
- The plan will also enable **PACS** to undertake various other activities such as:
 - Functioning as **Procurement centres** for State Agencies/ Food Corporation of India (FCI);
 - Serving as **Fair Price Shops (FPS)**;
 - Setting up **custom hiring centers**;
 - Setting up **common processing units**, including **assaying, sorting, grading units** for agricultural produce, etc.
- It would reduce **post-harvesting losses**, bring down the **food grain handling and transportation cost**.
- Farmers will also have a choice to sell their **produce** depending on the **market conditions**, and **not** be forced into **distress sale**.

What will the integrated facility look like?

- **Integrated facility** will be spread over **1 acre** of land, at a cost **Rs 2.25 crore**.
 - Of the **Rs 2.25 crore**, **Rs 51 lakh** will be **subsidy**, while the **remaining** will be **loan**.
- The integrated modular PACS will have a **custom hiring centre, a multi-purpose hall** – procurement centres, primary processing units for cleaning and winnowing, a storage shed, and container storage and silos.
- The new storage plan is based on the **hub and spoke model** where **55,767 PACS** of the country will function as **spoke** while the remaining **7,233 PACS** will function as **hubs**.
 - Thus, all the 63,000 PACs will have a combined grain storage capacity of 70 million tonnes.
- The PACS will purchase **agricultural equipment** like tillers, rotary tillers, disc harrows, harvesters, and tractors under various government schemes, such as **Sub-Mission on Agricultural Mechanisation (SMAM)** and **Agriculture Infrastructure Fund (AIF)**.

- It will then offer this **equipment** to farmers on rent.

35. Refugees as assets to their new countries

The World Refugee Day is celebrated on June 20 every year to honour the courage and resilience of the individuals displaced due to conflicts and unrest worldwide.

Significance of the World Refugee Day

- Around 103 million individuals who have endured forced displacement due to conflicts and unrest worldwide.
- These staggering figures mask countless human stories marked by loss and shattered dreams.
- The world refugee day is a reminder of our collective responsibility as global citizens and a call for engagement and empathy.
- It is a day to promote solidarity between communities, and, most importantly, to reflect on the importance of welcoming refugees and displaced persons into our communities.
- **Global conflicts** - It includes the ongoing wars in Ukraine, Myanmar and Sudan among others, and the protracted situations in Afghanistan, and Somalia present an unprecedented challenge.
- These crises extend to our region where many individuals have been uprooted from their homes.

What is the position of South and Southeast Asia with respect to refugees?

- Sadly, South and Southeast Asia are not immune to the challenges of displacement.
- **India** - It is home to some 250,000 forcibly displaced persons, with women and children constituting half of that population.
- India continues to graciously host and assist refugees and asylum-seekers within its territory, a testament to our shared humanity.

What is the need of the refugees?

- The refugees need opportunities and not handouts.
- For refugee youths, it is not just a matter of talent; it is a matter of prospects.
- They wish to be self-reliant and are eager to use their talents and passions to contribute to the communities hosting them.

How can the barriers be dismantled?

- **Obstacles** - Refugees and asylum seekers encounter a myriad of obstacles, such as legal recognition and challenges in obtaining government-issued documents.
- These obstacles hinder their access to essential services, including financial support and health care.
- **SDG** - To ensure that truly no one is left behind, it is necessary to engage with and include youth, especially refugee youth, in the realisation of the Sustainable Development Agenda.
- **Global Compact on Refugees** - It acknowledges the magnitude of the displacement crisis and calls for solidarity through a whole of society approach.
- It strives to enhance the international response, support host countries, promote self-reliance, and explore long-term solutions such as resettlement and safe returns.
- **Individual contribution** - It is built on the understanding that the responsibility towards the forcibly displaced is not limited to governments but extends to each, individuals.
- The individuals include the private sector, non-government organisations and community-based organisations.
- **Global South** - It also recognises that the Global South is disproportionately affected and that host communities need assistance.

What is the way forward?

- Addressing the rising number of the forcibly displaced is an urgent moral imperative that demands our collective action.
- It is incumbent upon us to dismantle these barriers and ensure that they are afforded equal opportunities in employment, education, housing, and health care.
- Our efforts in creating an inclusive society must cater to the unique needs of refugee youth.
- The principle of equitable burden-sharing should be accepted and the responsibilities should be fulfilled.
- Together, we can truly ensure the Government of India's vision of 'Viksit Yuva Viksit Bharat' is realised.

36. Habeas Corpus Petition

The Madras High Court has accepted a request made on behalf of a Minister's wife, for an urgent hearing of a habeas corpus petition filed by her accusing the Enforcement Directorate (ED) of not having followed due procedure while arresting her husband early.

Habeas Corpus: A Safeguard for Personal Liberty

1. **Definition:** Habeas corpus is a legal recourse that enables individuals to challenge unlawful detentions or imprisonments by reporting them to a court.
2. **Purpose:** It allows individuals to request the court to order the custodian, typically a prison official, to present the detained person before the court and determine the legality of the detention.
3. **Applicability in India:** In India, the power to issue a writ of habeas corpus is vested in the Supreme Court and the High Courts.
4. **Quick Remedy:** Habeas corpus is considered an effective means of promptly addressing the loss of personal liberty without legal justification.

Article 32: Right to Constitutional Remedies

1. **Fundamental Right:** Article 32 of the Constitution of India affirms the right to constitutional remedies, granting individuals the right to approach the Supreme Court for the enforcement of their fundamental rights.
2. **Scope:** It empowers the Supreme Court to issue directions, orders, or writs to uphold the rights conferred in Part III of the Constitution.
3. **Suspension:** The right guaranteed by Article 32 cannot be suspended except under specific provisions mentioned in the Constitution, such as during a state of emergency.
4. **Significance:** Dr. B.R. Ambedkar described Article 32 as the soul and heart of the Constitution, emphasizing its crucial role in safeguarding rights.

Rights Protected by Article 32

1. **Inclusion in Part III:** Article 32 is listed alongside other fundamental rights in Part III of the Constitution, including the right to equality, freedom of speech and expression, life and personal liberty, and freedom of religion.
2. **Direct Approach to Supreme Court:** Under Article 32, individuals can directly approach the Supreme Court only when any of their fundamental rights are violated.

Types of Writs under Article 32

1. **Habeas Corpus:** Pertains to personal liberty in cases of illegal detention and wrongful arrest.
2. **Mandamus:** Directs public officials, governments, and courts to perform their statutory duties.
3. **Quo Warranto:** Requires a person to demonstrate the authority by which they hold a public office.

4. **Prohibition:** Orders judicial or quasi-judicial authorities to halt proceedings beyond their jurisdiction.
5. **Certiorari:** Allows the re-examination of orders issued by judicial, quasi-judicial, or administrative authorities.

Remedy Hierarchy and Fundamental Rights Violations

- **Civil or Criminal Matters:** In civil or criminal cases, individuals first approach trial courts, followed by appeals to the High Courts and the Supreme Court.
- **Violation of Fundamental Rights:** In cases of fundamental rights violations, individuals have the option to approach the High Court under Article 226 or directly approach the Supreme Court under Article 32 for redress.

37. U.S.'s UNESCO re-entry

The United States said that it was re-joining the United Nations Educational, Scientific and Cultural Organization (UNESCO).

UNESCO

- UNESCO is the United Nations Educational, Scientific and Cultural Organization.
- It contributes to peace and security by promoting international cooperation in education, sciences, culture, communication and information.
- UNESCO promotes knowledge sharing and the free flow of ideas to accelerate mutual understanding and a more perfect knowledge of each other's lives.
- UNESCO's programmes contribute to the achievement of the Sustainable Development Goals defined in the 2030 Agenda, adopted by the UN General Assembly in 2015.

Why did the US leave the UNESCO?

- **Palestine** - UNESCO, which designates world heritage spots, accorded recognition in 2011 to Palestine as its 195th member.
- UNESCO is the first U.N. agency to do so.
- This triggered controversies over the historical status of the region's religious symbols.
- And this is also a continuing issue of contention between the already divided Palestinian Authority and Israel.
- The 2012 elevation to a non-member observer status at the UN came as a boost for Palestinians demanding separate statehood.

- **US** - The US had long had stronger ties with Israel and supported its settlements in Palestine.
- Also, U.S. laws bar funding to any UN agency that recognises the Palestinian state.
- Accordingly, the US had stopped funding the UNESCO since its 2011 decision, but the partnership with UNESCO continued.
- It also opposed to the admission of Palestine to world bodies until the question of its UN membership was resolved.
- **Holy sites** - Meanwhile, Arab nations at the UNESCO have sought to fast-track the designation of holy sites as endangered heritage sites.
- They alleged Israel of making attacks on religious sites, affecting their authenticity and integrity.
- **Hebron** - Notably, UNESCO declared a contested shrine in Hebron city as an endangered Palestinian heritage site.
- While most of Hebron is under Palestine administration, the core of the shrine is surrounded by Israeli military guards.
- Also, a resolution last year condemned Israel for hampering access for the Palestinians to Jerusalem's holy places.

Did the US leave other forums too?

- **WHO** - During the pandemic, in 2020, President Trump announced the U.S.'s withdrawal from funding the World Health Organization and the Paris Agreement.
- This followed from the Trumpist world view that the U.S. was being short-changed by major polluters such as China and India.
- In the case of WHO, the case was over its inadequate response time to the gravity of the pandemic originating in China.
- Following political change, President Joseph Biden has now brought the U.S. back into the fold of funding WHO as well as re-joining the climate treaty.

Why did the US return to the UNESCO?

- **China factor** - The reason for the U.S.'s return is ostensibly China.
- The U.S.'s absence had helped China gain more influence in setting the rules around artificial intelligence and the ensuing technological shifts.
- This is the first time that China has been proffered as a reason for the U.S.'s re-entry into, rather than its exit of, a multi-lateral treaty.
- **Israel** - Unlike the America First policies that propelled the Trump administration's exits, the U.S.'s UNESCO re-entry has little to do with why it exited it in the first place.
- It is not unreasonable to infer that the re-entry is a sign of America's growing paranoia about China.

- It is also appropriate to recall that the Reagan administration withdrew from UNESCO in 1984 for, among other things, advancing Soviet interests.

What is the role of AI in the U.S.'s move?

- **Artificial Intelligence (AI)** - Developments in AI are slightly different from historical technological developments.
- Here, product patents and their enforcement have helped countries such as the U.S. maintain their edge.
- However, with AI, China, along with a rising repertoire of patents and research publications, has the advantages of a much larger population and a more powerful surveillance state.
- This feeds into a cycle of generating greater troves of data that in turn feed and improve machine learning systems that make its AI far more formidable.
- Unlike other technologies, no country can have a sustained, natural edge in AI indefinitely.

What is the way forward?

- America might bring in at least \$600 million in outstanding dues to the UNESCO.
- However, it is high time and countries such as India would do well to point this out.
- Organisations should get stricter on countries exiting and entering on frivolous grounds, alongside framing policies and research that accommodate the tussles of a hyper-connected world.

38. Uniform Civil Code(UCC): Balancing Diversity and Gender Justice

- The 22nd Law Commission of India has recently announced its intention to gather public opinions and engage with recognized religious organizations regarding the Uniform Civil Code (UCC). This move comes as a result of the previous 21st Law Commission's consultation paper on the Reform of Family Law, which stated that the formulation of a UCC is not necessary or desirable at the present stage.

All you need to know about Law Commission of India

- The Law Commission of India is a statutory body established by the Government of India. It plays a crucial role in legal reforms and the development of the Indian legal system.

- **Establishment:** The first Law Commission was established in 1955, and since then, there have been several subsequent commissions. The Law Commission operates under the Law Commission Act, 1956.
- **Composition:** The Commission consists of a chairman, who is typically a retired judge of the Supreme Court of India or a retired Chief Justice of a High Court, and other members, including legal experts and scholars.
- **Role and Functions:** The primary function of the Law Commission is to examine and review the existing laws of the country, suggest reforms, and make recommendations for new legislation. It also conducts research, studies, and consultations on various legal issues referred to it by the government.
- **Research and Reports:** The Commission conducts in-depth research on legal matters, examines specific subjects, and prepares detailed reports with recommendations for legal reforms. These reports cover a wide range of topics, including civil and criminal laws, family laws, constitutional law, administrative law, and other legal areas.
- **Consultation with Stakeholders:** The Law Commission seeks public opinion and engages with stakeholders, including government departments, judiciary, legal professionals, academic institutions, and civil society organizations, to gather diverse perspectives on legal issues and proposed reforms.
- **Implementation of Recommendations:** The government reviews the reports and recommendations of the Law Commission and decides on their implementation. While the Commission's recommendations are not binding, they often influence legislative changes and legal reforms.
- **Timeframe and Term:** Each Law Commission has a specific term, usually three years, during which it functions. At the end of the term, a new Commission may be constituted.
- **Impact and Significance:** The Law Commission's recommendations and reports have played a crucial role in shaping Indian laws and legal reforms. Many landmark legislations and amendments have been based on the Commission's suggestions.
- **Relationship with Judiciary and Parliament:** The Law Commission often collaborates with the judiciary, seeking inputs from judges and addressing legal issues raised in court cases. It also interacts with Parliament, which may refer specific matters to the Commission for its expert opinion.
- **Recent Developments:** The Law Commission continues to address contemporary legal challenges, such as reforms in family laws, criminal justice system, electoral laws, and other areas. It adapts to changing societal needs and legal developments to provide relevant recommendations

Uniform Civil Code (UCC)

- The UCC aims to establish a single personal civil law for the entire country, applicable to all religious communities in matters such as marriage, divorce, inheritance, adoption, etc.
- The idea of a UCC has a long history in India and has been a topic of debate and discussion.
- This article explores the basis for a UCC, its timeline, the conflict with the right to freedom of religion, minority opinions, challenges to implementation, and the way forward.

What is the latest development regarding 22nd Law Commission and UCC?

- The 22nd Law Commission of India has expressed its intention to gather public opinions and engage with recognized religious organizations regarding the Uniform Civil Code (UCC).
- The Commission aims to solicit views from the public as well as religious organizations on the topic of the UCC.
- By actively seeking public opinions and engaging with religious organizations, the 22nd Law Commission aims to gather diverse perspectives on the UCC. This approach recognizes the significance of public input and the need to consider the viewpoints of various religious groups that may be affected by the implementation of a Uniform Civil Code.

Concerns associated with the process

- **Opposition from Religious Organizations:** Religious organizations may have differing views on the UCC, and some may oppose the idea altogether. Engaging with these organizations may lead to resistance and challenges in reaching a consensus on the implementation of a Uniform Civil Code.
- **Potential Polarization:** The UCC is a sensitive and contentious issue in India due to its potential impact on religious personal laws. Engaging with religious organizations and seeking public opinions may further polarize society along religious lines, leading to heightened tensions and divisions.
- **Influence of Traditional Practices:** Religious organizations may advocate for the preservation of traditional practices and oppose any reforms or changes proposed by the UCC. This can hinder the progress of gender equality and other social reforms that the UCC aims to achieve.
- **Difficulty in Reaching a Consensus:** Gathering public opinions from a diverse population with varying viewpoints can make it challenging to reach a consensus on the implementation of the UCC. Conflicting opinions and interests may hinder the formulation of comprehensive and effective recommendations.
- **Delay in Decision-Making:** Engaging with multiple stakeholders, including the public and religious organizations, can prolong the decision-making

process. This delay may impede the timely implementation of reforms and the realization of the goals set by the UCC.

- **Dilution of Gender Justice:** In some cases, religious organizations may advocate for the preservation of discriminatory practices against women in the name of religious freedom or cultural practices. This can hinder efforts to establish gender justice and equality, which are crucial objectives of the UCC.

'SUBJECT RELEVANT & IMPORTANT'

➤ In 2018, the 21st Law Commission had said **UCC was "neither necessary nor desirable at this stage"**

➤ The panel had held wide consultations and **reviewed 75,000 responses** over two years

➤ Current Law Commission seeks responses afresh, within 30 days. Responses can be submitted on Commission's website, through email or through post. Also open to **in-person consultations**

“ Since more than 3 years have lapsed from the date of issuance of the said consultation paper (of 21st Law Commission, in 2018), bearing in mind the relevance and importance of the subject and also the various court orders... the 22nd Law Commission considered it **expedient to deliberate afresh** over the subject — **Law Commission**

Pragmatic recommendations put forth by the 21st Law Commission

- **Gender Justice and Uniformity of Rights:** The Commission emphasized that family laws of every religion should be reformed to ensure gender justice. It advocated for the uniformity of rights rather than imposing uniform laws, recognizing the diversity of cultural practices while safeguarding equality.
- **Economic Rights of Women:** The Commission highlighted the need to address the economic rights of women. It recommended the abolition of the Hindu coparcenary system, which was seen as being used for tax evasion. The Commission also proposed reforms in inheritance laws across religions to ensure fair and equal distribution of property.
- **No-Fault Divorce and Division of Matrimonial Property:** The Commission suggested the introduction of "no-fault divorce" in all personal laws, simplifying the process of divorce and reducing the adversarial nature of divorce proceedings. It also recommended that all property acquired after

marriage should be divided between the spouses upon dissolution of the marriage, ensuring equitable distribution.

- **Muslim Law of Inheritance and Succession:** The Commission recommended the codification of the Muslim law of inheritance and succession, aiming to establish uniform provisions for Shias and Sunnis. It advocated for inheritance based on proximity to the deceased rather than preference to male agnates, promoting gender equality in inheritance rights.
- **Polygamy and Conversion:** The Commission commented on the issue of polygamy and conversion, noting that while polygamy is permitted within Islam, it is rare among Indian Muslims. It highlighted instances of individuals from other religions misusing conversion to Islam for the sole purpose of solemnizing another marriage. This observation supported the need for a Uniform Civil Code.
- **Best Interest of the Child:** The Commission stressed that courts should prioritize the principle of the “best interest of the child” in matters of custody and guardianship. This approach ensures that decisions related to child custody are made based on what is most beneficial for the child’s well-being and development.
- **Parsi and Christian Women’s Rights:** The Commission addressed the rights of Parsi and Christian women, recommending reforms in their personal laws to ensure gender equality and protection of women’s rights.

Conclusion

- The debate surrounding the Uniform Civil Code continues to evolve, with the 22nd Law Commission seeking public views and engaging religious organizations. However, it is crucial to consider the pragmatic recommendations made by the 21st Law Commission. Balancing diversity and equality remain a significant challenge, and any future actions regarding the UCC should strive to protect the rights of all individuals while recognizing the importance of cultural differences in a diverse society.

39. Key takeaways from PM Modi’s U.S. Visit

Prime Minister Narendra Modi had a three-day state visit to the United States adding momentum to the India-USA bilateral relationship.

How significant is the State visit?

- Prime Minister Narendra Modi's 3-day state visit to the US has had a significant impact on India's global standing.
- It highlights the country's dual identity as a **spiritual democracy** and an **economic power**.

- The visit showcased India's cultural heritage, diplomatic prowess, and its growing influence on the world stage.
- The bilateral meeting between the two sides brought out several strategic outcomes for India ranging from emerging technologies, space, energy and defence.
- It strengthened the bilateral relationship between India and the U.S.

What are the key takeaways from PM's U.S. visit?

INDIA - US TIES

STRATEGIC PARTNERSHIP ACROSS SECTORS



<p>TECHNOLOGY</p> <ul style="list-style-type: none"> ▶ The Indo-US Quantum Coordination Mechanism ▶ A \$2-million grant programme for joint development of AI ▶ Jointly funded research projects on cybersecurity <p>DEFENCE</p> <ul style="list-style-type: none"> ▶ Adoption of the Defense Industrial Cooperation Roadmap ▶ A defence acceleration platform for joint tech innovation <p>ENERGY TRANSITION</p> <ul style="list-style-type: none"> ▶ An India-US multibillion-dollar investment fund for green tech ▶ India to co-lead multilateral Hydrogen Breakthrough Agenda to boost availability of low-carbon hydrogen globally 	<p>TRADE</p> <ul style="list-style-type: none"> ▶ Mutual resolution of six WTO trade disputes ▶ India now part of the Minerals Security Partnership <p>SPACE</p> <ul style="list-style-type: none"> ▶ Nasa, Isro to develop strategic framework for human spaceflight by the end of 2023 <p>IMMIGRATION</p> <ul style="list-style-type: none"> ▶ New US consulates in Bengaluru and Ahmedabad; an Indian consulate in Seattle <p>AVIATION</p> <ul style="list-style-type: none"> ▶ Boeing to invest \$100 mn to train 31,000 pilots in India in 20 years
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- **Semiconductor Supply Chains** - A MoU on Semiconductor Supply Chain and Innovation Partnership was signed between the countries.
- **Critical Minerals** - India became the newest partner of the U.S.'s Minerals Security Partnership (MSP) to diversify and secure critical mineral supply chains.
- **Telecommunications** - India and the United States launched public-private Joint Task Forces.

