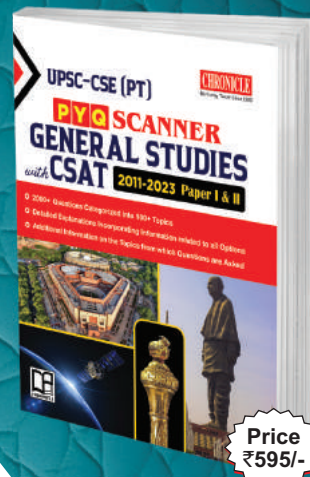


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# Geography & Indian Economy

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- Challenges in India-Maldives Relations
- Digital Inclusion
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# Vulnerability of the Himalayan Ecosystem

## Need for a Region-specific EIA Regime

*Developmental paths of the states in the Indian Himalayan Region should be consistent with concerns of sustainability of the ecosystem. The region is also characterized by its geological phenomena and natural disasters like landslides and earthquakes. These episodic events pose a challenge to the planners and to the development objectives of the states in the region.*

■ Ranjeet Shah

The recent Teesta dam breach in Sikkim, and floods and landslides in Himachal Pradesh are a stark reminder of the havoc India's development model is wreaking on environment and ecology, especially in the mountains. In the past few years there has been a marked increase in frequency of environmental hazards in India's Himalayan states. This puts a question mark on the current development model adopted in the region and points to the need for a region specific environmental impact assessment regime. Therefore, it is imperative to assess the worthiness of any significant human endeavour in terms of its impact on the environment.

### Causes of Increasing Vulnerability of the Himalayan Ecosystem

The Himalayan ecosystem is a highly sensitive and vulnerable region due to a variety of natural and human-induced factors. Several factors contribute to the increasing vulnerability of the Himalayan ecosystem.

- **Climate Change:** Climate change is one of the most significant drivers of vulnerability in the Himalayas. Rising temperatures lead to the melting of glaciers, changing precipitation patterns, and an increase in extreme weather events, all of which can disrupt the delicate ecological balance in the region.
- **Glacier Retreat:** The Himalayan glaciers are retreating at an alarming rate, primarily due to rising temperatures. This has far-reaching consequences for water availability in the region, affecting river flow, agriculture, and the livelihoods of millions of people.
- **Deforestation and Land Use Changes:** Deforestation and land use changes, often driven by agriculture, urbanization, and infrastructure development, result in habitat loss and soil erosion, making the ecosystem more vulnerable to degradation and landslides.
- **Infrastructure Development:** The construction of roads, dams, and other infrastructure projects can disrupt natural drainage patterns, leading to landslides and habitat fragmentation. These developments can also increase the risk of glacial lake outburst floods (GLOFs).

- **Rapid Urbanization:** Rapid population growth and urbanization in the Himalayan region put immense pressure on natural resources and ecosystems. This can lead to increased demand for land, water, and energy, further straining the environment.
- **Forest Fires:** Forest fires are becoming more frequent and severe in the Himalayas, partly due to changes in climate patterns. These fires can destroy large areas of forest, disrupting ecosystems and releasing carbon into the atmosphere.
- **Invasive Species:** The introduction of non-native species, both intentionally and accidentally, can threaten the native flora and fauna. These invasive species can outcompete native species, disrupt food chains, and alter the ecosystem dynamics.
- **Air Pollution:** The Himalayan region is affected by air pollution from nearby urban centres and agricultural activities. This pollution can lead to acid rain, which damages vegetation and affects water bodies, further impacting the ecosystem.
- **Water Pollution:** Pollution of rivers and streams in the Himalayas, often caused by sewage discharge and industrial effluents, can harm aquatic life and disrupt the availability of clean water for human and ecosystem use.

### EIA in India

Environmental Impact Assessment or EIA can be defined as the study to predict the effect of a proposed activity/project on the environment. A decision making tool, EIA compares various alternatives for a project and seeks to identify the one which represents the best combination of economic and environmental costs and benefits.

- The Indian experience with Environmental Impact Assessment began over 20 years back. It started in 1976-77 when the Planning Commission asked the Department of Science and Technology to examine the river-valley projects from an environmental angle. This was subsequently extended to cover those projects, which required the approval of the Public Investment Board. Till 1994, environmental clearance from the Central Government was an administrative decision and lacked legislative support.



## Vulnerability of the Himalayan Ecosystem

- On January 27, 1994, the Union Ministry of Environment and Forests under the Environment (Protection) Act 1986 (EPA), promulgated the first EIA notification making Environmental Clearance (EC) mandatory for setting up some specified new projects and also for expansion or modernisation of some specific activities. The notification of 1994 saw 12 amendments in 11 years before it was replaced by the EIA 2006 notification.
  - The hallmark of the 2006 notification was the decentralisation of the process of EC. State governments were also given powers to issue EC in certain cases. The 2006 notification has also been amended, in the name of fine-tuning the process several times.
  - The Union Ministry of Environment, Forests and Climate Change floated a draft EIA in 2020 for public comments which created uproar as it was perceived to be pro industry and compromising the ecological concerns. Despite all levels of government being acutely aware of the special needs of the Indian Himalayan Region (IHR), the region's vulnerabilities and fragility have not been considered separately.
- ♦ **Lack of Transparency:** There were concerns about the lack of transparency in the process, as certain information related to the environmental clearance process was not made public or easily accessible, making it difficult for stakeholders to monitor and scrutinize project impacts.
  - ♦ **Inadequate Monitoring and Enforcement:** The 2020 EIA regime was criticized for not providing adequate provisions for post-clearance monitoring and enforcement of environmental conditions. This could lead to non-compliance with the conditions set during the clearance process.
  - ♦ **Conflict of Interest:** Concerns were raised about the composition of expert appraisal committees and the potential for conflicts of interest, as some members of these committees had affiliations with industries that they were supposed to regulate.

### Putting in Place a Region-specific EIA Regime: Key Challenges

Implementing a region-specific Environmental Impact Assessment (EIA) regime in the Indian Himalayan Region (IHR) is a complex task due to the unique ecological and social dynamics of this area. However, EIA, as it is practised today, is being used as a decision-aiding tool rather than a decision making tool. Here are some key challenges in establishing such a regime:

### Limitations of Current EIA Regime

While the draft EIA has generated significant controversy, it stems from a broader EIA regime that has proved to be unwieldy. Re-engineered once and amended several times, the EIA is often described as a “thorn in the flesh of both industry and environmentalists”. Here are some of the common criticisms and limitations:

- ♦ **Weakened Public Participation:** One of the primary criticisms was that the 2020 EIA notification reduced the period for public consultations and eased the process for obtaining environmental clearances. This was seen as a limitation to effective public participation, as it limited the time for affected communities to provide their inputs and concerns.
  - ♦ **Post-facto Clearance:** The 2020 EIA notification allowed for post-facto approvals, which means projects that had already started without obtaining prior environmental clearance could be regularized with a fine. Critics argued that this could encourage violations and weaken the deterrence effect of the environmental clearance process.
  - ♦ **Reduced Scrutiny for Certain Projects:** There were concerns that the 2020 notification exempted a wide range of projects from detailed scrutiny, categorizing them as “strategic” or “modernization” projects, potentially leading to reduced environmental oversight for significant developments.
  - ♦ **Exemptions and Thresholds:** The 2020 EIA notification revised the threshold criteria for projects that require environmental clearance. Critics argued that these changes could lead to smaller projects with potentially significant environmental impacts escaping the need for thorough assessment and clearance.
- **Biodiversity and Fragile Ecosystems:** The IHR is home to diverse and fragile ecosystems with rich biodiversity. Assessing the impact on this unique flora and fauna requires expertise and data that may be limited.
  - **Geological Vulnerability:** The Himalayan region is geologically active, prone to earthquakes, landslides, and glacial lake outbursts. Predicting and mitigating such events is challenging.
  - **Climate Change:** The IHR is particularly vulnerable to climate change impacts, such as glacial melting and altered precipitation patterns. The EIA regime must consider these long-term changes.
  - **Indigenous Communities:** The IHR is inhabited by numerous indigenous and local communities. Their dependence on natural resources, traditional knowledge, and socio-cultural practices must be integrated into the EIA process.
  - **Inadequate Infrastructure:** The IHR often lacks proper infrastructure, making access for field studies and monitoring challenging. Developing this infrastructure may have its own environmental consequences.
  - **Data Gaps:** Data on the Himalayan region is often scarce and fragmented. Obtaining comprehensive data for EIA studies can be problematic.
  - **Policy Coordination:** The IHR spans multiple states and union territories, which may have different policies and priorities. Coordinating a unified EIA framework can be difficult.

- **Political and Economic Pressures:** The Himalayan region is often subject to political and economic interests, such as hydropower projects and tourism. Balancing development with environmental conservation is a major challenge.
- **Deforestation and Land-Use Changes:** The IHR has witnessed deforestation and changes in land use due to agricultural expansion and infrastructure development. These changes can have cascading impacts on the ecosystem.
- **Limited Scientific Capacity:** Building local scientific and technical capacity to conduct EIAs is a significant challenge. Training and knowledge transfer are crucial.
- **Cross-border Implications:** The Himalayan region spans international borders. Coordinating with neighbouring countries on trans-boundary issues, such as water resources and biodiversity, is complex.

To address these challenges and establish an effective EIA regime in the Indian Himalayan Region, it is important to involve a wide range of stakeholders, integrate local knowledge, conduct robust scientific research, and ensure rigorous

## ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

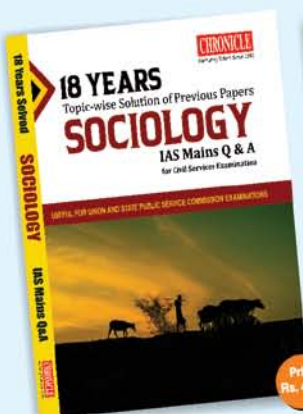
The EIA process begins with screening to ensure time and resources are directed at the proposal that matter environmentally and ends with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report. There are basically eight steps of the EIA process as presented in brief below:

- **Screening:** First stage of EIA, which determines whether the proposed project, requires an EIA and if it does, then the level of assessment required.
- **Scoping:** This stage identifies the key issues and impacts that should be further investigated. This stage also defines the boundary and time limit of the study.
- **Impact Analysis:** This stage of EIA identifies and predicts the likely environmental and social impact of the proposed project and evaluates the significance.
- **Mitigation:** This step in EIA recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.
- **Reporting:** This stage presents the result of EIA in the form of a report to the decision-making body and other interested parties.
- **Review of EIA:** It examines the adequacy and effectiveness of the EIA report and provides the information necessary for decision-making.
- **Decision-making:** It decides whether the project is rejected, approved or needs further change.
- **Post Monitoring:** This stage comes into play once the project is commissioned. It checks to ensure that the impacts of the project do not exceed the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report.

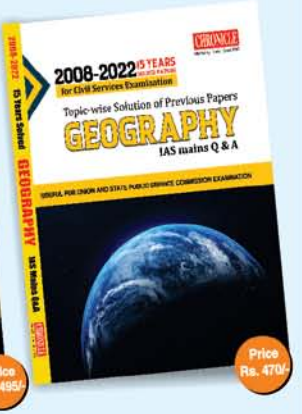
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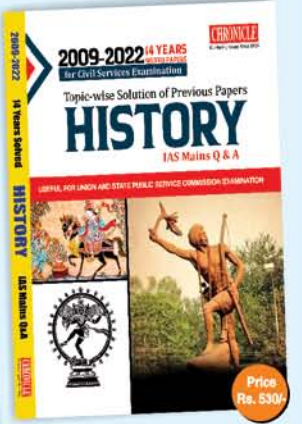
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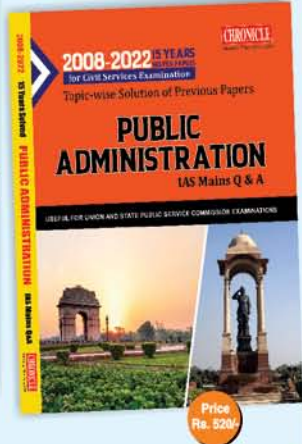
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## Vulnerability of the Himalayan Ecosystem

monitoring and enforcement of environmental regulations. Additionally, ongoing collaboration between the central government, state governments, and international partners is essential for addressing the unique environmental concerns of this region.

### Benefits of a Region-specific EIA Regime

EIA is a critical tool for assessing the potential environmental and social impacts of various development projects. Tailoring the EIA process to the specific characteristics and needs of different regions in India can lead to more effective environmental protection and sustainable development. Here are some of the benefits of a region-specific EIA regime:

- **Enhanced Environmental Protection:** By customizing the EIA process, it is more likely to identify and mitigate potential environmental impacts that might be overlooked in a one-size-fits-all approach. This can lead to better protection of the environment and the preservation of local ecosystems.
- **Streamlined Decision-making:** Region-specific EIAs can streamline the decision-making process by focusing on the key environmental issues relevant to the specific region. This can lead to faster approvals for projects that meet the region's criteria and higher scrutiny for those that pose a greater risk to local environments.
- **Adaptive Management:** A region-specific approach allows for more adaptive management of projects. In cases where unforeseen environmental impacts or changing circumstances arise, the EIA can be modified to suit the evolving needs of the region.
- **Reduced Conflicts and Litigation:** Region-specific EIAs can reduce conflicts and legal disputes that may arise due to project opposition or environmental concerns. By addressing local issues and involving communities from the beginning, it is possible to minimize disputes and legal challenges.
- **Improved Regulatory Efficiency:** A region-specific EIA regime can help regulatory authorities better allocate their resources and expertise to the areas that need them the most. This can improve the efficiency of the regulatory process.
- **Better Community Engagement:** Communities in different regions have varying levels of awareness, concerns, and interests regarding development projects. A region-specific EIA regime can adapt the engagement and consultation process to the unique needs of each region, fostering better communication and trust between project proponents, regulators, and affected communities.
- **Economic Development and Job Creation:** A tailored EIA approach can help identify projects that are better suited for a specific region's economic and developmental needs. This can lead to more targeted investments and job creation in regions that require them the most.

- **Sustainable Development:** By considering region-specific factors, EIAs can promote sustainable development practices that are much better aligned with local needs and objectives. This can lead to a more balanced approach to economic growth and environmental protection.
- **Knowledge Sharing and Best Practices:** A region-specific EIA regime can promote the sharing of best practices and lessons learned from one region to another, improving the overall effectiveness of the EIA process across India.

### What Needs to be Done?

- **Address the Special Needs of Indian Himalayan Region (IHR):** The needs of these mountains could be addressed at all stages of the EIA (screening, scoping, public consultation, and appraisal). The four stages will be effective if projects and activities requiring EC in mountainous regions are made proportionate with the ecological needs of this region.
- **Place IHR's Vulnerability and Fragility at the Centre of EIA:** While categorising projects it is important that the impacts of all such projects and activities are seen in the IHR in the context of this region's fragility and vulnerability.
- Himalayas are inherently vulnerable to extreme weather conditions such as heavy rains, flash floods, and landslides and are seismically active. Climate change has added another layer of vulnerability to this ecosystem.
- **Introduction of a Liability Clause for Projects in IHR:** General conditions mandated for all projects at the end of the notification could also have had a clause about the IHR or mountains above a certain altitude, or with some specified characteristics that could increase the liability of the project proponent.

### Conclusion

The vulnerability of the Himalayan ecosystem underscores the urgent need for a region-specific Environmental Impact Assessment (EIA) regime. The unique ecological, geological, and socio-cultural characteristics of the Himalayas require a tailored approach to assess and mitigate potential environmental risks associated with development projects. Such a region-specific EIA regime would not only help protect the fragile ecosystems, biodiversity, and natural resources of the Himalayas but also ensure the well-being of the local communities that depend on these ecosystems for their livelihoods. Recognizing and addressing the distinct challenges and vulnerabilities of the Himalayan region through a specialized EIA framework is essential for sustainable development, conservation, and the long-term resilience of this critical ecosystem. ■■



# Challenges in India-Maldives Relations

## Addressing Strategic, Geopolitical and Economic Concerns

*India-Maldives relations are based on a strong foundation. The cooperation between the two countries is marked by India's historical support to Maldives during various crises and people-to-people ties. Maldives' proximity to India's west coast and its position at the centre of important sea routes passing through the Indian Ocean add to its strategic importance for India. India should strive to continuously strengthen its relations with Maldives while remaining sensitive to the Maldivian perspective and concerns.*

■ Dr. Amarjeet Bhargava

Recently, in the presidential elections in Maldives, opposition candidate Dr. Mohamed Muizzu was elected as the new President by defeating Ibrahim Mohamed Solih. The Maldives presidential election was being seen as a clash between the 'India First' versus 'India Out' campaigns. Political analysts are seeing the victory of Mohamed Muizzu as the victory of 'India Out Campaign'. The 'India Out' campaign in Maldives has emerged as a major challenge in the restoration of India-Maldives relations. This campaign is directed against the presence of Indian Army on Maldivian soil. The campaign gained momentum in February 2021 with the signing of the Uthuru Thila Falhu (UTF) Port Development Agreement with India and India's announcement of opening a Consulate in South Addu Atoll Island. This campaign was made a major issue by the opposition parties in the current presidential election. Ibrahim Mohamed Solih, former President of Maldives (2018-2023), was a supporter of the 'India First' policy.

Maldives is known for its unique strategic location in the Indian Ocean. To analyze the concerns raised in the wake of recent events, it is necessary to take a comprehensive look at India-Maldives relations.

### Current Challenges in India-Maldives Relations

India-Maldives relations face several challenges at present. Some important challenges have been outlined here.

- ◆ **Political Challenges:** President-elect Dr. Mohamed Muizzu and former President Abdulla Yameen have been vocal supporters of the 'India Out' campaign. Both the leaders are against India's military presence in Maldives. Since they will take over power in Maldives, it can become a big challenge for India.
- ◆ **Radical Activities:** There is evidence of a large number of Maldivians joining various violent extremist organizations such as the Islamic State (IS).
  - The radicalisation of the Maldives has also been influenced by events in Pakistan, Afghanistan, and West Asia. This raises the risk that terrorist organisations

with a base in Pakistan could use distant Maldivian islands as a jumping-off point for strikes against India and Indian interests.

- Political and socio-economic instability are the main drivers fuelling the rise of Islamic fundamentalism in the Maldives.
- ◆ **Maldives' Domestic Challenges:** Democratic institutions have weakened in Maldives. If governance is not conducted effectively, the fragile Maldivian democracy can be influenced by fundamentalist ideologies. This can have significant implications for India as well.
- ◆ **The China Factor:** The increase in China's influence resulting from the implementation of ongoing China-led investment projects in Maldives is raising concerns for India.
  - Maldives is an important part of China's 'String of Pearls' policy in South Asia.
  - There are speculations that China may be attempting to establish strategic outposts in the archipelago due to its strategic location in the Indian Ocean.
- ◆ **Low Economic Engagement:** Bilateral trade between India and Maldives is very low; both countries have not yet entered into a 'Free Trade Agreement'.
- ◆ **Anti-India Sentiments:** India's military assistance, military equipment and presence of Indian troops in the Maldives have played a major role in promoting the 'India Out' campaign.
  - The people of Maldives believe that India is increasing its military presence in Maldives through military assistance.

### Significance of Maldives for India

- ◆ **Geo-economic Significance:** Maldives is strategically located at the crossroads of several important trade routes passing through the Indian Ocean. 50% of India's foreign trade and 80% of India's energy imports are routed through the 'Sea Lines of Communication' (SLOC) around Maldives.



## Challenges in India-Maldives Relations

- ♦ **Geopolitical Significance:** Maldives has been India's partner in many regional groupings. For example, Maldives is a key member of the Colombo Security Conclave (CSC), Indian Ocean Rim Association (IORA), SAARC, SASEC and India's SAGAR Initiative.
  - Similarly, Maldives supports India's permanent membership in the UNSC.
- ♦ **Security Perspective:** Maldives is India's first line of defence against terrorism, piracy, drug trafficking, narcotics and other maritime crimes.
  - The geographical location of Maldives makes it a 'toll gate' between the entry and exit points of the Western Indian Ocean and the Eastern Indian Ocean.
  - India and Maldives clearly have a responsibility to ensure stability and security in the Indian Ocean. India wants to see Maldives embrace Quad's Pacific strategy, which brings together India, the US, Japan, and Australia.
- ♦ **Indian Diaspora:** A large number of Indian expatriates live in Maldives. Indians are employed in the Maldives in education, health care system, and tourism and hospitality sectors.

### India's Development Assistance to Maldives Economic Cooperation

India is the second largest trading partner of Maldives. Some important milestones in this regard are outlined here.

- ♦ During the visit of President Nasheed to India in December 2008, the Government of India extended a Standby Credit Facility of US\$100 million to the Maldives.
- ♦ Again a new Standby Credit Facility of US\$ 100 million was extended to the Government of Maldives during the November 2011 visit of Prime Minister of India Dr. Manmohan Singh to the Maldives.
- ♦ Also, Maldives has been provided a credit facility of \$800 million from the Export-Import Bank of India (EXIM Bank).
- ♦ Maldives is an important tourist destination for many Indians. India is the top-ranked tourism market with 132,151 tourist arrivals in 2022 (as of July 2022), accounting for 14.7 percent of the market.

### Bilateral Assistance

The major bilateral assistance projects executed in Maldives by India are as follows:

- ♦ **Indira Gandhi Memorial Hospital (IGMH):** During former Prime Minister Shri Rajiv Gandhi's visit to Malé in 1986, it was agreed to establish a medical complex in Malé with Indian assistance. Accordingly, the 200-bed hospital was established at an estimated cost of Rs.42.5 crores and inaugurated in April 1995.

- ♦ **Faculty of Engineering Technology (FET):** Maldives Institute of Technical Education (MITE) was set up as a grant-in-aid project of the Government of India in 1996.
- ♦ Having a capacity to train at least 200 students a year in various technical/vocational disciplines, MITE was renamed as Faculty of Engineering Technology (FET) in order to better reflect the academic programmes conducted by it.

### Infrastructure Cooperation

Development of sustainable infrastructure in Maldives is one of the main goals of India. Some of the major projects involving Indian assistance are:

- ♦ **Greater Malé Connectivity Project:** This is the largest infrastructure project in Maldives with Indian assistance. It aims to connect Malé to the islands of Villingili, Gulhifalhu and Thilafushi through a series of bridges, causeways and roads. This project is important for the proposed Gulhifalhu Port.
- ♦ India agreed to provide a grant of 100 million USD and a new line of credit of 400 million USD under the Greater Malé Connectivity Project.
- ♦ To promote import and export to-and-fro from Maldives and India, a direct cargo ferry service to run between the two countries.
- ♦ **Expanded Coastal Surveillance Radar System (CSRS):** Since 2007, India has established 10 coastal surveillance radars across the Maldives and a CSRS to integrate information from these radars.
- ♦ **Airport Redevelopment Project:** India is running an airport redevelopment project at Hanimaadhoo International Airport.
- ♦ **Uthuru Thila Falhu Project:** Uthuru Thila Falhu Project (UTF) is a strategic port project. It will be used by the Maldives Coast Guard.
- ♦ **National College for Police and Law Enforcement (NCPL):** This is the single-largest grant project executed by India in the Maldives with grant funding of INR 222.98 Crore.
- ♦ **Police Infrastructure:** India has also designed and built 61 police infrastructure across Maldives. This will help in improving the policing service and safety of the people here.
- ♦ India and Maldives cooperate in maritime security, maritime domain awareness and **humanitarian assistance and disaster relief (HADR)** operations.

### Military and Security Cooperation

Maldives relies heavily on trilateral maritime security cooperation with India and Sri Lanka. Therefore, securing the maritime borders of Maldives is one of the biggest priorities of the Government of India. The major areas of military and security cooperation are as follows:

- ♦ India has gifted Landing Assault Craft and 24 Utility Vehicles to Maldives to strengthen maritime security.
- ♦ India signed a comprehensive Defence Action Plan in April 2016 to strengthen the India-Maldives defence partnership.
- ♦ About 70% of the defence training requirements of the Maldives National Defence Force (MNDF) are met by India.
- ♦ India and Maldives conduct several security joint exercises like 'Ekuverin', 'Dosti', 'Ekatha' and 'Operation Shield'.

### Humanitarian Assistance

India has always been at the forefront in providing humanitarian assistance to Maldives. Here are a few examples:

- ♦ India has signed an MoU with Maldives for 'High Impact Community Development Projects' (HICDP) in 2019.
- ♦ It is planned to implement many socio-economic development projects in Maldives through these projects.
- ♦ India provided 100,000 Covishield vaccines to Maldives in January 2021 during the COVID-19 pandemic.
- ♦ Through 'Operation Sanjeevani', India supplied 6.2 tonnes of essential medicines to Maldives to help in the fight against COVID-19.
- ♦ India helped Maldives in recovery efforts after the 2004 tsunami.
- ♦ India also helped in eliminating drinking water shortage in Maldives through 'Operation Neer' in 2014.
- ♦ MoU between Maldives Civil Service Commission and India's National Centre for Good Governance (NCGG) and the Technical Agreement on the exchange of White Shipping Information between Indian Navy & MNDF are other instances of cooperation.
- ♦ In July 2022, the Union Cabinet approved the signing of an MoU for Judicial Cooperation between India and Maldives which will accelerate court digitisation and boost prospects for IT companies and start-ups in both countries.

### Way Forward

- ♦ **Respect for Maldivian Sovereignty:** India should be sensitive to Maldivian concerns with respect to Maldivian sovereignty. India will have to stick to its commitment to respect the independence of Maldives and support its development goals.
- ♦ **Improving Relations with the Newly Elected Government:** India should engage with the newly elected government of Maldives to address its concerns. Maldives needs to assure the people that the ongoing projects with India's assistance are for the general welfare of the people of Maldives.
  - For example, tourism is the mainstay of the economy of Maldives and the Hanimaadhoo International Airport redevelopment project will increase the number of tourists.

- ♦ **Increase Development Assistance:** India should target projects that have a major impact on the general population of Maldives. This will increase goodwill towards India among the people of Maldives and help address the concerns that have led to the launch of the 'India Out' campaign.
- ♦ **Timely Completion of Projects:** Timely completion of the 'Greater Malé Connectivity Project' (GMCP) can provide India an attractive and important alternative to Chinese projects in Maldives.
- ♦ **Employment Generation:** The 'High Impact Community Development Projects' (HICP) undertaken with Indian assistance in the Maldives should include schemes aimed at improving the employability of the youth and promoting entrepreneurship.
  - By this, India can prevent the dangers of radical and extremist ideology developing among the youth in Maldives.
- ♦ **Working on Perception Management:** The increase in participation of ordinary citizens in the 'India Out' campaign is a matter of concern for India. Therefore, India will have to work on perception management in Maldives, which can help in earning the goodwill of the people.
- ♦ **Cooperation in other Areas:** Both countries can move forward on climate change, friendly foreign policy and maritime security initiatives to improve 'Neighbourhood First Policy'.

### Conclusion

India-Maldives relations have a long and friendly history. Both countries share ancient ethnic, linguistic, cultural, religious and commercial ties. Mutual cooperation between the two countries has led to the development of close, cordial and multidimensional relations. But, the 'India Out' campaign in Maldives, the increase in China's influence and the ongoing political uncertainty in the country have made India-Maldives relations tense. India has continuously increased its investment in Maldives through various projects. The current crisis has put India's investment returns and future prospects in doubt. The increase in China's influence under the guise of economic aid is further strengthening the emerging challenges. In this context, India should keep in mind that it is not possible to fully control China or any other country from entering Maldives; but by being alert, malicious activities of opposing countries can be monitored. India will have to proceed with its development activities in Maldives keeping in mind its cultural, geo-economic and geo-strategic sensitivities. Both countries will have to explore common global issues for cooperation and decide future strategies by promoting mutual understanding on the basis of trust. ■■

# Digital Inclusion

## Moving Towards an Empowered Society

*The concept of Digital Inclusion has gained prevalence in the 21st Century, with technology creating millions of jobs and being used in all spheres, all the way from banking to farming to defence. With the Indian government's proactive measures, the country is experiencing a digital revolution that is triggering transformative developments in areas like e-payments, digital literacy, financial inclusion, geographic mapping, rural development, and many more.*

■ **Sharmila Senthil Kumar**

On 14<sup>th</sup> September 2023, the Telecom Regulatory Authority of India (TRAI) released a Consultation Paper (CP) on “Digital Inclusion in the Era of Emerging Technologies”. The consultation paper aims to explore and address the challenges and opportunities presented by the rapid advancement of emerging technologies, with a focus on ensuring inclusivity for all segments of society and industries, particularly Micro Small and Medium Enterprises (MSMEs). TRAI recognizes that digital inclusion is crucial in empowering citizens of the country, failing which the gaps in access to digital services may widen further and thereby deprive large segments of the society from inclusive growth.

It is observed that disparities in internet broadband penetration and its effective usage across different sections of society and geographies still persist. The digital divide typically exists between those in urban areas and those in rural areas; between the educated and the uneducated; between socio-economic groups; and, globally, between the more and less industrially developed countries.

Factors such as low literacy and income levels, geographical restrictions, lack of motivation to use technology, lack of physical access to technology, and digital illiteracy contribute to the digital divide.

Digital Inclusion can create an ecosystem that benefits every individual, fostering a more equitable and accessible digital economy.

### Understanding Digital Divide and Inclusion

#### Digital Divide

- ◆ Digital divide is a term that refers to the gap between demographics and regions that have access to modern information and communications technology (ICT), and those that don't or have restricted access.
- ◆ This digital divide threatens to impede India's economic growth and development, making digital inclusion in rural India crucial for the country's progress.
- ◆ In rural India, where the majority of the population resides, lack of digital inclusion has a significant impact on economic opportunities, education, healthcare, and

financial inclusion. Digital divide is thus not only a social issue but also an economic one.

#### Digital Inclusion

- ◆ The United Nations defines digital inclusion as equitable, meaningful, and safe access to use, lead, and design of digital technologies, services, and associated opportunities for everyone, everywhere.
- ◆ There are four interdependent digital inclusion elements: Access, Skill, Motivation and Trust. Digital inclusion takes into account the various barriers individuals face when accessing and experiencing digital technologies.
- ◆ Through digital inclusion human rights are to be promoted, protected, respected, and enjoyed online as they are offline, and the specific needs of individuals need to be taken into consideration in the digital world so as not to leave anyone behind.

#### Digital Inclusion in India

India has made remarkable progress in digital transformation, emerging as the world's second-largest telecom market in terms of subscribers. The country has experienced significant growth in mobile broadband subscriptions and internet usage, along with a substantial reduction in data costs.

- ◆ The government's initiatives such as Digital India, National Digital Communications Policy 2018, National Broadband Mission 2019, BharatNet, Common Service Centres (CSCs), and Universal Service Obligation Fund (USOF) have played a pivotal role in expanding connectivity and promoting digital inclusion across the nation.
- ◆ The success story of Digital Public Infrastructure (DPI) for an inclusive financial society has been well acknowledged across the world.
- ◆ The Jan Dhan-Aadhaar-Mobile (JAM) trinity has played a pivotal role in transparent direct benefit transfers of welfare subsidies to bank accounts of the underserved. UPI has empowered users to conveniently transfer money from one bank account to another in real-time.

### Gaps

There are disparities in internet broadband penetration and its effective usage across different sections of society and geographies in the country.

- ◆ The National Family Health Survey 2019–21, however, shows a significantly larger gender gap in internet usage. The NFHS Report suggests that only 57.1 percent of the male population and 33.3 percent of the female population had ever used the internet.
- ◆ 72.5 percent of the urban males and 51.8 percent of the urban females have ever used the internet; only 48.7 percent of rural males and 24.6 percent of the rural females have used internet.
- ◆ According to the NSS data, only around nine per cent of students enrolled in any course had access to a computer with internet. Additionally, just 25 per cent of enrolled students could access to the internet through any sort of devices.

### Fostering Digital Inclusion: Challenges and Opportunities

#### Challenges

- ◆ **Access to Infrastructure:** Unequal access to infrastructure, limited digital literacy, and affordability issues hinder the equitable distribution and utilization of emerging technologies, exacerbating existing disparities in digital inclusion.
- ◆ **Affordability:** Even if a robust supporting infrastructure is in place, people may face barriers to accessing the internet. The first is affordability. For low-income families, the monthly cost of internet can be prohibitive. Devices used to access the internet can also be too expensive for people on the margins, rendering digital technology inaccessible.
- ◆ **Regulatory Mechanism:** The evolving digital landscape requires flexible and up-to-date regulations to ensure consumer protection, data privacy, and fair competition.
- ◆ **Resistance to Change:** Some sections of the population may be resistant to adopting digital technologies due to cultural or behavioral barriers.
- ◆ **Lack of Digital Skills:** Some people are digitally excluded because they do not have the skills to use the technology to its full potential. Older people who haven't spent as much of their lifetimes using the internet or devices often face this barrier. People who don't know how to safely use digital technology can be at risk of phishing scams or identity theft.
- ◆ **People with Physical Disability:** People with disabilities face unique challenges to accessing information and services online. These barriers will vary from person to person.

#### Opportunities

- ◆ **MSMEs:** This sector contributes significantly towards the nation's economy. It is imperative that the MSMEs are empowered to contribute more towards the digital economy through new emerging technology solutions, especially the micro-enterprises as majority of the MSMEs are micro-enterprises.

- ◆ **Education:** Digital technologies have the potential to revolutionize education in rural India by providing access to quality educational resources and creating new opportunities for distance learning.
- ◆ **Health Care:** Digital inclusion can improve healthcare in rural India. Telemedicine can provide remote access to healthcare services, reducing the need for travel and improving healthcare outcomes. It can help track disease outbreaks and improve public health outcomes.
- ◆ **Startups:** Digital inclusion enables nurturing innovation and startups in the digital domain. By fostering a conducive environment for startups, tap into the potential of young entrepreneurs, driving technological advancements and job creation.
- ◆ **Data-driven Decision-making:** Digital transformation generates vast amounts of data that can be analyzed to make data-driven decisions in various sectors, leading to better planning and resource allocation.

#### Way Forward

- ◆ **Develop a comprehensive digital inclusion strategy** that addresses the need for engaging with wired & wireless network operators, internet service providers, and infrastructure providers to ensure that all stakeholders are on board with the plan.
- ◆ **Establish a community** to identify needs and take initiatives to address them.
- ◆ **Foster partnerships** with wireless network operators, internet service providers, and infrastructure providers to provide access to digital devices, internet services, and infrastructure.
- ◆ **Develop transparent programmes** to provide access to digital devices and internet services to people who cannot afford them.
- ◆ **Conduct workshops** to teach people how to use digital devices and services, most importantly how to solve real-life problems with the help of digital technologies.
- ◆ **Develop a library** of digital content and applications that people can access for free.
- ◆ **Monitor and evaluate** the progress of the initiatives to ensure that the goals are being met.

#### Conclusion

Achieving digital inclusion leads to digital equity in the society. Digital equity is a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy and economy. Without access to digital technologies, rural India will continue to be left behind, impeding India's economic growth and development. By investing in digital infrastructure and promoting digital literacy, India can unlock the potential of its rural population and drive inclusive growth. It is time for the government, private sector, and civil society to work together to bridge the digital divide and make digital inclusion a reality for all. ■■



- [Supreme Court's Ruling on Same-Sex Marriages](#)
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## Supreme Court's Ruling on Same-Sex Marriages

On 17<sup>th</sup> October, 2023, the Supreme Court (SC), in a 3-2 majority decision, announced that it does not endorse legal recognition for same-sex marriages

### Major Highlights of SC Judgment

- **Same Sex Marriage:** The judgment noted that the gender of a person is not the same as their sexuality.
- Since marriage rights are denied, they have no legal status in terms of family matters, like succession, inheritance or even hospital visitation rights.
- **Special Marriage Act (SMA), 1954:** The SC could not interpret the SMA to include same-sex couples since the objective of the legislation is not to include same-sex couples within the realm of marriage.
- **State Regulation:** In the absence of any central law, the judgment holds that State legislatures can enact laws recognising and regulating same-sex marriages.

### Advocacy for LGBTQIA+ Community

- The petitioners argued that the right to marry for non-heterosexual couples is implicit in Article 14 (Equality), Article 15 (Non-Discrimination), Article 16 (Equality of Opportunity in Public Employment), Article 19 (Freedom of Speech) & Article 21 (Right to Life).
- They referred the Section 4 of SMA, which refers to a marriage in gender-neutral terms, between 'any two persons'.
- Asserting that queer persons' right to marry has already been recognised by the Transgender Persons Protection Act, 2019, flowing from the 2014 NALSA judgment, the petitioners argued that all queer identities are part of this term.
- They argued that the Central Adoption Resource Authority (CARA) guidelines, which do not allow unmarried couples to jointly adopt children, are discriminatory against queer couples who cannot legally marry.
- Individually, queer persons can adopt as single people (However, a single male is not eligible to adopt a girl child).

### Directions Issued by the Supreme Court

#### For the Union, the State Governments, and Governments in Union Territories

- Ensure that the queer community has access to goods and services without any discrimination.
- Governments must take the initiative to sensitise the public that queer identity is natural and not a mental disorder.
- Establish hotline numbers, and "safe houses" to assist queer persons who face violence and discrimination.
- Ban conversion therapy treatments for changing the gender identity or sexual orientation of a queer person.
- Prohibit inter-sex children from undergoing forced operations, especially at an age where they are unable to consent to the operation.

#### Directions for the Police Machinery

- Prohibit harassment of queer couples by the police.
- Ensure that a queer person is not forced to return to their "natal families if they do not wish to return to them."
- Uphold the queer person's freedom of movement.
- Extend protection to queer persons facing violence from their families.

#### Formation of High-Powered Committee

SC recommended that the committee should consider the following aspects:

- Queer partners should be considered as a part of the partners' family for the purpose of ration cards.
- Queer partners should be permitted to open a joint bank account with the option to add the name of the partner as a nominee.
- Queers partners should be considered "family" when a medical practitioner is consulting the "family" of a terminally ill patient under the Euthanasia guidelines.
- Permit succession rights, maintenance, financial benefits, family pension, and insurance for the queer partners.

#### Government's Stance

- The Central government opposed the pleas, asserting that India's legislative policy intentionally validates unions exclusively between biological men and women.

- The government informed the Supreme Court of its intent to establish a committee headed by the Cabinet Secretary to look into the matter.
- The committee's role would be to examine administrative measures addressing the "genuine concerns" of same-sex couples without delving into the issue of legalizing their marriages.

### Legality of Same-Sex Marriages in India

- The right to marry is not explicitly recognized as a fundamental or constitutional right under the Indian Constitution; instead, it is considered a statutory right.
- Marriage in India is regulated through various statutory enactments, and its recognition as a fundamental right has evolved through judicial decisions of the Supreme Court.

### Arguments in Favour of Same-Sex Marriage

#### Equal Rights and Protection under the Law

- All individuals, regardless of sexual orientation, have the right to marry and form a family.
- Same-sex couples should have the same legal rights and protections as opposite-sex couples.
- Non-recognition of same-sex marriage amounts to discrimination that infringes upon the dignity of LGBTQIA+ couples.

#### Cohabitation as a Fundamental Right

- The Chief Justice of India acknowledged that cohabitation is a fundamental right, and the government should legally recognize the social impact of such relationships.

#### Global Acceptance

- Same-sex marriage is legal in numerous countries worldwide, and denying this right in a democratic society con-

tradicts global principles. It is recognized in 32 countries.

### Arguments against Same-Sex Marriage

#### Religious and Cultural Beliefs

- Many religious and cultural groups maintain that marriage should be limited to unions between a man and a woman.
- Changing the traditional definition of marriage is perceived as conflicting with fundamental beliefs and values.

#### Procreation

- Some argue that the primary purpose of marriage is procreation and that same-sex couples cannot have biological children.
- This viewpoint contends that same-sex marriage disrupts the natural order of things.

### Conclusion

Even though the Supreme Court refrained from granting legal recognition for same-sex marriages, it did make a strong call to the State to take steps to end the discrimination faced by queer couples and to ensure protection for their right to cohabitation. The proposed Committee must discuss and deliberate with all relevant stakeholders — the queer community, to understand their problems; representatives of all religious communities, to understand if and how religious personal law can be suitably reconciled with the right of queer persons to marry; the Union and State Governments, to appreciate the practical difficulties involved in this deliberative exercise; as well as family law academics and practitioners, to understand the scope and draft the text of the necessary amendments.

## Automated Permanent Academic Account Registry

Recently, the Ministry of Education directed schools to seek parental consent for the creation of a new student identity card known as the Automated Permanent Academic Account Registry (APAAR).

### Rationale

- The goal behind introducing APAAR is to make education hassle-free and reduce the need for students to carry physical documents.
- The vision is to create a positive change, allowing state governments to track literacy rates, dropout rates, and more, helping them make improvements.
- APAAR also aims to reduce fraud and duplicate educational certificates by providing a single, trusted reference for educational institutions.

### Salient Features of APAAR

#### Part of One Nation, One Student ID Initiative

- APAAR is part of the 'One nation, One Student ID' initiative of the Union government, stemming from the new National Education Policy of 2020.

#### Special ID

- It is envisioned as a special ID system for all students in India, starting from childhood.
- Under the initiative, each student would get a lifelong APAAR ID, making it easy for the learners, schools, and governments to track academic progress from pre-primary education to higher education.

#### Functionality of APAAR ID

- Each student will possess a unique APAAR ID, linked

to the Academic Bank Credit (ABC), a digital repository housing information about the credits earned by students throughout their educational journey.

- With the APAAR ID, students can digitally store all their certificates and credits, whether obtained through formal education or informal learning.
- When a student completes a course or accomplishes a milestone, he/she receives digital certification which is securely stored by authorized institutions.
- In the event of a student transferring to a different school, either within the state or to another state, all their data in the ABC will seamlessly migrate to the new school simply by sharing the APAAR ID.
- There is no need to present physical documents or transfer certificates.

#### Data-driven Decision Making

- For educational institutions, APAAR will provide valuable insights into student performance, learning trajectories, and areas needing improvement.
- With the help of this data, academic institutions can tailor their teaching methods and support services to better meet the needs of individual students, fostering a more personalised and effective education system.

#### UDISE & AISHE ID

- With regards to educational institutions, the Registry ID shall be based on Unified District Information System for Education (UDISE) ID for school education, All India Survey on Higher Education (AISHE) ID in case of higher education and PAN/TAN for education providers, skill providers, etc.

#### Recognition of Co-curricular Achievements

- It will also encompass co-curricular achievements, such as rankings in Olympiads, specialised skill training, and extra-curricular accomplishments.

- This comprehensive repository will help students showcase their holistic growth and diverse talents, which are increasingly valued by universities and employers.

#### Associated Challenges

##### Data Privacy

- Data privacy and security are paramount concerns. The scheme collects a vast amount of personal data from students. Centralized databases of such magnitude are tantalizing targets for hackers.

##### Concerns with UDISE+

- The government says that the information shared by students will be kept confidential and will not be shared with any third party except for entities engaged in educational activities, such as the Unified District Information System for Education Plus (UDISE+) database.
- But there are no laid down guidelines for UDISE+ to strictly adhere to in order to prevent any breach of data.

##### Implementation Challenges

- Implementing APAAR in all educational institutions and ensuring data accuracy can be a logistical challenge.
- Transparency is another critical element in the successful implementation of the scheme.

#### Conclusion

The APAAR is a bold initiative to create a single student ID card valid across all schools and colleges; it promises to streamline the educational process across the country. The government would need to invest heavily in infrastructure and technology to create and manage the new system. The successful implementation of the scheme requires careful consideration, oversight, and a commitment to transparency, data security, and individual rights, thus paving a significant step towards enhancing the educational landscape in India.

## World Energy Outlook 2023

On 24<sup>th</sup> October, 2023, the International Energy Agency (IEA) released its World Energy Outlook 2023 report which provides in-depth analysis and strategic insights into every aspect of the global energy system.

#### Major Findings

- **Extreme volatility** in energy markets during the global energy crisis has highlighted the importance of affordable, reliable and resilient supply, especially in price-sensitive developing economies that see the largest increase in demand for energy services.
- **Continued fighting in Ukraine**, more than a year after Russia's invasion, is now accompanied by the risk of protracted conflict in the Middle East.

- Against this complex backdrop, the **emergence of a new clean energy** economy, led by solar PV and electric vehicles (EVs), provides hope for the way forward. Investment in clean energy has risen by 40% since 2020. The push to bring down emissions is a key reason, but not the only one.
- The **share of coal, oil and natural gas in global energy supply** – stuck for decades around 80% – starts to edge downwards and reaches 73% in the Stated Policies Scenario (STEPS) by 2030.
- **Sales of cars and two/three-wheel vehicles** with internal combustion engines are well below where they were before the Covid-19 pandemic.

- In the **electricity sector**, worldwide additions of coal- and natural gas-fired power plants have halved, at least, from earlier peaks.
- **Solar has become a major global industry** and is set to transform electricity markets even in the STEPS.
- By the end of the decade, the **world could have manufacturing capacity for more than 1 200 GW** of panels per year.

### India-related Observations

- India is the **world's largest source of energy demand growth in the STEPS**, ahead of Southeast Asia and Africa.
- Since 2000, **India has brought electricity to 810 million people**, larger than the population of the European Union and the United States combined.
- India has also brought **clean cooking access to 655 million people** over the same period, although 430 million people continue to live in households that use traditional biomass today.
- Over the past five years, **solar PV has accounted for nearly 60% of new generation capacity**.
- India has had the **single largest light-emitting diode (LED) adoption campaign in the world**, with around 370 million LEDs distributed through the **UJALA scheme by 2023**.
- India has also **achieved self-sufficiency in petroleum refining capacity** despite being a net crude oil importer, although certain petroleum products continue to be imported.
- India is moving into a **dynamic new phase in its energy development** marked by a long-term net

zero emissions ambition, increased regulatory sophistication, a focus on clean energy deployment, and the creation of domestic clean energy technology supply chains.

- While clean energy investment in India more than doubles in the STEPS by 2030 from around USD 60 billion in 2022, **investment needs to nearly triple** by the end of this decade to be on a trajectory to meet its net zero emissions target.

### Recommendations

- Encouraging the **transition to cleaner and more sustainable energy sources** such as renewable energy (solar, wind, hydropower) to reduce greenhouse gas emissions and combat climate change.
- **Increase investment in renewable energy infrastructure**, including solar and wind power projects, to meet growing energy demand and reduce dependence on fossil fuels.
- **Promote electrification** of the transport sector, including development of electric vehicles (EVs) and necessary charging infrastructure.
- **Implementation of carbon pricing mechanisms**, such as carbon taxes or cap-and-trade systems, to incentivize emissions reduction efforts.
- To engage in **international partnerships** and collaborations to access technology, expertise and financing for sustainable energy projects.
- **Implementing measures** to address air pollution, including stricter emission standards for vehicles and industries, to improve public health and reduce environmental damage.