- India's Bharat 6G and the U.S. Next G Alliance will co-lead this public-private research.
- **Space** - India has signed the Artemis Accords, a common vision of space exploration for the benefit of all humankind. **Quantum tech** - A Joint Quantum Coordination Mechanism was established to facilitate joint research between the public and private sectors across both countries.
- **iCET** - 'Innovation Handshake', a commercial Dialogue will be launched to connect each country's start-up ecosystems, supporting U.S.-India Initiative on Critical and Emerging Technology (iCET).
- **Civil Aviation** - Air India strike a historic agreement with Boeing to acquire more than 200 American-made aircraft.
- **Defence** - The India-U.S. Defence Acceleration Ecosystem (INDUS-X) was inaugurated joint innovation on defense technologies integrating India's private defense industry.
- **Student Exchange** - Launched a new Joint Task Force of the Association of American Universities and leading Indian educational institutions, including the Indian Institutes of Technology.
- **Research** - Launched a university network of Indo-U.S. Global Challenge Institutes to help create more research partnerships and exchanges in agriculture, energy, health, and technology.
- **Energy** - USAID signed an MOU with the Ministry of Railways to work together on Indian Railways' target to become a "net-zero" carbon emitter by 2030.
- India and the United States committed to creating innovative investment platforms for Green Technology.
- **Medicine** - The U.S. National Cancer Institute through two new grants to develop an artificial-intelligence (AI)-enabled digital pathology platform.

How is India's strategic independence and geopolitical balance?

- **Indo-Pacific** - The United States to join the Indo-Pacific Oceans Initiative, a regional initiative inaugurated by Indian Prime Minister.
- **Indian Ocean** - The United States and India will hold an Indian Ocean Dialogue that convenes U.S. and Indian officials to promote greater regional coordination.
- The United States promised its support for India in several international forums like
 - Reiterates permanent membership in a reformed UNSC,
 - Has announced support for Indian membership in the International Energy Agency (IAEA)
 - Recommits to advancing Indian membership in the Nuclear Suppliers Group (NSG)

- Also President Biden has invited Prime Minister Modi to attend the APEC Summit in San Francisco in November 2023.

40. India needs a Uniform Civil Code: PM

- Immediately after returning from the US, PM Modi said that India needed a Uniform Civil Code (UCC) as the country could not run with the dual system of “separate laws for separate communities”.
- This has raised the level of speculations among the left liberal groups in India.

Key statements made by PM

- **Abolishing Dual System:** PM highlighted the impracticality of maintaining separate laws for different communities and emphasized the need for a unified legal framework.
- **Discerning Political Manipulation:** He urged the Muslim community to be vigilant about political parties that exploit their interests for personal gains.
- **Constitutional Provisions:** He emphasized that the Constitution already upholds the principle of equal rights for all citizens.
- **Opposition’s Exploitation:** He criticized political opponents for using Muslims, particularly Pasmanda Muslims, to further their own interests at the expense of the community’s well-being.

Uniform Civil Code (UCC)

- The UCC aims to establish a single personal civil law for the entire country, applicable to all religious communities in matters such as marriage, divorce, inheritance, adoption, etc.
- The idea of a UCC has a long history in India and has been a topic of debate and discussion.
- This article explores the basis for a UCC, its timeline, the conflict with the right to freedom of religion, minority opinions, challenges to implementation, and the way forward.

Basis for UCC: Article 44

- Article 44 of the Directive Principles envisions the state’s endeavor to secure a UCC for all citizens throughout the country.
- While DPSP of the Constitution are not enforceable by courts, they provide fundamental principles for governance.

Personal Laws and UCC: A Timeline

- **Colonial Period:** Personal laws were first framed for Hindu and Muslim citizens during the British Raj.
- **1940:** The idea of a UCC was proposed by the National Planning Commission, examining women's status and recommending reforms for gender equality.
- **1947:** UCC was considered as a fundamental right during the framing of the Constitution by Minoo Masani, Hansa Mehta, Amrit Kaur, and Dr. B.R. Ambedkar.
- **1948:** The Constitution Assembly debated Article 44, which emphasizes the implementation of uniform civil laws as a state duty under Part IV.
- **1950:** Reformist bills were passed, granting Hindu women the right to divorce and inherit property and outlawing bigamy and child marriages.
- **1951:** Ambedkar resigned when his draft of the Hindu Code Bill was stalled in Parliament.
- **1985:** Shah Bano case highlighted the need for a UCC and the rights of divorced Muslim women.
- **1995:** Sarla Mudgal v. Union of India reiterated the urgency of a UCC for national integration and removing contradictions.
- **2000:** The Supreme Court, in Lily Thomas v. Union of India, stated it could not direct the government to introduce a UCC.
- **2015:** The apex court refused to mandate a decision on implementing a UCC.
- **2016:** The Triple Talaq debate gained attention, leading to the ruling of its unconstitutionality in 2017.

UCC vs. Right to Freedom of Religion

1. **Article 25:** Guarantees an individual's fundamental right to religion.
 2. **Article 26(b):** Upholds the right of religious denominations to manage their own affairs.
 3. **Article 29:** Protects the right to conserve distinctive culture.
- Reasonable restrictions can be imposed on freedom of religion for public order, health, morality, and other provisions related to fundamental rights.

Minority Opinion in the Constituent Assembly

- Some members sought to exempt Muslim Personal Law from state regulation, arguing against interference in personal laws based on secularism.
- Concerns were raised about uniformity in a diverse country like India and the potential for opposition from different communities.
- Gender justice was not a significant focus during these debates.

Enacting and Enforcing UCC

- Fundamental rights are enforceable in courts, while Directive Principles have varying degrees of enforceability.
- The wording of Article 44 suggests a lesser duty on the state compared to other Directive Principles.
- Fundamental rights are considered more important than Directive Principles, and a balance between both is crucial.

Need for UCC

- **Multiple personal laws:** Different religions and denominations follow distinct property and matrimonial laws, hindering national unity.
- **Absence of exclusive jurisdiction:** Such thing in the Union List implies that the framers did not intend to have a UCC.
- **Customary laws are discriminatory:** These laws also vary among different communities and regions.

Why is UCC Necessary?

- **Harmonizing equality:** UCC would provide equal status to all citizens, promote gender parity, and align with the aspirations of a liberal and young population.
- **Promote fraternity:** Implementation of UCC would support national integration.

Hurdles to UCC Implementation

- **Opposition from religious factions:** The diverse religious and cultural landscape of India poses practical difficulties.
- **Minority resistance:** UCC is often perceived by minorities as an encroachment on religious freedom and interference in personal matters.
- **Societal preparedness:** Experts argue that Indian society may not be ready to embrace a UCC at present.

Unaddressed Questions

- **Ignoring diversities:** Maintaining the essence of diverse components of society while achieving uniformity in personal laws.
- **One size fits all:** The assumption that practices of one community are backward or unjust.
- **Uniqueness of diversity:** The effectiveness of uniformity in eradicating societal inequalities.

Way Forward

- **Theological education:** Religious intelligentsia should educate their communities about rights and obligations based on modern interpretations.
- **Open discussion:** The government should create an environment conducive to UCC by explaining Article 44's contents and significance while considering different perspectives.
- **Gradual introduction:** Social reforms should be gradual, addressing concerns such as fake news and disinformation.
- **Prioritizing social harmony:** Preserving the cultural fabric of the nation is essential.

GS 3 : Economy, Science and Technology, Environment

1. Impact of climate change on water bodies

Climate change has severe effects on waterbodies causing decline in freshwater supply, environment degradation and deterioration of water quality for humans and livestock.

Importance of water bodies or lakes

- **Water supply** - Lakes are a major source of freshwater for drinking, irrigation, and industrial use.
- **Recreation** - Lakes are popular for swimming, boating, fishing, and other recreational activities.
- **Employment** - The fishing and tourism industries that rely on lakes provide jobs for millions of people around the world.
- **Water quality** - Lakes help to filter and clean water which helps to protect human health and the environment.
- **Climate regulator** - Lakes help to regulate the climate by storing heat and releasing it slowly.
- This helps to moderate temperatures and reduce the risk of extreme weather events.
- **Biodiversity** - Lakes are home to a wide variety of plants and animals, which play an important role in the ecosystem.
- **Flood prevention** - Lakes can help to prevent flooding by storing excess water during heavy rains.
- **Erosion control** - Lakes can help to control erosion by slowing down the flow of water and depositing sediment.

- **Hydroelectric Power Generation** - Some lakes, especially those formed by dams, are utilized for hydroelectric power generation.
- **Carbon Sink and Nutrient Cycling** - Lakes are significant components of the global carbon cycle.
- They can act as carbon sinks, sequestering carbon dioxide from the atmosphere.
- Additionally lakes play a role in nutrient cycling, influencing the distribution and cycling of important elements like nitrogen and phosphorus.
- **Cultural and Spiritual Significance** - Many lakes hold cultural and spiritual significance for indigenous communities and local populations.



What are the effects of the climate changes on water bodies?

- **World's largest lakes and reservoirs** - Have shrunk more than 50% over the 3 decades.
- From these water bodies, approximately 600 cubic km of water was lost between 1992 and 2020 which is equivalent to the total water used in the United States for the entire year of 2015.
- **Sedimentation** - Main cause of the decline in the water storage for more than more than half of the reservoirs located in peninsular India.
- Sedimentation has a larger impact than hydro climate variability such as droughts and recovery from droughts.
- Among the worst affected natural lakes in the country is Ladakh's Tso Moriri.
- **Water consumption** - Unsustainable water consumption in the world's large lake have led to the decreased water levels.

- **Arctic lakes** - Shrunk as a result of a combination of changes in precipitation, runoff, temperature, and PET, which are likely a concurrent result of natural variability and climate change.
- **Humid tropics and high altitudes** - Natural lakes located in humid tropics and high altitudes are also experiencing water shortages.
- **Human activities** - Such as unsustainable consumption of water and increasing temperature and potential evapotranspiration (PET) have led to reduced water levels.

Sedimentation is the process of particles such as sand and stones settling to the bottom of a body of water.

Consequences of shrinking lakes

- Nearly two billion people or one-quarter of the global population in 2023 will be affected as their livelihood depends on lakes.
- Affects hydroelectricity generation as lakes are important source of hydroelectricity.
- Freshwater decline and environmental degradation.
- Disrupts the water and carbon cycles.
- Reduce the environmental capacity to absorb carbon dioxide and increase carbon emissions as lakes are hotspots of carbon cycling.

Potential evapotranspiration (PET) is the loss of water due to both evaporation and transpiration.

What are the ways to conserve water bodies?

- There is a need to manage water bodies in an integrated manner.
- Restrictions on water consumption and climate mitigation to bring down global temperatures.
- Promote sustainable fisheries.
- Reduction in water pollution
- To make awareness about responsible use of water.
- To manage Nutrient Runoffs.

2. Harnessing the Potential of Graphene: India's Path to Leadership

- In the realm of technological advancements, certain breakthroughs possess the power to revolutionize entire industries. Artificial Intelligence (AI) for

software, quantum computing for computers, and graphene for materials are such game-changers. While India has made commendable progress in AI and shows promise in quantum computing, it is crucial for the country to catch up in the domain of graphene.

Graphene

- Graphene is a single layer of carbon atoms arranged in a hexagonal lattice pattern. It is a two-dimensional material that is incredibly thin, strong, and lightweight. In fact, it is the thinnest material known to date, with a thickness of just one atom.
- Despite its thinness, graphene is remarkably strong, around 200 times stronger than steel, yet incredibly flexible.

Why Graphene is known as The Wonder Material?

- **Exceptional Strength:** Despite being only one atom thick, graphene is incredibly strong. It is approximately 200 times stronger than steel, yet it is incredibly flexible. This combination of strength and flexibility makes it highly desirable for applications where strength and durability are crucial.
- **Superb Electrical Conductivity:** Graphene is an excellent conductor of electricity, even surpassing traditional conductors like copper. It allows the flow of electrons with minimal resistance, making it ideal for developing high-performance electronics and electrical devices.
- **High Thermal Conductivity:** Along with its electrical conductivity, graphene also exhibits excellent thermal conductivity. It can efficiently transfer heat, making it valuable for applications requiring efficient heat management, such as in electronics, thermal management systems, and energy storage devices.
- **Transparency:** Graphene is nearly transparent and can absorb only 2% of light passing through it. This property makes it an intriguing material for optoelectronic devices, transparent conductive films, and touchscreens, as it enables the transmission of light while maintaining conductivity.
- **Impermeability to Gases:** Graphene is impermeable to gases, even those as small as hydrogen and helium. This property opens up possibilities for applications in gas separation, filtration, and storage, as well as creating barriers against moisture or gas permeation in various industries.
- **Versatility and Composite Formation:** Graphene can be combined with other materials to create composite materials with enhanced properties. Even in small quantities, graphene can significantly improve the strength, conductivity, and other characteristics of composite materials. This versatility expands its potential applications in fields such as aerospace, automotive, construction, and sports equipment.

- **Wide Range of Applications:** Graphene has the potential to revolutionize numerous industries and sectors. It can be used in energy storage devices like batteries and supercapacitors, for developing sensors, inks, membranes for water purification, and in healthcare for drug delivery systems and biosensors. Its applications also extend to areas such as defense and aerospace, where its exceptional strength, conductivity, and sensitivity to environmental changes offer unique advantages.

Global Graphene Landscape

- **China:** China declared graphene a priority in its 13th Plan. China has emerged as a global leader in the production and commercialization of graphene. China's emphasis on graphene is evident from its graphene-related patent filings, which have surpassed those of other leading nations in recent years.
- **United States:** The United States has a strong presence in the graphene landscape, with active research and development initiatives. Several universities, research institutions, and companies in the U.S. are at the forefront of graphene research, exploring its potential applications and commercialization prospects. The country has a considerable number of graphene-related patents and is home to leading graphene companies and startups.
- **United Kingdom:** The UK has been a pioneer in graphene research since its discovery. The University of Manchester, where graphene was first isolated, remains a hub for graphene research and innovation. The UK government has invested in the National Graphene Institute and the Graphene Engineering Innovation Centre to support research and development in graphene applications.
- **South Korea:** South Korea has active research programs, industry collaborations, and graphene-related patent filings. South Korean companies are involved in graphene production, commercialization, and application development across various sectors.
- **Japan:** Japan has a significant presence in graphene research and commercialization. Japanese universities and research institutions have made notable contributions to the field. The country has a strong focus on developing graphene-based technologies in areas such as electronics, energy storage, and composite materials. Japanese companies are actively involved in graphene production and application development.
- **Russia:** Russia has a growing presence in the graphene landscape, with notable research activities and patents in the field. Russian universities and research institutes are engaged in graphene research, and the country has witnessed the establishment of graphene-focused companies.

- **Singapore:** Singapore has invested in graphene research and development, aiming to position itself as a regional hub for graphene-related technologies. The country has established research institutes and centers focused on graphene and has attracted collaborations with international partners.

India's progress in the graphene sector

- **Research and Academic Contributions:** The Centre for Nano Science and Engineering at the Indian Institute of Science (IISc) Bangalore, in collaboration with KAS Tech, has been actively involved in graphene research and development.
- **Start-ups and Industry Initiatives:** Several start-ups and foreign subsidiaries have emerged in India, focusing on graphene or graphene derivatives. Notably, Tata Steel has achieved success in growing graphene using annealing and extracting atomic carbon from steel surfaces. They have also explored the use of graphene in recycling plastic products. Other start-ups, such as Log 9 and RF Nanocomposites, have patented graphene-based technologies for ultracapacitors, EMI shielding, and stealth applications, respectively.
- **Graphene Innovation Centre in Kerala:** In a laudable step, the India Innovation Centre for Graphene was established in Kerala. This center, implemented by the Digital University Kerala in partnership with Tata Steel and C-MET, Thrissur, aims to foster large-scale innovation activity around graphene. It serves as a collaborative platform for research, development, and commercialization of graphene-based technologies.
- **Patents and Intellectual Property:** While India's graphene-related patent filings are relatively modest compared to other leading countries, there have been efforts to secure intellectual property. Indian researchers and institutions have filed patents for graphene-based technologies and applications, demonstrating innovation and progress in the field.

Way Ahead: India's graphene sector

- **National Graphene Mission:** Establish a dedicated National Graphene Mission, similar to initiatives undertaken by other countries. This mission should focus on fostering research, development, and commercialization of graphene-based technologies, with clear objectives, timelines, and allocated resources.
- **Increased Research and Development:** Encourage and fund research and development activities in graphene across academic institutions, research organizations, and industry. Foster collaborations between academia, industry, and government to drive innovation and accelerate the discovery of new applications for graphene.

- **Infrastructure and Facilities:** Invest in infrastructure and facilities for large-scale production, characterization, and testing of graphene. Develop advanced laboratories equipped with state-of-the-art instruments to support graphene research and development.
- **Skill Development and Training:** Promote skill development programs and training initiatives to build a skilled workforce with expertise in graphene technology. Develop specialized courses and training modules at educational institutions to produce a talent pool proficient in graphene research, fabrication, characterization, and application development.
- **Industry-Academia Collaboration:** Foster stronger collaboration between industry and academia to bridge the gap between research and commercialization. Encourage joint research projects, technology transfer, and the establishment of industry-academia consortia focused on graphene.
- **Funding and Financial Support:** Increase funding for graphene research and development through government grants, industry investments, and venture capital. Provide financial support and incentives for start-ups and companies working on graphene technologies to encourage entrepreneurship and product development.
- **Intellectual Property Protection:** Strengthen intellectual property protection mechanisms and encourage researchers and companies to file patents for graphene-based technologies and applications. Support the development of patent pools and licensing frameworks to facilitate technology transfer and commercialization.

Conclusion

- The potential of graphene to transform industries cannot be understated. As the world advances towards the graphene age, India must secure its position as a leader rather than a bystander. The time to prioritize graphene is now, as the production of high-grade graphene may become concentrated in select global locations, similar to semiconductors. India has witnessed the consequences of missing out on the semiconductor wave, and it cannot afford to repeat history.

3. Evergreening of Loans

The Reserve Bank of India (RBI) Governor Shaktikanta Das raised red flags over banks adopting innovative methods for evergreening of loans.

What does evergreening of loans mean?

- The evergreening of loans is a term in which banks try to revive a loan that is on the verge of default by granting further loans to the same borrower.

- It is a form of zombie lending in which banks provide more loans to the borrowers to stop them from turning into huge non-performing assets (NPAs).
- The process of evergreening of loans is typically a temporary fix for a bank covering up the real status of stressed loans.

A loan turns into a nonperforming asset (NPA) if the interest or instalment remains unpaid even after the due date and remains unpaid for a period of more than 90 days.

Why do banks follow evergreening of loans?

- If an account turns into a non-performing asset (NPA), banks are required to make higher provisions which will impact their profitability.
- To avoid classifying a loan as an NPA, banks adopt the evergreening of loans.
- Banks offer fresh loans to borrowers on the verge of default to ensure they repay an old loan.
- Banks delay the recognition of losses through evergreening process.
- Banks also avoid provisioning to cover loan losses and increase their liquidity.

What are the evergreening methods?

- Bringing two lenders together to evergreen each other's loans by sale and buyback of loans or debt instruments.
- Good borrowers being persuaded to enter into structured deals with a stressed borrower to conceal the stress.
- Use of internal or office accounts to adjust borrower's repayment obligations.
- Renewal of loans or disbursement of new/additional loans to the stressed borrower or related entities closer to the repayment date of the earlier loans.

What do bankers say?

- It is difficult for banks to indulge in the evergreening of loans as the RBI monitors each and every loan on a regular basis.
- Once an account is classified as an NPA, the situation will become worse.
- By evergreening, banks try to save a borrower from becoming NPA by extending temporary liquidity.

What is the problem with evergreening?

- Bad loans are made to look good at the risk of additional lending to unviable borrowers.
- Evergreening of loans put lenders at risk of huge amounts of default.