## India's National Framework for Climate Services

On 1<sup>st</sup> November, 2023, the final draft of National Framework for Climate Services (NFCS) was released as part of India's endeavour to introduce its inaugural national-level framework for delivering climate services and information.

- Spearheaded by the India Meteorological Department (IMD), the National Framework for Climate Services (NFCS) is poised to establish an integrated platform for climate data users, facilitating the assessment and mitigation of climate-related risks in vital sectors, including agriculture, energy, disaster management, health, and water.
- NFCS has been developed based on the Global Framework for Climate Services (GFCS).

### Global Framework for Climate Services

- The GFCS, a global consortium involving governments and organizations, is dedicated to the enhancement of climate information and services. It aims to unite climate researchers and information users in making well-informed and long-term decisions.

### GFCS's Mandate

- **High-Quality Data Generation:** GFCS is committed to producing high-quality data from both national and international sources. This data encompasses parameters like temperature, rainfall, wind, soil moisture, and ocean conditions, laying the foundation for long-term historical averages, risk assessments, vulnerability analyses, and extensive projections.



- **Comprehensive Components:** The GFCS comprises five major components: Observations and Monitoring, Research, Modelling and Prediction, Climate Services Information System, User Interface Platform, and Capacity Building.
- **Sectoral Focus:** Currently, GFCS prioritizes vital sectors, including agriculture and food security, energy, health, water, and disaster risk reduction.

### What is NFCS?

- **Overview:** The national framework aligns with the global framework but is tailored to country-specific weather and stakeholder needs.
- It serves as a multi-stakeholder platform, facilitating the development and delivery of climate services.
- **Goals:** The NFCS's objective is to coordinate institutions to co-design, co-produce, communicate, deliver, and use climate services. While focusing on specific sectors, India can also include other relevant areas such as transport and tourism as needed.
- **Nodal Agency:** The IMD is the nodal agency responsible for formulating and implementing the national framework in India.
- **Functions:** Initially, the NFCS will bridge operational gaps among agencies requiring climate services. These encompass hydrology, power, renewable energy, transport, dams, irrigation, and health agencies at central, state, and other levels.

### What the NFCS will Achieve

In alignment with the global framework, the national framework will be adapted to suit India's specific weather and stakeholder requirements.

- **Extending to Diverse Sectors:** Apart from the identified sectors of focus, India will have the flexibility to incorporate additional relevant areas, such as transport and tourism, as the need arises.
- **The Imperative for the NFCS:** While the IMD has made significant strides in providing high-quality weather services to India and its neighbouring South Asian nations, for certain geographical regions, there remain data gaps, particularly across terrains and seas.
- The absence of long-term climatological data from regions such as the Himalayas, the oceans, and the lack of

radar and satellite-based climatology has hindered the IMD's ability to provide accurate climate predictions, particularly over extended periods.

- **Integrated Observations and Predictions:** The NFCS aims to bolster the observational network on land and at sea.
- It will improve data inflow and utilize it to develop weather and climate models for precise climate predictions.
- These climate data and information products will be customized to meet various needs, including agricultural production, health trends, population distribution in high-risk areas, infrastructure mapping, and socio-economic variables.
- **Promoting Preparedness and Adaptation:** The NFCS is designed to support initiatives aimed at preparing for emerging climate conditions and adapting to their consequences, encompassing water supplies, health risks, extreme events, agricultural productivity, infrastructure placement, energy generation, and more.

### Implementing the NFCS

- Since the declaration of frameworks for climate services in 2009, several countries, including Switzerland, China, Germany, and the United Kingdom, have initiated their NFCS.
- India has taken significant strides by organizing its first workshop in Pune and joining countries like Cuba, Ghana, Liberia, Malawi, Nigeria, Rwanda, Sierra Leone, Democratic Republic of Congo, Congo Brazzaville, and Ethiopia in planning NFCS-related national consultation workshops.
- India is poised to release the NFCS statement after reaching consensus with key partnering stakeholders.

### The Way Forward

- Though the idea of an NFCS in India dates back to 2008, it faced delays in implementation. However, with the increasing frequency of climate vagaries and extreme events affecting India and the world, early implementation and acceleration of the NFCS are achievable by planning in a mission-oriented manner and receiving support from the country's highest decision-making body.

## India's Groundwater Depletion: UNU-EHS Report

A recent report by the United Nations University-Institute for Environment and Human Security (UNU-EHS) has sounded the alarm on India's proximity to a critical groundwater depletion tipping point.

- The report, titled 'Interconnected Disaster Risks Report 2023' evaluates six environmental tipping points, including accelerating extinctions, groundwater depletion, mountain glacier melting, space debris, unbearable heat, and an uninsurable future.

## Groundwater Depletion: Key Findings

- **Global Aquifer Depletion:** 27 out of the world's 31 major aquifers are depleting at a faster rate than they can be naturally replenished, emphasizing the global nature of the issue.
- **Punjab's Overexploitation:** 78% of wells in Punjab, a state in India, are considered overexploited. It predicts critically low groundwater availability for the northwestern region, including Punjab, by 2025.
- **Accelerating Depletion:** Groundwater depletion rates have accelerated since the mid-20th century and are now a significant contributor to rising sea levels.
- **India's Groundwater Use:** India is cited as the world's largest user of groundwater, surpassing both the United States and China combined.
- **North-Western India at Risk:** The north-western region of India, particularly Punjab and Haryana, is essential for the nation's food production, accounting for 50% of the country's rice supply and 85% of its wheat stocks.
- But the region faces a heightened risk of groundwater depletion.

## Groundwater as a Non-Renewable Resource

- Groundwater is an essential freshwater resource stored in underground reservoirs called aquifers, providing drinking water for over two billion people and supporting about 70% of withdrawals for agriculture.
- Groundwater accumulates over thousands of years; it essentially qualifies as a non-renewable resource.

## Environmental Tipping Points

- Environmental tipping points as critical thresholds in the Earth's systems, beyond which abrupt and often irreversible changes occur, with significant impacts on ecosystems, climate patterns, and the overall environment.
- The tipping point in groundwater depletion occurs when the water table falls below a level that existing wells can access. This leads to potential risks for farmers, food security, and the entire food production system.

## Impacts of Groundwater Depletion

- **Crop Production:** Groundwater is a primary source of irrigation for agriculture, particularly in regions with unreliable rainfall. Depletion of groundwater can lead to reduced crop yields, affecting food production.
- **Crop Diversity:** With less access to groundwater, farmers may limit their choice of crops, impacting the diversity of agricultural output.
- **Farmers' Livelihoods:** Farmers who rely on groundwater for irrigation could face economic hardships due to reduced yields and income.
- **Ecosystems:** Groundwater depletion can disrupt natural ecosystems that depend on stable water sources, impacting flora and fauna.
- **Aquifer Health:** Continued depletion can lead to the intrusion of saltwater into freshwater aquifers, render-



- ing them unusable and causing environmental damage.
- **Drinking Water:** Many communities rely on groundwater for their drinking water supply. Depletion can lead to water scarcity, posing a threat to public health.
- **Impact on Earth's Axis:** Recent research has shown that excessive groundwater pumping has even caused a shift in the Earth's axis, emphasizing the global consequences of groundwater depletion.
- **Wetlands:** Groundwater provides essential support for wetlands, and its depletion can lead to the degradation of these critical ecosystems.
- **Biodiversity:** Depletion of groundwater can harm diverse ecosystems, impacting biodiversity and ecosystem services.
- **Health Risks:** Reduced access to clean groundwater can increase health risks due to contaminated or inadequate water supply.
- **Migration:** Water scarcity can drive people to migrate in search of better living conditions.
- **Local and Global Food Supply:** Groundwater depletion affects both local food production and the global food supply chain, leading to potential food shortages and price fluctuations.
- **Urban Development:** Groundwater depletion can limit urban development and expansion, affecting city planning.
- **Access to Water:** Groundwater depletion can exacerbate disparities in access to water, affecting marginalized and vulnerable communities the most.
- **Transboundary Water Resources:** Depletion can lead to conflicts over shared groundwater resources between neighbouring countries.

## Conclusion

The severe depletion of groundwater has a profound and multifaceted impact on society, the environment, and the global economy. Countries overdrawing groundwater resources export products, grown using depleted groundwater, to other nations, creating an interconnected issue. Addressing this issue requires a comprehensive and coordinated effort that involves sustainable water management, technological innovations, and policy changes. ■■



## Polity & Governance

- 43<sup>rd</sup> PRAGATI Interaction
- Offences Relating to Religion: Section 295A of IPC
- Lok Sabha's Ethics Committee

## Polity & Governance

### 43<sup>rd</sup> PRAGATI Interaction

- On 25<sup>th</sup> October, 2023, Prime Minister chaired the meeting of the 43<sup>rd</sup> edition of Pro-Active Governance And Timely Implementation (PRAGATI) platform involving Central and State governments.

#### Key Agenda of the Meeting

- A total of eight projects were reviewed. Among these, four projects were concerned with water supply and irrigation, two projects for expanding National highways and connectivity, and two projects for rail and metro rail connectivity.
- Prime Minister emphasised that PM Gati Shakti National Master Plan Portal in conjunction with technologies such as satellite imagery can help address various issues of implementation and planning relating to location and land requirements for projects.
- For irrigation projects, Prime Minister advised that visits of stakeholders be organised where successful rehabilitation and reconstruction work has been done.

#### About PRAGATI Platform

- It was launched on 25<sup>th</sup> March, 2015, as a part of Digital India Programme.
- It is a multi-purpose and multi-modal platform that is aimed at addressing common man's grievances and simultaneously monitoring and reviewing important programmes and projects of the Government of India as well as projects flagged by State Governments.

#### Key Features

- The system builds upon and enhances the databases of the Centralized Public Grievance Redress And Monitoring System (CPGRAMS) for grievances, the Project Monitoring Group (PMG), and the Ministry of Statistics and Programme Implementation.

## Judiciary

- Writ Jurisdiction
- Curative Petition

## Plans/Policies

- MoU Signed between MEPSC & Magic Bus India Foundation
- Draft CCI (Lesser Penalty) Regulations, 2023
- SC Directions for Effective Implementation of POSH Act, 2013

## Reports

- Phenomenal Impact of PM SVANidhi Scheme on Street Vendors

- This platform is combined with the three latest technologies, that are-
  1. Video-conferencing;
  2. Digital data management; and
  3. Geo-spatial technology.
- It is also a robust system for bringing e-transparency and e-accountability with real-time presence and exchange among the key stakeholders.

#### Modus Operandi

- Issues to be flagged before the PM are picked up from the available database regarding public grievances, on-going programmes and pending projects.
- The issues flagged are uploaded 7 days prior to the PRAGATI day (i.e. on third Wednesday of every month).
- Union Government Secretaries and Chief Secretaries have to put their comments and updates about the flagged issues within three days.

#### Significance

- This programme has proved effective in addressing and resolving issues by bringing down the inter-departmental communication gap and thus minimizing the time taken for implementation of projects and schemes.
- It has helped in promoting cooperative federalism by bringing together both the Secretaries of the Government of India and the Chief Secretaries of the States on a single platform.

## Offences Relating to Religion: Section 295A of IPC

On 30<sup>th</sup> October, 2023, the Supreme Court directed the Uttar Pradesh (UP) government to immediately decide on granting sanction to prosecute a school teacher accused of instructing her students to slap a Muslim classmate for failing to complete his homework.

- In response, the UP government informed that the section 295A of Indian Penal Code along with second proviso of section 75 (cruelty to children by Child Care Institu-

tions staff) of the Juvenile Justice (Care and Protection of Children) Act, 2015 (JJ Act) has been invoked against the accused teacher.

**About Section 295A**

- The object of Section 295-A is to punish deliberate and malicious acts intended to outrage the religious feelings of any class by insulting its religion or religious beliefs.
- This section only punishes an aggravated form of insult to religion when it is perpetrated with the deliberate and malicious intention of outraging the religious feelings of a class.

**Ingredients of Section 295A**

- The accused must insult or attempt to insult the religion or religious beliefs of any class of citizens of India.
- The said insult must be with a deliberate and malicious intention of outraging the religious feelings of the said class of citizens.
- The said insult must be by words, either spoken or written, by signs or by visible representation or otherwise.
- The offence under this Section is cognizable and a non-bailable and non-compoundable offence.
- The police have a power under to arrest a person charged under Section 295-A without a warrant.

**Supreme Court Verdict on Section 295A**

- In 1957, a Constitution Bench of the Supreme Court upheld the constitutionality of the said section in ‘Ramji Lal Modi v. State of U.P.’
- The Court held that Section 295A IPC does not penalise any and every act of insult to or attempt to insult any religion or the religious beliefs of a class of citizens.
- The Court cautioned that only those acts of insult or attempts to insult can be penalised under this provision if they are perpetrated with the deliberate and malicious intention of outraging the religious feelings of that class.
- The Court further clarified that the provision would only apply to aggravated forms of insult to religion that are calculated to disrupt public order.

**Important Facts**

**SECTION 295 of IPC**

- It makes destruction, damage, or defilement of a place of worship or an object held sacred, with intent to insult the religion of a class of persons, punishable with imprisonment which may extend to two years, or with fine, or with both.
- This section has been enacted to compel people to respect the religious susceptibilities of persons of different religious persuasion or creeds.

**Lok Sabha’s Ethics Committee**

Recently, the Speaker of the Lok Sabha referred a complaint against sitting Member of Parliament (MP) to the House Ethics Committee.

**About the Ethics Committee**

- The genesis of formation of Ethics Committee in Parliament can be traced to a resolution adopted at the Presiding Officers Conference held in New Delhi in October, 1996 which desired the legislatures to explore the possibility of constituting Ethics Committee.
- In the case of Lok Sabha, a study group of the house committee of privileges in 1997 recommended the constitution of an Ethics committee, but it could not be taken up by Lok Sabha.
- The Committee of Privileges finally recommended the constitution of an Ethics Committee during the 13<sup>th</sup> Lok Sabha.
- The late Speaker, G M C Balayogi, constituted an ad hoc Ethics Committee in 2000, which became a permanent part of the House only in 2015.
- This Committee consists of 15 Members nominated by the Speaker. The term of the Committee is one year.
- Its function is to examine every complaint relating to unethical conduct of a Member of Lok Sabha referred to it by the Speaker and makes such recommendations as it may deem fit and formulate a code of conduct for Members and suggest amendments or additions to the code of conduct from time to time.

**Procedure for Complaints**

- Any person can complain against a Member through another Lok Sabha member, along with evidence of the alleged misconduct, and an affidavit stating that the complaint is not “false, frivolous, or vexatious”.
- If the Member himself complains, the affidavit is not needed.
- The Speaker can refer to the Committee any complaint against an MP.
- The Committee does not entertain complaints based only on media reports or on matters that are sub judice.
- The Committee makes a Prima Facie inquiry before deciding to examine a complaint. It makes its recommendations after evaluating the complaint.

**OVERLAP WITH PRIVILEGES COMMITTEE**

- The work of the Ethics Committee and the Privileges Committee often overlap. An allegation of corruption against an MP can be sent to either body, but usually more serious accusations go to the Privileges Committee.
- The mandate of the Privileges Committee is to safeguard the “freedom, authority, and dignity of Parliament”.
- These privileges are enjoyed by individual Members as well as the House as a whole. An MP can be examined for Breach of Privilege; a non-MP too can be accused of breach of privilege for actions that attack the authority and dignity of the House.
- The Ethics Committee can take up only cases of misconduct that involve MPs.



- The Committee presents its report to the Speaker, who asks the House if the report should be taken up for consideration.

## Judiciary

### Writ Jurisdiction

On 14<sup>th</sup> October, 2023, the Allahabad High Court refused to exercise its writ jurisdiction in a petition seeking compliance of a Supreme Court order.

#### Writ Jurisdiction of Courts in India

- According to Articles 12-35 of the Indian Constitution, every citizen is given a number of Fundamental Rights. Granting these rights is necessary, but it is also necessary to protect them.
- As a result, the Indian Constitution's Article 32 provides a remedy for the protection of Fundamental Rights by allowing the Supreme Court to issue writs when a citizen's basic rights are violated and to the High Court under Article 226 of the Constitution.
- The writs issued in India are called the prerogative writs.
- In the case of *L. Chandra Kumar v. Union of India*, 1997, the Supreme Court held that the power of the Supreme Court to issue writs to the citizens of India for the enforcement of their Fundamental Rights forms a part of the basic structure doctrine, and hence this power can never be amended or eliminated.

#### Differences between Writ Jurisdiction of Supreme Court and High Courts

##### Jurisdiction

- The jurisdiction of the Supreme Court to issue writs extends all over the country.
- The jurisdiction of the High Court to issue writs is limited only to the state or the union territory which comes under the jurisdiction of the concerned High Court.

##### Cases in which Writ can be Issued

- The Supreme Court can issue writs only when the Fundamental Rights of an individual are violated.
- The High Court can issue writs in two circumstances- when the Fundamental Rights of an individual are violated when the legal rights of an individual are violated, the issuance of the writ is a proper remedy in such a case under the law.

### Curative Petition

On 10<sup>th</sup> October, 2023, the Supreme Court (SC) agreed to hear curative petitions filed by two telecom operators citing arithmetical errors in calculation of adjusted gross revenue (AGR) dues by the department of telecommunications (DoT), in an open court.

#### About Curative Petition

- It is the last resort to the highest court that can be petitioned for redressal of grievances in court, and its ruling is final.
- It is a way to ask the court to review and revise their own decision, and it is filed after a review petition is dismissed or used.
- It is the final and last option for the people to acquire justice, as mentioned and promised by the Constitution of India.
- It is meant to ensure there is no miscarriage of justice and to prevent abuse of process.
- A curative petition must be accompanied by certification by a senior advocate, pointing out substantial grounds for considering it.
- It must be first circulated to a bench of the 3 senior-most judges, and the judges who had passed the concerned judgment, if available.
- Only when a majority of the judges conclude that the matter needs hearing should it be listed, before the same Bench.

#### Evolution

- The concept of curative petition originated from the case of *Rupa Ashok Hurra Vs. Ashok Hurra* and another case (2002) where the following question arose before the court of law: 'Whether an aggrieved person is entitled to any relief against the final judgment/order of the Supreme Court, after the dismissal of a review petition?'
- The court used the Latin maxim "actus curiae neminem gravabit", which means that an act of the court shall prejudice no one.
- The maxim becomes applicable when the court is under an obligation to undo a wrong done to a party by the act of the court itself.
- This led to the creation of the concept of a curative petition by the Supreme Court to prevent the miscarriage of justice and to prevent the abuse of process.
- In this case, a five-judge constitution bench of the Supreme Court unanimously held that in order to rectify gross miscarriage of justice, the court will allow the curative petition filed by the victim.

#### Important Facts

##### Adjusted Gross Revenue (AGR)

- AGR is a fee-sharing mechanism between the government and the telcos who shifted to the 'revenue-sharing fee' model in 1999, from the 'fixed license fee' model.
- In this course, telcos are supposed to share a percentage of AGR with the government.
- As per DoT, the charges are calculated based on all revenues earned by a telco – including non-telecom related sources such as deposit interests and asset sales.

## Plans/Policies

### MoU Signed between MEPSC & Magic Bus India Foundation

On 26<sup>th</sup> October, 2023, Management & Entrepreneurship and Professional Skills Council (MEPSC) entered into a Memorandum of Understanding (MoU) with Magic Bus India Foundation, a leading non-profit organisation in the education and skilling space.

#### About the Collaboration

- This collaboration is poised to empower 3 lakh marginalized youth in the next 3 years, by providing them with transferable life and employability skills required in today's competitive job market.
- These youth will receive skilling in sectors such as Banking, Financial Services, and Insurance (BFSI), Information Technology and IT-enabled Services (IT - ITeS), Retail, Quick Service Restaurants (QSR), and Logistics.
- The partnership with MEPSC will span across three years, with each year outlined by a comprehensive action plan.
- In the first year, the focus will be on obtaining recognition for Magic Bus' Transferable Life and Employability Skills Curriculum for youth and ensuring alignment with the existing National Occupational Standard (NOS) code for life and employability skills.
- From the second year onwards, the partnership will focus on conceptualising, planning, and coordinating joint programmes, workshops, seminars, and other policy-focused interventions across skilling ecosystem.
- Additionally, the certification of Magic Bus trainers and beneficiaries will be conducted in accordance with MEPSC norms.

#### MANAGEMENT & ENTREPRENEURSHIP AND PROFESSIONAL SKILLS COUNCIL (MEPSC)

- MEPSC is a horizontal Sector Skill Council (SSC) incorporated as a Section-8 (Not for Profit Company) under the Companies Act, 2013, in a one of its kind, Public-Private Partnership (PPP) model.
- The Council has been working under the tutelage of the Ministry of Skill Development and Entrepreneurship.
- It is being promoted by All India Management Association (AIMA), the apex body of management profession in India, as its sole promoter.
- MEPSC is recognised as an awarding body by the skills regulator, the National Council for Vocational Education and Training (NCVET), and is supported by the National Skill Development Corporation (NSDC).

#### Expected Impact

- **Generating Opportunities:** It will help generate opportunities where youth from underserved households will acquire transferable life and employability skills that can be applied in the world of work.
- **Achieving the Vision of Skill India:** This collaboration marks a significant stride towards empowering India's youth and fulfilling the vision of skilled India.

#### Important Facts

##### All India Management Association (AIMA)

- AIMA was created as an apex body of the management profession with the active support of the Government of India and Industry in 1957.
- AIMA is a not-for-profit, non-lobbying organisation, working closely with industry, government, academia, and students to further the cause of the management profession in India.
- It is represented in a number of policy-making bodies of the Government of India and national associations.
- It offers various services in the areas of testing, distance education, skill development & training, research, publications, executive education, and management development programmes.
- It is an active member of the Asian Association of Management Organisations (AAMO), which is the Asia-Pacific regional body of the World Management Council (CIOS).

### Draft CCI (Lesser Penalty) Regulations, 2023

On 17<sup>th</sup> October, 2023, the Competition Commission of India (CCI) published the draft Competition Commission of India (Lesser Penalty) Regulations, 2023 (LPR 2023).

- Once notified, the LPR 2023 will amend the Competition Commission of India (Lesser Penalty) Regulations, 2009 (LPR 2009).
- The LPR 2009 regulates the leniency programme which is available to those enterprises / individuals who disclose their role in a cartel to the CCI and cooperate with subsequent investigations in return of a reduction in penalty.
- The LPR 2023 will operationalise the lesser penalty plus / leniency plus facility introduced by the Competition (Amendment) Act, 2023 (Amendment Act).

#### Proposed Changes

- **Withdrawal of Application Allowed:** The LPR 2023 provides leniency and leniency plus applicants an option to withdraw their application any time before the receipt of the report of the Director General by the CCI.
- **Power of Discretion:** The proposed regulations also grant the competition watchdog the discretion to determine the extent of penalty reduction based on the quality of information provided and the stage at which the applicant comes forward.

- If the commission already possesses evidence and facts regarding the case, the reduction will be less substantial.
- **Hub and Spoke Cartels Recognised:** The LPR 2009 regime only recognized “horizontal” cartels (i.e., cartels between competitors). In line with the recognition afforded to hub and spoke arrangements as a “cartel” in the Amendment Act, the LPR 2023 will extend the benefit of the leniency and leniency plus facility to the participants of hub and spoke cartels as well (i.e., cartel amongst competitors through or involving vertically linked players / other facilitators in the market).
- **Waterfall Mechanism for Leniency Plus:** The LPR 2023 clarifies that the benefit under leniency plus will only be given to one leniency plus applicant.
- Accordingly, the CCI will consider only one leniency plus application at a time. Unless the CCI rejects a leniency plus application filed by the first applicant, no subsequent applications will be considered.

### About Leniency Plus Regime

- It is a new cartel detecting tool and sheds light on how the competition watchdog intends to operationalize it.
- Leniency Plus is a proactive antitrust enforcement strategy aimed at attracting leniency applications by encouraging companies already under investigation for one cartel to report other cartels unknown to the competition regulator.
- The benefit that would entail such disclosure is a reduction of penalty in the first cartel to the person disclosing the information, without prejudice to the company obtaining lesser penalty regarding the newly disclosed cartel.
- This “leniency plus” regime is already recognised in jurisdictions like the UK, US, Singapore, and Brazil.

### COMPETITION (AMENDMENT) ACT, 2023

- The amendments aim to strengthen competition regulation, streamline operations, and foster a business-friendly environment.
- One of the most significant changes introduced by the amendment is the establishment of a new deal value threshold.
- The amendment has also reduced the timeline for the implementation of a combination from 210 days to 150 days.
- It also introduces a three-year limitation period for entertaining information or references regarding alleged contraventions under the Act.
- It introduces a settlement and commitment mechanism for enterprises under inquiry for abuse of dominance or anti-competitive agreements.

## SC Directions for Effective Implementation of POSH Act, 2013

On 19<sup>th</sup> October, 2023, the Supreme Court of India (SC) directed Ministry of Women and Child Development (MoWCD) of all states/UTs to appoint district officers under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act) to ensure the effective implementation of the law.

- The Supreme Court’s directives aim to strengthen the implementation of the POSH Act, ensuring that it fulfills its intended purpose of preventing and addressing sexual harassment in the workplace.

### Rationale

- The SC found that many states had not bothered to notify District Officers under the POSH Act all these years. Therefore, it directed all states to immediately appoint district officers under the POSH Act.

### Key Directions

#### District Officers

- The POSH Act mandates states to appoint an officer in every district who would play a “pivotal” role in the implementation of the Act.
- The District Officer would constitute Local Complaints Committees (LCCs) to receive complaints from women employed in small establishments with less than 10 workers or cases in which the assailant is the employer himself.
- A District Officer’s responsibilities also included appointing nodal officers under the Act in rural, tribal and urban areas.

#### Nodal Persons

- Every State/UT through its Principal Secretary should consider identifying a ‘nodal person’ within the Department, to oversee and aid in coordination as contemplated under the POSH Act.
- This person would also be able to coordinate with the Union Government on matters relating to this Act and its implementation.

#### Deadline of Report Submission

- Further, each State/UT Government is to submit a consolidated report of its compliance with the below directions to the Union Government within 8 weeks.

#### Amendments and Gaps in Rules

- The Union Government ought to consider amending the Rules, so as to operationalise Section 26 of the Act, by recognising a reporting authority, and/or a fine collecting authority.
- This direction must be read in light of the discussion in paragraph 21 (on the penalty regime contemplated in the Act and resulting lacunae in the Rules) of the Judgment.

**About POSH Act, 2013**

- The Act was based on the Supreme Court’s judgment in the Vishakha and others v State of Rajasthan 1997 case, where the SC issued ‘Vishakha guidelines’.

**Important Sections**

- **Section 2** sets the context by defining a workplace and sexual harassment. It provides the reader with key elements, such as examples of sexual harassment as well as scenarios and the impact of such behaviour.
- **Section 3** focuses on the key individuals and institutions involved in the prohibition and prevention processes and their responsibilities.
- **Section 4** is about redress. This section identifies and defines the key players involved in the complaint mechanism (including the complainant and the respondent). It details the stages of the complaint process. Particular attention is paid to the complaints committee which plays a very important role in this process.
- **Section 5** describes the monitoring requirements as per the Act.
- **Section 6** lists the important international frameworks and select best practices on sexual harassment at the workplace.

**Reports**

**Phenomenal Impact of PM SVANidhi Scheme on Street Vendors**

Recently, the State Bank of India (SBI) released a research work titled PM SVANidhi: Strengthening Country’s Social Fabric through empowering grassroots market mavericks which analysed the transformative impact of PM Street Vendor’s AtmaNirbhar Nidhi (PM SVANidhi).

**Major Findings**

**Ensured Inclusive Entrepreneurship**

- PM SVANidhi has seamlessly connected marginalized urban micro-entrepreneurs, breaking down community barriers along the way.
- Almost 75% loan beneficiaries come from non-general category, a testament of the innate power of well-intended policy schemes to seed transformative changes.
- OBCs account for 44% of total disbursement, while SCs/ STs account for 22%.
- 43% of the total beneficiaries are women.
- Female share indicates empowerment of entrepreneurial capabilities of urban female, giving SVANidhi a gender equalizer tag.

**Increasing Persistency Ratio**

- The persistency ratio (2<sup>nd</sup> loan/1<sup>st</sup> loan repaid) is increasing indicating need and popularity of PM SVANidhi Scheme and also incentivizing those who are paying back the loan in terms of further loans are acting as a better conduit.

- Under the scheme regular repayments are incentivized with a 7% interest subsidy and digital transactions are rewarded with cashback up to Rs 1,200 per year.
- The ratio of people repaying first loan of Rs 10,000 and taking the second loan of Rs 20,000 loan is 68%.
- The ratio of people repaying second loan of Rs 20000 and taking the third loan of Rs 50,000 loan is 75%.

**Fifty Percent Increase in Average Consumption**

- The average debit card spending of PM SVANidhi account holders increased by 50% to Rs 80,000 in FY23 as compared to FY21.
- In just 2 years average spending per annum increased by Rs 28,000, with a rather small amount of seed capital infused to informal urban entrepreneurs.

**Pradhan Mantri Jan Dhan Yojana (PMJDY) Beneficiaries**

- It has been estimated that SVANidhi loan given in FY22 to the Pradhan Mantri Jan Dhan Yojana (PMJDY) beneficiaries has increased their spending/Treatment Group at merchant outlets on an average by at least Rs 1385, in comparison to PMJDY beneficiaries who have not got the SVANidhi Loans /Control Group.

**About PM SVANidhi**

- It was launched in June 2020 as a Micro-Credit facility which aims to empower street vendors to recover losses incurred as a result of the COVID-19 pandemic.
- It has been established under the aegis of the Ministry of Housing and Urban Affairs (MoHUA)

**Key Objectives**

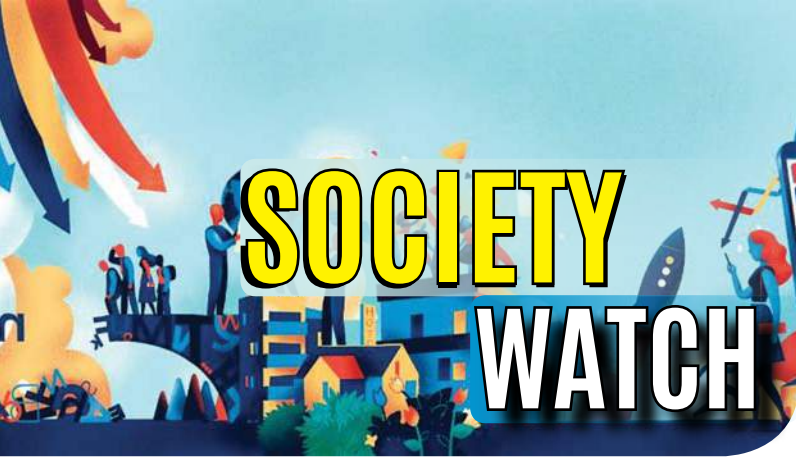
- Facilitating working capital loans upto INR 10,000.
- Incentivising regular repayment of loans by offering an interest subsidy of 7% per annum. This subsidy will be credited back on a quarterly basis.
- Rewarding digital transactions with monthly cash back offers.

**Eligibility of Beneficiaries**

- Possession of Certificate of Vending / Identity Card issued by Urban Local Bodies (ULBs).
- Identification in the survey but not in possession of Certificate of Vending / Identity Card.
- Possession of Letter of Recommendation by Urban Local Body (ULB) / Town Vending Committee (TVC).







## Social Justice

- Habitat Rights of PVTGs
- Supreme Court Directions on Eradication of Manual Scavenging
- Enhancing Corporate Inclusivity for Persons with Disabilities

## Social Issues

- Protocol for Management of Malnutrition in Children

## Indian Society

- Right of the Unborn Child

## Plans /Policies

- Mera Yuva Bharat

## Reports

- ILO Study on Transformative Childcare Policy
- International Migration Outlook 2023

## Social Justice

### Habitat Rights of PVTGs

On 9<sup>th</sup> October, 2023, the Chhattisgarh Government granted habitat rights to its Baiga Particularly Vulnerable Tribal Group (PVTG) right after the Kamar PVTG received habitat rights in August 2023.

- Out of 75 PVTG in India, only three have habitat rights. The Bharia PVTG in Madhya Pradesh was the first, followed by the Kamar tribe and now the Baiga tribe in Chhattisgarh.

### About Habitat Rights (HRs)

- Habitat rights recognition grants specific rights to the concerned community over their customary habitation territory.
- Legal Framework was provided under Section 3(1) (e) of The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, also known as the Forest Rights Act (FRA).
- Section 2(h) of FRA defines “habitat” to encompass customary habitats, reserved forests, protected forests of primitive tribal groups, pre-agricultural communities, and other forest dwelling Scheduled Tribes.

### Process for Granting HRs

- The procedure is based on a detailed guideline given for this purpose in 2014 by the Ministry of Tribal Affairs.
- Four state-level departments (Forest, Revenue, Tribal, and Panchayati Raj) collaborated with the United Nations Development Programme (UNDP) to define what constitutes a habitat after consulting traditional tribal leaders about culture, traditions, and occupation of tribes.
- As per habitat rights, the District Collector should take cognisance of rights of the PVTGs in their district and initiate the process of habitat rights on priority basis.

### HABITAT RIGHTS UNDER FRA, 2006

- Right to perform all customary religious or cultural ceremonies in the landscape related their clans.
- Right to protect and conserve the natural entities and sacred sites recognised under habitat rights.
- Right to protect and conserve places important for religious and spiritual purposes such as sacred groves; the right of passage to abodes of deities in forests, hill tops, origin of rivers and other remote parts of forests.
- Right to practice traditional cultivation systems and other livelihood generating activities including seasonal resource use.
- Habitat rights exclude any traditional right of hunting or trapping or extracting a part of the body of any species of wild animal.

### Benefits

- It safeguards traditional livelihood and ecological knowledge passed through generations.
- This would facilitate coordination of government schemes and initiatives from different departments to empower PVTG communities in developing their habitats.
- It would stop or regulate activities like mining or developmental activities harming the habitat and livelihoods of PVTGs.
- It would promote sustainable development and conservation, which is crucial for the environment and the overall well-being of society.

### Important Facts

#### Criteria for Identification of PVTGs

- There are 75 PVTGs out of 705 Scheduled Tribes, spread over 18 states and 1 Union Territory (A&N Islands).
- In 1973, the Dhebar Commission created Primitive Tribal Groups (PTGs) as a separate category, who are less developed among the tribal groups.

- In 2006, the Government of India renamed the PTGs as PVTGs.
- PVTGs are identified based on criteria such as technological backwardness, stagnant or declining population growth, low literacy levels, subsistence economy, and challenging living conditions.
- Highest number of PVTGs is present in Odisha (13) followed by Andhra Pradesh & Telangana (12 each).

## Supreme Court Directions on Eradication of Manual Scavenging

On 20<sup>th</sup> October, 2023, expressing profound concern over the rising number of deaths during manual cleaning of sewers, the Supreme Court (SC) directed the Central and State Governments to eradicate the practice of manual scavenging entirely.

- The Court also pointed out that the major short-coming in the implementation of the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013.
- It said that the State and the Central Governments have not even constituted the institutions that are required to implement the Act.

### SC Directions

#### Complete Eradication

- Union should take appropriate measures and frame policies, and issue directions, to all statutory bodies, including corporations, railways, cantonments, as well as agencies under its control, to ensure that manual sewer cleaning is completely eradicated in a phased manner.
- Ensure that directions issued for eradication are followed by states.

#### Rehabilitation

- The Union, States and Union Territories are directed to ensure that full rehabilitation (including employment to the next of kin, education to the wards, and skill training) measures are taken in respect of sewage workers, and those who die.

#### Compensation

- The compensation for sewer deaths to be increased from Rs. 10 lakhs to Rs. 30 lakhs.
- If the disability is permanent, and renders the victim economically helpless, the compensation shall not be less than 20 lakhs.

#### Mechanism for Accountability

- The appropriate government shall devise a suitable mechanism to ensure accountability, especially whenever sewer deaths occur in the course of contractual or “outsourced” work.

#### Model Contract

- The Union shall devise a model contract, to be used wherever contracts are to be awarded, by it or its agencies and corporations, in the concerned enactment in conformity with the 2013 Act.

- This model shall also be used by all States and Union Territories.

#### Designated Portal

- A portal and a dashboard, containing all relevant information, including the information relating to sewer deaths, and victims, and the status of compensation disbursement, as well as rehabilitation measures taken, and existing and available rehabilitation policies shall be developed and launched at an early date.

### Government's Initiatives to Restrict Manual Scavenging

- **Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013:** The law bans manual scavenging and provides for rehabilitation. Violation of the Act is punishable with imprisonment up to 2 years or a fine up to Rs. 1 Lakh or both.
- **Swachh Bharat Abhiyan:** Aims to promote sanitation and reduce manual scavenging.
- **National Action Plan for Mechanised Sanitation Ecosystem (NAMASTE):** Collaborative effort between the Ministry of Housing and Urban Affairs and the Ministry of Social Justice and Empowerment, with the objective of eliminating hazardous manual cleaning of sewer and septic tanks.
- **Rashtriya Garima Abhiyaan:** National Campaign focused on eradicating the dehumanizing practice of manual scavenging and ensuring comprehensive rehabilitation for manual scavengers throughout India.

## Enhancing Corporate Inclusivity for Persons with Disabilities

On 20<sup>th</sup> October, 2023, a Memorandum of Understanding (MoU) was signed between the Indian Institute of Corporate Affairs (IICA) and the Skill Council for Persons with Disability (SCPwD) at the IICA Campus in Manesar, Gurugram (Haryana).

### Objective

- To promote the inclusion of differently abled people among Corporates and other organisation's workforce
- To leverage the expertise of SCPwD and IICA to equip corporations with the knowledge, skills, and competencies required for creating and managing a diverse workforce.

### Job Coach for Inclusivity (JCI) Programs

- This collaboration will facilitate skill courses in areas like “Qualification – Job Coach for Inclusivity (JCI)” programs and other diverse fields.

### Impact

- **Capacity Building & Inclusion:** The collaboration will help build capacities among corporate representatives and other stakeholders entering the Diversity and Inclusion domain.

**SKILL COUNCIL FOR PERSONS WITH DISABILITY (SCPWD)**

- It is a not-for-profit organization established under the Societies Registration Act, 1860.
- It was created in October 2015 in alignment with the National Policy for Skill Development and Entrepreneurship, 2015.
- SCPwD's formation was a joint effort of the Ministry of Social Justice and Empowerment (MSJE), National Skill Development Corporation (NSDC), and Confederation of Indian Industry (CII), under the Ministry of Skill Development and Entrepreneurship (MSDE) to mainstream Persons with Disabilities (PwD).

**Important Facts**

**Indian Institute of Corporate Affairs (IICA)**

- It was registered as a society on September 12, 2008, under the Societies Registration Act, 1860.
- It is an autonomous body that acts as a think-tank and a Centre of Excellence to support the growth of the corporate sector in India through an integrated and multi-disciplinary approach.
- It offers its capacity-building and advisory solutions through various schools and centres.
- The School of Business Environment at IICA works in the areas of Environmental-Social Governance (ESG), Corporate Social responsibility (CSR), and Business & Human Rights (BHR).

**Social Issues**

**Protocol for Management of Malnutrition in Children**

On 10<sup>th</sup> October, 2023, the Ministry of Women and Child Development launched the first ever ‘Protocol for Identification and Management of Malnutrition in Children’ in collaboration with the Ministry of Health and Family Welfare and the Ministry of Ayush.

**About the Protocol**

- The protocols define in detail the identification of children suffering from severe acute malnutrition (SAM), the processes that needed to for a healthy weight, and even comprehensive norms on dietary requirements for various levels of malnutrition among children.
- The protocol provides detailed 10-step guidelines for the management of malnutrition in Children. Some of the important guidelines are given below:
  - ♦ The identification and management of children suffering from severe acute malnutrition (SAM) at the Anganwadi level, including decision-making for referral, nutritional management and follow-up care.

- ♦ The processes that are needed for healthy weight management, and
- ♦ The comprehensive norms on dietary requirements for various levels of malnutrition among children.
- After the identification of children through growth monitoring data, appetite tests will be done on all SAM children for medical complications.
- SAM children who fail the appetite test will be referred to Nutritional Rehabilitation Centres, which will also be linked to medical centres.
- The protocol also includes unique initiatives like the ‘Buddy mother’ concept which was first used in the state of Assam. Under this scheme, the mother of a healthy baby guides the mother of a malnourished child at an Anganwadi centre every week.



**Significance**

- The new guidelines will check malnutrition among children, which the government is tackling through the implementation of ‘Poshan Abhiyan’.
- The identification of malnourished children and their treatment is an integral aspect of Mission Poshan 2.0 and more than 17 crore activities have taken place during the ‘poshanmaah’ (nutrition month).
- The standardised protocol is significant since treatment of children with SAM was previously thought to be limited to facility-based approaches. This is the first time this issue would be addressed at the Anganwadi level.



### Important Facts

#### Severe Acute Malnutrition (SAM)

- It is defined by very low weight-for-height/length (Z-score below -3 SD of the median; WHO child growth standards) or by visible severe wasting or by the presence of nutritional oedema. Severe underweight (SUW) is defined by very low weight-for-Age (Z-score below -3 SD of the median; WHO child growth standards).
- 7.7 per cent of children in the country are in the SAM category.

## Indian Society

### Right of the Unborn Child

On 16<sup>th</sup> October, 2023, the Supreme Court (SC) declined a married woman's plea to medically terminate her 26-week pregnancy, saying the court is averse to ordering doctors to "stop the heartbeat" of the foetus when medical reports say she will give birth to a "viable baby".

#### Ruling of Supreme Court

- **Right of the Unborn Child:** The Indian legal framework on reproductive rights tilts to the side of the woman's autonomy to decide and choose more than towards the rights of the unborn child. No international law recognises the right of the foetus or right of the unborn child.
- **Absolute, Overriding Right:** Woman cannot claim an "absolute, overriding right" to abort, especially when multiple reports from the AIIMS medical board have confirmed that the pregnancy was neither a cause of immediate danger to her life or that of the foetus.
- **Foetal Viability:** The test of "foetal viability" as a benchmark to allow abortion is new in India.
- *Foetal viability is time after which a foetus can survive outside the womb. The landmark 1973 US Supreme Court verdict made abortion a constitutional right and allowed abortion up to the point of foetal viability.*
- *Foetal viability in 1973 was pegged at 28 weeks (7 months), which is now lowered at 23-24 weeks (6 months). It has been argued that foetal viability is an arbitrary standard.*

#### India's Law on Abortion

- The Medical Termination of Pregnancy Act, 1971 ("MTP Act") was passed due to the progress made in the field of medical science with respect to safer abortions.
- The new Medical Termination of Pregnancy (Amendment) Act, 2021 expands the access to safe and legal abortion services on therapeutic, eugenic, humanitarian and social grounds to ensure universal access to comprehensive care.

### SALIENT FEATURES OF THE MEDICAL TERMINATION OF PREGNANCY (AMENDMENT) ACT 2021

- **20 Weeks of gestation:** Only one trained doctor (registered medical practitioner) required for abortion, expanding access to remote/rural areas where provider shortages exist.
- **20-24 weeks of gestation:** Special provision made for vulnerable women (survivors of violence minors, women affected by disasters etc. as per Medical Termination of Pregnancy rules) with opinion of two providers.
- **Beyond 24 weeks of gestation:** Provision for cases of substantial foetal abnormalities, to be determined by a Medical Board.
- **Ensuring privacy:** Name and details of woman seeking abortion to be kept confidential, when legally mandated.
- **Provision for equity:** Expanded access, irrespective of marital status, including provision for seeking abortion on grounds of contraceptive failure.

### Important Facts

#### SAMARTH Initiative

- Sustain-Accelerate-Mainstream Access to Reproductive Health Through Health System (SAMARTH) initiative is a collaboration with Ministry of Health and Family Welfare (MoHFW) and WHO Country Office for India (WCO).
- Key areas of focus for the initiative in consultation with MoHFW are family planning (FP), comprehensive abortion care (CAC), adolescent health (AH), health system strengthening (HSS) and monitoring and evaluation (M&E).

## Plans /Policies

### Mera Yuva Bharat

On 31<sup>st</sup> October, 2023, the Prime Minister launched 'Mera Yuva Bharat (MY Bharat)' platform for youth of the country at Kartavya Path, New Delhi. It is a 'Phygital Platform' (physical + digital) comprising physical activity along with an opportunity to connect digitally.

#### Need

- With a view to engage youth and their empowerment guided by the principles of 'whole of government approach', in a rapidly changing world, which has an environment of high velocity communications, social media, new digital opportunities and emergent technologies, the Government has decided to establish overarching enabling mechanism in a form of a new Autonomous Body, namely Mera Yuva Bharat.



**Objective**

- To make it a whole of Government platform for youth development.

**Vision**

- It envisions a framework where the youth of our country can seamlessly connect with programs, mentors, and their local communities.
- This engagement is designed to deepen their understanding of local issues and empower them to contribute to constructive solutions.

**Beneficiaries**

- It will benefit the youth in the age group of 15-29 years, in line with the definition of ‘Youth’ in the National Youth Policy.
- In case of program components specifically meant for the adolescents, the beneficiaries will be in the age-group of 10-19 years.

**Yuva Setu**

- The platform aims to connect youth to programs that enhance their capabilities and engage them in community activities, creating a phygital ecosystem that empowers young individuals as ‘Yuva Setu,’ linking government with its citizens.

**One-Stop Shop**

- MY Bharat will serve as a comprehensive platform for young people, ministries, and other stakeholders involved in youth initiatives and activities.

**Active Drivers of Development**

- It seeks to shift the government’s focus toward youth-led development, fostering an environment where the youth are viewed as active drivers of development rather than passive recipients.

**Expected Impacts**

- Improve the leadership skills through experiential learning by shifting from isolated physical interaction to programmatic skills.
- Investing in youth to make them social innovators, and leaders in the communities.
- Better alignment between the aspirations of the youth and the community needs.
- Enhanced efficiency through Convergence of existing programs.
- Improved two-way communication to connect youth government initiatives and activities of other stakeholder that engage with youth.
- Ensuring accessibility by creating a Phygital Ecosystem - a blend of physical and digital experiences.

**Reports**

**ILO Study on Transformative Childcare Policy**

On 26<sup>th</sup> October, 2023, the International Labour Organization (ILO) released a new study titled- “The benefits of investing in transformative childcare policy packages towards gender equality and social justice”.

- The Study provides insight regarding the transforming childcare policies so that they universally and effectively cover children from birth until the start of mandatory primary education.

**Major Findings**

- Progress in closing legal and implementation gaps in care leave policies and services has not been sufficient as, currently, there exists a global average childcare policy gap of 4.2 years, which acts as a structural barrier in the world of work, especially for women.
- It is estimated that every dollar invested in closing the childcare policy gap could result in an average increase of US\$3.76 in global GDP by 2035.