- The RBI does not approve of evergreen loans and it is going against its norms.
- This is a misgovernance in banking.

How can evergreening be stopped?

- The audit committee needs to be particularly vigilant.
- A significant evergreening is assumed to be wilful, with support from sections of the senior management of the bank.
- It then becomes necessary to levy penalties and action against the erring officers. Few are -
- Penalties should be levied through cancellations of unvested stock options.
- Claw-back of monetary bonuses on officers concerned and on all whole-time directors.
- The Chairman of the audit committee could be asked to step down from the board.

4. Implications of Pakistan's Internal Unrest for India's National Security

- The events of May 9, 2023, which saw violent protests and attacks on military installations in Pakistan, are expected to have far-reaching consequences for the country. The repercussions of these developments raise questions about the implications for India's national security, given the limited influence India has over the situation in Pakistan.

Factors attributed to the Pakistan's Internal Unrest

- **Political Turmoil:** Pakistan has witnessed political instability over the years, with frequent changes in government and power struggles among political parties. The arrest of former Prime Minister Imran Khan and the subsequent protests by PTI activists have added fuel to the political turmoil, leading to further unrest.
- **Dissatisfaction with Governance:** Widespread dissatisfaction with governance, corruption, and economic challenges have fuelled public discontent. High levels of poverty, unemployment, inflation, and inadequate public services have contributed to frustrations among the population, especially the youth.
- **Military Interference:** The history of military intervention and its influence on civilian affairs in Pakistan has created a complex power dynamic. The perception of the military's meddling in political matters has raised concerns about democratic processes and civilian control over governance.
- **Radicalization and Extremism:** Pakistan has been grappling with the rise of radicalization and extremist ideologies within certain segments of society. Militant groups, such as Tehrik-e-Taliban Pakistan (TTP) and sectarian

organizations, pose a significant threat to stability. Their ability to exploit social unrest and ideological divisions further exacerbates internal tensions.

- **Socio-economic Disparities:** Pakistan faces significant socio-economic disparities, with a large portion of the population living in poverty and lacking access to basic necessities. Economic inequalities, coupled with ethnic and regional grievances, contribute to social unrest and political instability.
- **Ethnic and Sectarian Divisions:** Pakistan is a diverse country with various ethnic and sectarian groups. Historical grievances, competition for resources, and political marginalization of certain groups have led to tensions and sporadic violence.

Internal Dynamics within the Pakistani Army

- **Leadership Disputes:** In recent years, there have been instances of discord between political leaders and successive army chiefs, including the prolonged discord between former Prime Minister Imran Khan and two successive chiefs. These leadership disputes have highlighted potential fissures within the army's leadership and raised questions about unity and loyalty within its ranks.
- **Perceptions of Political Support:** There have been perceptions that support for political actors, such as Imran Khan, exists at various levels within the army. While initial perceptions suggested that support for Khan was mainly concentrated in the middle and lower ranks and among retired service personnel. These perceptions add complexity to the army's internal dynamics and raise concerns about its role in political affairs.
- **Influence on Civilian Affairs:** The Pakistani army has a long history of interfering in civilian affairs and exerting influence over the country's political processes. This interference has often been seen as undermining democratic institutions and civilian control over governance.
- **Institutional Cohesion:** The recent events, such as the attacks on military installations and the subsequent arrests have tested the army's unity and revealed potential fault lines within the Pakistan Army set up.

Implications for National Security of India

- **Regional Stability:** The events of internal unrest in Pakistan can have spillover effects on regional stability. A political and economic meltdown leading to widespread chaos and social unrest in Pakistan can create a volatile environment in the region. India shares a long and sensitive border with Pakistan, and any instability in its neighbor directly affects India's security interests.
- **Security of Pakistan's Nuclear Arsenal:** The internal unrest and potential vulnerabilities within the Pakistani army raise questions about the safety and

security of Pakistan's nuclear weapons. The risk of extremist elements or terrorist organizations gaining access to nuclear components or fissile material could have severe implications for the entire region, including India.

- **Potential for Terrorist Exploitation:** The presence of numerous terrorist organizations within Pakistan, such as Tehrik-e-Taliban Pakistan (TTP), creates a fertile ground for extremist elements to exploit situations of chaos and instability.
- **Escalation of Cross-Border Tensions:** In the past, during periods of internal instability, Pakistan has attempted to divert attention and rally support by escalating tensions with India. Any provocative actions or attempts to divert attention from internal issues could lead to increased border tensions, posing risks to regional stability.
- **Impact on Counterterrorism Efforts:** If internal unrest in Pakistan leads to a weakening of the country's institutions and security apparatus, it could hamper the effectiveness of counterterrorism efforts.
- **Humanitarian and Refugee Concerns:** A political and economic meltdown in Pakistan could result in a significant humanitarian crisis, including a large influx of refugees across the border into India. This could strain resources and infrastructure in border areas, creating additional security challenges for India.

Way ahead

- **Strengthening Governance and Institutions:** Efforts should be made to strengthen democratic institutions, enhance transparency, and promote good governance. This includes addressing issues of corruption, improving public service delivery, and ensuring the rule of law.
- **Counterterrorism Measures:** Pakistan needs to accelerate its efforts to counter terrorism effectively. This includes robust intelligence gathering, coordination among security agencies, and targeted operations against terrorist networks. Enhancing border security and cooperation with neighboring countries, including intelligence sharing, can help in curbing cross-border terrorism.
- **Addressing Socio-Economic Disparities:** Addressing socio-economic disparities and promoting inclusive development are essential to undermine the appeal of radical ideologies. This involves investing in education, healthcare, infrastructure, and job creation to uplift marginalized communities.
- **Balancing National Security and Civil Liberties:** While ensuring national security is crucial, it should be done in a manner that respects civil liberties, human rights, and the rule of law. Striking a balance between security measures and preserving individual freedoms is essential for maintaining societal harmony and preventing further radicalization.

Conclusion

- The internal unrest in Pakistan following the violent events implications for both Pakistan's national security and India's interests. The security of Pakistan's nuclear arsenal, the potential influence of terrorist organizations, and the internal dynamics within the Pakistani army are critical considerations. In light of these developments, India must exercise caution and adopt a prudent approach, focusing on regional stability and maintaining a cautious stance rather than embracing triumphalism.

5. Concerns over Neuralink Chip

Elon Musk's company Neuralink gets the U.S. Food and Drug Administration's (FDA) approval for study of brain implants in humans.

Neuralink

- Neuralink is brain-implant Company, co-founded by Elon Musk.
- Neuralink is making a Class III medical device known as a brain-computer interface (BCI).
- The device connects the brain to an external computer via a Bluetooth signal, enabling continuous communication back and forth.

What is the device?

- The device itself is a coin-sized unit called a Link.
- It's implanted within a small disk-shaped cut-out in the skull using a precision surgical robot.
- The robot splices a thousand tiny threads from the Link to certain neurons in the brain.
- Each thread is about a quarter the diameter of a human hair.

Benefits of Neuralink

- If the Neuralink successfully works in humans, it would have wide range of benefits.
- The device could enable precise control of prosthetic limbs, giving amputees natural motor skills.
- It could revolutionise treatment for conditions such as Parkinson's disease, epilepsy, and spinal cord injuries.
- It can also be used in the treatment of obesity, autism, depression, schizophrenia and tinnitus.

What were the FDA's concerns over clinical human trials of Neuralink?

- Neuralink finally received FDA approval for its first human clinical trial in May 2023.
- The FDA had also raised a list of concerns that needed to be resolved before human trials could commence.
- **Safe surgery** - A precision robot known as Implant/r1 performs the surgical procedure to implant the Neuralink BCI.
- This robot should be reliably and safely implant and remove the Neuralink BCI without damaging surrounding brain tissue.
- **Harmful side effects** - The implanted Neuralink BCI must not unintentionally influence other brain functions.
- It should not cause any unwanted side effects such as seizures, headaches, mood changes, or cognitive impairment.
- **Safe power supply** - Overheating lithium-ion batteries can pose great risk to BCI users.
- **Wire migration** - The Link consists of a disk-shaped chip with very thin wire electrodes that connect to neurons in the brain.
- There is the risk of wire migration over time due to natural movement, inflammation, or scar tissue formation.
- **Implant removal** - The safety and difficulty of removal of implants.
- **Data privacy and security** - Safeguards of the data collected against being hacked, manipulated or otherwise misused.

What Neuralink's reply to the FDA's concerns?

- Extensive animal studies have been conducted by Neuralink.
- It provides evidence that its wires did not migrate significantly over time, or cause any adverse effects on the brain.
- The company also has come up with a method for tracking and adjusting the position of the wires to overcome wire migration.
- Neuralink specially designed battery to evaluate its performance, durability and bio-compatibility.

What is the way ahead?

- Musk has made many radical claims regarding his future vision for the technology beyond its potential medical use.
- He claims Neuralink could augment human intelligence by creating an on-demand connection with artificial intelligence systems.
- For example, improved cognition through enhanced memory, and improved learning and problem-solving skills.
- Neuralink with at this growth pace needs regulation.

- The cutting edge technology must not be released to the public until proven to be safe and this requires exhaustive testing.

6. The Need for Fact-Checking Units to Combat Fake News

- The IT (Intermediary Guidelines and Digital Media Ethics Code) Amendment Rules, 2023 aim to tackle the dissemination of false or misleading information through the introduction of fact-checking units. In light of the detrimental impact of fake news, particularly during the Covid-19 crisis, governments worldwide have recognized the urgency to combat this menace. India, in particular, has experienced a surge in fake news related to the pandemic, making it crucial for the government to proactively address the issue.

Fake news

- Fake news refers to intentionally fabricated or misleading information presented as if it were real news. It can be spread through traditional media sources like newspapers or television, but it is more commonly associated with social media platforms and other online sources.
- Fake news can range from completely made-up stories to misleading headlines and selectively edited or out-of-context information designed to deceive readers.
- It is often used for political purposes, to manipulate public opinion or to spread misinformation about individuals, organizations or events
- Scholars at the Massachusetts Institute of Technology even found that falsified content spreads six times faster than factual content on online platforms.

The Menace of Fake News

- **Dissemination of misinformation:** Fake news spreads false or misleading information, leading to a distortion of facts and events. This can misguide individuals and the public, leading to incorrect beliefs and actions.
- **Erosion of trust:** Fake news undermines trust in media organizations, journalism, and sources of information. When people encounter fake news repeatedly, it becomes challenging to distinguish between reliable and unreliable sources, eroding trust in the media landscape.
- **Manipulation of public opinion:** Fake news is often created with the intent to manipulate public sentiment and shape public opinion on specific issues, individuals, or events. This manipulation can have far-reaching effects on public discourse and decision-making processes.
- **Polarization and division:** Fake news can contribute to the polarization of society by promoting extreme viewpoints, fostering animosity, and

deepening existing divisions. It can exacerbate social, political, and cultural conflicts.

- **Personal and reputational harm:** Individuals, public figures, and organizations can suffer reputational damage due to false information circulated through fake news. Innocent people may be targeted, leading to personal, professional, and social repercussions.
- **Public safety concerns:** Fake news related to public safety issues, such as health emergencies or natural disasters, can spread panic, hinder effective response efforts, and jeopardize public safety. It can impede the dissemination of accurate information and guidance.

Deepfakes

- Deepfakes refer to synthetic media or manipulated content created using deep learning algorithms, specifically generative adversarial networks (GANs).
- Deepfakes involve altering or replacing the appearance or voice of a person in a video, audio clip, or image to make it seem like they are saying or doing something they never actually did. The term “deepfake” is a combination of “deep learning” and “fake.”
- Deepfake technology utilizes AI techniques to analyze and learn from large datasets of real audio and video footage of a person.

The Rise of Deepfakes

- **Advanced manipulation technology:** Deepfakes leverage deep learning algorithms and artificial intelligence to convincingly alter or generate realistic audio, video, or images. This technology enables the creation of highly sophisticated and deceptive content.
- **Spreading disinformation:** Deepfakes can be used as a tool to spread disinformation by creating fabricated videos or audio clips that appear genuine. Such manipulated content can be shared on social media platforms, leading to the viral spread of false information.
- **Political implications:** Deepfakes have the potential to disrupt political landscapes by spreading misinformation about politicians, political events, or election campaigns. Fabricated videos of political figures making false statements can influence public opinion and undermine trust in democratic processes.
- **Amplifying fake news:** Deepfakes can amplify the impact of fake news by adding a visual or audio component, making false information appear more credible. Combining deepfakes with misleading narratives can significantly enhance the persuasive power of fabricated content.

- **Challenges for content verification:** The emergence of deepfakes presents challenges for content verification and authentication. The increasing sophistication of deepfake technology makes it harder to detect and debunk manipulated content, leading to a potential erosion of trust in online information sources.
- **Detection and mitigation efforts:** Efforts are underway to develop deepfake detection tools and techniques. Researchers, tech companies, and organizations are investing in AI-based solutions to identify and combat deepfakes, aiming to stay ahead of the evolving manipulation techniques.

Existing Provisions to Combat Fake News

- **Intermediary Guidelines of 2021:** The most preferred democratic process to combat the threats and impact of fake news on a polity would be through Parliament-enacted laws. India opted for the speedier alternative of an addition to the Intermediary Guidelines of 2021 (as amended), through Rule 3(1)(v).
- **Can not disseminate misleading content:** Under this rule, intermediaries including social media platforms have to ensure that users do not disseminate content that deceives or misleads on the origin or knowingly and intentionally communicates any information which is patently false or misleading in nature but may reasonably be perceived as a fact.

Importance of Fact-Checking Units

- **Ensuring accuracy:** Fact-checking units play a crucial role in verifying the accuracy of information circulating in the media and online platforms. They employ rigorous research and investigation techniques to assess the credibility and truthfulness of claims, helping to distinguish between reliable information and misinformation.
- **Countering fake news:** Fact-checking units are instrumental in combating the spread of fake news and misinformation. By systematically debunking false claims, identifying misleading narratives, and providing accurate information, they help to minimize the impact of false information on public perception and decision-making.
- **Promoting media literacy:** Fact-checking units contribute to promoting media literacy and critical thinking skills among the general public. Their work serves as a valuable resource for individuals seeking accurate information, encouraging them to question and verify claims rather than relying solely on unsubstantiated sources.
- **Enhancing transparency:** Fact-checking units operate with transparency, providing detailed explanations and evidence-based assessments of their

findings. This transparency helps to build trust with the audience, fostering credibility and accountability in the information ecosystem.

- **Holding accountable those spreading misinformation:** Fact-checking units contribute to holding accountable those who deliberately spread misinformation or engage in disinformation campaigns. By publicly exposing false claims and identifying the sources of misinformation, they discourage the dissemination of false information and promote ethical standards in media and public discourse.

Conclusion

- With over 80 million Indian citizens online, the challenge of combating false information cannot be underestimated. The Indian government's initiative to introduce fact-checking units reflects an understanding of the urgent need to tackle the spread of fake news. Jonathan Swift's timeless quote, "**Falsehood flies, and the truth comes limping after,**" captures the essence of the problem we face today.

7. CBDT notifies e-appeals scheme

Recently, the Central Board of Direct Taxes (CBDT) notified the e-appeals scheme.

e-Appeals Scheme:

- The scheme is aimed at addressing the **issue of pending appeals** related to **Tax Deducted at Source (TDS) default** and **tax collection at source (TCS)**.

Empowering Joint Commissioner (Appeals)

- It empowers the **Joint Commissioner (Appeals)** for disposing of appeals filed before it or allocated or transferred to it, with the power to send **show cause notice** and **initiate penalty** under the relevant provisions of the Act.

However, they will have **no power** to issue the summons, as there is **no provision for a physical meeting** either personally or through authorised representatives in connection with any proceedings under this Scheme.

An appeal for a personal hearing will be done by **video conference**.

Amendments in Finance Bill

- The government has already inserted new **Section 246** in Chapter XX in the **Finance Act, 2023** to Insert Designation **New Joint Commissioner (Appeals) in the Income Tax Act**.
- The CBDT will deploy **100 posts of joint commissioners** for this purpose.

TDS Default and Processing of Return of Income

The scheme deals mainly with resolving appeals related to **TDS default, orders on TDS default, and orders on the processing of return of income.**

8. Groundwater depletion and recovery

This article discusses various parameters of groundwater recovery.

Introduction:

- Over the past few decades, the rapid depletion of groundwater in north India has become a common occurrence, with 95% of India's groundwater depletion happening in this region between 2002 and 2022.
- The two main factors driving groundwater storage are groundwater use and variability in summer monsoon rainfall.

Impact of Climate change on groundwater:

- Climate change poses new challenges for groundwater sustainability by increasing the need for groundwater pumping to meet irrigation demands.
- The warming climate is expected to bring more hydroclimate extremes like floods and droughts, which will further strain groundwater resources.
- Increased evapotranspiration resulting from a warming climate will reduce water availability for groundwater recovery, although its impact will be overshadowed by increased groundwater use for irrigation.

Research Findings:

- A team from IIT Gandhinagar analysed groundwater well data, satellite observations from Gravity Recovery and Climate Experiment (GRACE) and hydrological model simulations to understand groundwater storage variability under a warming climate.
- The team discovered that continued unsustainable groundwater extraction and excessive pumping from non-renewable sources will worsen groundwater loss.
- Despite the potential for periods of high precipitation to contribute to partial groundwater recovery, the projected increase in rainfall may not lead to an overall increase in groundwater storage due to the dominant influence of evapotranspiration in the long run and at higher warming levels.

Implications and Solutions:

- Climate projections suggest that an increase of 6-8% in summer monsoon rainfall could aid in groundwater recovery.
- However, even in the most optimistic scenario, this increase would only help recover about 50% of the groundwater lost in the last two decades, emphasising the need to address unsustainable groundwater usage.
- It is crucial to restrict unsustainable groundwater use for irrigation to maximise the benefits of increased precipitation.
- With the possibility of more frequent droughts, efficient irrigation practices and the relocation of crop-growing areas is a way forward to mitigate the adverse effects on groundwater storage.
- Promoting groundwater conservation is essential for long-term sustainability, as groundwater plays a vital role, especially during periods of drought, even when increased rainfall can enhance recharge.

9. Hydroelectric power deals in Arunachal Pradesh

Arunachal scraps 44 hydel deals with private companies.

Introduction:

- The government of Arunachal Pradesh has cancelled 44 hydroelectric power contracts with private developers due to the lack of commitment from them despite multiple notices.
- The withdrawn projects, with a total capacity of 32,415 megawatts, will now be transferred to Central Public Sector Undertakings (PSUs) through new agreements.
- The Central PSUs, including National Hydroelectric Power Corporation and Tehri Hydro Development Corporation Ltd., have analysed and evaluated an indicative list of 29 projects provided by the union government.

National Hydroelectric Power Corporation(NHPC):

- NHPC was established in 1975 with the objective of harnessing the country's hydroelectric potential to meet the increasing demand for electricity and promote sustainable development.
 - As a public sector undertaking, NHPC operates under the administrative control of the Ministry of Power, Government of India.
- It has developed and commissioned several major hydroelectric projects across different states, including the prestigious 2,000 MW Subansiri Lower Hydroelectric Project in Arunachal Pradesh.
- NHPC's projects not only generate clean and renewable energy but also contribute to the economic growth and development of the regions where they are located.

- The company emphasises the sustainable utilisation of water resources and environmental conservation in its project planning and execution.
- The company has a strong focus on corporate social responsibility (CSR) initiatives, including community development, healthcare, education, and environmental conservation in the areas surrounding its projects.
- NHPC also collaborates with various stakeholders, including state governments, local communities, and technical institutions, to ensure the successful implementation of its projects.

Tehri Hydro Development Corporation Ltd (THDC):

- THDC is a public sector undertaking under the administrative control of the Ministry of Power, Government of India.
- It was incorporated in 1988 with the primary objective of developing and operating the Tehri Hydro Power Complex in Uttarakhand, India.
- The Tehri Hydro Power Complex, located on the Bhagirathi River near Tehri town, is one of the largest hydroelectric projects in India.
- It comprises the Tehri Dam and the Tehri Pumped Storage Plant. The Tehri Dam, with a height of 260.5 metres, is one of the highest dams in the world.
- Apart from the Tehri Hydro Power Complex, THDC has also undertaken several other hydroelectric projects across the country, including the Koteshwar Dam and the Vishnugad Pipalkoti Hydro Electric Project.