**MERA YUVA BHARAT**

**Impact :**

- Leadership Development in the Youth
- Better alignment between youth aspirations and community needs
- Enhanced efficiency through convergence of existing programmes
- Act as one stop shop for young people and Ministries
- Create a centralized youth data base
- Ensuring accessibility by creating a physical ecosystem

**CHILDCARE POLICY GAP**

- The childcare policy gap refers to the period between the end of statutory childcare-related leave and the starting age for free, universal early childhood care and education or primary education.
- Currently, this averages approximately 4.2 years globally.
- Maternity, paternity and combined parental leave available to households average 6.1 months globally, while the average starting age for free and universal early childhood care and education is 4.7 years.
- The gap affects 90 per cent of actual and potential parents (nearly 3.5 billion people) worldwide.

- Regional and income group ROI estimates show that closing the childcare policy gap yields benefits for everyone, everywhere.
- The investment benefit is not limited to the potential return on investment but also to the benefits related to gender equality.
- The investment in childcare-related leave and early childhood care and education (ECCE) services could increase women's employment rate from a global average of 46.2 per cent in 2019 to 56.5 per cent in 2035, and reduce the global gender gap in monthly earnings from 20.1 per cent in 2019 to 8.0 per cent in 2035.

### Moving Forward: Policy Response

- **Building fiscal, regulatory and technical capacity** to design, finance and implement inclusive care policies, including maternity, paternity and parental leave and protections; care services; and care-related social protection benefits.
- **Promoting the multiple benefits of investments** in care policies and good-quality care jobs, including a better sharing of care responsibilities between women and men and between families and the public, not-for-profit and private sectors, through national, community and awareness-raising, participatory research and data collection.
- **Designing rights-based programmes**, through social dialogue, that address the care needs of the most disadvantaged workers and the decent work deficits in care employment, particularly among childcare workers, including volunteers and the most precarious care workers, as well as domestic and migrant care workers, and all of the ways these intersect.

## International Migration Outlook 2023

On 23<sup>rd</sup> October, 2023, the Organization for Economic Cooperation and Development (OECD) released International Migration Outlook 2023.

### Major Highlights

- With more than 6 million new permanent immigrants (not including Ukrainian refugees), permanent-type migration to OECD countries reached a record level in 2022. This was driven by increases in humanitarian and managed labour migration, along with accompanying family members.
- As of June 2023, there were around 4.7 million displaced Ukrainians in OECD countries.
- Germany, Poland and the United States host the highest number of refugees from Ukraine in absolute terms, while Estonia, the Czech Republic and Lithuania have received the highest number as a share of the population.
- Family migration remained the primary category of entry for new permanent-type migrants, representing

- 40% of all permanent-type migration, while managed labour migration and free mobility both accounted for 21% each.
- The top origin countries for asylum applicants within the OECD in 2022 were Venezuela (221 000), Cuba (180 000), Afghanistan (170 000) and Nicaragua (165 000).
- In more than half of OECD countries, the employment rate of migrants is at the highest in more than two decades.

### India-Specific Findings

- India saw the highest migration flows to Organisation for Economic Cooperation and Development (OECD) countries in 2021 and 2022.
- In terms of nationalities, 0.13 million Indian citizens acquired the nationality of an OECD country in 2021.
- In terms of workers, migration flows from India (+172 percent), Uzbekistan (+122 percent), and Turkey (+240 percent) rose sharply, making them primary countries of origin after Ukraine.

### Impacts of Migration on Labour Markets and Economic Growth

#### Positive Impacts

- Labor markets benefit from migrants filling niches.
- Young migrants are generally more educated.
- Migrants enhance labor-market flexibility, especially in Europe.
- Migrants contribute more in taxes than they consume in benefits.
- Economic growth factors include boosting working-age population, skills contribution, and technological progress.

#### Negative Impacts


- Racial tension and discrimination.
- Gender imbalance with predominant male migration.
- Increased pressure on natural resources leading to housing and environmental issues. ■■

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# Heritage Art & Culture

## Art & Culture

- Revival of Kashmiri Dogra Architecture
- Someshwara Inscription of Alupa Dynasty

## Art & Culture

### Revival of Kashmiri Dogra Architecture

On 21<sup>st</sup> October, 2023, Srinagar Smart City Limited and the Kashmir chapter of Indian National Trust for Art and Cultural Heritage (INTACH) have joined hands to conserve vernacular elements of Kashmiri architecture, particularly those introduced by Dogra Hindu kings between 1846 and 1947.

#### About Dogra Architecture

- Dogra architecture is a term used to describe the architectural style associated with the buildings and structures constructed during the rule of the Dogra Hindu kings who governed Jammu and Kashmir from 1846 to 1947.
- This unique architectural style is a testament to the historical and cultural blend that characterized the region during this period.

#### Distinctive Features

- **Nanakshahi Bricks:** These bricks are thin, rectangular, and reddish in color. They are named after Guru Nanak, the founder of Sikhism, and were also used by Sikh rulers in Punjab.
- **Wooden Beams (Latain):** Wooden beams, often referred to as “latain,” are used to support the roofs and floors of Dogra buildings.
- **Ballay and Ceilings (Barghay):** Wooden planks known as “ballay” are used to create ceilings, known as “barghay.” These planks may be covered with gypsum plaster or “kallai,” enhancing the visual aspect of the ceilings.
- **Arches (Mehraab):** Dogra architecture incorporates pointed or cusped arches, reflecting the influence of Islamic architecture. These arches are used in doorways, windows, and niches, adding an element of elegance to the buildings.

- Edakkal Caves
- Vajra Mushti Kalaga
- Banni Festival
- Ratna Bhandar of Puri Jagannath Temple
- Talagirishwara Temple

## Personality

- 500<sup>th</sup> Birth Anniversary of Veerangana Rani Durgavati
- Sardar Vallabhbhai Patel

- **Domes (Gumbad):** Buildings in this style are often crowned with domes. These domes are typically hemispherical or onion-shaped and may feature a spire or “shikhara” on top, showcasing the influence of Hindu architecture.
- **Jharokha (Projecting Balconies):** Dogra architecture borrows the feature of “jharokha” from Rajasthani architecture. Jharokhas are projecting balconies that adorn the facades of buildings. They serve multiple purposes, including providing shade, enhancing privacy, and offering scenic views.

#### Examples

- **Mubark Mandi:** A hub of Dogra culture until 1947, with a jharokha style of balcony.
- **Maharaj Gunj:** A market area with a variety of colonial and vernacular architecture.
- **Rani Charak Mahal:** A mahal with phenomenal architecture and interiors.

### Someshwara Inscription of Alupa Dynasty

On 18<sup>th</sup> October, 2023, archaeologists discovered a rare inscription connected to the Alupa dynasty during a recent archaeological exploration at Someshwara near Mangaluru, Karnataka.

#### About the Someshwara Inscription

- The inscription was the first record of the Alupas dynasty that announced the death of King Kulashekara Alupendra I also mentions terms related to the Siri cult, such as Siri, Dalya and Chattara (Chatra).
- The human figures shown in the inscription represent Kulashekara Alupendra himself.
- A Kesava is responsible for the erection of the edifice in honour of Kulashekara Alupendra.
- It has two panels on the top, and in between the two panels the first line is engraved.



- The rest of the inscription written below the panels is in the Kannada script and the language of 12th century characters announces the death of Alupendra I.
- The Keerthi sthamba or pillar found in the inscription is a replica of the original pillar found in the premises of a church in Kulashékara, Karnataka.

### Depiction of Kulashékara Alupendra in the Inscription

- In the first figure, he is standing in Tribhanga (tribent posture) and holds a sword in his right hand while the left hand rests on a gurani (shield).
- To the left of this panel, divided by a pillar, the King is shown in a sitting posture on a mound resting both his palms on the centre of his legs in dhyana mudra.



### Important Facts

#### Kulashékara Alupendra I

- Kulashékara Alupendra I was a famous ruler of the Alupas of South Canara.
- He ruled Tulunadu from 1156-1215 A.D., as per the records found.
- He established a new city called Kulashékara in Mangaluru, Karnataka.
- He laid down strict rules and regulations for temple administration, which are still followed in all temples in this region.
- He was the first ruler to give royal patronage to Tulu language and culture.

### Edakkal Caves

Recently, Kerala Tourism has initiated a Rs. 2.9-crore project aimed at enhancing civic amenities surrounding the renowned Edakkal Caves in Wayanad, celebrated for its prehistoric rock art.

#### About the Caves

- Despite their name, the Edakkal Caves are not actually caves. They are part of a pre historic rock shelter, formed naturally when one huge boulder got wedged between two bigger ones. The name Edakkal itself means “a stone in between”.
- The caves were discovered by Fred Fawcett, the then Superintendent of Police of the Malabar district in 1890, during his hunting trip to Wayanad.

#### Stone Age Carvings

- Edakkal is India’s only site where Stone Age carvings have been found. Carvings from the Neolithic and Mesolithic periods can be found here.

- These caves’ human figurines have raised hair and some wear masks. They are all archaeologically significant and intriguing.
- There are ancient inscriptions as well with some pointing to a Tamil Brahmi script.



- Recently, historians and archaeologist have speculated that there is a link to the Indus Valley civilisation as they have found a carving of “a man with a jar cup”, one of the most distinct motifs of the Indus Valley civilisation (2300 BC to 1700 BC).

#### Paintings

- The Edakkal Caves have three types of petroglyphs, the oldest of which date back 8,000 years.
- The paintings consist of human figures, animals, symbols, and letters.
- The etchings and prehistoric line drawings document the culture and lives of those who lived in the caverns thousands of years ago.
- Some of the Edakkal Caves have petroglyphs; they are not caves, but rather rifts or clefts in the rocks.



### Vajra Mushti Kalaga

Vajra Mushti Kalaga, a form of wrestling popular during the medieval era was held recently to mark the Vijayadashmi celebrations of Wadiyars dynasty in Karnataka.



- This form of wrestling was popular during the Vijayanagar period (14th to 17th centuries), but currently held only at Savari Thotti in Mysuru Palace during Dasara (Vijayadashmi).
- It has been held for more than 400 years without any break since 1610 AD, when Raja Wadiyar started Dasara in Srirangapatna.
- Its first literary mention is from the Manasollasa of Chalukya king Someswara III (1124– 1138), although thought to be as early as the Maurya dynasty.
- Vajra Mushti (knuckleduster) means Thunderbolt Fist, made of animal horns like buffalo, elephant (ivory), and worn on knuckles of the fighter.



- It is a unique martial art, different from conventional grappling, and entails two jettys taking a swipe at each other's head with a knuckleduster (small metal weapon).
- The person who first extracts blood from the opponent's head is declared the winner.
- Medieval Portuguese travelers like Fernao Nuniz (1535-37), have described accounts on this event during the Navaratri celebrations in Vijayanagar Empire.
- As a variant of wrestling, vajra-musti shares its training methodology with malla-yuddha.

Malla-yuddha is the traditional form of combat-wrestling originating in India. It is closely related to Southeast Asian wrestling styles such as naban and is one of the two ancestors of kushti. Indian wrestling is described in the 13th century Malla Purana. Additionally, malla-yuddha is divided into four categories-

1. **Hanumanti** - concentrates on technical superiority.
2. **Jambuvanti** - uses locks and holds to force the opponent into submission.
3. **Jarasandhi** - concentrates on breaking the limbs and joints while fighting.
4. **Bhimaseni** - focuses on sheer strength.

### Banni Festival

On 24<sup>th</sup> October, 2023, three people lost their lives and more than a hundred were injured in the traditional Banni festival at Devaragattu in Kurnool district, Andhra Pradesh.

#### About the Festival

- Banni actually refers to a mock fight for capturing the idols during the Banni festival.
- It is a traditional stick-fight.
- It is celebrated on the night of Dussehra celebration (Vijaya Dasami) every year.
- The objective of this event was to snatch the idols from God's team, leading to a fierce battle known as the Banni Fight.
- This festival was celebrated by people under the Vijayanagara Empire.
- It is celebrated on account of the victory of Lord Mala Malleswara Swamy and Goddess Parvati over demonish Mani and Mallasura, who troubled the people in the Devaragattu region.
- The Supreme Court had put a ban on this festival in 2008, but the ritual has continued to be held over the years.

#### Rituals

- The ritual takes place at midnight when the procession of idols of the ruling deities Malamma (Parvati) and Malleshwara Swamy (Shiva) are brought down the hill temple at Neraneki.
- Devotees carry long sticks or lathis with them for hitting each other with these sticks on the head.
- The basic idea of this fight is to capture the procession idol.

### Important Facts

#### Vijayanagara Empire

- The Vijayanagara Empire was based in the Deccan, in peninsular and southern India, from 1336 onwards.
- It was founded by Harihara, also known as Hakka, and his brother Bukka Raya.
- It is named after its capital city (now ruined) of Vijayanagara, in modern Karnataka.
- It was ruled by four important dynasties and they are: Sangama, Saluva, Tuluva and Aravidu.
- It lasted until 1646, although its power declined after a major military defeat in the Battle of Talikota in 1565 by the combined armies of the Deccan sultanates.

### Ratna Bhandar of Puri Jagannath Temple

Recently, the demand to open the Ratna Bhandar (treasure room) of the Jagannath Temple in Odisha is growing louder again. The treasure room has not been unlocked for three decades.

#### About Ratna Bhandar

- The precious ornaments of sibling deities — Lord Jagannath, Lord Balabhadra and Goddess Subhadra — given by devotees and erstwhile kings over centuries, are stored in the Ratna Bhandar of the 12th century shrine.
- It is located within the temple and has two chambers—Bhitar Bhandar (inner chamber) and Bahara Bhandar (outer chamber).
- The outer chamber is opened regularly to fetch ornaments for the deities during the Suna Besha (golden attire), a key ritual during the annual Rath Yatra, and also during major festivals throughout the year.
- According to official sources, the last inventory of the Ratna Bhandar was made between May 13 and July 23, 1978.
- Though it was opened again on July 14, 1985, the inventory was not updated.

#### Reasons behind the Demand

- Demands to open the Ratna Bhandar gained strength after the Archaeological Survey of India (ASI), the custodian of the 12th-century shrine, gave a requisition for repair/conservation of the chamber.
- There are apprehensions that cracks have emerged in its walls that could endanger the precious ornaments stored there.
- Servitors, devotees, and temple managing committee members have asked for the reopening to ascertain the safety of the structure and its contents, and to make an inventory.

**Important Facts**

**Puri Jagannath Temple**

- It was constructed by a famous king of Ganga Dynasty Ananta Varman Chodaganga Deva dating back to 12th century.
- It is known as the “White Pagoda” and one of the four pilgrimage sites of Char Dham Pilgrimage.
- It is an outstanding example of Kalinga architecture, featuring distinctive curvilinear towers, intricate carvings, and ornate sculptures.



**Talagirishwara Temple**

Recently, the 1,300-year-old Pallava period paintings at Talagirishwara temple at Panamalai in Villupuram district of Tamil Nadu attracted attentions due to their dilapidated state.

**Paintings in the Temple**

- The paintings in this temple bear a close resemblance to the paintings in Ajantha and Chithannavasal.
- The paintings are on the wall of a sub-temple on the northern side of the Talagirishwara (Siva) temple.
- There is a painting of Lord Shiva with eight hands dancing known as Latathilagabhani, being watched by Goddess Parvathi with her crown and well decorated umbrella.
- These paintings were older than Chithannavasal paintings.
- These paintings were created after covering stonewalls with paste made of limestone and sand.

**About the Temple**

- The temple was constructed by Pallava king Narasimhavarman II, popularly known as Rajasimha.
- This Seventh Century structure incorporates a Vimana that resembles that of Kailasanatha temple in Kanchipuram.
- The garbhagriha stocks a Dharalingam, and as in Pallava temples of that period, there is a Somaskanda section on hindmost wall of the shrine.
- It includes Ardhamandapam (partial Mandapam) .The walls of the Ardhamandapam post panels of divinities, including Brahma with Saraswati and Vishnu with Lakshmi on either flank.

- The temple faces east and the garbhagriha is enclosed on all three sides by sub shrines.
- The Vimana is 3 layered and the high tier has also been rebuilt.
- The typical Pallava mark, pillars with crouching lions, is also found.

**Important Facts**

**Pallava Dynasty**

- The Pallavas ruled south-eastern India from the 3rd through the 9th centuries CE. Their empire covered what is today the Tamil Nadu state.
- The Pallava Empire was divided into provinces, each of which was governed by a provincial governor or viceroy known as a “Maharaja.”
- The revenue collection system was crucial for the administration. Land revenue, known as “Bali,” was collected from agricultural lands.

**Personality**

**500<sup>th</sup> Birth Anniversary of Veerangana Rani Durgavati**

On 5<sup>th</sup> October, 2023, Prime Minister performed ‘bhoomi poojan’ of ‘Veerangana Rani Durgavati Smarak aur Udayan’ in Jabalpur (Madhya Pradesh) in line with the 500<sup>th</sup> birth centenary celebrations of Rani Durgavati.

**About Rani Durgavati**

- Rani Durgavati, the descendant of the famous Chandela dynasty of Mahoba, and the queen of the Gond kingdom of Garha-Katanga.
- She was born on 5 October 1524 in Kalinjar, one of the most important forts of medieval India, which lies in the Banda district of the state of Uttar Pradesh and was married to Dalpat Shah of Gond Dynasty of Garha-Katanga in 1542.
- She took reins of the Gond Dynasty in 1550 after Dalpatshah’s death as the guardian of her son Veer Narayan.

**Contributions**

- She constructed reservoirs such as Ranital, Cherital and Adhartal and moved the Capital to Chauragarh (from Singaargarh) on the strategic Satpura Hill Range.
- She allowed Acharya Bitthalnath to establish a seat of the Pushtimarg Cult at Garha.

**War with Mughals**

- In 1562, Akbar conquered Malwa and made it a Mughal dominion. Consequently, the state boundary of the Rani touched the Mughal Empire.

- Rani's contemporary was a Mughal General, Khwaja Abdul Majid Asaf Khan. The prosperity of Rani Durgavati's state lured him, and he invaded Rani's state after taking permission from the Mughal emperor Akbar.
- While fighting them in battle, she is believed to have stabbed herself with her dagger to not surrender to the Mughal forces.
- The Mughal encounter with the Rani was documented by Abul Fazl, Akbar's chronicler and other Persian writers.

**Recognitions and Honours**

- In 1983, the Government of Madhya Pradesh renamed the University of Jabalpur as Rani Durgavati Vishwavidyalaya in her memory.
- The government of India issued a postal stamp commemorating her death on 24 June 1988.
- The train between Jabalpur Junction and Jammutawi is known as Durgavati Express after the name of the Queen.
- Indian Coast Guard in 2018 commissioned ICGS Rani Durgavati, the third Inshore Patrol Vessel (IPV) of its kind.



**Important Facts**

**Chandela**

- The Chandela or Chandel was Indian Rajput clan of Central India. They were popularly termed as Chandelas or Jejakabhukti dynasty in Indian history.
- A section of the Chandelas which was also known as Chandela dynasty ruled much of the Bundelkhand region of Central India for long periods approximately 500 years between the 9th and the 13th centuries AD.
- The Chandel dynasty is famous in Indian history for Maharaja Rao Vidyadhara, who repulsed the attacks of Mahmud of Ghazni.

**Sardar Vallabhbhai Patel**

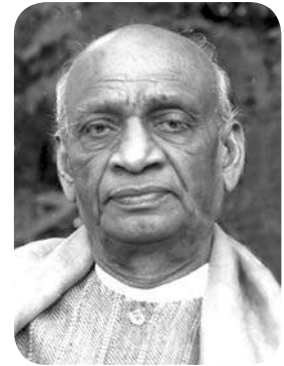
On 31<sup>st</sup> October, 2023, the Prime Minister paid tributes to Sardar Patel on his Jayanti. The Rashtriya Ekta Diwas or National Unity Day is celebrated every year on 31st October to commemorate Sardar Patel's birth anniversary.

**Contributions of Sardar Patel**

**In India's Freedom Struggle**

- **Kheda Satyagraha (1917):** Patel supported and assisted Mahatma Gandhi in organising and leading the Satyagraha. He provided strong leadership and direction

to the local community, encouraging them to join the protest against the British-imposed unjustified tax on land revenue.



- **Non-Cooperation Movement (1920-22):** He recruited approximately 300,000 members and raised 1.5 million rupees for the Non-cooperation Movement. He advocated the boycott of British goods and use of Khadi as a symbol of economic and cultural self-sufficiency.
- **Bardoli Satyagraha (1928):** Sardar Patel stood in solidarity with the people of Bardoli who were suffering from the devastating effects of famine along with the burden of increased land taxes imposed by the British.
- The dual crisis of food scarcity and higher taxes had caused immense hardships to the local population. The central strategy of Bardoli Satyagraha was complete denial of tax payments to the British.
- **Civil Disobedience Movement (1930-34):** During the course of the movement, he promoted boycotts of British goods, refusal to pay taxes, and nonviolent protests and strikes.
- He aligned himself with Gandhi in advocating for individual disobedience, and as a result, he was arrested and sentenced to prison for around 9 months.
- **Quit India Movement (1942):** He organised protests and strikes against British rule, and delivered compelling and electrifying speeches throughout India, inspiring and mobilising people to join mass protests, engage in acts of civil disobedience, boycott tax payments, and stage civil service shutdowns.
- He implemented strategies to safeguard national leaders from arrest along with spearheading fundraising campaigns to support the movement.

**In Unification of India**

- **Political Integration of India:** He played a pivotal role during the political integration of India and the Indo-Pakistani War of 1947.
- **Integration of Princely States:** He was instrumental in persuading almost every princely state to accede to India. His commitment to national integration in the newly independent country earned him the sobriquet 'Iron Man of India'.

**Administrative Reforms**

- He is remembered as the 'patron saint of India's civil servants' for playing a pioneering role in establishing the modern All India Services system. ■■

# ECONOMY WATCH

## Banking & Finance

- RBI Issues Norms to Regulate Cross-Border Payment Aggregators
- Withholding Tax
- RBI Issue Norms for Closure of DCCBs
- Government Allows Direct Overseas Listing of Indian Companies

## Banking & Finance

### RBI Issues Norms to Regulate Cross-Border Payment Aggregators

On 31<sup>st</sup> October, 2023, the Reserve Bank of India (RBI) issued a circular that lays out new rules for entities that facilitate cross-border payments for import and export of goods and services.

#### Regulations Issued by RBI

- All entities processing cross-border transactions will come under RBI's ambit and will be clubbed under 'Payment Aggregator-Cross Border' (PA-CB) class.
- Authorisation can be sought under any of the three categories – only payment aggregator-cross border, import only PA-CB, export and import PA-CB.
- Authorised Dealer (AD) Category-I banks do not require separate approval for PA-CB activity.
- Further, the central bank has prescribed networth criteria for non-banks providing PA-CB services. Non-banks providing PA-CB services as on the circular date (October 31) must apply to the RBI for authorisation by April 30, 2024; they will be allowed to continue such services until the RBI decides on their application.
- Non-banks providing PA-CB services as on the date of circular should have a minimum networth of Rs. 15 crore at the time of application for authorisation and a minimum networth of Rs. 25 crore by March 31, 2026.
- If the per unit goods/ services imported exceeds Rs. 2.5 lakh, then the PA-CB concerned must undertake due diligence of the buyer also.

#### About Payment Aggregator-Cross Border (PA-CB)

- PAs-CB facilitates cross-border online payments for the import and export of permissible goods and services.