10. ISRO's new NavIC satellite

The Indian Space Research Organisation (ISRO) launched the first of the second-generation satellites for its navigation constellation successfully.

NavIC

- NavIC (Navigation with Indian Constellation) is a regional navigation satellite system of India.
- NavIC is erstwhile known as the Indian Regional Navigation Satellite System (IRNSS).
- NavIC is designed with a constellation of 7 satellites, all launched by PSLV rockets.
- Three satellites of the constellation are placed in geostationary orbit and the other 4 satellites are placed in inclined geosynchronous orbit.
- NavIC offers two services: Standard Position Service (SPS) for civilian users and Restricted Service (RS) for strategic users.
- NavIC satellites will broadcast SPS signals in L1, L5 and S bands after the addition of NVS-01.
- RS signals will be broadcasted in L5 and S bands.

Current issues with IRNSS constellation

- **Atomic clock** - Satellite-based positioning system determines the location of objects by using the atomic clocks on board.
- The atomic clocks accurately measures the time it takes for a signal to travel to and back from it.
- In 2018, ISRO started the launch of the replacement satellites after their onboard atomic clock failed and it stopped providing accurate location data.
- **Mission Life** - IRNSS-1A which was launched into orbit in 2013, is almost defunct.
- All the 3 oldest satellites in the constellation are close to the end of their 10-year mission lives.
- At least three new satellites must be put into orbit to keep the seven-satellite constellation fully functional.
- **Signal Band** - The L1 frequency is among the most commonly used in the Global Positioning System (GPS).
- Earlier IRNSS used only L5 and S frequencies, this limits the interoperability with other global navigation satellite system (GNSS).

What is second generation satellites?

- They are replacement satellite for the Indian Regional Navigation Satellite System.
- The second generation satellites will replace satellites located at a geosynchronous orbit with additional features.
- NVS series of satellites will sustain and augment the NavIC with enhanced features.
- **NVS-01** - It is the first of the second-generation satellites envisaged for NavIC services.
- NVS-01 was launched by a Geosynchronous Satellite Launch Vehicle (GSLV) rocket.
- It is the heaviest satellite in the constellation weighing 2,232 kg.

What's new in the second-generation NavIC satellite?

- **Mission Life** - The second-generation satellites will also have a longer mission life of more than 12 years.
- The existing satellites have a mission life of 10 years.
- **New band (L1)** - The NVS series incorporates L1 band signals additionally to widen the services.
- The existing satellites provide L5 and S frequency signals.
- L1 signals increases the interoperability with other satellite-based global navigation systems.

- It will increase the use of NavIC in wearable devices and personal trackers that use low-power, single-frequency chips.
- **Atomic clock** - For the first time, an indigenous atomic clock will be flown in NVS-01.
- The satellite will have a Rubidium atomic clock onboard, indigenously developed by Space Application Centre-Ahmedabad.

What practical purpose does the NavIC constellation serve for users?

- After the development of the user receivers, NavIC is used for practical public applications.
- NavIC is in use for projects like public vehicle safety, power grid synchronisation, real-time train information systems, and fishermen's safety.
- Initiatives such as common alert protocol based emergency warning and unmanned aerial vehicles are in the process of adopting NavIC system.
- The Ministry of Electronics and IT urging smartphone companies to make their handsets NavIC compatible.

What is the advantage of having a regional navigation system?

- There are four global satellite-based navigation systems
 - The American GPS
 - The Russian GLONASS
 - The European Galileo
 - The Chinese Beidou
- Japan has a 4-satellite system that can augment GPS signals over the country, similar to India's GAGAN.
- India is the only country that has a regional satellite-based navigation system.
- **Accuracy** - GPS signals are accurate up to around 20 metres whereas NavIC open signals will be accurate up to 5 metres and restricted signals will be even more accurate when fully operational.
- **Coverage** - NavIC provides coverage over the Indian landmass and up to a radius of 1,500 km around it.
- **Consistency** - NavIC uses satellites in high geo-stationery orbit which enables the satellite to look over the same region on Earth always.
- **Penetration** - NavIC signals come to India at a 90-degree angle, making it easier for them to reach devices located even in congested areas, dense forests, or mountains.

11. The decade-long search for a rare Higgs boson decay continues

- A very rare decay process was observed by the physicists working with the Large Hadron Collider (LHC) particle smasher at CERN (Europe).
 - The Higgs boson decayed into a Z boson particle and a photon.

Higgs Boson:

- It is a type of boson, a force-carrying subatomic particle.
- The Higgs boson carries the force that a particle experiences in the Higgs field.
 - The Higgs field is an energy field that is present in the entire universe.
 - For instance, when an electron interacts with the Higgs field, the effect it experiences is due to its interaction with the Higgs boson.
- It should be noted that the stronger a particle's interaction with the Higgs boson, the more mass it has.
- However, photons don't interact with Higgs bosons as they have no mass.
 - Photons are particles of light.

Analysis of the Study:

- As discussed above, photons don't interact with the Higgs boson. But the research shows that the Higgs boson decayed into a Z boson and photon.
 - This is because of spacetime.
 - The standard model theory shows that the Higgs boson will decay to a Z boson and a photon 0.1% of the time.
- It should be noted that the Higgs boson is a heavy particle and unstable and thus decays into lighter particles.
- Moreover, the Z boson is also unstable which further decays into two muons (3% of the time).
- ATLAS and CMS, the two detectors that announced the new measurement found the decay earlier in 2018 and 2020. They combined their data and increased their statistical precision.

Challenges:

- There is still some uncertainty about the result, reflecting the rarity of the decay pathway.

Despite several accurate predictions by Standard Model, some questions remain unanswered. For example, what is dark matter? And why Higgs Boson is so heavy?

12. Enhancing Rail Safety and Speed: A Critical Imperative for India

- The recent tragic collision in Balasore, Odisha, resulting in a substantial loss of lives and injuries, highlights the urgent need for improving rail safety in India. To compete with advancements in air and road transport, India must invest in expanding and modernizing its rail network.

Safety Concerns in India's Railway System

- **Train Accidents:** India has witnessed train accidents, including derailments and collisions, which pose a significant safety risk. These accidents can result from various factors such as track defects, signalling failures, human error, and equipment malfunction.
- **Overcrowding:** Overcrowded trains, especially during peak travel times, raise safety concerns. Passengers boarding overcrowded coaches may face difficulties in movement, increasing the risk of falls, accidents, and potential stampedes in emergency situations.
- **Level Crossings:** Unmanned level crossings and inadequate safety measures at crossings pose a significant safety challenge. Accidents occur when vehicles or pedestrians cross railway tracks without proper warning systems, leading to collisions with trains.
- **Inadequate Safety Infrastructure:** The absence of modern safety infrastructure, such as advanced signalling systems, Automatic Train Protection (ATP) systems, and train control mechanisms, can compromise safety standards. Outdated equipment and infrastructure increase the risk of accidents.
- **Maintenance and Inspections:** Insufficient maintenance practices and inadequate inspection protocols can result in safety hazards. Timely inspection of tracks, bridges, signals, rolling stock, and electrical systems is crucial to identify and rectify potential risks.
- **Encroachment on Tracks:** Unauthorized encroachments near railway tracks, including slums, settlements, and informal markets, pose safety risks. These encroachments increase the likelihood of accidents and hinder effective track maintenance and monitoring.
- **Human Factors:** Human error, including negligence, fatigue, and inadequate training, can contribute to safety incidents. Ensuring well-rested and properly trained staff, including drivers, guards, and maintenance personnel, is essential to mitigate human-related safety risks.
- **Security Concerns:** Security threats, including theft, sabotage, and acts of terrorism, pose safety risks for passengers and railway operations. Ensuring robust security measures and coordination with law enforcement agencies are crucial to maintain a safe railway environment.

International Comparison of Railway Safety

- **Developed Countries:** Countries with well-developed railway systems such as Japan, China, Turkey, France, Spain, Germany, Italy, Sweden, and the United Kingdom have significantly better railway safety records compared to India. Stringent safety regulations, advanced infrastructure, modern signalling systems, and effective maintenance practices contribute to their superior safety standards.
- **Passenger Train Speeds:** In developed railway systems, most passenger trains operate at much higher speeds compared to India. For instance, Japan's Shinkansen, China's high-speed trains, and European high-speed rail services commonly achieve speeds of 200-350 kmph, ensuring efficient and safe travel. This stands in contrast to India's average train speeds of approximately 50 kmph.
- **Safety Performance Ranking:** If a ranking of major railways based on safety performance were to be made, India would likely place slightly higher than countries such as Egypt, Mexico, Tanzania, the Democratic Republic of the Congo, Nigeria, and Pakistan. This suggests the need for improvement to match the safety standards of leading railway systems.
- **Infrastructure and Network Length:** China, with its similar geographic size and population, provides a relevant comparison for India. China has made significant strides in expanding and modernizing its railway network. By surpassing India's total route length and investing in infrastructure upgrades, China has been able to enhance safety and accommodate growing passenger and freight demands effectively.
- **Technological Advancements:** Developed countries have embraced advanced technologies and innovations to enhance railway safety. These include state-of-the-art signaling systems, automated train control mechanisms, and advanced maintenance practices. India can draw lessons from their successful adoption of these technologies to improve safety standards.

Lessons from China's Success

- **Phased Development:** China's phased approach to railway development, focusing on speed enhancements on existing lines, allows for a smooth transition towards faster rail travel. India can learn from this approach and prioritize upgrades on existing routes before venturing into new high-speed projects.
- **Dedicated Passenger Lines:** China's emphasis on dedicated passenger lines played a crucial role in achieving optimal speed and efficiency. India should prioritize the development of dedicated passenger lines, especially on major trunk routes, to enhance safety and improve service quality.

- **Expansion of Route Length:** China's ambitious expansion of its rail network demonstrates the importance of extending routes and connecting major cities and regions. India can benefit from infrastructure expansion to accommodate growing demands, reduce congestion, and improve connectivity.
- **Technological Advancements:** China's investment in advanced technologies, such as signaling systems, train control, and maintenance practices, significantly improved its railway system. India can learn from this and prioritize technological innovation to enhance safety, efficiency, and maintenance protocols.
- **Balancing Cost and Affordability:** While China's high-speed rail network is impressive, India must find a balance between cost and affordability. Investing in 200-250 kmph high-speed lines on the existing broad-gauge network offers a cost-effective solution that leverages India's terrain and existing infrastructure.
- **Public-Private Partnerships and International Collaboration:** China's railway success was built on strong collaborations and partnerships. India can learn from this approach by fostering public-private partnerships and collaborating with countries known for their advanced railway systems. This enables knowledge transfer, technology sharing, and financial support.

Conclusion

- For India to transform its railways into a lifeline of transportation, urgent attention must be given to enhancing rail safety and speed. Drawing inspiration from successful models like China, India should invest in modernizing its infrastructure and building high-speed lines on the existing network. By doing so, India can overcome safety concerns, compete with other modes of transport, and ensure a brighter future for rail travel.

13. A global order as technology's much needed pole star

Details:

- The rapid scale and speed of technological developments have radically and disruptively transformed societies and daily lives.
- Though lives have become much easier, several other complex challenges have appeared.

Challenges Posed by Technology:

- There are several externalities occurring beyond the scope of geographical national borders like Cyberattacks.

- Cyberattacks challenge the socio-economic and political existence by creating a ripple effect.
- The advent of the internet and other technologies like blockchain allows state and non-state actors to influence areas of trade, commerce, health, and education even while remaining outside the financial and judicial scope.
- There is a declining significance of conventional geographical borders as data travel across the world wide web at an unimaginable speed.
 - The existing constitutionally established institutions are inadequate in tackling malicious 'virtual activities'.
 - It is also difficult to establish the applicability of any country-specific law due to the universal nature of technology.
 - In the absence of a globally-accepted norm, it is difficult to collect evidence and book the recalcitrant actors.
- Constantly emerging technologies expose the inability and incapacity of the nation-state to administer them.
 - Technological entities have transcended boundaries to collaborate with the rest of the world. For example,
 - Topographical maps which used to be produced by public and military institutions are now available through private entities like Google Maps.
- The five largest American tech companies (namely Google, Amazon, Facebook, Apple, and Microsoft) have a valuation of approximately \$4,100 billion (more than Germany's GDP).
- Data has become one of the most important raw materials with only a few countries having power and influence over it.

Way Ahead:

- A principle-based global order can streamline the enforceability and challenges in the adoption and diffusion of technology.
- Moreover, it will provide guidance to emerging and least-developed countries.
- India also needs to have laws for data transfer and data privacy. It should be complemented by global regulation architecture trusted by all countries.
- It is a great opportunity for India (as a current chair of G20) to take a leadership role similar to International Solar Alliance and the Coalition for Disaster Resilient Infrastructure.

14. Central Vista Project

In the 75th year of Independence, India has a new Parliament building, built by Indians, and embodying the culture, pride and spirit of the entire nation.

Central Vista Project

- The Central Vista project is the revamping project of the Central vista area from Rashtrapati Bhavan till India Gate.
- The plan includes the construction of a new parliament, Prime Minister and Vice-President's residences along with 10 building blocks to accommodate all government ministries and departments.
- **Ministry** - The project is piloted by the Central Ministry of Housing and Urban Affairs.
- **Time Frame** - The project was announced in 2019 by the Central government of India and is estimated to be completed by 2024.
- **Budget Outlay** - The gross rough estimation for all the planned development/ redevelopment works is about Rs. 20,000 crore.

Need for the project

- The existing Parliament House was commissioned in 1927 and showing signs of distress and over-utilization.
- The existing Parliament is not able to meet the current requirements in terms of space and amenities.
- **Safety concerns** - Current building is not designed according to fire norms.
- **Distressed infrastructure** - Excessive repairs have worsened the condition of the building.
- **Inadequate workspace** - The current parliament building poses a space constraint.
- **Narrow seating space** - The seating halls are cramped and only the first two benches have the desk space to place documents and papers.
- **Obsolete communication structures** - The communications infrastructure and technology is dated.
- **Vice President's House** - Vice-President, Chairman of Rajya Sabha's house is in Maulana Azad Road away from the Central vista.
- **Prime Minister's House** - Prime Minister's official residence is also outside the Central Vista in Lok Kalyan marg.
- **Decolonisation** - The old structures in the Central Vista embodies the Colonial rule of India.
- **Ministries** - Out of 51 ministries, 12 have offices outside the Central Vista which hinders coordination and synergy.

Criticisms against the project

- The project started along with the COVID-19 pandemic year which spurred several criticisms.

- **Healthcare** - Funds have been diverted from public healthcare and COVID-19 response to the Central Vista Project.
- **Renovate** - Instead of building a New Parliament building, the existing Parliament building could be renovated.
- **Green Space** - The revamping project reduces the green spaces in the area.
- **Heritage** - The Central Vista Project is leading to a destruction of its Architectural Heritage.
- **Public Space** - The project will lead to reduction of public spaces and conversion of public spaces into Government use.
- **Old Act** - The role of managing the task is assigned to Central Public Works Department (CPWD) based on old Colonial Act, the Government Buildings Act, 1899.

What are the arguments put forward by the government?

- **Healthcare** - The Master Plan was conceived in September 2019, much earlier than the outbreak of COVID-19 pandemic.
- Public Health has been a priority of the government and never compromised at the cost of the project.
- Till date, only 2 projects of New Parliament Building and Redevelopment of Central Vista Avenue have been awarded fund.
- **Green Space** - The overall green cover within Central Vista area will increase under the Master Plan.
- No trees would be cut and the trees would also be transplanted to Eco-park.
- **Old Act** - The Government Buildings Act, 1899 is in operation since 1899 and has not been repealed.
- The CPWD has been awarded the role based on the Section 3 of the Act which exempts all Government Buildings from the regulation of municipal laws.
- **Public Space** - Additional public and green spaces shall be added in Central Vista Avenue.
- Places like the National Museum, Indira Gandhi National Centre for Arts, Central Vista Avenue and India Gate will be accessible to the public.
- **Heritage** - None of the listed Heritage Buildings in Central Vista will be demolished further they will be retrofitted and refurbished for their future use.

What is the way ahead?

- India has grown out of its colonial past and the new Parliament building should be considered as a symbol of it.
- Still the heritage of the century old building must be preserved for its architectural marvel.

- The proximity of the ministry offices must aid and improve the synergy among the ministries.
- The technological and communication features added to the Parliament should be put in good use to improve its efficiency.
- The resilient and safe buildings of Central Vista should be made an example of Indian Architectural heritage.

15. Plastic Pollution: A glossary of related terms

This year 2023 celebrates the 50th anniversary of World Environment Day on June 5th.

World Environment Day

- World Environment Day has been held annually on June 5, since 1973.
- The day is led by the United Nations Environment Programme (UNEP).
- The date '**June 5**' was chosen by UN General Assembly at the 1972 Stockholm Conference on the Human Environment.

What is about the 2023 World Environment Day?

- The 2023 World Environment Day marks its 50th Anniversary.
- This year's theme focuses on solutions to plastic pollution under the campaign #BeatPlasticPollution.
- The campaign calls for global solutions to combat the pandemic of plastic pollution.
- World Environment Day 2023 is hosted by Côte d'Ivoire (a Western African country) in partnership with the Netherlands.

How adverse is Plastic pollution?

- The world is being inundated by plastic and plastic pollution is one of the gravest threats to the planet.
- According to UN data, more than 400 million tonnes of plastic is produced every year worldwide, half of which is single-use plastic.
- Out of which less than 10% is recycled and an estimated 19-23 million tonnes end up in water bodies.
- Plastic clogs our landfills (Land pollution), leaches into the ocean (water pollution) and is combusted into toxic smoke (Air pollution).

Terms related to Plastic Pollution

- In line with the theme of this year's Environment Day, listed out a few terms related to plastic pollution.
- **Plastics** - Derived from the Greek word *plastikos*, meaning capable of being shaped or moulded.
- It refers to a wide range of synthetic or semi-synthetic materials that use polymers as a main ingredient with their plasticity.
- Most modern plastics are derived from fossil fuel-based chemicals like natural gas or petroleum.
- Recently, variants made from renewable materials, such as corn or cotton derivatives have also emerged.
- **Commodity plastics** - These refer to the 6 major polymer types which constitute around 70% of global plastic production.
- Each of the 6 types has different properties.
- They can be identified by their resin identification code (RIC) denoted by symbols found on plastic products.
- **Resin Identification Code** - RIC shows the consumer which type of plastic resin was used to make the chosen product.
- The symbol looks similar to recycle symbol but it explicitly does not mean the product can be recycled.
- The RIC is strictly an identifier of the type of plastic and doesn't address the recycled content or recyclability of the container.
- The adverse environmental impact of plastic is primarily due to its slow decomposition rate in natural ecosystems.
- **Decomposition rate** - It refers to the rate at which a material breaks down into its constituent parts through chemical processes.
- Plastics crumble into smaller particles but do not break down into simpler substances resulting in microplastics.
- **Microplastics** - Officially defined as plastics less than 5 millimetres in diameter and categorised into two.
 - Primary microplastics are tiny particles designed for commercial use, such as in cosmetics or textiles.
 - Secondary microplastics are particles that are a product of the breakdown of larger plastic items.
- Secondary microplastics are formed due to exposure to environmental factors such as sun radiation or ocean waves.
- Microplastics do not break down into simpler particles but find their way across the world including the food chain.
- **Toxins** - Microplastics contain a number of toxic chemicals such as BPA which pose severe risks to human health.
- BPA or Bisphenol A which is used to harden the plastic, contaminates food and drinks.
- **Great Pacific Garbage Patch** - It is the largest collection of plastics and microplastics in the ocean.

- It is a collection of marine debris in the North Pacific Ocean and is also known as the trash vortex.
- It is located between California and Japan, and formed due to converging ocean currents.
- The GPGP comprises majorly of single-use plastics.
- **Single-use plastics** - A term which refers to any plastic items which are either designed to be used one time by the consumer before they are thrown away or recycled or used in this way.
- Many countries, including India, have passed legislation to either ban or severely restrict their use.

16. The Effectiveness of Production-Linked Incentive Schemes: A Critical Analysis

- Former Reserve Bank of India (RBI) Governor, Raghuram Rajan, recently expressed doubts regarding the efficacy of the production-linked incentive (PLI) scheme in boosting India's domestic manufacturing and exports. While the government believes that the PLI scheme has been successful in enhancing the manufacturing sector, critics have raised concerns about its effectiveness.

Production-Linked Incentive scheme (PLI)

- PLI is a scheme introduced by the Indian government in 2020 to promote domestic manufacturing in specific sectors.
- Under the PLI scheme, eligible companies receive financial incentives or subsidies based on their incremental production or sales.
- The objective of the scheme is to boost the competitiveness of Indian manufacturers, attract investment, create employment opportunities, and enhance exports in targeted sectors.
- The scheme aims to encourage both domestic and foreign companies to set up or expand their manufacturing operations in India, thereby strengthening the country's manufacturing ecosystem and reducing reliance on imports.

Significance of the policy of subsidizing domestic sectors

- **Promoting Domestic Industries:** Subsidies provide financial support to domestic industries, encouraging their growth and competitiveness. By reducing production costs, subsidies enable businesses to offer goods and services at more competitive prices, both in domestic and international markets.
- **Encouraging Employment Generation:** Subsidies can stimulate job creation within domestic sectors. By providing financial incentives to businesses,

subsidies help them expand their operations, leading to increased hiring and reduced unemployment rates.

- **Enhancing Competitiveness:** Subsidies can bolster the competitiveness of domestic industries, particularly in sectors where foreign competitors have a significant advantage. Financial assistance can be used to invest in research and development, adopt advanced technologies, upgrade infrastructure, and improve product quality, enabling domestic businesses to compete more effectively on a global scale.
- **Reducing Dependency on Imports:** By subsidizing domestic sectors, governments aim to reduce reliance on imported goods and services. This supports import substitution, where domestic industries are incentivized to produce goods that were previously imported, thereby strengthening the domestic manufacturing base and reducing trade deficits.
- **Fostering Innovation and Technology Development:** Subsidies can facilitate research and development activities within domestic sectors. By providing financial support for innovation, governments encourage businesses to invest in new technologies, processes, and products.
- **Sectoral Development and Economic Diversification:** Subsidies can be targeted towards specific sectors deemed strategically important for the country's economic development and diversification. By incentivizing investments in these sectors, governments aim to create a robust industrial base, foster industrialization, and facilitate economic growth.
- **Addressing Market Failures:** Subsidies can be used to rectify market failures, such as externalities or information asymmetries. For example, subsidies can be provided to encourage the adoption of environmentally friendly practices or to support industries with high spillover effects on other sectors of the economy.
- **Attracting Investments:** Subsidies serve as a tool to attract domestic and foreign investments. By offering financial incentives and creating a favorable business environment, governments can entice businesses to establish or expand their operations within the country. This promotes economic development, job creation, and technology transfer

Role of tariffs on imports

- **Protecting Domestic Industries:** Tariffs are often imposed on imported goods to provide a level of protection to domestic industries. By increasing the cost of imported products, tariffs make them less competitive in the domestic market.
- **Creating a Level Playing Field:** Tariffs can help create a level playing field for domestic industries by counterbalancing advantages enjoyed by foreign competitors. These advantages may include lower production costs, access to subsidies, or different regulatory standards.

- **Promoting Import Substitution:** Tariffs incentivize domestic production by making imported goods more expensive. This stimulates import substitution, where domestic industries are encouraged to manufacture goods that were previously imported.
- **Generating Government Revenue:** Tariffs are a significant source of revenue for governments. By levying taxes on imports, governments can generate funds that can be allocated for various public purposes, including infrastructure development, social programs, and public services.
- **Balancing Trade Deficits:** Tariffs can be utilized to address trade imbalances and reduce trade deficits. If a country consistently imports more than it exports, imposing tariffs on certain imported goods can help reduce the trade deficit by discouraging excessive imports.
- **Encouraging Domestic Industry Development:** Tariffs can encourage the development and growth of domestic industries by making imported goods relatively more expensive. Higher prices on imports can incentivize domestic businesses to invest in their production capabilities, innovate, and improve efficiency.

Challenges of effective implementation of the PLI in manufacturing sector

- **Targeting and Selection:** Identifying the right sectors and companies for incentives is crucial to the success of the PLI scheme. Determining the sectors that have the potential for growth, job creation, and export competitiveness requires careful analysis and assessment.
- **Administrative Efficiency:** Efficient administration and implementation of the PLI scheme are essential. This involves the timely disbursement of incentives and the monitoring of compliance by beneficiary companies.
- **Funding and Budgetary Allocation:** The PLI scheme requires significant financial resources to support the incentives provided to eligible companies. Ensuring adequate funding and appropriate budgetary allocation pose challenges, especially in balancing the financial burden on the government while meeting the scheme's objectives.
- **Meeting Performance Criteria:** The PLI scheme typically includes performance-based criteria that companies must meet to qualify for incentives. Ensuring that beneficiary companies adhere to these criteria and meet the prescribed benchmarks can be challenging and requires continuous monitoring and evaluation.
- **Risk of Subsidy Dependence:** There is a risk that companies may become overly reliant on subsidies and may not invest adequately in improving their competitiveness or innovation capabilities.
- **Sector-Specific Challenges:** Different sectors within the manufacturing industry have unique challenges that need to be considered during the implementation of the PLI scheme. These challenges could include

technological barriers, supply chain complexities, skill gaps, or global market dynamics.

Way ahead: Addressing the structural issues in the manufacturing sector

- **Infrastructure Development:** Adequate and modern infrastructure, including transportation networks, power supply, logistics, and connectivity, is essential for the smooth functioning of manufacturing activities.
- **Access to Finance:** Availability of affordable and accessible finance is critical for the growth of the manufacturing sector, especially for small and medium enterprises (SMEs). Enhancing access to credit, promoting innovative financing mechanisms, and easing collateral requirements can help address the finance gap and support the expansion of manufacturing businesses.
- **Quality of Education and Skill Development:** A skilled workforce is vital for the manufacturing sector's productivity and competitiveness. Addressing the quality of education and aligning it with the needs of the industry can help bridge the skill gap.
- **Research and Development (R&D) and Innovation:** Promoting R&D and innovation is crucial for enhancing the technological capabilities and competitiveness of the manufacturing sector. Encouraging investment in R&D, fostering collaboration between industry and research institutions can help drive technological advancements
- **Regulatory Reforms:** Simplifying and rationalizing regulatory frameworks can reduce bureaucratic burdens, enhance ease of doing business, and attract investments. Streamlining processes, reducing red tape, and ensuring transparent and efficient regulatory mechanisms can create a conducive environment for manufacturing businesses to thrive.
- **Supply Chain Integration:** Strengthening supply chain integration is essential for improving efficiency, reducing costs, and enhancing competitiveness.
- **Sustainability and Environment:** Integrating sustainability practices and adopting eco-friendly technologies are increasingly important for the manufacturing sector. Emphasizing resource efficiency, reducing carbon emissions, and promoting circular economy principles can enhance the sector's environmental sustainability and compliance with global sustainability standards.
- **Market Access and Trade Policies:** Facilitating market access, reducing trade barriers, and promoting export-oriented policies are critical for the manufacturing sector's growth and global competitiveness.

Conclusion

- The efficacy of the PLI scheme in boosting India's domestic manufacturing and exports is a subject of debate. While targeted subsidies can stimulate growth in strategic sectors and cater to existing demand, concerns surrounding cronyism and bureaucratic control must be addressed. Focusing on improving the investment environment and addressing infrastructural and educational deficiencies will contribute to sustainable growth in the manufacturing sector.

17. Agni Prime Missile Successfully Tested

India successfully tested the new-generation Agni-Prime ballistic missile with a strike range of 1,000 to 2,000 kilometres.

Agni Prime Missile

- **Stages:** Agni-P is a two-stage, surface-to-surface, road-mobile, and solid-fueled missile.
- **Canister-Launch System:** Agni-P is launched via a canister, providing operational flexibility and ease of transport.
- **Advanced Systems:** Agni-P incorporates new propulsion systems, composite rocket motor casings, and advanced navigation and guidance systems.

History and Development

- **Development Timeline:** Beginning in 2016, DRDO has been developing Agni-P as a successor to enhance accuracy and reliability.
- **Indo-Pacific Strategy:** Agni-P is part of India's strategy to counter China's naval capabilities and achieve parity in anti-access/area denial.
- **International Implications:** Agni-P's development positions India in the regional power dynamics and could impact arms control treaties.

Missile Capabilities

- **Manoeuvrability and Accuracy:** Agni-P features a manoeuvrable reentry vehicle (MaRV) for precise delivery of warheads to multiple locations.
- **Transportability:** The missile is stored in a hermetically sealed tandem twin canister launcher, allowing for swift transportation through road and rail.
- **Weight Reduction:** Composite materials are utilized in both stages of Agni-P to reduce weight and enhance performance.

Strategic Importance

- **Counterforce Capability:** Agni-P aims to deter neighbourhood enemy forces, given its limited range.
- **Enhanced Deterrence:** The missile strengthens India's deterrence capabilities and contributes to national security.
- **Regional Power Dynamics:** Agni-P's development is part of India's Indo-Pacific strategy, impacting regional power dynamics.

18. Precision Farming

India's food requirement is likely to go up from the present level of 330 million tonne (MT) to more than 500 MT by 2050. India needs to meet the growing demand for food amidst shrinking land size.

'Precision farming'

- Precision farming is a site-specific crop management concept.
- It is based on observing, measuring and responding to inter- and intra-field variability in crops.
- This involves leveraging digital tools such as AI, Machine Learning, and IoT to optimise crop yield and quality while minimising costs and resources.
- It is also referred to as precision agriculture, satellite agriculture, and site-specific crop management (SSCM).

How Precision farming happens?

- The following things are needed to increase the efficiency of the input resources
 - Quality estimation of the seeds to be cropped
 - Well-prepared soil
 - Precise seeding advisory
- **Farming Stage** - Based on the soil health analytics, the amount and type of micro/macro nutrients is decided and added to the soil.
- IoT enabled soil sensors combined with remotely sensed data through drones/satellites and fast processing determines what the soil needs.
- This information is either sent as a notification to the farmer's phone or through a central server.

Benefits of precision farming

- In order to meet the growing demand for food amidst shrinking land size, precision farming is a promising solution avoiding crop failure.

- **Harvesting stage** - Any errors at this stage can result in crop failure.
- Crop surveillance is the only way that a farmer can ensure a timely harvest, especially when dealing with seasonal crops.
- It also helps in understanding and planning for the next farming season.
- Effective inspection of the field with infrared cameras and based on their real-time information improves crop surveillance.
- Data-based harvesting decisions are the next important step that can increase the efficiency of farming decisions.
- IoT and analytical tools can identify the parameters for harvesting in real-time.
- Farmers can estimate when the nutritional content is highest in the crop through digital tools and determine the correct time of harvesting.
- For example, the harvesting of sugarcane crop can be done based on sugar content in the plant and not by its size.
- **Post-harvest stage** - Digital tools helps farmers with price, storage, transportation and logistics information.
- Precision technology can play a useful role in 'traceability in supply chain', particularly in exports.

What are the issues in adapting to precision farming?

- There is a slow uptake of digital agriculture due to various data collection and analytics hindrances.
- **Data collection** - The prominence of segregated smallholder farms in the country, which makes data gathering a complicated activity.
- **Lack of centralised Repository** - Data of different geographical locations, weather, soil types, crop types, and other parameters are needed to make a viable advanced technology-based model.
- At present, there isn't a centralised repository of different varieties of data stacks to be used in agriculture.
- **Cadastral data** - To improve analytics, Cadastral data with administrative boundaries and geo-coded soil data must be made available through public sources.
- At present, only few States have GIS maps of cadastral boundaries which limits the potential of wide scale implementations of digital solutions.
- **Disparate data** - Rich data sets like soil health card on micro-nutrients, are disparate and not interoperable, limiting analytics and value creation.
- **Affordability** - technological interventions used in precision farming is unaffordable for Indian farmers.

What is the way forward?

- **Farm Digitization** - Scaling up of digital agriculture in India by bringing digitisation to the farm.
- **Effective partnership** - Learnings can be drawn from several successful examples of partnerships between stakeholders within India and around the globe.
- **Digital Infrastructure** - Development of digital public infrastructure for farmers covering all areas from input to output.
- **Accessibility** - Government subsidising the cost of technology to enable them move towards digital technology.
- **Carbon trade** - Creation of carbon credits for the farmers would encourage the adoption of precision agriculture.

19. Transgenic Cotton

Proposal to test transgenic cotton rejected by three States.

- The proposal endorsed by the Genetic Engineering Appraisal Committee (GEAC), which aimed to conduct field tests for a new type of transgenic cotton seed, has been rejected by Gujarat, Maharashtra, and Telangana.
- Bioseed Research India, based in Hyderabad, has developed a transgenic cotton seed containing the cry2Ai gene, which is believed to confer resistance to the pink bollworm, a significant pest.
 - However, Gujarat, Maharashtra, and Telangana have declined the GEAC's recommendation to test this seed in farmer's fields.
- According to the existing regulations, transgenic seeds must undergo field testing before obtaining clearance from the GEAC for commercial development.
- Bioseed sought permission from four states for conducting these tests, but only Haryana granted approval.

Educating the States:

- The GEAC has requested the Department of Biotechnology and the Indian Council of Agricultural Research to collaborate in organising capacity-building activities.
- These activities aim to inform State/UT Governments about the technology and regulatory framework associated with evaluating genetically modified (GM) crops.
- In India, transgenic cotton is the sole GM crop that has received approval and is currently being cultivated in fields.

Process of approval of GM Crops in India:

- RCGM (Review Committee on Genetic Manipulation) assesses and decides on the applications regarding the testing of GM crops. (conducts Biosafety Research Level 1 trial)
- GEAC (Genetic Engineering Appraisal Committee) then assesses the applications for field trials. (Biosafety Research Level 2 Trial)
- If approved, field trial assessment is done to decide if the crop can be commercialised.
- The developers of GM crops conduct field trials to assess their performance, agronomic traits, and potential environmental impacts.
 - These trials are carried out under strict containment and biosafety guidelines, ensuring that the GM crops do not escape into the environment.
- MEC (Monitoring and Evaluation Committee) monitors small-scale trials on behalf of GEAC and reports them.
- The GEAC forms a sub-committee of scientific experts, known as the Institutional Biosafety Committee (IBC), to review the data submitted by the developers. The IBC examines the safety, efficacy, and environmental impact of the GM crop and prepares a report.
- Following the IBC review, the GEAC invites public comments and suggestions on the GM crop. This step allows stakeholders, including farmers, NGOs, scientists, and concerned citizens, to voice their opinions and concerns regarding the potential release of the GM crop.
- After considering the IBC report and public comments, the GEAC makes a decision on the approval or rejection of the GM crop. If approved, specific conditions, restrictions, or monitoring requirements may be imposed to ensure the safe use and cultivation of the GM crop.
- The Union Ministry of Agriculture, after checking the seed act, allows for the seed to be released in the market.
- Once a GM crop is approved, post-approval monitoring and surveillance are conducted to monitor its performance, potential impacts, and compliance with the prescribed conditions.

20. Pitfalls of the Food Storage Plan

The Union Cabinet decided to create additional decentralised grain storage at the block level for strengthening the agriculture sector.

New initiative

- Checking post-harvest losses is critical for achieving food security.
- In this context, the Union government has announced 'World's Largest Grain Storage Plan in Cooperative Sector'.

- **IMC** - An Inter-Ministerial Committee (IMC) will be constituted under the Chairmanship of Minister of Cooperation and the 3 concerned ministers as its members.
- The IMC converges eight ongoing schemes of three ministries - Minister of Agriculture and Farmers Welfare, Minister of Consumer Affairs, Food and Public Distribution, Minister of Food Processing Industries.
- The plan entails setting up various types of agri-infrastructure, including warehouse, custom hiring center, processing units, etc. at the level of PACS, thus transforming them into multipurpose societies.
- The initiative also aims to create additional decentralised grain storage at the block level.
- **Investments** - The cooperative sector will manage the public investments.
- The new initiative tries to address two of the most important objectives of farm laws -
 - Strengthening/expanding the market infrastructure.
 - Ensuring remunerative prices to farmers.

The value of food losses (agriculture, horticulture, milk, meat and fish) are above Rs. 1,40,000 crore per year.

Important aspects that need to be considered

- Reducing post-harvest losses should be a key objective of the new storage infrastructure.
- Strengthening the infrastructure in the existing market yards.
- Creating storage facilities within the market yards, wherever possible.
- Providing safe and secure market yards, especially protecting stocks from natural calamities.

What are the issues?

- **Governance** - Coordination and cooperation between the States and the Centre is required to strengthen storage facilities.
- **Coops' shortfalls** - Elite capture, bureaucratic/political interference, poor marketing are few problems associated with agriculture co-operatives.
- **Overlap** - Farmer Producer Organisations (FPOs) are also involved in post-harvest handling of the produce and are promoted to address the limitations of co-operative societies.
- Multiplicity of institutions with cross-cutting objectives are likely to dilute their effectiveness.
- **Maintenance** - Capital maintenance expenditure (Capex) is rarely incorporated into annual budgets making managing and maintaining is a bigger challenge.

- **Elite Farmers** - Elite capture is rampant in co-operatives.
- Thus small and marginal farmers lose on gaining access to competitive markets and getting remunerative prices.

India has the storage capacity for only one-eighth of its annual perishable produce.

What should be done?

- Modernising the existing storage infrastructure should be a priority.
- Judicious planning and estimation of storage requirements for different products across the regions of the country.
- There is need for creating adequate storage facilities for horticultural crops, given their increasing production.
- Going beyond grains and create storage infrastructure for perishable commodities like fruits, vegetables, milk, meat, fish, etc.
- Processing the perishables can increase the longevity of the food and but modern technologies are required for ensuring high quality processing.
- Maintaining the quality of food is important to maintain nutrition security.

21. Fruit Flies: Unveiling their Contributions to Science and Medicine

- **Flies' negative perception:** Fruit flies often considered annoying pests, but their significance in biological and medical science is immense.
- **Economic and environmental importance:** Flies, including fruit flies, play crucial roles as pollinators for plants and contribute to decomposition processes.

Fruit Flies (*Drosophila melanogaster*)

- **Overview:** Fruit or vinegar fly species known for its nuisance during summer.
- **Scientific significance:** *Drosophila melanogaster* is a well-understood animal organism globally and has contributed to numerous Nobel Prize-winning discoveries in physiology and medicine.

Partnership between Science and Flies

- **Early collaborations with flies:** Biologist Thomas Hunt Morgan's experiments with fruit flies revolutionized evolutionary and genetic research.
- **Discoveries in genetics:** Fruit flies provided insights into genetic mutations, inheritance patterns, and the mapping of genes on chromosomes.

- **Understanding biological processes:** Studies in fruit flies helped unravel mechanisms of development, gene regulation, and protein synthesis.

Insights from Drosophila Research

- **Embryo studies:** Microscopic examination of Drosophila embryos aided in understanding genetic defects and gene networks that control development.
- **Contribution to genetic medicine:** Research on fruit flies helped decipher the genetic code, map DNA structure, and investigate inherited disorders.
- **Remarkable genetic similarity:** Fruit flies and humans share striking biological similarities, allowing for the study of human biology and disease in flies.

Versatility and Applications of Drosophila Research

- **Efficient and cost-effective research:** Fruit flies offer a fast and versatile model organism for studying various aspects of human biology and disease.
- **Neuroscience and behavioral research:** Fruit flies provide insights into learning, memory, sleep, aggression, addiction, and neural disorders.
- **Broad range of applications:** Fruit flies are used to study cancer, aging, development, gut microbiome, stem cells, muscles, and the heart.

Bridging Knowledge Gaps

- **Complementary to human studies:** Fruit flies serve as a bridge to understanding complex human diseases and physiological processes.
- **Insights into neurodegenerative diseases:** Although flies cannot fully mimic personality loss in Alzheimer's disease, they contribute to studying neuronal death and related mechanisms.

Paradigm for Scientific Discoveries

- **Accelerating research in complex organisms:** Knowledge gained from fruit flies can be applied to more complex organisms, expediting scientific progress.
- **Global research community:** Over 10,000 researchers worldwide utilize fruit flies for diverse areas of study, enriching our understanding of human biology and disease.

Shifting Perspectives

- **Appreciating the significance:** Fruit flies, despite their annoyance, play a vital role in advancing scientific knowledge and medical breakthroughs.

- **Rethinking flies' presence:** Viewing fruit flies in a different light, recognizing their value in research and their contributions to understanding the world around us.