- Section 54EC Bonds
- Double Taxation Avoidance Agreement

#### Plans/Policies

- Energy Efficiency Programmes Launched by Ministry of Power
- RBI includes PM Vishwakarma under PIDF Scheme
- Amendment to Aircraft Rules, 1937
- Toll Operate Transfer (TOT) Model

#### Infrastructure

- Jamrani Dam Multipurpose Project
- Standards & Labelling Programme for Solar PV Modules
- Indian Oil launches Reference Fuels

- The RBI has set a minimum net worth requirement of Rs. 15 crore for these entities, which will be categorised as PA-CB.
- They will be accountable for ensuring that they do not facilitate payment transactions for the import of any restricted or prohibited goods and services.
- If the amount involved exceeds Rs. 2.5 lakh, the PA-CB must carry out due diligence on the buyer as well.

#### Important Facts

##### Payment Aggregator (PA)

- Also known as a merchant aggregator, it is a third-party service provider that allows merchants to accept payments from customers by integrating it into their websites or apps.
- It facilitates different types of payment transactions, including cash and cheques, online payments through multiple payment sources, or offline touchpoints.
- It allows merchants to accept bank transfers without setting up a bank-based merchant account. It means a merchant need not have a merchant account directly with the bank.
- A PA in India is incorporated under the Companies Act 2013.
- A PA can be a bank or a non-bank entity.
- Since a PA handles funds, it requires a license from the RBI.
- Examples: Amazon (Pay) India, Razorpay, etc.

#### Withholding Tax

Recently, the Supreme Court (SC) held that without an express notification, the companies cannot, automatically, claim lower withholding tax of 5%, even if provided for in the Direct Tax Avoidance Agreement (DTAA).



- The SC was hearing a case concerning the withholding tax rate on payments of companies whose parent companies were located in the Netherlands, Switzerland, or France.
- The companies argued that the double taxation avoidance agreements (DTAAs) between India and these countries had a Most Favoured Nation (MFN) clause.
- The SC ruled that a 10% withholding tax rate and the benefits under the MFN clause would only be available if the government issued a specific notification.

### **About Withholding Tax**

- Also known as retention tax, withholding tax is withheld or deducted from certain types of income, such as wages, dividends, interest, and royalties, when they are paid to the recipient (non-resident individual).
- The purpose of withholding tax in India is to ensure that the government receives a portion of the income tax owed by the recipient.
- It is applicable in the case of payments made to non-resident individuals.
- If the income is paid in India, the person responsible for payments to Non Resident Indian (NRI) must deduct the withholding tax at the time of payment or when the amount is credited to the NRI's account, according to Section 195 of the Income Tax Act, 1961.
- The amount of withholding tax in India depends on the type of income, the amount of income earned, and the tax laws of the country where the income is earned.
- The tax rate is decided as prescribed in the Income Tax Act, 1961, or Double Taxation Avoidance Agreement (DTAA), whichever is lower.

### **Determining Tax Liability for Withholding Tax**

- To calculate tax liability, it is important to know the residential status of any person: "Resident Indian" and "Non-Resident Indian".
- An individual is considered to be a resident in India for tax purposes if he or she satisfies any of the following conditions:
- Stays in India for 182 days or more during the financial year, or
- Stays in India for 60 days or more during the financial year and for 365 days or more during the 4 years immediately preceding the financial year.
- If an individual does not meet either of these conditions, he or she will be considered a non-resident for tax purposes.

### **RBI Issue Norms for Closure of DCCBs**

On 30th October, 2023, the Reserve bank of India (RBI) announced a significant change in its regulations, allowing the District Central Co-operative Banks (DCCBs) to close their un-remunerative branches without prior permission of the central bank.

### **New Norms for DCCBs**

- DCCBs are allowed to close their un-remunerative branches without prior permission of the central bank, though a nod will be needed from the Registrar of Co-operative Societies of the respective state.
- The decision to close down branches should be taken by the Board after taking into account all the relevant factors and should be properly recorded/minuted in the proceedings of the Board meeting.
- The bank should give two months' notice in advance to all existing depositors/ clients of the branch through press release in local leading newspapers as well as communicate to each constituent of the branch, well in advance of the closure of the branch.
- Also, the District Central Co-operative Bank (DCCB) should return the original licence/s issued for the closed branch to the Regional Office concerned of the Reserve Bank.
- However, DCCBs will not be allowed to close branches if restrictions have been imposed on the bank by the RBI.

### **About DCCBs**

- A DCCB is a rural cooperative bank operating at the district level in various parts of India.
- It is established to provide banking to the rural hinterland for the agricultural sector, with the branches primarily established in rural and semi-urban areas.
- DCCB provides finance to all the co-operative societies in the district, conducts activities, and provides banking services according to the provisions of the co-operative act and banking act.
- They act as a link between the primary credit co-operative society and the State Co-operative Bank.
- At the district level, DCCB works as a banker of state government. Educational institutions, Zilla Parishad, Panchayat Samiti, Gram Panchayat, cooperative societies, etc. have accounts in this bank.
- All the financial transactions of co-operative sector are conducted through DCCB.

### **Sources of Funding**

DCCBs have three sources of funds:

1. Their own share capital and reserves,
2. Deposits from the public,
3. Loans from the state co-operative banks.

### **Main functions of DCCBs**

- To meet the credit requirement of member-societies,
- To perform banking business,
- To act as a balancing centre for the Primary Agricultural Credit Societies (PACS) by diverting the surplus funds of some societies to those which face shortages of funds,
- To undertake non-credit activities,
- To maintain close and continuous contact with PACS and provide leadership and guidance to them,
- To supervise and inspect the PACS,
- They also lend directly to the public for non-agricultural purposes within the area of operation of their branches.

## Government Allows Direct Overseas Listing of Indian Companies

On 30<sup>th</sup> October, 2023, in a step towards allowing Indian companies to list on foreign stock exchanges, the ministry of corporate affairs (MCA) brought into force a provision to allow certain public companies to issue a class of securities for listing on foreign bourses.

- The provision, which comes into effect from October 30, was introduced in the Companies Amendment Act 2020.
- This action comes after the statement by the Finance Minister in September, 2023, allowing Indian companies to engage in a direct “foreign listing” in International Financial Services Centres, specifically in GIFT City(Gujarat).

### New Provisions

- Section 5, which has been implemented, makes changes to Section 23 of the Companies Act, 2013.
- It adds new sub-sections to Section 23.
- It states that certain types of public companies are allowed to issue certain types of shares or bonds. They can do this so that their shares or bonds can be listed on stock exchanges in other countries that are allowed by the law.
- The central government will have the power to remove certain rules for specific types of public companies. This should also help the government’s plan to reverse-flip holding structures of Indian companies as well.

### Benefits for Indian Companies

- With direct listing, domestic companies can tap foreign markets to raise funds.
- A direct listing abroad would help Indian companies attract a large and diverse pool of capital.
- It will also help improve corporate governance as well as the benefits of dollar-denominated trades which enable investors to save hedging and currency conversion costs.

### Important Facts

#### Process Involved in Listing on Foreign Exchanges

- Currently, domestic listed companies depository receipts uses American Depository Receipts (ADR) or Global Depository Receipts (GDR) to list in the overseas market.
- A depository receipt (DR) is a negotiable certificate issued by a bank.
- It represents shares in a foreign company traded on a local stock exchange and gives investors the opportunity to hold shares in the equity of foreign countries.
- It gives them an alternative to trading on an international market.
- Between 2008 and 2018, 109 companies raised more than Rs. 51,000 crore through the ADRs/GDRs route. After 2018, none of the companies got listed overseas.

## Section 54EC Bonds

Recently, REC Limited, the Maharatna Central Public Sector Enterprise launched a mobile application, exclusively for current and future investors in REC’s Section 54EC bonds.

- Named ‘SUGAM REC’, the mobile app will offer investors with complete details of their investment in REC 54EC Bonds.

### About Section 54EC Bonds

- Section 54EC Bonds, also known as capital gain bonds are a type of fixed income financial instruments which provide tax exemption under capital gains to investors, under Section 54EC of the Income Tax Act, 1961.
- These bonds provide an opportunity for individuals to save on long-term capital gains taxes incurred from the sale of property or assets.
- Section 54EC of Income Tax Act allows for tax deductions of capital gains after the transfer of original or long-term capital assets.

### Key Features

- **Eligibility:** The exemption under Section 54EC can be claimed by any taxpayer, including individuals, Hindu Undivided Families (HUFs), companies, LLPs, firms, and others.
- **Rating:** A 54EC mortgage, rated AAA, is considered a safe investment, meaning high creditworthiness.
- **Interest:** Interest earned on 54EC bonds is taxable. But one advantage is that no Tax Deducted at Source (TDS) is applied to the interest. In addition, investors are exempt from wealth taxes, reducing their overall tax liability.
- **Tenure:** The investment has to be made within six months of capital gain. 54EC bonds have a lock-in period of five years (enabled in April 2018).
- **Investment:** The minimum investment in 54EC bonds is one bond for Rs. 10,000. Meanwhile, investors can invest around 500 shares, which has a total value of Rs. 50 lakhs in one financial year.

### Bonds Eligible for Exemption under Section 54EC of the Income Tax Act

- Rural Electrification Corporation Limited or REC bonds,
- National Highway Authority of India or NHAI bonds,
- Power Finance Corporation Limited or PFC bonds,
- Indian Railway Finance Corporation Limited or IRFC bonds.

## Double Taxation Avoidance Agreement

On 19<sup>th</sup> October, 2023, the Supreme Court held that a Double Taxation Avoidance Agreement (DTAA) cannot be given effect unless notified under the Income Tax Act (1961).

A Notification under Section 90 of the Income Tax Act is a necessary and a mandatory condition for a court, authority or a tribunal to give effect to a Double Taxation Avoidance Agreement or any protocol changing its terms and conditions which has the effect of altering the existing provisions of law.

**About DTAA**

- It is a treaty signed between two or more countries and is applicable in cases where a taxpayer residing in one country has to earn his/her income from another country.
- It is signed between two countries, which, through the elimination of international double taxation, promote the exchange of goods, services, and investment of capital between the two countries.
- This implies that there are consented tax rates and jurisdiction on specified kinds of incomes arising in one country to a tax resident of another nation.
- India establishes DTAA with other countries through Section 90 of the Income Tax Act, 1961.

**Difference between Section 90 and 90A of Income Tax Act**

- While Section 90 refers to tax relief under DTAA between the Indian government and foreign governments, Section 90A refers to DTAA between an Indian organisation and a foreign organisation.
- On the other hand, both tax credit and exemption are possible under Section 90, but only credit is possible under Section 90A.

**Important Facts****Double Taxation**

- The taxation of corporations and their shareholders is frequently referred to as Double Taxation.
- After the corporation has already paid taxes on its profits or earnings, shareholders of corporations, which include independent investors and corporate executives, pay taxes on dividends they obtain a share of the corporation's earnings.
- **Corporate Double Taxation:** The taxation of corporate profits through both corporate taxation and dividend taxation is known as Corporate Double Taxation (imposed on dividend payouts).
- **International Double Taxation:** It is the practice of taxing foreign income in both the nation from which it is derived and the nation in which the investor resides.

**Plans/Policies****Energy Efficiency Programmes Launched by Ministry of Power**

On 2<sup>nd</sup> November, 2023, Energy Efficiency Services Limited (EESL), a joint venture of Public Sector Undertakings under Ministry of Power, launched its groundbreaking National Efficient Cooking Programme (NECP) and Energy Efficient Fans Programme (EEFP).

**About National Efficient Cooking Programme (NECP)**

- NECP would introduce induction-based cook-stoves across India, offering a cost advantage of 25-30% over traditional cooking methods.

- The objective is to reduce the environmental impact of cooking methods, ensuring cleaner air and improved health for citizens.
- EESL promised energy savings and cost-effective cooking solutions by deploying 20 Lakh Induction cook-stoves in partnership with Modern Energy Cooking Services (MECS).

**About Energy Efficient Fans Programme (EEFP)**

- EEFP focuses on deploying energy-efficient to distribute 10 million energy-efficient BLDC (Brushless Direct Current) fans across India, with the goal of distributing 1 crore ceiling fans.
- BLDC is an energy-efficient technology applied to ceiling fans for best performance and cost-cutting over power consumption by 65%.
- The objective is to reduce electricity consumption and promote the use of energy-saving appliances.
- It would reduce energy usage, environmental impact and enhance consumer comfort while lowering electricity bills.
- The program for deploying one crore ceiling fans was initiated during the G20 Energy Transitions Working Group in Goa, 2023.

**Expected Impact**

- With the launch of the NECP and EEFP, EESL is taking a significant step towards revolutionizing cooking practices in India and promoting energy efficiency.
- These programs not only offer cost-effective solutions for households but also contribute to a greener and more sustainable future.

**Important Facts****Energy Efficiency Services Limited (EESL)**

- It was established in 2009 to implement the National Mission for Enhanced Energy Efficiency (NMEEE), one of the eight missions under the National Action Plan on Climate Change (NAPCC).
- EESL's main objective is to create and sustain markets for energy efficiency services and products in India and abroad. It does so by providing end-to-end solutions for energy efficiency projects, such as demand aggregation, project design, financing, procurement, installation, monitoring and verification.
- EESL has successfully implemented several flagship programmes in India, such as;
  - ✓ The Unnat Jyoti by Affordable LEDs for All (UJALA) scheme.
  - ✓ The Street Lighting National Programme (SLNP).
  - ✓ The Smart Meter National Programme (SMNP).

## RBI includes PM Vishwakarma under PIDF Scheme

Recently, Reserve Bank of India (RBI) included PM Vishwakarma under the Payments Infrastructure Development Fund (PIDF) Scheme.

### About PM Vishwakarma Scheme

- It is a Central Sector Scheme launched on 17<sup>th</sup> September, 2023.
- **Time Period:** Five years (FY 2023-24 to FY 2027-28).

### Aim

- This initiative supports small businesses, focusing on traditional artists and craftspeople.
- It also aims at improving the quality as well as the reach of the products and services of artisans and craftsmen.

### Eligibility

- Eighteen traditional crafts will be covered under this-Carpenter, Boat Maker, Armourer, Blacksmith, Hammer, Tool Kit Maker, Locksmith, Goldsmith, Potter, Sculptor, Stone breaker, Cobbler (Shoemaker/ Footwear artisan), Mason (Rajmistri), Basket/Mat/Broom Maker/Coir Weaver, Doll & Toy Maker (Traditional), Barber, Garland maker, Washerman, Tailor; and Fishing Net Maker.

### Loan

Loan will be provided in two phases:

- In First Phase, loan up to Rs. 1,00,000 with Interest rate of 5% will be provided.
- In Second Phase, loan up to Rs. 2,00,000 with Interest rate of 5 % will be provided.

### Skill Upgradation

- Basic Training of 5-7 days and Advanced Training of 15 days or more, with a stipend of Rs. 500 per day.

### Important Facts

#### PIDF Scheme

- Launched in January 2021, PIDF is a fund set up by the RBI, in consultation with major authorised card networks, to facilitate the development of payment acceptance infrastructure in tier-3 to tier-6 cities and the north-eastern states of India.
- Beneficiaries of the PM SVANidhi Scheme in Tier-1 and 2 centres were later included in August 2021.
- It is funded by the RBI and the major authorized card networks in India.
- It is governed through an Advisory Council and managed and administered by the RBI.
- The implementation of targets shall be monitored by the RBI with assistance from card networks, the Indian Banks' Association (IBA) and the Payments Council of India (PCI).

## Amendment to Aircraft Rules, 1937

Recently, the Ministry of Civil Aviation notified the Amendments to the Aircraft Rules, 1937, aiming to promote Safety and Ease of Doing Business in Aviation Regulation.

### Key Amendments

#### Extension of License Validity

- It extended the validity of Airline Transport Pilot License (ATPL) and Commercial Pilot License (CPL) holders' licenses from five years to ten years.
- This change is expected to streamline the licensing process and reduce administrative burdens on pilots and aviation authorities like the Directorate General of Civil Aviation (DGCA).

#### Changes under Rule 66

- It introduces key changes under Rule 66, addressing concerns related to the display of "false lights" in the vicinity of an aerodrome.
- It empowered the government to take action against individuals displaying lights disrupting aircraft operation, and in case of unattended lights, the government can intervene and report the matter to the relevant authorities for legal action under the Indian Penal Code (IPC).

#### Removal of Redundant Rule

- Rule 118, pertaining to the validation of foreign licenses, was removed to align regulations with the evolving needs of the aviation sector.

#### Air Traffic Controller License

- The amendment introduced flexibility in recency and competency requirements for Air Traffic Controller License holders, allowing for simulated exercises, emergencies, and skill assessments.
- This ensures continued competence, particularly during limited movements or watch hours.

### Significance

- The amendments can play a crucial role in enhancing aviation safety, thus ensuring a safer operational environment, reducing potential hazards and disruptions to aircraft operations.
- These amendments will enhance the growth and sustainability of the aviation industry, ensuring it remains at the forefront of global aviation standards.
- These amendments align India's aviation regulations with the International Civil Aviation Organization's (ICAO) Standards and Recommended Practices (SARPs) and international best practices.

### Important Facts

#### International Civil Aviation Organization (ICAO)

- It is a specialized agency of the United Nations that was created in 1944 to promote safe, secure, and efficient air transportation around the world.



- ICAO develops international standards and recommended practices for aviation, including regulations for air navigation, communication, and airport operations.
- It also works to address global aviation issues, such as air traffic management, aviation security, and environmental protection.

### Toll Operate Transfer (TOT) Model

On 29<sup>th</sup> October, 2023, the National Highways Authority of India (NHAI) recently awarded two highway monetisation projects worth Rs 6,584 in the toll, operate, and transfer (TOT) mode.

#### About TOT Mode

- In 2016, the Cabinet Committee on Economic Affairs (CCEA) authorised the National Highway Authority of India (NHAI) to monetise public-funded national highway projects and approved the TOT model.
- In the TOT model, public-funded projects, operational for two years, are put up for bidding, wherein the right of collection and appropriation of fees is assigned for a predetermined concession period (30 years) to concessionaires (developers or investors) against the upfront payment of a lump sum amount to NHAI.
- Such assignment of rights shall be based on the toll revenue potential of the identified NH projects.
- Operation & Maintenance (O&M) obligations of such projects shall be with the concessionaire till the completion of the concession period.
- The concessionaires for such projects shall be appointed through a transparent and uniform procurement process within the ambit of a pre-defined and approved implementation framework.
- It will help in the utilisation of the corpus (generated from proceeds of such project monetisation) by the Government to meet fund requirements for future development and O&M of highways in the country, including in unviable geographies.
- TOT model has been developed to encourage private participation in Highway sector.

## Infrastructure

### Jamrani Dam Multipurpose Project

On 25<sup>th</sup> October, 2023, the Cabinet Committee on Economic Affairs (CCEA) approved the inclusion of Jamrani Dam Multipurpose Project of Uttarakhand under the Pradhan Mantri Krishi Sinchai Yojana-Accelerated Irrigation Benefits Programme (PMKSY-AIBP) of the Department of Water Resources, River Development and Ganga Rejuvenation.

#### About the Project

- It envisages the construction of a dam near Jamrani village across river Gola, a tributary of river Ram Ganga, in Nainital district, Uttarakhand by 2028.
- It would provide irrigation for Nainital and Udham Singh Nagar districts (Uttarakhand), Rampur and Bareilly districts (Uttar Pradesh).
- The dam would feed the existing Gola barrage, through its 40.5 km length of canal system and 244 km long canal system, which was completed in 1981.
- It would involve construction of feeder canals, renovation of existing canals and pucca field channels.
- This will generate 14 MW hydroelectricity and provide drinking water to Haldwani and nearby areas benefitting more than 10.65 lakh population.
- The cost/benefit sharing is based on an MoU that provides irrigation facilities to Uttar Pradesh and drinking water and power benefits entirely to Uttarakhand.

#### Significance

- With the inclusion of the Jamrani Dam Multipurpose Project in the PMKSY-AIBP framework, it becomes the seventh project to be incorporated since the inception of PMKSY 2.0 in 2021-22.
- This aligns with the government's vision for holistic agricultural development and water resource management.

#### Important Facts

#### Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

- It was launched during the year 2015-16, with an aim to enhance physical access of water on farm and expand

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cultivable area under assured irrigation, improve on-farm water use efficiency, introduce sustainable water conservation practices, etc.

- Government has approved implementation of PMKSY during 2021-26 with an overall outlay of Rs.93,068.56 crore.
- Accelerated Irrigation Benefits Programme (AIBP) component of PMKSY is for creation of irrigation potential through major and medium irrigation projects.

## Standards & Labelling Programme for Solar PV Modules

On 20<sup>th</sup> October, 2023, the Union government launched the Standards & Labelling Programme for solar PV modules.

### About the Programme

- **Aim:** Launched by the Bureau of Energy Efficiency (BEE), it aims to provide consumers an informed choice about the energy and cost-saving potential of the star labelled appliances/equipment being sold in the Indian market.
- **Rating:** It involves laying down energy performance norms for appliances/equipment by rating its energy performance on a scale of 1 to 5 with 5 star labelled appliances being the most energy efficient one.
- **Appliances Covered:** The program presently covers 34 appliances. 15 appliances are under the mandatory regime which means these appliances cannot be sold in the market without the label and 19 appliances are in voluntary regime where the market is in development stage.
- **Product Differentiation:** It seeks to bring product differentiation to a market where solar products are currently commoditized.

### Expected Impact

- The programme, based on effective efficiency, is expected that the Solar PV module efficiency will enhance by 2% over its existing levels. Owing to performance improvement, the electricity generation is expected to increase by 33GWh/year and this will offset ~27,000 tons of CO<sub>2</sub> emission per annum.
- The programme aligns with the government's broader commitment to enhancing the share of renewable energy and reducing the emission intensity of GDP by 45% by 2030.

### Important Facts

#### Standards & Labelling Programme

- Launched in 2006, the energy efficiency labeling programs under Bureau of Energy Efficiency (BEE) intends to reduce the energy consumption of appliance without diminishing the services it provides to consumers.
- The scheme is invoked for 34 equipment/appliances including 14 for which it is mandatory.
- This program is expected to save approximately 11.2 billion units of electricity by 2030 and will enable the reduction of CO<sub>2</sub> emission close to 9 million tonne by

2030 and shall support India to transition towards low carbon sustainable growth and achieve its ambition of net zero by 2070.

## Indian Oil launches Reference Fuels

Recently, the Union Minister of Petroleum & Natural Gas launched the 'Reference Gasoline and Diesel Fuels' produced by Indian Oil for the first time in India.

### About Reference Fuels

- Reference fuels (Gasoline and Diesel) are premium, high-value products used for calibration and testing of vehicles by auto OEMs and organisations involved in testing and certification in the automotive field.
- Indian Oil has successfully commenced the production of Reference Gasoline and Diesel Fuels for the first time in India.
- These fuels are used for calibration and testing of vehicles by automobile manufacturers and testing agencies like ICAT (International Centre for Automotive Technology) and ARAI (Automotive Research Association of India).
- These indigenously developed products will lead to import substitution at better price and a shorter lead time for the vehicle manufacturers.
- Reference Gasoline fuels will be available in E0, E5, E10, E20, E85, and E100 from Flagship Paradip Refinery.
- Reference diesel fuel shall be available in B7 grade from Panipat Refinery.
- The demand for Reference Fuels in India is currently met by imports from other countries.
- Indian Oil Corporation Limited has established facilities for the production of Reference Gasoline Fuels (E-5, E-10 and E-20) at its Paradip Refinery and Reference Diesel Fuel (B-7) at its Panipat refinery.