22. JATAN: Virtual Museum Software

- The Union government plans to complete the 3D digitisation of all museums under its administrative control by the end of 2023.
- The digitisation initiative using JATAN software aims to enhance the conservation and preservation of artefacts.

JATAN Software

- JATAN is a virtual museum builder software used in Indian museums.
- It enables the creation of a digital collection management system and is deployed in several national museums across India.
- The objective of JATAN is to digitally preserve and document museum objects for the benefit of researchers, curators, and other interested individuals.
- The software was designed and developed by the Human Centres Design and Computing Group at the Centre for Development of Smart Computing (C-DAC) in Pune.
- JATAN facilitates the creation of digital imprints of preserved objects and monuments.
- These digital imprints are integrated into the national digital repository and portal, making them accessible to the public.

Benefits of 3D Digitisation

- 3D digitisation offers improved conservation and preservation of artefacts, ensuring their long-term protection.
- It enhances accessibility and exploration for museum visitors, providing new ways to engage with the collection.
- The 3D models generated through digitisation can be used in augmented reality, virtual reality, and interactive learning experiences, creating immersive educational opportunities.
- Furthermore, the digitisation process enables the potential for 3D printing, allowing for replication and detailed study of artefacts.

23. Challenges of moving from LIBOR

The RBI has set a deadline of June 30, 2023, for complete switch-over from LIBOR and some banks and financial institutions (FI) are yet to facilitate an absolute transition.

LIBOR

- London Interbank Offered Rate (LIBOR) is a global benchmark interest rate for unsecured short-term borrowing in the interbank market.
- It combines individual rates at which banks opine they may borrow from each other (for a particular period of time) at the London interbank market.
- It is used as a benchmark to settle trades in futures, options, swaps and other derivative financial instruments in over-the-counter markets and on exchanges globally.
- Further, consumer lending products like mortgages and credit cards, too use it as a benchmark rate.

Why are we moving from LIBOR?

- In India, several banks and financial institutions (FIs) followed LIBOR.
- The Financial Conduct Authority (FCA) of UK ended the Libor settings in 2021, except for certain types of tough legacy contracts which could not be transitioned.
- Owing to the LIBOR scandals and reforms to provide risk-free interest rates, RBI recommended transitioning from LIBOR.

What did the central bank of India do?

- The LIBOR transition will impact a wide range of financial institutions across various sectors of the financial industry.
- These institutions will need to transition their existing contracts and develop new products based on alternative reference rates.
- The RBI has issued two circulars giving the road map to the transition and arrangements for transition from LIBOR.
- It established a system of *alternative reference rates* (ARRs) that allows banks to choose rates from a basket of currencies for international financial transactions.
- The RBI continues to monitor the efforts of banks/FIs for ensuring a smooth transition from LIBOR.

What are the challenges in transition?

- **Alternative** - Identifying and adopting suitable alternative reference rates to replace LIBOR.
- Different jurisdictions and markets have chosen different rates, such as the SOFR in the US, the SONIA in the UK, TONA in Japan and the EU-STR in the Euro Zone.
- Assessing the suitability of these rates for their specific products and contracts to avoid contractual fallback is a challenge.
- **Fallback provisions** - Transitioning these contracts to alternative rates requires addressing the fallback provisions,
- Updating these provisions can be complex, as they involve legal, operational, and documentation changes.
- **Internal Changes** - Making significant adjustments to internal systems, processes, and models.
- **Technology aspects** - Banks and FIs need to invest in the necessary technology upgrades and ensure smooth integration without disrupting day-to-day operations.
- **ARR** - The introduction of alternative reference rates (ARRs) also poses challenges of market liquidity and product availability.
- **Legal challenges** - Contract interpretation, amendment, and litigation arising from the transition process.
- **Awareness** - Effective communication and engagement with clients and stakeholders by banks and FIs needed to educate their clients about the upcoming changes.

Benefits of transition

- The transition from LIBOR has the potential to reduce the cost of financing in several ways.
- **Risk Premium** - The calculation of alternative reference rates is based on more robust and transparent methodologies which certainly can help reduce the risk premium associated with LIBOR.

"LIBOR premium" was typically included in their lending rates to compensate for the potential volatility and uncertainty associated with LIBOR.

- **Pricing** - Introduction of ARRS increases competition for reference rates which lead to more transparent and competitive pricing of financial products.
- This potentially results in lower financing costs for borrowers.
- **Liquidity** - the alternative reference rates increased liquidity can lead to more efficient pricing and tighter spreads in the market, benefiting borrowers.
- **Harmonisation** - The increased harmonisation can help reduce the cost of financing for borrowers accessing international markets.

- The alignment of Indian banks and FIs to international standards promotes consistency and comparability across markets, reducing uncertainty and facilitating cross-border transactions.

Way forward

- Capacity building of financial institutions such as pension funds, insurance companies, hedge funds, and non-banking institutions needs to be done.
- Supplement the capacity of these institutions to evaluate and select appropriate alternative reference rates that are recommended by the RBI.
- Inform and educate customers and clients about the transition from LIBOR to alternative reference rates.
- Provide clear and timely communication about the changes, impacts on existing contracts, and any actions required from customers.

24. India's Middle Class: Estimation, Expansion and Economic Impact

- **Estimating India's middle class:** This article delves into the estimation of India's middle class, a crucial indicator of household consumption and the economy's health.

Key points of discussions

- **Lack of clarity in defining the middle class:** The absence of a clear definition results in diverse estimations, based on subjective judgments or income ranges and consumption benchmarks.
- **Importance of expanding the middle class:** Despite the impact of the existing middle class, the focus is shifting towards significant expansion to unleash India's economic potential.

Understanding a Genuine Middle Class

- **Characteristics of a genuine middle class:** It entails stable and resilient consumption patterns, enabling them to weather economic downturns without significantly reducing consumption.
- **Implications for investors and the economy:** A stable and resilient middle-class demand instills investor confidence, leading to job creation and reinforcing the middle class. Surplus income contributes to overall savings.
- **Continuous income improvement:** A strong foundation for continuous income growth within the middle class drives higher-quality consumption and stimulates diverse and high-quality supply responses.

Features of the Indian Middle Class

- Stable income
- Higher levels of education and skills
- Limited disposable income for discretionary spending
- Homeownership aspirations
- Access to credit and financing
- Affordability of consumer durables and comforts
- Prioritization of healthcare and insurance
- Emphasis on savings and investments
- Associated with upward social mobility
- Value placed on education and success
- Active civic engagement

Estimating India's Genuine Middle Class

- **Discrepancy in popular estimates:** Popular estimates tend to overstate the middle class's size, obscuring the actual extent.
- **Concentration within the richest deciles:** India's genuine middle class is primarily concentrated within the richest 10 to 20 percent of households rather than uniformly distributed.
- **Concerns about occupation profiles:** Instability characterizes the occupation profiles of the richest deciles, with a reliance on small agricultural land and informal non-agricultural occupations.
- **Limited upward mobility:** Chief wage earners in the richest deciles demonstrate limited potential for upward mobility into higher-skilled occupations.

Issues faced by the Indian Middle Class

- **Income Stagnation:** Many middle-class individuals in India struggle with stagnant income levels, with limited opportunities for significant wage growth or promotions.
- **Rising Cost of Living:** The increasing cost of essential goods and services, including housing, education, healthcare, and transportation, often outpaces income growth, putting financial strain on the middle class.
- **Inflationary Pressures:** Inflation rates impact the purchasing power of the middle class, making it challenging to maintain their standard of living and meet their financial obligations.
- **Job Insecurity:** Middle-class individuals face concerns about job security, as economic uncertainties and technological advancements lead to changes in job markets and potential layoffs.

- **Healthcare Expenses:** Rising healthcare costs and limited access to quality healthcare put a significant burden on the middle class, impacting their financial well-being and ability to seek necessary medical care.

Consequences of Limited Middle-Class Expansion

- **Economic implications:** The limited expansion of the middle class hinders the economy from reaching its fullest potential in terms of consumption, investments, and job creation.
- **Inequality concerns:** A small middle class contributes to income inequality, as a significant portion of the population remains deprived of upward mobility and economic opportunities.
- **Overreliance on the affluent:** The concentration of economic power and consumption within the richest deciles may result in skewed market dynamics and limited inclusivity.

Strategies for Expanding the Middle Class

- **Enhancing education and skill development:** Investing in education and skill-building initiatives to equip individuals with the qualifications needed for higher-skilled occupations.
- **Promoting entrepreneurship and small businesses:** Creating an enabling environment for entrepreneurial growth, which can generate jobs and foster economic resilience within the middle class.
- **Strengthening social safety nets:** Developing robust social safety nets to provide support during economic downturns and help individuals bounce back without significant setbacks.
- **Addressing informal employment:** Implementing policies that promote formalization of employment, providing stability and better benefits for workers.

Way forward

- **Strengthen financial literacy:** Implement comprehensive programs, accessible resources, and collaborations to improve understanding of personal finance.
- **Promote entrepreneurship and innovation:** Foster an ecosystem with resources, mentorship, and support for middle-class individuals starting businesses.
- **Build social safety nets:** Establish comprehensive programs for unemployment benefits, healthcare coverage, and retraining support during economic shocks.

- **Foster social dialogue:** Create platforms for inclusive discussions, partnerships, and collaborations between policymakers, businesses, and the middle class.
- **Prioritize work-life balance:** Advocate for family-friendly policies, flexible work arrangements, and support for well-being and productivity.
- **Support family-friendly policies:** Implement policies for affordable childcare, parental leave, and flexible work arrangements to support work-life balance.

25. Controversial Species Names in Taxonomy

- The field of taxonomy, which involves naming and classifying living beings, is currently engaged in a heated discussion regarding the renaming of species with objectionable scientific names.
- These names often stem from problematic individuals associated with slavery, racism, derogatory terms, and racial slurs.
- The debate has gained prominence in recent years, particularly in the wake of movements like Black Lives Matter, which seeks to address systemic racism and dismantle symbols of oppression.

Controversial Naming Practices

(1) Species Named after Controversial Figures:

- **Anophthalmus hitleri:** The blind beetle named after Adolf Hitler by an entomologist who admired him gained popularity among Neo-Nazis, leading to its near-extinction.
- **Uta stansburiana:** The lizard named after Howard Stansbury, known for his involvement in the massacre of Timpanogos Native Americans.
- **Hibbertia scandens:** The plant named after George Hibbert, a prominent member of the pro-slavery and anti-abolition lobby.

(2) Species Named with Derogatory Terms:

- **Hottentotta tamulus scorpion:** The use of “Hottentot” as a derogatory term for Indigenous Black people in Africa.
- **Rauvolfia caffra:** The quinine tree named with an offensive term considered hate speech against Black communities in South Africa.

Rules and International Bodies

- **Nomenclature Codes:** International bodies such as ICZN, ICNafp, ICNB, and ICTV govern the naming of animals, plants, bacteria, and viruses, respectively.
- **Validity and Publication:** New names must be published in openly distributed publications and accompanied by detailed descriptions of typical specimens.

ICZN: International Commission of Zoological Nomenclature

ICNafp: International Code of Nomenclature for algae, fungi, and plants

ICNB: International Code of Nomenclature of Bacteria

ICTV: International Committee on Taxonomy of Viruses

Scientific Naming Process

- **Two-part Scientific Names:** Each species has two scientific names, with the first denoting the genus and the second identifying the species within the genus. Both names are italicized.
- **Naming Conventions:** Names are often derived from Latin or Greek, reflecting distinctive features or characteristics of the species.

Challenges in Changing Offensive Names

- **Limited Appetite for Change:** International committees show little inclination to engage in debates on potentially offensive names, prioritizing stability and universality.
- **Criteria for Name Change:** The rules state that name changes should only occur with profound taxonomic knowledge or to rectify names conflicting with established rules.

26. Centre Discontinues Sale of Rice and Wheat under OMSS

- The Centre has discontinued the sale of rice and wheat from the central pool to State governments under the Open Market Sale Scheme (OMSS).
- This move is aimed at controlling price inflation and stabilizing food prices, but it may have an impact on states like Karnataka that offer free grains to the poor.

Open Market Sale Scheme (OMSS)

- The OMSS refers to the government's selling of food grains, such as rice and wheat, in the open market at predetermined prices.
- The scheme aims to enhance grain supply during the lean season and moderate open market prices.
- It consists of three components:
 1. Sale of wheat to bulk consumers/private traders through e-auction.
 2. Sale of wheat to bulk consumers/private traders through e-auction by dedicated movement.
 3. Sale of Raw Rice Grade 'A' to bulk consumers/private traders through e-auction.

Working of OMSS

- To ensure transparency, the Food Corporation of India (FCI) has adopted e-auction as the method for selling food grains under the OMSS (Domestic).
- Weekly auctions are conducted on the NCDEX platform.
- State governments and Union Territory Administrations can participate in the e-auction if they require wheat and rice outside TPDS & OWS (Targeted Public Distribution System & Other Welfare Schemes).

Reasons for Discontinuation of OMSS:

- **Controlling price inflation:** Discontinuing OMSS helps regulate the supply of rice and wheat to prevent price hikes.
- **Ensuring price stability:** By limiting the availability of grains through OMSS, the government aims to maintain stable market prices.
- **Balancing stock levels:** Discontinuation allows for better management of grain stock in the central pool.
- **Streamlining distribution channels:** OMSS discontinuation enables a more focused and efficient distribution of grains through targeted welfare schemes.
- **Efficient utilization of resources:** By discontinuing OMSS, resources can be allocated more effectively to optimize procurement and distribution efforts.
- **Flexibility in response to market conditions:** The discontinuation provides flexibility to adjust grain supply based on market demands and conditions.
- **Promoting market competition:** The absence of OMSS encourages the participation of private traders and bulk consumers, fostering a competitive market environment.

Concerns and Production Challenges

- **Adverse weather conditions:** Unseasonal rains, hailstorms, and higher temperatures have posed challenges to wheat production.

- **Lower production and higher prices:** The adverse weather conditions may lead to reduced wheat production and subsequent price increases.
- **Rice price fluctuations:** Rice prices have already increased by 10% at the mandi level in the last year.
- **Dependence on monsoon rains:** Monsoon rains are crucial for rice production, as 80% of the country's total rice production occurs during the kharif season.
- **Potential impact on food security:** Lower production and price fluctuations can affect food security, particularly for vulnerable sections of society.
- **Procurement challenges:** Slow wheat procurement and increased prices create difficulties in achieving procurement targets and maintaining stock levels.
- **Potential impact on overall agricultural output:** Production challenges in wheat may have a ripple effect on the overall agricultural sector and farm incomes.
- **Need for stabilizing measures:** Measures to stabilize supply, improve agricultural practices, and manage weather-related risks are crucial to address these concerns.

Efforts to Stabilize Supply and Stock Levels

- **Food Corporation of India:** FCI plays a vital role in ensuring the availability of food grains at reasonable prices to vulnerable sections of society through the Public Distribution System.
- **Increased Procurement:** The government has set a procurement target of 341.5 lakh metric tonnes of wheat for the ongoing Rabi Marketing Season (RMS) 2023-24.

Conclusion

- The Centre's decision to discontinue the sale of rice and wheat to states under the OMSS aims to control price inflation and stabilize food prices.
- Exceptions have been made for regions facing specific challenges.
- The imposition of stock limits and offloading through the OMSS demonstrates the government's efforts to manage overall food security and prevent hoarding.
- However, concerns remain regarding lower wheat production due to adverse weather conditions, highlighting the need for measures to stabilize supply and stock levels.

27. Sixteenth Finance Commission

The Finance ministry is likely to initiate the process to set up Sixteenth Finance Commission.

Finance Commission

- **Constitutional body** - The Finance Commission is a constitutional body formed by the President of India to give suggestions on centre-state financial relations.
- **Autonomous body** - The Finance Commission (FC), an autonomous body which is governed by the government of India.
- **Article 280** - It was established by the President of India in 1951 under Article 280 of the Indian Constitution.
- It was formed to define the financial relations between the central government of India and the individual state governments.
- As per the Constitution, the Commission is appointed every 5 years and consists of a chairman and 4 other members.

Role of Finance Commission has changed over the years

- **Pre-reforms** - In the pre-reform period, the Finance Commission recommendations were not that critical.
- This is because the Centre had other ways to compensate States, or indeed to play favourites, through plan financing and public sector undertaking (PSU) investments.
- **Post-reforms** - Post reforms, fresh PSU investments have thinned out and the Planning Commission was abolished in 2014.
- This virtually made the Finance Commission the sole architect of India's fiscal federalism.
- Its responsibility and influence are, therefore, much larger.

What is horizontal and vertical tax devolution?

- Article 280 of the Constitution mandates that each FC make recommendations about the distribution of net proceeds of taxes between the Union and states and among the states.
- **Vertical devolution** - The distribution of net proceeds of taxes between the Union and States is called vertical devolution.
- **Horizontal devolution** - The distribution of net proceeds among states is called horizontal devolution.
- The FC has wide powers under the Constitution to redefine financial relations between and among the Union and states.

Why the 16th Finance Commission will face an issue in horizontal distribution?

- **Tax pool** - Currently, the Centre gives away 41% of its tax pool to the States and the States will demand that this proportion be raised.
- **Borrowing Limit** - However, there is not much room for stretching this further, given the Centre's expenditure needs and the constraints on its borrowing limit.
- **Fiscal incapacity** - Historically, Finance Commissions have struggled to determine how much a State's deficit is due to its fiscal incapacity and how much is due to fiscal irresponsibility.
- **Distribution formula** - They have tried to tweak the distribution formula to support deficit States without penalising responsible States.
- This is regarded as a mathematically impossible task since it is not possible to give more to a State without giving less to another.
- **Inefficient & unfair** - The net result is that every horizontal distribution formula has been criticised as being inefficient or unfair or both.
- The bottom-line though is that it is in the very nature of horizontal distribution that *richer States compensate poorer States*.
- This will challenge the government in defining the terms of reference of the 16th FC, and of the FC itself in delivering on those terms of reference.

How will the 16th FC deal with Cesses and Surcharges?

- The terms of reference of the FC enjoin it to take into account the expenditure needs and revenue earning capacity of the Centre and States.
- The 16th FC should use this leverage to focus on 2 issues in particular.
- The first is the bad practice by the Centre of increasingly resorting to a levy of cesses and surcharges rather than raising taxes.
- The FC should also lay down guidelines for when cesses and surcharges might be levied, and suggest a formula to cap the amount that can be raised.

How should freebies dealt in the 16th FC?

- Another issue of focus for the 16th FC should be government spending on what has come to be called freebies.
- All political parties are guilty on this count, some more than others.
- In a poor country, where millions of households struggle for basic human needs, it sounds cruel to argue against safety-nets for the poor.
- However, it is precisely because India is a poor country that we need to be more circumspect about freebies.

What is the way forward?

- In theory, the restraints imposed by the Fiscal Responsibility and Budget Management (FRBM) Act should have acted as a check on such populist spending.
- However, the governments have found ingenious ways of raising debt without it appearing in the budget books.
- The next Finance Commission should bite the bullet in the interest of long-term fiscal sustainability and lay down guidelines on the spending on freebies.
- Good governance can trump the lure of freebies and the 16th FC should embolden itself to formalise a mechanism for a restraint on freebies.

28. RBI permits loan default guarantee in digital lending

The Reserve Bank of India (RBI) has recently allowed **default loss guarantee (DLG)** in the **digital lending** to boost fintech activity in the **financial sector**.

About the Default Loss Guarantee:

- The Default Loss Guarantee is also known as **First Loss Default Guarantee (FLDG)**.
- The First Loss Default Guarantee is an **arrangement** whereby a **third party** such as a **Lending Service Providers (LSP)** **compensates lenders** if the **borrower defaults**.
- The Default Loss Guarantee acts as a **safety-net arrangement** among **banks**, non-banking **finance** companies, and LSP.
 - Lending Service Providers is also known as financial technology (**fintech**) **player**.
- The LSP provides certain **credit enhancement** features such as **first loss guarantee** up to a **pre-decided** percentage of **loans** generated by it.
- For all purposes, **credit risk** is borne by the **LSP without** having to maintain any **regulatory capital**.
- The loan portfolio backed by **FLDG** is similar to the **off-balance sheet portfolio** of the LSP wherein the **nominal loans** are written in the books of the **lender** without having to participate in any **lending process**.
 - **Off Balance Sheet Portfolio** means **principal balance** of loans securitized, assigned, originated on behalf of other **institutions** in respect of which the **Issuer** has provided **credit enhancements** in any **form** or manner.

What reservations did RBI have initially?

- RBI had earlier reserved the **FLDG arrangement** as it felt that the **model** could pose a **systemic risk**.
- A **working group committee of the bank** has suggested that in some cases, **fintechs** were undertaking **balance-sheet lending** along with a **bank/ NBFC**.
 - **Balance sheet lending** is a **monetary loan** in which the **original lender** retains the **debt** throughout the **life cycle** of the loan.
 - This was happening outside the **RBI regulations**.
- The RBI has issued guidelines on **digital lending** in 2022, but it did **not** clarify on the **FLDG structure**.
- In the absence of clear directions, **regulated entities** like banks had stopped entering into such **arrangements** with **fintech players** which posed a **threat** to their business.

What does an LSP do?

- Lending service providers use **technology platforms** for the lending purpose.
- Lending service providers are **agents** of a **bank** or **NBFC** who carry out one or more of a **lender's functions** in customer acquisition, underwriting support, pricing support, disbursement, servicing, monitoring, recovery of specific loan or loan portfolio on behalf of **regulated entities** (REs).

RBI's Guidelines on FDLG:

- The RBI has stated an **RE** can enter into **DLG arrangements** only with an **LSP** or other REs with which it has entered into an **outsourcing** (LSP) **arrangement**.
 - **Outsourcing** is the business practice of hiring a party outside a **company** to perform some services that were traditionally performed by the company's own **staff**.
- The **LSP-providing DLG** must be **incorporated** as a company under the **Companies Act, 2013**.
- The RBI has allowed banks to accept DLG in **digital lending** only if the **guarantee** is in the form of a **cash deposit**, or **fixed deposits** in a bank in favour of the **RE**, or a **bank guarantee** in favour of the RE.
- Banks and NBFCs should ensure that the **total amount** of DLG cover on any outstanding portfolio does **not** exceed **5%** of the **amount** of that loan portfolio.

29. First Loss Default Guarantee for Fintechs

The Reserve Bank of India (RBI) has allowed First Loss Default Guarantee (FLDG) for fintech Lending Service Providers (LSP).

FLDG arrangement

- Default loss guarantee (DLG) is also known as First Loss Default Guarantee (FLDG).
- First loss default guarantee (FLDG) is a lending model between banks or non-banking finance companies (Regulated Entities) and lending service providers (fintech firms).
- In FLDG arrangement, the initial hit on a default is taken by a third party such as fintech firm that originated the loan.
- The fintech player (LSP) compensates lenders if the borrower defaults up to a certain threshold of the loan portfolio.

How do FLDG work?

- The LSP provides first loss guarantee up to a pre-decided percentage of loans generated by it.
- The loan portfolio backed by FLDG is similar to the off-balance sheet portfolio of the LSP.
- The lender do not partake in any lending process but the nominal loans sit in the balance sheet of the lender.
- But the credit risk is borne by the LSP without having to maintain any regulatory capital.

From the perspective of the fintechs, offering FLDG acts as a demonstration of its underwriting skills.

Why do we need FDLG?

- To avoid 'synthetic securitisation' as it is prohibited by the RBI.
- REs were hesitant to lend through fintechs without commitment towards loan loss.
- Fintech industry's business is affected by RE's hesitancy.

From the perspective of the lender, FLDG ensures the platform's skin in the business.

What did the RBI say on FDLG?

- The RBI has released a circular clearly specifying details on scope, eligibility, structure, form, cap, disclosure requirements, and exceptions.
- **Conditions** - A Regulated Entity (RE) can enter into DLG arrangements only with an LSP or other REs with which it has entered into an outsourcing (LSP) arrangement.

- The LSP-providing DLG must be incorporated as a company under the Companies Act, 2013.
- The total amount of DLG cover on any outstanding portfolio does not exceed 5% of the amount of that loan portfolio.
- The guarantee is accepted by the bank only in the form of a cash deposit, or fixed deposits in a bank.

What are the benefits of FDLG?

- Facilitates orderly development of the digital lending ecosystem and boosts fintech activity in the financial sector.
- Enhances credit penetration through digital space.
- Facilitate entry of small and medium fintechs into the digital lending space in partnerships with banks or NBFCs.
- The guidelines facilitates all players to participate in an effective and transparent manner.

30. NIA to probe Khalistani Attacks on Indian Missions

The National Investigating Agency (NIA) has assumed control of the investigation into the attacks carried out by Khalistan supporters on Indian Missions in the US and Canada.

National Investigating Agency (NIA)

(1) Establishment and Mandate

- The NIA was established in December 2008 in response to the 26/11 Mumbai terror attacks.
- It operates under the National Investigation Agency Act.
- It is responsible for investigating offenses related to terrorism, smuggling of arms, drugs, counterfeit currency, and cross-border infiltration.

(2) Jurisdiction and Powers

- The NIA has jurisdiction over the whole of India and extends to Indian citizens abroad, government personnel, and individuals on Indian-registered ships and aircraft.
- It possesses extensive powers to search, seize, arrest, and prosecute those involved in scheduled offenses under various acts, including the Unlawful Activities (Prevention) Act and the Indian Penal Code.

(3) Scheduled Offenses:

- The NIA investigates offenses listed under the schedule of the NIA Act, which includes acts related to explosives, hijacking, unlawful activities, terrorism, maritime navigation safety, and more.
- In 2020, the NIA was empowered to probe offences under the Narcotic Drugs and Psychotropic Substances Act connected to terrorism cases.

Operational Procedures of the NIA

1. **Referral and Direction:** State governments can refer cases involving scheduled offences to the Union Home Ministry, which can then direct the NIA to take over the investigation. The Central government can also initiate investigations suo motu if it believes a scheduled offence has been committed.
2. **Assistance and Cooperation:** State governments are required to provide full assistance to the NIA during investigations. This includes sharing information, providing logistical support, and cooperating in the arrest and prosecution of suspects. The NIA relies on the collective efforts of state and central agencies to ensure a comprehensive and effective investigation.
3. **Proactive Investigations:** The NIA has the authority to proactively investigate cases involving scheduled offenses, taking the initiative to prevent and preempt acts of terrorism and other serious crimes. This proactive approach enables the agency to identify and neutralize threats in a timely manner, safeguarding national security.

Investigating the recent Attacks

- **Attacks on Indian Missions in the US and Canada:** Khalistan supporters targeted Indian Missions in the U.S. and Canada in March. A group of protesters attacked the Indian Consulate in San Francisco, breaking makeshift security barriers and placing Khalistani flags inside the premises.
- **Violent Protests at Indian High Commission in London:** Pro-Khalistani protestors attempted to vandalize the Indian High Commission in London and removed the national flag during their demonstrations.

31. Train Safety in India

The triple-train collision in Odisha's Balasore, one of the deadliest in India, raises questions about safety in rail travel.

How did the trains collide?

- The **Coromandel Express** (Kolkata to Chennai), The **Howrah Superfast Express** (From Yeshwantpur) and a stationary goods train collided at the Bahanaga Bazar station in Balasore, Odisha.
- The Coromandel Express headed towards Chennai, collided with the goods train stationed and derailed, after failure of signal.
- The derailed train coaches fell on and derailed the last few coaches of the Howrah Superfast Express which was passing by.
- The tragic collision led to the death of nearly 300 passengers.
- None of the trains in the crash were equipped with anti-collision equipment nor was the section covered by Kavach System.
- The accident has drawn attention to the safety preparedness of the Indian Railways.

Status of safety of Indian Railways

- The Indian Railways (IR) saw an average of about 1,390 accidents per year in the 1960s.
- The number has dramatically dropped to 80 per year in the past decade.
- **Reasons** - IR's safety record improved over the years because of -
 - The track works and its maintenance.
 - Elimination of unmanned level crossings.
- Though there is a fall in number of train accidents, the focus on safety measures of Indian Railways is still on decline.

The number of deaths in Odisha train incident is higher than the annual fatalities of the last 16 years

- **CAG's Report** - According to Comptroller and Auditor General's report for the period of April 2017 to March 2021, Indian Railways recorded 2,017 accidents from 2017 to 2021.
- Derailments accounted for majority (69%) of the accidents, resulting in 293 deaths.
- Among the consequential train accidents, 55% had occurred due to negligence or failure of the Railways staff.

What are the existing concerns over Indian Railways?

- **Staffing** - Understaffing in safety categories of work.
- Huge number of vacancies causes excessive stress on existing employees making them susceptible to make mistakes.

- **Expenditure** - Misuse or underuse of funds allocated for enhancement of safety mechanisms.
- **Control of Authority** - Dual control of the Commission of Railway Safety (CRS) where the committee is originally under the administrative control of Civil Aviation Ministry and the Commissioners are mostly from Railways.
- **Timeframe** - Railway departments delay in answering the Action Taken reports of CRS.
- **Legal upper hand** - Railway act of 1989 provides exclusive control to modify the rules to the Railways.
- **Technology** - Implementation and integration of upgraded technology in major tracks and services.

What are the existing safety mechanisms?

- Several safety technologies have been implemented in Indian Railways, both imported and indigenous.
- **Automatic Signaling (ABS)** - To increase line capacity to run more trains on existing High Density Routes of Indian Railways.
- **Interlocking** - Provision of Electronic Interlocking (EI) to increase Safety and Flexibility to avoid collision of trains.
- So far 2837 stations have been provided with Electronic Interlocking covering 44% of IR.
- **Interlocking of Level Crossing Gates** - Safety at Level Crossing Gates (manned/unmanned) has been a major area of concern.
- So far, 10986 LC gates have been provided with gate signals for interlocking to enhance the safety at Level Crossings
- **SigDATE** - Signal Design Automation Tool for Electronic Interlocking (SigDATE), an indigenously developed automatic Route Control Chart generating system has been introduced to expedite infrastructural works, improving efficiency & enabling safe train operations
- **KAVACH** - The Train Collision Avoidance system (TCAS) or KAVACH is an indigenously developed comprehensive signalling system.
- Kavach is under deployment on Delhi-Mumbai & Delhi-Howrah corridors.
- Kavach overrides the driver in case of any unsafe situation and activates the train's braking system automatically.
- It also helps to increase sectional capacity to run more trains as the signal aspects are communicated to the driver fairly well in advance.

Recommendations for the future safety

- The CAG's 2022 report on 'Derailments in Indian Railways' had flagged multiple shortcomings and made several recommendations.
- **Administrative** - Railway system needs to prioritize safe tracks and collision protection.
- Vacancies in safety categories should be filled up post haste.
- Improving the skill of workmen and other existing employees.
- **Financial** - The Centre pumping substantial funds into Indian Railways (IR), so the IR should upgrade its systems when finance is not a problem.
- The Rashtriya Rail Sanraksha Kosh (RRSK), a special fund created by the Centre in 2017 to ramp up railway safety should be judicially utilized
- With indigenous signalling system like Kavach which costs far less than the imported ETCS (Level II) system, its implementation could cover more area.
- **Technical** - With 18 'Train 18s' (Vande Bharat) till date, operations to higher speeds should be made more convenient by inducting proper technology.
- Enhancement of safety and improvement in the capacity of the tracks should be done to run more trains.
- Thorough rehabilitation and upgradation of railway infrastructures apart from new trains and coaches.
- Renewal of complete track structure including sleepers with deep screening and provision of thick web switches should be done.
- IR's safety record improved after eliminating unmanned level crossings, now manned level crossings should be upgraded through grade separation.
- **Supervision** - As far as CRS is concerned, instead of a single Commissioner heading an inquiry, in cases of serious accidents, the inquiry should be conducted by a panel of Commissioners.
- Fixed time frame for submission of the Action Taken Reports to CRS.

32. Miyawaki Technique of Urban Afforestation

Prime Minister during his latest 'Mann ki baat' episode spoke about Miyawaki plantation, the Japanese method of creating dense urban forests in a small area.

Miyawaki Method

- Miyawaki method is a method of urban afforestation by turning backyards into mini-forests.
- It includes planting trees as close as possible in the same area which not only saves space, but the planted saplings also support each other in growth and block sunlight from reaching the ground, thereby preventing the growth of weed.

- Thus the saplings become maintenance-free (self-sustainable) after the first three years.
- It helps to create a forest in just 20 to 30 years while through conventional methods it takes anywhere between 200 to 300 years.

The technique

- The native trees of the region are identified and divided into **four layers** – shrub, sub-tree, tree, and canopy.
- The quality of soil is analysed and biomass which would help enhance the perforation capacity, water retention capacity, and nutrients in it, is mixed with it.
- A mound is built with the soil and the seeds are planted at a very high density – three to five sapling per square meter.
- The ground is covered with a thick layer of mulch.

33. Senior IPS officer Ravi Sinha appointed Chief of R&AW

The Appointments Committee of the Cabinet (ACC) appointed senior IPS officer Ravi Sinha as Secretary, Research and Analysis Wing (RAW), the country's external intelligence agency.

Research and Analysis Wing (R&AW)

- **Foreign Intelligence:** R&AW's primary function is to gather foreign intelligence, focusing on counter-terrorism, counter-proliferation, and advancing India's foreign strategic interests.
- **National Security:** It also plays a role in safeguarding India's nuclear program and advising policymakers on matters related to national security.
- **Social and Political Events:** R&AW has been involved in major events, such as the accession of the state of Sikkim to India in 1975.

History and Establishment

- **Background:** Prior to R&AW, intelligence collection was the responsibility of the Intelligence Bureau (IB) during the British Raj.
- **Need for a Dedicated Agency:** The failure of intelligence during the 1962 Sino-Indian War and the Indo-Pakistani war of 1965 led to the establishment of a separate foreign intelligence agency.
- **Formation:** R&AW was officially formed in 1968, with Rameshwar Nath Kao appointed as its first chief.
- **Organizational Structure:** R&AW's structure is modeled after the CIA, and it reports to the Prime Minister without parliamentary oversight.

- **Additional Child Agencies:** Over the years, R&AW added agencies like the Radio Research Center, Electronics & Tech. Services, Aviation Research Centre, and Special Frontier Force to enhance its capabilities.

Operations and Activities:

- **Global Operations:** R&AW carries out operations and intelligence activities in various countries, focusing on political, military, economic, and scientific developments that affect India's national security.
- **Liaison with Foreign Agencies:** R&AW maintains active relationships and coordination with intelligence agencies of other countries, including Russia's SVR, Afghanistan's NDS, Israel's Mossad, Germany's BND, the CIA, and MI6.
- **Field Formations:** R&AW has ten field formations, known as Special Bureaus, strategically located along India's borders.
- **Recruitment and Training:** R&AW recruits personnel from various civil services, armed forces, and universities. Training involves both basic and advanced levels, covering areas such as intelligence techniques, espionage, and self-defence.

Challenges and Controversies

- **Staff Shortage:** R&AW faces a significant shortage of employees, with a deficit of 40% below the sanctioned strength.
- **Criticisms and Controversies:** R&AW has faced criticism over bureaucratic issues, favoritism in promotions, corruption allegations, inter-departmental rivalries, and ethnic imbalances in the officer level.
- **Legal Status and Accountability:** R&AW is not answerable to the Parliament of India and is exempt from the Right to Information Act, which has raised concerns about transparency and accountability.

Impact and Significance

- **National Security and Foreign Policy:** R&AW plays a crucial role in safeguarding India's national security, shaping foreign policy, and countering threats to the country.
- **Counter-Terrorism Operations:** R&AW is actively involved in anti-terror operations, neutralizing elements posing a threat to India's security.
- **International Cooperation:** R&AW collaborates with intelligence agencies from various countries, sharing intelligence and coordinating efforts to address common challenges.

34. Digital Public Infrastructure, What it is and what is its significance

Recently, the **third** meeting of **G20 DEWG** has started with inauguration of the Global DPI Summit and Global DPI Exhibition by **Union Minister of State in Electronics and IT and MSDE**.

Digital Public Infrastructure (DPI)

- The Digital Public Infrastructure is an intermediate layer with a set of **shared digital building** blocks powered by interoperable open standards or specifications.
- The Digital Public Infrastructure helps **mediate** the flow of **people, money** and information with ease.
 - The flow of people happens through a digital ID System.
 - The flow of money happens through a real-time fast payment system.
 - The flow of personal information happens through a consent-based data sharing system to actualise the benefits of DPIs and empower the citizen to control data.
- These layers interact with each other to create an **ecosystem** that facilitates **seamless** and uninterrupted **public service delivery** that allows **businesses** to **design novel** solutions using **DPI layers**.
- DPIs does **not** succumb to monopolisation, authoritarianism and digital colonisation.
- DPI acts as a **connective platform layer**, offering registries for the unique ID of people, payments infrastructure, data exchange, consent networks, and so forth.
- DPI sits atop a **physical layer** (including **connectivity**, devices, servers, data centers, routers, etc.), and supports an **apps layer** (information solutions to different verticals, e-commerce, cash transfers, remote education, telehealth, etc.).

Attributes of Ideal DPI

- DPI should accelerate sustainable development by building applications in agriculture, education, healthcare, and financial access.
- DPI should be inclusive, citizen-centric, trustworthy and interoperable.
- DPI should support innovation, resilient and be politically viable.

35. India's trade dilemma with China

China has emerged as India's top source of imports and the share of China in India's total merchandise imports has steadily increased.

Status of India's imports and exports?

- **Exim imbalance** - India exports primary, low value added produce, but imports intermediates and manufactured items
- **China's domination** - India has signed many Free Trade Agreements with different countries, however, there has been no noticeable decline in China's market share in India's total imports.
- **China+1** - Contrary to the global slogan of "China plus One", trade deficit between India and China has been high and growing.

What are the commodities that constitute the Indo-China trade basket?

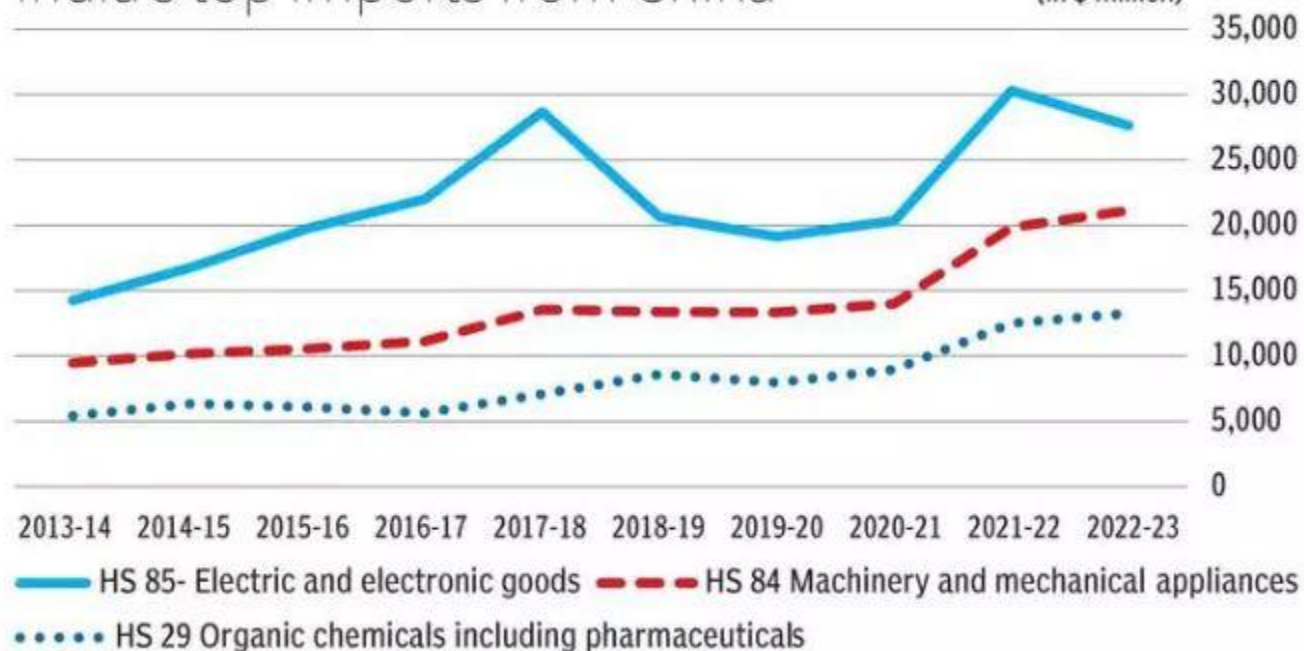
- **Harmonized System (HS)** - The HS of global trade is a standardised numerical method of classifying traded products.
- Using the dataset on international trade maintained by the Ministry of Commerce, 10 product groups' account for about 80% of India's total imports from China.