### Need for Reference Fuels

- Reference fuels are required by automobile manufacturers for developing engines and assessing vehicles' performance to ensure operability in all global climatic conditions.
- Currently, these reference fuels are being imported by India from select companies in Europe and the US.

### Important Facts

#### Octane Ratings

- Octane ratings are the measure of fuel stability. It is the ability of the fuel to avoid knock. Knock occurs when the fuel is prematurely ignited in the engine cylinder.
- This degrades the efficiency of the engine and damages the engine. Higher the Octane number higher is the resistance of the fuel to knock.
- In other words higher the Octane number, the fuel can withstand more compression before detonating. ■■



# SCIENCE & TECHNOLOGY

## Space Science

- NASA Launches Psyche Mission
- ISRO Successfully Launches Test Vehicle for Crew Safety in Gaganyaan Mission
- Moon Found to be 40 Million Years Older than Previously Believed

## Space Science

### NASA Launches Psyche Mission

On 13<sup>th</sup> October, 2023, National Aeronautics and Space Administration (NASA) launched its Psyche Mission, embarking on a six-year, 3.6 billion-kilometre voyage to an asteroid of the same name, a metal-rich world that could tell us more about the formation of rocky planets.

#### Key Points

- **Psyche's Peculiar Beginnings:** Psyche, named after the Greek goddess of the soul, is a celestial object that has intrigued astronomers since its discovery in 1852.
- It is the 16th asteroid ever found, residing in the asteroid belt between Mars and Jupiter, known for its diverse range of space rocks.
- **Psyche's Unique Composition:** Psyche stands out due to its vast size, with an average diameter of approximately 226km.
- This potato-shaped planetoid is predominantly composed of iron and nickel, akin to Earth's core.
- **NASA's Ambitious Journey:** This extraordinary expedition will span six years, covering a colossal distance of 3.6 billion kilometers.
- The mission is designed to collect vital clues for understanding Earth's inaccessible core.
- **Mission Objectives:** The mission aims to confirm whether Psyche represents the core of a former planet, which initially was molten but cooled and solidified over time.
- Alternatively, it may be composed of materials that never underwent melting.

#### Unlocking Earth's Enigmatic Core

- The mission's primary significance lies in its potential to indirectly explore Earth's core through the study of Psyche, an asteroid with attributes resembling our planet's core.

- JWST Discovers High-Speed Jet Stream on Jupiter
- Discovery of Bright Gamma-Ray Burst Resulting from Neutron Star Merger

## Defence Technology

- Yard 12706 (IMPHAL): India's First Warship with Dedicated Accommodation for Women

## New Technology & Innovations

- Niobobaotite Ore Discovered in Inner Mongolia
- BIS Approves Indigenous AC/DC Charging Standard for Light Electric Vehicles
- China Constructing Underwater Telescope to Detect Ghost Particles

## Biotechnology

- Study Reveals How Cell Microenvironment Stiffness Affects Tissue Form

- It provides an opportunity to investigate core-like materials without the need to penetrate Earth's rocky exterior.

## M-type Asteroids as Natural Laboratories

- M-type asteroids like Psyche are considered remnants of early planetary formations, making them ideal "natural laboratories" for studying planetary cores.
- These investigations have the potential to alter our understanding of how terrestrial planets form and evolve.

## Challenges in Studying Earth's Core

- The Psyche mission addresses the limitations of traditional methods for studying Earth's core, including limited access to core materials and seismic data.
- The parallels between Psyche and Earth's core offer a unique perspective on a complex subject.

### ISRO Successfully Launches Test Vehicle for Crew Safety in Gaganyaan Mission

On 21<sup>st</sup> October, 2023, Indian Space Research Organisation (ISRO) scientists overcame a two-hour delay and initial engine ignition issues to successfully launch a test vehicle related to crew safety for the Gaganyaan Mission.

- ISRO launched the rocket carrying payloads crucial for ensuring crew safety in India's Gaganyaan mission from Sriharikota, Andhra Pradesh.
- An onboard computer identified an anomaly, leading to the **automatic launch sequence** being held.
- ISRO ensured that the launch vehicle was safe and promised to analyze and understand the anomaly.
- The payloads splashed into the sea as planned, marking a successful mission.
- ISRO Chairman explained that the mission aimed to demonstrate the Crew Escape System and performed flawlessly, taking the crew module to safety.
- Prime Minister praised the launch, stating it brings India a step closer to realizing the Gaganyaan Mission and its first human space flight program.

The mission demonstrated the effectiveness of the Crew Escape System, a critical component of ensuring astronaut safety during space missions.

## Moon Found to be 40 Million Years Older than Previously Believed

A recent reevaluation of Apollo 17 mission's lunar samples suggests that the Moon's age surpasses previous estimates by 40 million years, with important implications for understanding its formation.

### Key Points

- **The Moon's Formation:** The Moon came into existence over 4 billion years ago during the early stages of our solar system's development when a Mars-sized object collided with Earth. However, the precise timing of this event has been a topic of debate in the scientific community.
- **New Study:** Researchers conducted a study, recently published in *Geochemical Perspectives Letters*, that utilized crystals retrieved from the Moon by the Apollo 17 astronauts in 1972. This research aimed to enhance our understanding of the Moon's age.
- **Revised Age:** The study findings suggest that the Moon is 40 million years older than previously assumed, with an estimated age of at least 4.46 billion years, as reported by the University of Chicago.
- **Crystals as Timekeepers:** The lunar samples contain minuscule crystals that formed billions of years ago, offering clues about the Moon's origin.
- These crystals could only have formed after the Moon's surface cooled from the lunar magma ocean, providing a minimum age for the Moon.
- **Analytical Technique:** Researchers employed atom probe tomography to determine the age of these crystals, a method that unveiled new insights into the Moon's formation history.

## JWST Discovers High-Speed Jet Stream on Jupiter

Recently, the James Webb Space Telescope (JWST) has uncovered a new element on Jupiter – a high-speed jet stream racing along its equator. Jupiter, the largest planet in the solar system, has a turbulent atmosphere with features like the Great Red Spot.

- The high-speed jet stream is **situated approximately 40 kilometres above the cloud tops** in Jupiter's lower stratosphere.
- Its wind speeds exceed even the most powerful tropical cyclone, Hurricane Patricia, which had a maximum wind speed of 345 kilometres per hour.
- Webb's observations provided a level of **detail and clarity** in Jupiter's atmosphere that was previously unattainable.

- Blurry features in Jupiter's atmosphere are now seen as distinct elements that can be tracked alongside the planet's rapid rotation.
- While other telescopes and spacecraft, such as **NASA's Juno and Cassini**, have examined Jupiter's changing weather patterns, Webb has brought new insights regarding Jupiter's rings, satellites, and atmosphere.

The discovery of the high-speed jet stream on Jupiter has unveiled a new level of detail about the planet's atmosphere and provided valuable insights into the complex interactions within Jupiter's weather systems.

## Discovery of Bright Gamma-Ray Burst Resulting from Neutron Star Merger

Recently, an international team of scientists made a groundbreaking observation of a remarkably bright gamma-ray burst, GRB 230307A, using a combination of space and ground-based telescopes.

- This gamma-ray burst was determined to be the **outcome of a rare cosmic event** – the **merger of two neutron stars**, resulting in a powerful explosion capable of generating heavy elements.
- The team, including researchers from NASA, utilized a **trio of telescopes**: the James Webb Space Telescope, the Fermi Gamma-ray Space Telescope, and the Neil Gehrels Swift Observatory to study the burst.
- Following the explosion, the scientists detected tellurium, a chemical element even rarer than platinum on Earth.
- This discovery raises the possibility that other elements adjacent to **tellurium** on the periodic table, such as iodine, an essential mineral nutrient for life, may also be present in the material ejected from the kilonova.
- **Kilonovae - massive explosions** resulting from the collision of two neutron stars or a neutron star and a black hole - are incredibly energetic events, releasing as much energy in seconds as the Sun does in its entire 10-billion-year lifespan.
- **GRB 230307A** stands out as the second brightest gamma-ray burst observed in over 50 years of observations.
- It was about **1,000 times brighter** than the typical gamma-ray bursts observed by Fermi and lasted for 200 seconds, classifying it as a long-duration gamma-ray burst, despite its distinct origin.
- The collaboration of multiple ground and space telescopes allowed scientists to gather a wealth of information about this event immediately upon its detection, illustrating the synergy of satellite and telescope observations in capturing real-time changes in the universe.

These findings represent a significant advancement in understanding the origins of heavy elements in the universe and highlight the potential for further kilonova discoveries.



## Defence Technology

### Yard 12706 (IMPHAL): India's First Warship with Dedicated Accommodation for Women

- On 20<sup>th</sup> October, 2023, the Indian Navy marked a historic milestone by receiving its latest stealth destroyer, IMPHAL, featuring a groundbreaking feature – separate berthing facilities for women sailors.

#### Key Points

- This development comes after the navy began recruiting women as sailors under the **Agnipath recruitment** scheme.
- IMPHAL, constructed by Mazagon Dock Shipbuilders Limited (MDL) in Mumbai, is the third of four warships sanctioned **under Project P-15B**, focusing on enhancing the navy's capabilities in the Indian Ocean region.
- It belongs to the Visakhapatnam-class destroyers.
- The warship boasts advanced technology, state-of-the-art weaponry, and a crew of 312 members.
- Separate berthing facilities for women sailors** have become essential with the entry of women into the navy's personnel below officer rank (PBOR) cadre, which began in March 2023.

The Visakhapatnam-class destroyers, also referred to as the P-15 Bravo-class destroyers or simply P-15B, represent a line of guided-missile warships presently in the construction phase for the Indian Navy. This P-15 class constitutes an upgraded iteration of the preceding Kolkata-class, featuring improved stealth, mechanization, and armament capabilities.

## New Technology & Innovations

### Niobobaotite Ore Discovered in Inner Mongolia

On 3<sup>rd</sup> October, 2023, in Inner Mongolia's Bayan Obo deposit, Chinese geologists unearthed **niobobaotite**, a new-found ore containing niobium, a prized metal celebrated for its superconductive attributes, heralding significant potential for battery technology.

#### Key Points

- Discovery of Niobobaotite:** Chinese geologists uncovered niobobaotite, the 17th new mineral found in this deposit and one of 150 new minerals unearthed in the region.
- Niobium:** It is a light-gray metal, predominantly used in the **steel industry** to enhance steel's strength without adding excessive weight.

- Applications:** It is instrumental in manufacturing construction materials, oil and gas pipelines, propeller blades, and jet engines.
- Furthermore, niobium exhibits **superconductivity at low temperatures**, making it invaluable in creating superconducting magnets for applications like particle accelerators, MRI scanners, and NMR equipment.
- Niobium oxide compounds are employed to improve the refractive index in glass, facilitating the production of thinner lenses in corrective eyewear.

#### Reducing Import Dependency

- The discovery of niobobaotite holds the potential to reduce China's reliance on niobium imports, which currently stands at 95%.
- Brazil is the world's primary supplier, accounting for around 89% of niobium production, with Canada contributing approximately 8%.
- China's self-sufficiency in niobium production depends on the ore's volume and quality.

#### Future Battery Advancements

- Niobium's significance may rise with the development of niobium-lithium and niobium-graphene batteries.
- These advanced batteries promise enhanced safety, faster charging times, and longer lifespans compared to conventional lithium-ion batteries.
- Niobium-graphene batteries, for instance, could last up to 30 years and charge fully in under 10 minutes.

### BIS Approves Indigenous AC/DC Charging Standard for Light Electric Vehicles

Recently, the Bureau of Indian Standards (BIS) has given its approval for a new, locally developed AC and DC combined charging standard for light electric vehicles (LEVs), marking a significant step in the standardization of EV charging in India.

#### Key Points

- Unique AC/DC Charging Standard:** The newly approved standard, known as ISI7017 (Part 2 / Sec 7): 2023, is the world's first to combine both alternating current (AC) and direct current (DC) for light electric vehicles.
- This unified charging standard offers interoperability for various EV models and charging infrastructure providers.
- Collaborative Development:** The standard emerged through a collaborative effort involving key stakeholders, including NITI Aayog, the Department of Science and Technology, Ather Energy (an electric two-wheeler manufacturer), and various government and industry contributors.

- **Diverse Charging Standards in India:** Until now, Indian EV manufacturers have followed different charging standards for their electric two-wheelers, leading to a lack of uniformity.
- For instance, Ola Electric, Ather Energy, and Ultraviolette Automotive have employed varying standards for their EVs, akin to the earlier scenario of different mobile phone chargers.
- **Range Anxiety:** The multitude of charging standards complicates the establishment of public charging stations, contributing to range anxiety among EV users.
- The new unified standard addresses this issue by consolidating both AC and DC charging.
- **Not Mandatory for EV Makers:** While the approved standard creates a unified AC/DC standard for EVs, it does not mandate EV manufacturers to adhere to a single standard, potentially hindering the rapid adoption of EVs.

### International Comparisons

- Various countries have approached EV charging standards differently. China utilizes the GB/T national standard, complemented by an extensive charging network, effectively alleviating range anxiety.
- In the United States, there is no national standard, but automakers are working to establish some degree of standardization.
- Europe has the CCS standard as the primary charging connector, which is also an EU requirement.

### Indian Context

- The approval of an indigenous AC/DC charging standard for light electric vehicles is a promising development for India's EV ecosystem.
- However, the lack of a mandate for uniformity among EV makers may still pose challenges to the widespread adoption of electric vehicles in the country.

### Importance of Standardization

- Standardization is crucial for ensuring seamless EV charging infrastructure and user convenience.
- By encouraging a common charging standard, India can facilitate the growth of its electric vehicle market and enhance the user experience.

While the new standard marks a step in the right direction, the potential for broader standardization and government incentives to encourage adherence among EV manufacturers could further boost the EV sector in India.

## China Constructing Underwater Telescope to Detect Ghost Particles

China is in the process of building an enormous telescope in the western Pacific Ocean, designed to detect elusive particles known as neutrinos, also known as 'ghost particles'.

### Key Points

- Neutrinos are elusive, tiny, and nearly massless subatomic particles that have negligible charge, making them challenging to detect.
- These particles **rarely interact with other matter**, but they can create observable by-products when they interact with water or ice, such as the production of "muons" that generate flashes of light.
- China's new telescope, called "**Trident**," is designed to be located in **the South China Sea**, spanning an impressive 7.5 cubic kilometres, which is significantly larger than existing underwater neutrino telescopes.
- Trident is expected to be 10,000 times more sensitive than current underwater telescopes, making it a groundbreaking tool for neutrino research.

### Unravelling the Neutrino Mystery

- Neutrinos have long fascinated scientists due to their unusual properties, including their mysterious behaviour that defies established physical laws.
- Researchers are eager to answer fundamental questions about neutrinos, such as their mass, origin, and role in the universe.
- The construction of Trident aligns with the scientific community's quest to unravel the neutrino mystery.

### Cosmic Implications

- Neutrinos are believed to play a crucial role in understanding cosmic phenomena, including the origins of cosmic rays.
- These high-energy particles have baffled scientists for generations, and their connection to neutrinos represents a promising avenue of research.
- By shedding light on the sources and behaviours of neutrinos, Trident's findings may provide crucial insights into the enigmatic world of cosmic rays.

## Biotechnology

### Study Reveals How Cell Microenvironment Stiffness Affects Tissue Form

Recently, an interdisciplinary research team from the Indian Institute of Science (IISc) has revealed the impact of a cell's microenvironment stiffness on its structure and function, offering insights into tissue healing and scar formation.

- Inefficient wound healing can lead to **tissue fibrosis and scar formation**, with implications for conditions like cardiac arrest and diseases such as cancer.
- Changes in stiffness influenced cell structure and function, with fibroblasts on less stiff substrates showing rounder shapes, **altered cytoskeleton protein levels**, cell cycle arrest, reduced growth rates, and cell death.

- The research focused on **Transforming Growth Factor-β (TGF-β)** as the master regulator driving cell changes in response to substrate stiffness.

The research sheds light on the mechanical factors, particularly substrate stiffness, that influence cell behaviour, offering valuable insights into tissue healing and the prevention of conditions like scar formation.

## Miscellaneous

### Earth's Core Leak Revealed through Ancient Arctic Rocks

Recently Geochemists have made a surprising discovery about the Earth's core by analyzing 62-million-year-old Arctic rocks, uncovering compelling evidence of a slow leak from the planet's core. Scientists found record concentrations of helium isotopes in ancient Arctic rocks, suggesting a slow leak from Earth's core.

- The discovery was detailed in a research publication in Nature and is based on an analysis of ancient lava flow with high helium-3 concentrations.
- Researchers speculate that there may be reserves of this elusive gas buried approximately 2,900 kilometers underground. Helium, primarily from the Big Bang, was partially retained by the Earth during its formation, and the rest was expelled.
- The helium detected in volcanic lava comes from the mantle and was first discovered years ago when geochemist Forrest Horton found extremely high helium isotope ratios in olivine samples collected from Baffin's lava fields.

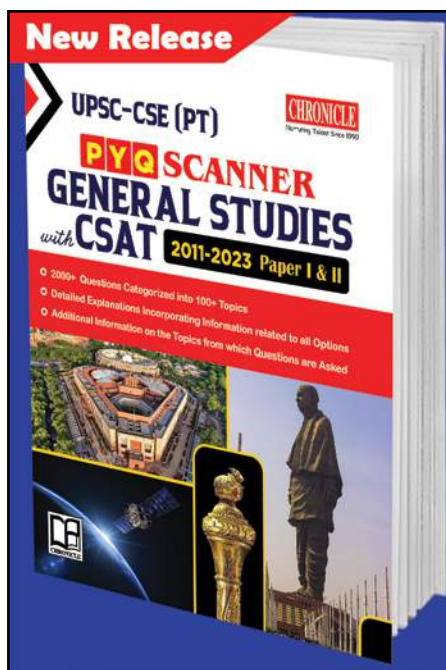
This groundbreaking discovery is shedding light on the planet's geological mysteries and the conditions during its formation.

### 120-Million-Year-Old Pontus Tectonic Plate Unveiled in Asia-Pacific Region

Recently, geologists from Utrecht University in the Netherlands have uncovered the existence of the Pontus tectonic plate, which existed 120 million years ago and once covered a quarter of the Pacific Ocean's current expanse.

- Named the **Pontus plate**, this ancient tectonic plate is estimated to have covered a quarter of the present-day Pacific Ocean based on their reconstructions dating back 160 million years.
- It existed during a time when a vast **ocean separated Eurasia and Australia**, which were part of the super-continent Pangaea.
- As Pangaea began to break apart, the Pontus plate slowly sank into the Earth's mantle over millions of years as other plates carried regions like Borneo and the Philippines to their current positions.
- To reconstruct the plate movements, the researchers avoided relying on **paleogeomagnetic data** due to its scarcity in the region.
- Instead, they considered the western Pacific region and its predecessor, the Panthalassa superocean, which surrounded Pangaea.
- They worked backward from the present-day geological arrangements and adopted the simplest plate tectonic scenario that aligned with geological observations.
- The existence of the Pontus plate confirms predictions made by geologists 11 years ago, based on anomalies in seismic data.

Relics of the Pontus plate had also been found in Palawan and the South China Sea, aligning with the geological findings on Borneo.



#### DID YOU KNOW ?

As per the **recent trends**, in **UPSC CSE (PT) Examination PYQs are not repeated** but the **topics of the PYQs are repeated.**  
**PYQ Scanner is based on the above trend analysis.**

#### In this Book

- Prelims and Mains Questions Trend Analysis
- Prelims and Mains Syllabus
- Exam Preparation Guidance for Beginners
- Prelims GS I & II 13 Yrs Solved Papers
- 2000+ Questions Divided into 100+ Topics
- Categorization of Questions according to Topics
- Detailed Explanation to the Questions Asked
- Explanation on Options other than the Correct One
- Additional Information on the Topics
- Previous Years' Mains GS and Essay Questions





# ECOLOGY & ENVIRONMENT

## Sustainable Development

- Failure to Reach Agreement on Climate “Loss and Damages”
- WMO Urges Improved Water Resource Monitoring
- NCCR Attributes Algal Bloom in Puducherry to Human Factors

## Sustainable Development

### Failure to Reach Agreement on Climate “Loss and Damages”

On 21<sup>st</sup> Oct, a significant pre-COP28 meeting focused on climate “loss and damages” concluded in failure as countries from both the global north and south could not come to an agreement.

- The dedicated fund for addressing climate “loss and damage” was a major achievement at last year’s **COP27 in Egypt**, but the specifics of its structure, beneficiaries, and contributors were deferred to later discussions.
- Several talks held this year aimed to establish a consensus on fundamental aspects, with one of the primary issues being the **contribution of funds by richer nations**, particularly regarding China’s involvement.
- A transition committee convened in Aswan, Egypt, over the establishment of the fund but failed to reach an agreement, postponing the decision to a subsequent meeting scheduled for November 3 to 5 in the United Arab Emirates.
- The discussions encountered difficulties concerning the management of the funds, with a divide between proponents of the World Bank, **accused of Western influence**, and a new independent structure, favoured by many developing nations but seen as challenging to replenish with new funds.
- The breakdown reflects the **significant divide between rich and poor nations**, underscoring the challenge of reaching consensus on this critical climate issue.
- The failure to reach an agreement on climate “loss and damages” highlights the complexities and contentious issues surrounding **climate financing and accountability** in international climate talks.

## Climate Change

- New Climate Report Raises Alarm
- Massive Ozone Hole Detected Over Antarctica

## Biodiversity

- Rubber Production in Southeast Asia Drives High Forest Loss
- Chennai Tops Trafficking Network for Tortoises and Turtles
- New Dragonfly Species Discovered in Wayanad
- Decline in Bird Species Recorded in Tamil Nadu: SOIB 2023

## Government Policies/ Initiatives

- Punjab to Ban Cultivation of PUSA-44 Paddy Variety
- Gujarat Government Bans Planting of Ornamental Conocarpus Trees

- Despite the setback, discussions on climate “loss and damages” are expected to continue at COP28, with the hope of finding common ground on this crucial issue.

Climate change impacts disproportionately affect vulnerable communities and countries, emphasizing the urgency of addressing loss and damages associated with climate change.

## WMO Urges Improved Water Resource Monitoring

On 12<sup>th</sup> October, 2023, the World Meteorological Organization (WMO) warned that climate change has disrupted the hydrological cycle, caused imbalances, and called for enhanced monitoring efforts.

- The WMO released its “**State of Global Water Resources**” report for 2022, highlighting the impact of climate change on the hydrological cycle.
- WMO Secretary-General noted that climate change has led to more intense **precipitation episodes**, causing flooding, while also contributing to increased evaporation, dry soils, and severe droughts.
- The report revealed that over 50% of global catchment areas experienced deviations from normal river discharge conditions, with most of them being drier than usual. It cited China’s Yangtze River as an example.
- In contrast, the report mentioned floods in Pakistan that resulted in the tragic loss of over 1,700 lives last year.
- The WMO emphasized that there is **insufficient knowledge about the actual state of the world’s freshwater resources**, highlighting the need for improved measurement and monitoring.
- The water report represents the WMO’s second comprehensive analysis in this domain, incorporating data from major river basins, covering aspects like river discharge, groundwater levels, evaporation rates, soil moisture, and reservoir inflow.



- It underscores the importance of effective monitoring to address the hydrological challenges posed by climate change.
- The WMO's call for **enhanced monitoring** aligns with the idea that to manage water resources effectively, it is crucial to understand their current conditions and variations.
- **Climate-induced imbalances** in the hydrological cycle can lead to a range of water-related issues, including droughts, floods, and water scarcity.
- The report's findings emphasize the necessity of collaborative efforts to better understand, manage, and adapt to the changes in global water resources.