Import basket

- **At HS 2-digit level** - Among these, the top three product groups, make up for more than 60% of India's total imports from China.
- These product categories include products like electronic goods, mobile phones, semiconductors, electrical appliances, organic chemicals including pharmaceuticals.
- In each of these three product categories, China's share in India's total imports varies between 40 and 50%.
- And for the last 10 years these top 3 product categories have remained unchanged.
- **At HS 4-digit level** - India's top 10 imports from China are mostly value-added manufacturing products.
- These are electrical goods and machinery, electronics and semiconductors, organic chemicals and pharmaceuticals.

Among India's top imports from China, a few are final goods, but the others are mostly intermediate goods which are used as inputs in Indian industries.

India's top imports from China



Export basket

- India's exports to China have been more volatile and the latest data show that in 2022-23, India's exports to China has declined in absolute terms.
- India's merchandise imports from China was more than 6 times of its merchandise exports to China.
- **Refined petroleum** - These products have become India's most important export item to China.
- **Agri products** - Other than that, India's exports to China have been mostly dominated by agricultural goods and metals.
- **Metal ores** - Iron ores, semi-finished products of iron, copper and copper products, cotton and cotton yarn, fish and marine products, vegetables, vegetable oils and rice are India's major export items to China.

What does these trade patterns indicate?

- **More import than export** - Such trade pattern reveals that trade is not only highly unbalanced between China and India, but India is also primarily exporting low value added products.
- India mostly imports value-added manufacturing goods and intermediate goods from China.
- **Low value exports** - India's exports are mostly resource intensive primary or semi-processed products.
- In international trade, it has been observed that countries which operate at the lower end of the value chain tend to gain much less from trade.

- This is because gains from exports depend to a large extent on domestic value addition and export sophistication.
- While China has emerged as a big export market for India, India ends up exporting low value-added goods to China, then its gains will be limited.

Does manufacturing sector gain from this trade pattern?

- **Cheap inputs** - It can be argued that certain manufacturing sectors in India may be gaining from Indo-China trade as availability of cheap intermediate inputs from China.
- **Competitive markets** - The cheap inputs has possibly helped them stay competitive in the domestic and international markets.
- However, it is also true that some sub-sectors of Indian manufacturing may have been adversely affected because of imports from China.
- However, such inter-sectoral trade-offs are inevitable in international trade.

What can India do?

- **High value exports** - If India wants to make a mark in the global value chain and at the same time emerge as a manufacturing giant, then Indian exports need to move up the value chain.
- Over the years, quality, complexity, and sophistication of exports all over the world are growing rapidly and India is no exception.
- **Impetus to manufacturing** - The renewed emphasis on manufacturing in India should further improve the quality of Indian exports.
- Given that China is the world's second largest economy, it is a huge market and India must look to break into the higher value-added segments there.
- India's trade strategy needs to be linked up with China in a more organic manner and come out from its current pattern.

What is the way forward?

- There is no economic logic suggesting that in international trade, each pair of countries needs to have balanced trade.
- Depending on the country's comparative and competitive advantage, trade will take place in different dimensions and different product categories, qualitatively and quantitatively.

36. Bonn climate meet takeaways

The Bonn climate change conference that finished last week was built up as an opportunity for course correction, however, it underperformed.

Background of the issue

- A massive and immediate scale-up in climate action is essential to keep alive any realistic chance of meeting the 1.5 degree or 2 degree Celsius targets.
- Bonn was expected to act as the springboard for accelerated action.
- However, just like the more famous year-ending climate conferences, Bonn underperformed.
- Developed and developing countries bickered on issues old and new, and could not even agree on the agenda of one of the meetings till the penultimate day.

What is Global Stocktake (GST)?

- The countries did manage to wrap up, however, was the third and final round of technical discussions on global stocktake, or GST.
- **GST** - Mandated by the 2015 Paris Agreement, GST is an exercise aimed at assessing the progress in the fight against climate change.
- The GST helps in deciding ways and means to enhance global action to bridge the adequacy gap.
- The Paris Agreement says GST must be conducted every 5 years, starting in 2023.
- The actual meat in GST would come in at COP28, the year-ending climate conference, held in Dubai.
- The technical discussions just produced a short 'framework' on the elements to be included in the stocktake exercise.

What is the tussle between developing and developed countries?

- A bulk of the accumulated greenhouse gas emissions, the reason for global warming, have come from a group of about 40 rich and industrialised countries.
- Such countries are referred to as Annex I countries under the 1992 UN Framework Convention on Climate Change, or UNFCCC.
- This historical responsibility has been the basis for the differentiated burden-sharing on developed and developing countries in the climate change framework.

What is the argument of Australia?

- Australia issued a statement which downplayed the historical responsibility of the developed countries in causing global warming.
- Australia argued that the historical emissions happened at a time when there was no alternative to fossil fuel based energy sources.

- It argued the emissions happened when there was little understanding on the harm caused by greenhouse gases.
- It pointed out that since 1992, about 57% of the carbon dioxide emissions had come from non-Annex I countries.
- It said that 70% of the incremental warming since 1992 due to emissions from carbon dioxide, methane and sulphur dioxide had come from non-Annex I countries.
- Australia said that developed countries would take lead in climate action, however, it did not believe there was an unambiguous debt owed by the developed countries for past actions.

Do other countries have similar view point?

- The stand of Australia was similar to the one taken by the US at the start of the Bonn meeting.
- US said bridging the adequacy gap was not the sole responsibility of the developed nations and that it would not agree to references to pre-2020 commitments in the GST.
- Erasure of historical responsibility is the most sensitive red line for developing countries.

Why the money matters?

- Apart from GST, another mechanism was set up at COP26 in Glasgow in 2021 for climate action.
- **MWP** - Mitigation Work Programme (MWP), is a temporary emergency exercise focused only on increasing emission cuts.
- **IPCC** - The Intergovernmental Panel on Climate Change (IPCC) says global emissions have to come down by 43% from 2019 levels by 2030 to keep alive hopes of meeting the 1.5 degree target.
- **Monetary aid** - Most developing countries, including India, have said they would be able to act more if international support in the form of money and technology transfer was made available.
- **Tech transfer** - Developed countries are under an obligation to support the implementation of climate action plans of developing countries through money and tech transfers.
- However, money has been in perennial short supply and more funds are needed for all kinds of other purposes, the total estimated to be running in several trillions of dollars every year.

Way forward

- A fresh effort at raising financial resources for climate change is being made in Paris.
- The Summit for a New Global Financial Pact is an attempt at redirecting global financial flows and raising new money to fight climate change.
- The Pact will also help in dealing with associated problems like biodiversity loss and poverty.

37. IMF's World Economic Outlook (WEO) (April 2023)

IMF's latest World Economic Outlook (WEO) has stated that outlook is uncertain again amid financial sector turmoil, high inflation, ongoing effects of Russia's invasion of Ukraine, and three years of COVID.

World Economic Outlook about

- The World Economic Outlook (WEO) is an International Monetary Fund (IMF) report providing output, inflation, employment, fiscal balances, and debt statistics for member countries.
- The report forecasts the global growth, summarizes the state of global economy and highlights the most important developments.
- The IMF publishes the WEO report twice a year (April and October) based on data obtained from its consultations with member countries' governments.
- The IMF also publishes two additional and less comprehensive WEO updates a year, each three months after the main WEO report.

What is the model used by IMF?

- **Macroeconomic model** - The IMF used a macroeconomic model based on Platzer and Peruffo (2022) to analyse the impact of different forces on the world economy.
- This includes foreign developments affecting domestic interest rates through net international capital flows.
- **8 economies** - The model represents 8 major global economies, including the United States, Japan, Germany, the United Kingdom, France, China, India, and Brazil.
- The model is calibrated to reflect demographic developments, productivity trends, retirement age, and other factors.
- **Global GDP** - These are the five largest advanced economies and the three largest emerging market and developing economies, which cover some 70% of global GDP.

What are the findings of the latest report?

- The baseline forecast is for growth to fall from 3.4% in 2022 to 2.8% in 2023, before settling at 3.0% in 2024.
- Advanced economies are expected to see an especially pronounced growth slowdown, from 2.7% in 2022 to 1.3% in 2023.
- In a plausible alternative scenario with further financial sector stress, global growth declines to about 2.5% in 2023 with advanced economy growth falling below 1%.
- Global headline inflation in the baseline is set to fall from 8.7% in 2022 to 7.0% in 2023 on the back of lower commodity prices but underlying (core) inflation is likely to decline more slowly.
- Inflation's return to target is unlikely before 2025 in most cases.

Global Prospects and Policies

- **Steady growth** - Tentative signs in early 2023 that the world economy could achieve a soft landing, with inflation coming down and growth steady.
- **Price pressure** - Although inflation has declined as central banks have raised interest rates and food and energy prices have come down, underlying price pressures are proving sticky.
- **Geopolitical tensions** - Supply-chain disruptions, rising geopolitical tensions, brought the risks & potential benefits of geo-economics fragmentation to the centre of the policy debate.
- **FDI** - FDI flows are increasingly concentrated among geopolitically aligned countries, particularly in strategic sectors.
- Several emerging market and developing economies are highly vulnerable to FDI relocation, given their reliance on FDI from geopolitically distant countries.
- Multilateral efforts to preserve global integration are the best way to reduce the large and widespread economic costs of FDI fragmentation.

What is the forecast for India?

- **In bright spot** - The International Monetary Fund (IMF) has identified India as a bright spot in the world economy and a key contributor to global growth in the coming years.
- **Contribute to global growth** - The report showed that India is likely to grow 5.9% in 2023 and will contribute 15% of the global growth in 2023.
- **Impressive performance** - The report cites India's impressive performance, with digitization helping to pull the country out of pandemic lows.

- **Prudent policies** - The country also has prudent fiscal policies and significant financing for capital investments which are expected to sustain growth momentum.

38. Status of transgenic crops in India

Gujarat, Maharashtra and Telangana have deferred a proposal, approved by the Centre's Genetic Engineering Appraisal Committee (GEAC), to test a new kind of transgenic cotton seed that contains a gene, Cry2Ai.

Status of transgenic crops in India

- There is an array of crops – **brinjal, tomato, maize, chickpea** – in various stages of trials that employ **transgenic technology**.
 - However, **cotton** is the **only transgenic crop** that is being **commercially cultivated** in India.
- After a long hiatus, the GEAC, approved the environmental **release of Mustard hybrid DMH-11** and its parental lines, during its 147th meeting on 18 October 2022 for seed production and testing.
 - GEAC is the **apex technical body** charged with evaluating proposals for testing **genetically modified (GM) seeds**.
 - It works under **Union Environment Ministry**.
- This is **one step away from full commercial cultivation**.
 - However, the GEAC isn't the final **arbiter in the case of GM crops**.
- There is long-standing **litigation in the Supreme Court** on the permissibility of allowing transgenic food crops in farmer fields.
- Following the GEAC approval for **DMH-11**, the petitioners approached the Supreme Court asking for a **stay on the release of the crop** because it would encourage farmers to **spray herbicides**, which are banned in India.
 - Hearings on this case are still ongoing.
- **GM Mustard**: The GEAC had accorded clearance for **GM mustard** but went back on its decision and imposed additional tests in 2017.
- **GM Brinjal**: The GEAC had approved **GM Brinjal** in 2010, but this was put on an "**indefinite moratorium**" by the United Progressive Alliance government.

Process of regulating transgenic crops in India

- Developing transgenic crops involves a **complex process of inserting transgenic genes** into plants, combining science and chance to create a sustained protective response.

- Safety assessments conducted by committees are essential before conducting further tests in open plots of land.
 - They are typically located at **agricultural universities** or under the control of the **Indian Council for Agricultural Research (ICAR)**.
- For a transgenic plant to receive commercial clearance, it must demonstrate **superiority over non-GM variants** in specific areas (e.g., drought tolerance or insect resistance) without **causing harm** to other cultivated species nearby.
- Open field trials evaluate transgenic crops across various crop **seasons and geographical conditions** to determine their suitability in different states.

Why have Gujarat, Maharashtra and Telangana rebuffed the GEAC?

- Bioseed Research India, based in Hyderabad, has developed a cotton seed with **Cry2Ai**, providing resistance against the pink bollworm.
- Initially, transgenic cotton was developed to **protect against the American bollworm**, a more widespread pest.
- Since agriculture is a **State subject**, companies seeking to test their seeds typically require **approvals from the respective States**.
 - Only **Haryana** granted permission for testing the **Cry2Ai seed**.
- The seed had successfully passed **confined trials** and received a recommendation from the GEAC.
- Further field tests were planned in **Telangana, Maharashtra, Gujarat, and Haryana**.

39. The Link between Earthquakes and Cosmic Radiation

Scientists from the Institute of Nuclear Physics of the Polish Academy of Sciences (IFJ PAN) in Krakow, Poland, have made a significant discovery regarding the correlation between earthquakes and changes in cosmic radiation intensity.

Unveiling the Link between Earthquakes and Cosmic Radiation

Researchers have identified a compelling link between earthquakes and changes in the intensity of cosmic radiation measured on Earth's surface. This discovery opens up new possibilities for earthquake prediction and understanding the complex interactions between cosmic phenomena and geological events.

Predictive Potential of Cosmic Ray Data

The research suggests that cosmic ray data shifted 15 days forward relative to seismic data could potentially aid in predicting earthquakes up to two weeks in advance. This insight offers valuable time for preparedness and response measures.

The Cosmic Ray Extremely Distributed Observatory (CREDO) Project

The Institute of Nuclear Physics of the Polish Academy of Sciences (IFJ PAN) initiated the Cosmic Ray Extremely Distributed Observatory (CREDO) project in 2016. This international project provides a virtual cosmic ray observatory accessible to all. It aggregates and processes data from various detectors, including smartphone sensors transformed into cosmic ray detectors through a simple app.

Primary Source of Cosmic Radiation

The primary source of cosmic radiation is mainly from the Sun and deep space. These high-energy particles permeate the universe and interact with Earth's atmosphere and magnetic field.

The Role of Earth's Magnetic Field

Earth's magnetic field, generated by eddy currents in the planet's liquid core, plays a significant role in altering the trajectory of charged particles in primary cosmic radiation. This magnetic field influences the path and behavior of cosmic rays as they reach Earth's surface.

Correlations on a Global Scale

Location-specific analyses do not reveal clear correlations between cosmic ray intensity and earthquakes. However, when seismic activity is taken into account on a global scale, these correlations become more noticeable. This suggests that changes in cosmic ray intensity may be a phenomenon experienced by the entire planet.

The Intriguing Mention of Dark Matter Streams

The study raises thought-provoking inquiries regarding how phenomena such as dark matter streams might impact fluctuations in cosmic ray intensity. Dark matter, a mysterious form of matter that does not interact with light, could potentially have an impact on cosmic radiation patterns.

40. Greedflation

There is a growing consensus across the world that corporate turns crisis into an opportunity for businesses to make supernormal profits.

How inflation is contained in an economy?

- **Inflation** - It is the rate of increase in prices over a given period of time.
- There are two main ways in which inflation happens.
- **Cost-push inflation** - Prices get pushed up because input costs have risen.
- **Demand-pull inflation** - Prices are pulled up because there is excess demand.
- **Containing inflation** - Central banks use monetary policy to contain the inflation.
 - It raise interest rates to bring overall demand in line with overall supply containing demand-pull inflation.
 - It raise interest rates to contain demand which in turn contains cost-push inflation.
- In case of Greedflation, the whole monetary policy prescription becomes more unjust and ineffective.
- Because it is neither due to higher input cost nor due to excess demand.

Greedflation

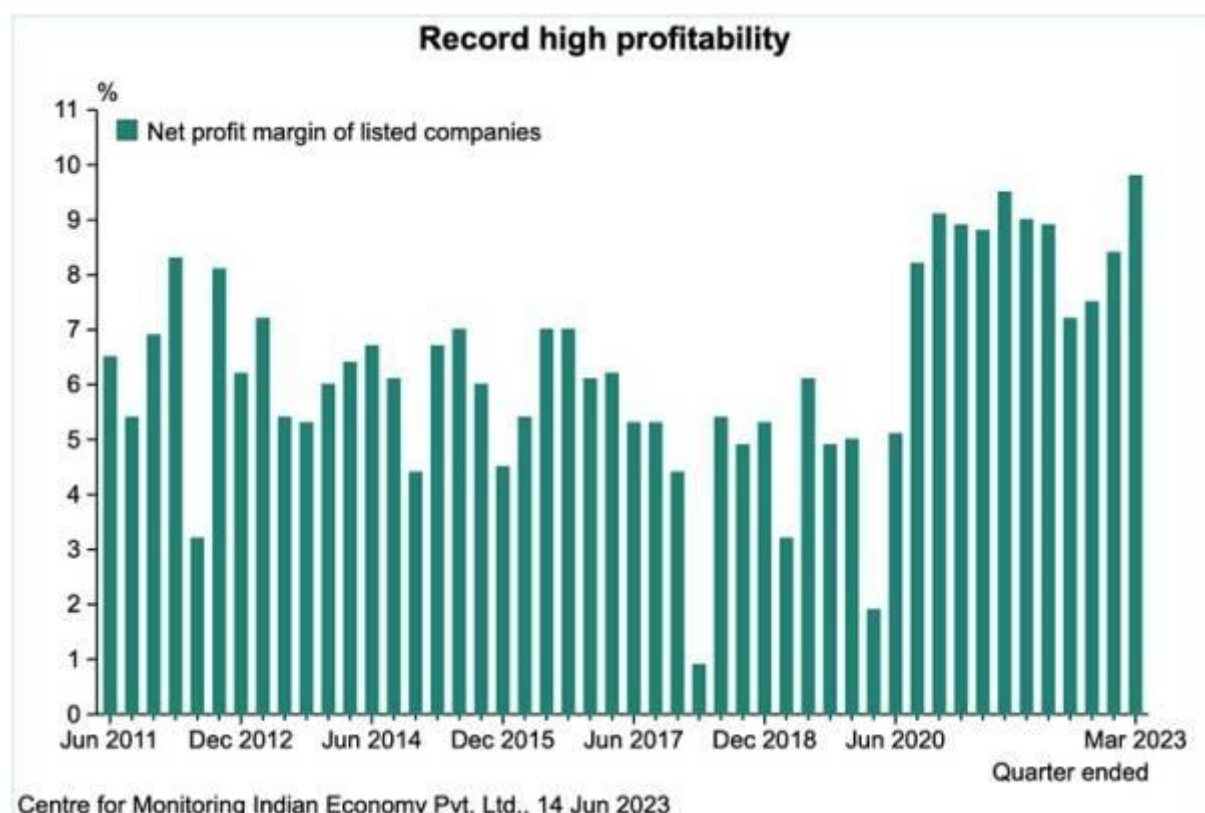
- Greedflation is the exploitation of inflation by corporates to create excessive profits.
- It simply means (corporate) greed fuelled inflation.
- In normal inflation situation, corporates go for the wage-price spiral, in Greedflation corporates choose the profit-price spiral.
- **Wage-price spiral** - A cyclical condition where the rise in wages leads to increased prices, resulting in inflation.
- **Profit-price spiral** - Companies exploit the existing inflation by putting up their prices way beyond just covering their increased costs.
- This is used to maximise their profit margins that, in turn, further fuelled inflation.
- Greedflation happens in two scenarios.
 - When the price mark-up is far in excess of the increase in inputs.
 - When businesses do not bring down the market prices even when the input prices fall.

What are the implications of greedflation?

- Less likeliness to spend money will lead to reduced economic activity.
- Reduces the purchasing power of the people making even basic needs hard to afford.
- Creates social unrest due to raising cost of living.
- On the corporates' side it affects the business as well as loss of customer trust.
- Forces governments to intervene like windfall tax to contain inflation.

Is Greedflation happening in India?

According to the Centre for Monitoring Indian Economy (CMIE), '60% of the growth in net profit can be attributed entirely to the increase in profit margin.'



- Net profits of 4,293 listed companies reached Rs.2.9 trillion in the March 2023 quarter.
- This spike in profits is over 3.5 times the average quarterly profit earned by listed companies till before the pandemic of 2020.
- The data shows the Indian corporate sector has generated superlative profits in the post pandemic period.
- The sharp spike in profits depicts there is a very good chance that corporate greed also played a role in spike the inflation rate in India.