### **NCCR Attributes Algal Bloom in Puducherry to Human Factors**

Recently, the National Centre for Coastal Research (NCCR) has linked the recent harmful algal bloom along Puducherry's Promenade Beach to human-induced factors, including sewage discharge, shifting ocean currents, and rising nutrient levels in coastal waters.

- Concerns were raised by environmentalists due to the emergence of algae patches along the coastline.
- NCCR Director explained that the **algal bloom** resulted from a reversal of ocean currents, shifting from north to south, mixing with sewage from the northern areas, leading to a higher concentration of nutrients in coastal waters.
- Despite the striking **reddish tinge in the water**, experts believe there is no reason for immediate alarm.
- Preliminary assessments by the Puducherry Pollution Control Committee (PPCC) confirmed that the phenomenon is indeed a **red tide or algal bloom**.
- **Algae proliferation** is often associated with **elevated nutrient levels in coastal waters**, which can lead to harmful algal blooms.
- Water samples collected during the investigation have been sent to Chennai for further biological and chemical analysis.

This incident underscores the importance of monitoring and addressing human influences on coastal ecosystems, such as sewage discharge and changes in ocean currents.

## **Climate Change**

### **New Climate Report Raises Alarm**

Recently, an international coalition of climate scientists has published a paper, warning that the Earth's vital signs have worsened significantly, putting life on the planet in jeopardy. Titled "The 2023 State of the Climate Report: Entering Uncharted Territory," the paper highlights that 20 out of 35 key planetary indicators tracking climate change have reached record extremes.

### **Key Points**

- **Imperilled Planet:** The authors emphasize that humanity's excessive exploitation of the Earth's resources threatens natural and socioeconomic systems, potentially leading to a world with unbearable heat and shortages of food and freshwater.
- **Record-Breaking Extremes:** In 2023, many climate-related records have been shattered, particularly concerning ocean temperatures, sea ice, and a severe wildfire season in Canada with unprecedented carbon dioxide emissions.
- **Continuing Crisis:** The report follows a 2019 "World Scientists' Warning of a Climate Emergency," co-signed by over 15,000 scientists, which stressed the urgency of the climate crisis.
- **Key Findings:** The report presents alarming statistics and facts, including a doubling of fossil fuel subsidies from \$531 billion to over \$1 trillion between 2021 and 2022, severe Canadian wildfires emitting more carbon than the country's 2021 greenhouse gas emissions, and an increase in global average temperatures surpassing 1.5 degrees Celsius above pre-industrial levels.
- **Unprecedented Heat:** July 2023 recorded the highest average Earth surface temperature ever, potentially the hottest in 100,000 years.
- **Urgent Action Needed:** The authors call for policies targeting the root issue of ecological overshoot, highlighting that solely addressing carbon or climate will not alleviate the crisis.
- **Recommendations:** The report recommends transitioning to an economy prioritizing human well-being, reducing overconsumption, and emissions by the wealthy.
- It suggests phasing out fossil fuel subsidies, promoting plant-based diets, expanding forest protection, and implementing international treaties for coal elimination and fossil fuel non-proliferation.

### **Massive Ozone Hole Detected Over Antarctica**

Recently, a significant ozone-depleted area, three times the size of Brazil, has been identified over Antarctica through satellite measurements.

### **Key Points**

- **Massive Ozone Hole:** The European Space Agency's Copernicus Sentinel-5P satellite observed a massive ozone hole on September 16, 2023, as part of the EU's environmental monitoring program.
- **One of the Largest on Record:** This ozone-depleted area covered 26 million square kilometres, making it one of the largest ever recorded.
- **Early Start and Remarkable Size:** The early start and substantial size of this year's ozone hole are noteworthy.
- **Ozone's Vital Role:** Ozone, present in the stratosphere, acts as a shield against harmful ultraviolet radiation, reducing skin cancer risks and protecting ecosystems.

- **Seasonal Variation:** The size of the ozone hole in Antarctica varies annually, typically opening in August and closing in November or December.
- **Formation Mechanism:** The ozone hole forms due to specific wind patterns over Antarctica, creating a “mini climate” that prevents the mixing of air. When these winds subside, the hole naturally closes.
- **Volcanic Eruptions’ Impact:** This ozone hole is believed to be linked to volcanic eruptions in Hunga Tonga, Tonga, during December 2022 and January 2023.
- **Chemical Reactions:** These eruptions introduced water vapour into the stratosphere, affecting the ozone layer through chemical reactions and changing its heating rate.
- **Historical Ozone Depletion:** Human activities, particularly the use of chlorofluorocarbons (CFCs), were responsible for significant ozone depletion in the 1970s.
- **Montreal Protocol:** The Montreal Protocol, established in 1987, effectively controlled emissions of ozone-depleting substances.

**Ozone Holes and Seasonal Changes**

- Ozone depletion, while not a primary contributor to global climate change, can impact the environment in various ways.
- It is not a major concern for climate change but remains an important subject of study and monitoring.
- Ozone holes can alter the progression of seasons.
- Their presence can extend the duration of polar vortex conditions, potentially affecting the length of winter seasons.
- Scientists are closely monitoring the interactions between ozone depletion, climate change, and natural events like fires and eruptions.
- These interactions are complex and continue to be a subject of study to better understand their implications for the environment.

**Biodiversity**

**Rubber Production in Southeast Asia Drives High Forest Loss**

Recent research has indicated that forest loss due to rubber production in Southeast Asia may be two to three times greater than previous estimates, posing challenges for importers seeking sustainable sources.

- **Increasing global demand** for rubber is contributing to deforestation and biodiversity loss, with Southeast Asia, responsible for 90% of global rubber production, particularly affected.
- Prior data suggested that rubber had a relatively minor role in deforestation compared to commodities like soy and palm oil.

- However, high-resolution satellite data and identification of smallholder plantations have revealed that forest losses due to rubber significantly exceed earlier estimates.
- Over **4 million hectares of forest** have been lost to rubber plantations since 1993, with two-thirds of these losses occurring in Indonesia, Thailand, and Malaysia.
- Currently, in the Southeast Asian region, **more than 14 million hectares** are dedicated to rubber cultivation, compared to 10 million in 2020.
- Additional forest losses may result from plantations initially established during a rubber boom two decades ago, which have been converted to other uses due to a price crash in 2011.
- **The European Union will implement a law** by the end of the following year, preventing commodity importers from purchasing products linked to forest loss, including rubber.
- The law originally covered commodities such as soy, beef, palm oil, wood, cocoa, and coffee, with rubber added in response to EU lawmakers’ request.
- Importers must provide proof that their products are not linked to deforestation after 2020 to avoid fines, potentially encouraging them to source rubber from larger producers with more straightforward supply chains.

Organizations like the Forest Stewardship Council are working to enhance traceability for smallholders, who account for 85% of global rubber production, ensuring their rubber can be sold in Europe.

**Chennai Tops Trafficking Network for Tortoises and Turtles**

A new study has found Chennai as the highest-ranked node in a trafficking network responsible for fuelling the global pet trade in tortoises and hard-shell turtles.

- The study also highlighted that **Mumbai, Kolkata, Bengaluru, Anantapur, Agra, North 24 Parganas, and Howrah** are ranked high in this trafficking network.
- Researchers noted that the trafficking of soft-shell turtles for meat was primarily a domestic issue, with international trafficking of the reptile restricted to Bangladesh.
- The term ‘**Asian turtle crisis**’ is used to describe the challenges faced by tortoises and freshwater turtles in Asia, with populations suffering from habitat destruction and unsustainable harvesting.
- The illegal trade in tortoises and freshwater turtles poses a significant threat, with India experiencing illegal trade in at least 15 out of 30 species.
- Researchers aimed to understand the similarities and differences in the operation of illegal trade in these animals to design targeted interventions.
- The study involved a systematic online search for media reports on seizures of tortoises and freshwater turtles originating from India between 2013 and 2019.

Chennai was identified as the most central node in the trafficking network, while Kuala Lumpur, Bangkok, and unspecified districts in Bangladesh were noted as significant importing nodes.

## New Dragonfly Species Discovered in Wayanad

A recent collaborative effort by researchers in Kerala has led to the discovery of a new dragonfly species in the lush environs of Wayanad, aptly named the **Red-rumped Hawklet** (*Epithemis wayanadensis*).

- The discovery occurred during an investigation into the odonates (dragonflies and damselflies) of Kerala and a study of dragonfly populations that resembled the Ruby-tailed Hawklet (*Epithemis mariae*), a **species native to the Western Ghats**.
- *Epithemis mariae* is a small dragonfly known for its blackish-brown and red colouration in males and golden-yellow and black hues in females.
- It is a **seasonal species** found exclusively during the southwest monsoon and inhabits marshes and pools at the base of forested hills.
- The newly discovered dragonfly species, *Epithemis wayanadensis*, was found in the shrub-filled areas near streambanks within Wayanad's forested terrain and parts of the Nilgiri Coorg landscapes within the Western Ghats.
- *Epithemis wayanadensis* distinguishes itself with darker pigmentation, a limited red colouration on the abdomen, and the absence of the yellow antehumeral stripe.
- Extensive study revealed that this dragonfly species is profoundly seasonal, taking flight only in October, disappearing from sight by early November, and spending the rest of the year in the aquatic larval stage.
- To validate their discovery, researchers conducted DNA analysis, which showed an astonishing 12% genetic difference, confirming the presence of a new species, a first for Indian dragonflies.
- This significant discovery with genetic evidence highlighting morphological distinctions suggests the possibility of other undiscovered species within the region.

The dragonfly species was named *Epithemis wayanadensis* to honour the biodiverse Wayanad plateau located within the Western Ghats.

## Decline in Bird Species Recorded in Tamil Nadu: SOIB 2023

A recent analysis of the State of India's Birds (SOIB) 2023 report revealed that approximately 110 bird species observed in Tamil Nadu are currently experiencing population declines.

- In Tamil Nadu, **86 bird species**, including garganey, northern shoveler, common sandpiper, and common teal, are categorized as undergoing a "rapid decline," as

reported by the Salem Ornithological Foundation (SOF) using data from the SOIB 2023 report.

- Surprisingly, species that were previously considered common by birding enthusiasts, such as Indian rollers, have been included in the declining category.
- **Indian rollers**, although not frequently seen in Chennai, were once a common sight in outer areas and towns. However, they have become increasingly difficult to spot in recent years.
- **Urbanization and changing landscapes** have contributed to shifts in bird populations, making it essential to have a region-specific report to understand these patterns.
- The SOIB report mainly relied on data uploaded to **eBird, a citizen portal for birders** and researchers, for assessing trends.
- Out of the 451 bird species in Tamil Nadu, long-term trends are available for only 39 species, indicating a data deficiency.
- The lack of adequate data in Tamil Nadu led the SOIB report to focus more on India-wide trends, where a greater number of species could be analysed.

The data deficiencies are expected to be mitigated in the future as more birders contribute information to eBird, allowing for a more comprehensive analysis of the bird species in the state.

## Government Policies/ Initiatives

### Punjab to Ban Cultivation of PUSA-44 Paddy Variety

On 4<sup>th</sup> October, 2023, Punjab Chief Minister declared that the state will prohibit the cultivation of the PUSA-44 paddy variety from the upcoming year.

- This decision marks a significant shift as PUSA-44 was once a dominant choice for farmers, covering a substantial portion of the state's paddy fields.

#### Key Points

- PUSA-44, a paddy variety, was introduced in Punjab in 1993 and gradually gained popularity among farmers due to its high yield.
- By the end of the 2010s, PUSA-44 covered 70 to 80% of the state's paddy cultivation area.
- The Punjab government initially discouraged its cultivation in 2018, reducing the area under PUSA-44 to 18% of the total paddy area. However, it rebounded to 22% in the previous year.
- Farmers claim that PUSA-44 yields significantly more paddy compared to other varieties, contributing to higher incomes, as it offers 7-10 quintals more per acre.
- PUSA-44 is linked to the problem of stubble burning, a significant contributor to air pollution in north India.

- Several districts in Punjab, including Barnala, Sangrur, Ludhiana, Moga, Patiala, Fatehgarh Sahib, Muktsar, Bathinda, Faridkot, and Mansa are known for extensive PUSA-44 cultivation and higher stubble-burning incidents.

### The Rationale behind Banning PUSA-44

- **Water Conservation Concerns:** The ban on PUSA-44 is primarily motivated by the need to conserve irrigation water, given Punjab's severe groundwater depletion. The variety's extended maturity period necessitates additional irrigation cycles, which the state aims to mitigate to save water resources.
- **Impact on Stubble Burning:** PUSA-44's extended maturity period also contributes to the problem of stubble burning, which has significant environmental and health consequences.
- The limited timeframe between paddy harvesting and wheat sowing makes proper stubble management challenging, resulting in increased incidents of burning.
- **High Yield vs. Water Conservation:** The ban highlights the trade-off between high yield and sustainable agricultural practices. While PUSA-44 offers higher yields, it also places a strain on water resources and worsens environmental issues.
- **Groundwater Depletion in Punjab:** Punjab's status as a "dark zone" reflects the severity of groundwater depletion, necessitating measures to alleviate the over-exploitation of water resources.
- **Implications for Farming Communities:** The decision affects farming communities that have relied on PUSA-44 for its high yield. Farmers may need to adapt to alternative varieties with shorter maturity periods.
- **Environmental Impact:** The ban on PUSA-44 is expected to have a positive impact on air quality by reducing the incidence of stubble burning, particularly in the districts where the variety is predominantly cultivated.

This move underscores the need to balance agricultural practices with environmental and sustainability considerations, aiming to find a harmonious coexistence between farming needs and ecological well-being.

## Gujarat Government Bans Planting of Ornamental Conocarpus Trees

Recently, the Gujarat government imposed a ban on planting ornamental Conocarpus trees in both forested and non-forested areas, citing concerns about their adverse effects on the environment and human health.

- The ban applies to both forested and non-forest areas within the state.
- The deep roots of Conocarpus damage telecommunication lines, drainage systems, and freshwater resources.



### Environmental Concerns

- The ban on Conocarpus trees in Gujarat highlights the increasing awareness of the environmental consequences of introducing non-native species into ecosystems.
- Conocarpus, although a fast-growing tree, has proven to be a threat to local biodiversity and ecosystems.
- Its aggressive nature, including deep root systems, makes it a formidable competitor for indigenous plants, which can disrupt the balance of the local ecosystem.

### Public Health Considerations

- Another significant aspect of this ban is the recognition of the impact of non-indigenous trees on public health.
- Conocarpus trees produce pollen that can lead to respiratory issues, such as colds, coughs, asthma, and allergies.
- This link between tree species and health concerns is an essential consideration for policymakers, especially in regions with a high prevalence of respiratory illnesses.

### Impact on Wildlife and Habitat Quality

- Invasive plants can have detrimental effects on wildlife and the quality of forest habitats.
- The reduction in fodder availability, as seen in Kerala, forces animals to venture into human settlements and farmlands, leading to conflicts. Additionally, the cultivation of non-indigenous species can disrupt the natural balance of the ecosystem, further affecting the habitat's quality.

### Balancing Conservation and Green Initiatives

- Bans on non-indigenous tree species should not be seen as an outright rejection of green initiatives.
- In many cases, the introduction of exotic species is driven by the desire to increase green cover rapidly.
- However, the focus should shift towards promoting the growth of native trees, which can benefit both the environment and local wildlife. ■■





# WORLD WATCH

## International Relations

- Indian Navy Veterans Sentenced to Death in Qatar
- UAE-India Joint Task Force Meeting Discusses Investment and Cooperation
- IORA Council of Ministers Meeting in Sri Lanka

## International Relations

### Indian Navy Veterans Sentenced to Death in Qatar

On 26<sup>th</sup> October, 2023, eight former Indian Navy personnel were sentenced to death by a court in Qatar. They were arrested on August 30, 2022. The development has raised concerns and diplomatic challenges.

#### Key Points

- **India's Response:** The Ministry of External Affairs expressed deep shock at the verdict and stated it was exploring all legal options in response to the death penalty. The reasons for the arrests and the death penalty have not been publicly disclosed.
- The eight former Navy personnel were working at Al Dahra Global Technologies and Consultancy Services, a defence services provider company in Qatar.
- **Company's Role:** Al Dahra Global Technologies provided training, logistics, and maintenance services to the Qatari Emiri Naval Force (QENF).
- **Arrest and Custody:** The men were arrested by the Qatari State Security Bureau and were initially held in solitary confinement.
- The charges against them were never made public, leading to speculation of a security-related offense.

#### Analysis

- **Diplomatic Challenge:** The sentencing of former Indian Navy veterans to death in Qatar poses a significant diplomatic challenge for India, as it seeks to navigate the reasons behind the arrests and the death penalty.
- **India-Qatar Relations:** India and Qatar have enjoyed friendly relations for years, with regular high-level visits and extensive bilateral trade.
- Defence cooperation has been a significant aspect of their ties, with mutual visits, training, and joint naval exercises.

- Canada Recalls 41 Diplomats from India over Immunity Concerns
- Passenger Ferry Service between India and Sri Lanka Inaugurated
- India and Tanzania Sign Multiple MoUs to Enhance Bilateral Cooperation

## World Issues

- Maria Corina Machado's Victory and US-Venezuela Relations
- Israeli Ground Incursion into Gaza
- China and Bhutan Sign "Cooperation Agreement" After Border Talks
- Armenia's President Signs Rome Statute amid Russian Concerns

- However, recent challenges, including the derogatory remarks incident and the current sentencing, require careful management.
- **Regional Dynamics:** The ongoing crisis in the Middle East, with the Israeli-Gaza conflict, further complicates the situation, with Qatar playing a role in mediating and adding another layer of complexity to the diplomatic landscape.

### UAE-India Joint Task Force Meeting Discusses Investment and Cooperation

On 5<sup>th</sup> October, 2023, the eleventh meeting of the UAE-India High Level Joint Task Force on Investments was held in Abu Dhabi.

- The meeting assessed progress made under the Comprehensive Economic Partnership Agreement (CEPA) between the UAE and India, in effect since May 2022.
- **CEPA has significantly reduced tariffs** on over 80% of product lines, removed trade barriers, and stimulated investment and joint ventures.
- The first year of CEPA implementation saw **bilateral non-oil trade** reach US\$50.5 billion, a 5.8% increase from the previous year, bringing the two nations closer to their US\$100 billion non-oil trade target by 2030.
- Discussions highlighted the status of negotiations for **the India-UAE Bilateral Investment Treaty**, emphasizing the need for balanced agreements that benefit both nations and investors.
- The meeting explored strategies and incentives for promoting increased investment flows from UAE sovereign investment entities into India, with a focus on sectors like renewable energy and asset monetization.
- Progress on the creation of the **Fast Track Mechanism for Indian investment** in the UAE was discussed, with a specific emphasis on priority sectors like renewable energy.

- The **India-UAE Start-Up Bridge**, aimed at facilitating knowledge-sharing and training in various areas, including market access and venture capital, was also on the agenda.
- The establishment of the **Abu Dhabi – India Virtual Trade Corridor**, designed to enhance trade efficiency and security through data exchange systems, was a key topic, with plans for its early implementation.
- Progress on the food security corridor investment under the I2U2 Framework, intended to address food security challenges and strengthen supply chains, was reviewed.
- The **Abu Dhabi Investment Authority (ADIA)** is set to establish a presence in Gujarat International Finance Tec-City (GIFT City), inviting other Sovereign Wealth Funds in the UAE to do the same in India.
- An MOU between the UAE Ministry of Industry & Advanced Technology and the Ministry of Commerce & Industry of India was signed, focusing on cooperation in areas like space, healthcare, renewable energy, and artificial intelligence.

Additionally, an agreement was inked between Al Etihad Payments and the National Payments Corporation of India to develop the UAE's Domestic Card Scheme (DCS), advancing the nation's digital financial infrastructure.

### **IORA Council of Ministers Meeting in Sri Lanka**

On 11<sup>th</sup> October, 2023, India, led by External Affairs Minister, participated in the 23rd Council of Ministers (COM) meeting and the 25th Committee of Senior Officials of the Indian Ocean Rim Association (IORA), hosted in Colombo, Sri Lanka.

- India took on the role of **Vice Chair of the Indian Ocean Rim Association** for the year 2023-2025 during the meeting. This position will be followed by India assuming the Chairmanship for 2025-2027.
- Prior to the meeting, IORA Senior Officials comprehensively reviewed the organization's ongoing and future activities for the period from 2022 to 2027.
- The COM adopted significant documents during the meeting, including the Colombo Communique and '**IORA Vision 2030 and Beyond**,' among others.
- External Affairs Minister held talks with Sri Lankan President at the President's Secretariat.
- Several agreements were exchanged between the two nations, including a letter of exchange and acceptance regarding Phase 4 of the **Indian Housing Project**, aiming to construct 10,000 houses in plantation areas.
- Additionally, additional funding was infused into nine ongoing High Impact Community Development projects.
- Various housing projects were inaugurated virtually during a ceremony.
- A joint logo commemorating **75 years of diplomatic relations** between India and Sri Lanka was also unveiled.

- A Joint Venture Shareholders' agreement was signed between the National Dairy and Development Board (NDDB), Gujarat Cooperative Milk Marketing Federation, and the Cargill Group of Sri Lanka. This initiative aims to enhance the Sri Lankan dairy sector.

India emphasized that its dedication to the Indian Ocean Rim Association is deeply rooted in the principles of peaceful coexistence, shared prosperity, and regional collaboration.

### **Canada Recalls 41 Diplomats from India over Immunity Concerns**

On 19<sup>th</sup> October, 2023, amid the ongoing diplomatic standoff between India and Canada, the Canadian government announced the recall of 41 diplomats and their family members from India.

#### **Key Points**

- **Background of Diplomatic Standoff:** The diplomatic row between India and Canada was triggered by Canadian Prime Minister's remarks in the Canadian Parliament in September 2023.
- Canada's PM suggested a potential Indian government link to the killing of pro-Khalistan separatist leader Hardeep Singh Nijjar in Canada, a claim India vehemently rejected.
- **Canada's Diplomatic Recall:** Canada's Foreign Minister stated that the recall was necessary because diplomats were at risk of losing their diplomatic immunity.
- This action aimed to prevent the diplomats' personal safety from being compromised.
- **US and UK Support Canada:** The United States and the United Kingdom have expressed support for Canada's stance.
- They emphasized the importance of diplomats being present on the ground to resolve differences.
- **Similar Incidents:** In the past, countries like Russia and the United States have asked for mutual diplomatic recalls based on the principle of parity during periods of strained relations.

#### **India's Response**

- India refuted Canada's claims of unilateral revocation of diplomatic privileges, citing it as a violation of the Vienna Convention on Diplomatic Relations.
- India insisted that the recall was justified given the state of bilateral relations, and the higher number of Canadian diplomats in India involved in internal affairs.

#### **Vienna Convention on Diplomatic Relations**

- The Vienna Convention, ratified by 193 countries, governs international diplomatic relations and provides diplomatic immunity to diplomats posted abroad.
- Article 9 of the Convention allows the receiving state to declare diplomats persona non grata without providing a specific reason, leading to their recall.

**Parity in Diplomatic Presence**

- India invoked the principle of parity, as allowed by the Vienna Convention, to address concerns about Canadian interference in its affairs.
- The Convention permits the receiving state to request that the size of the diplomatic mission be within reasonable limits.

**Passenger Ferry Service between India and Sri Lanka Inaugurated**

On 14<sup>th</sup> October, 2023, a historic sea route connecting India and Sri Lanka has been resurrected with the commencement of a passenger ferry service from Nagapattinam in Tamil Nadu to Kankesanthurai in Jaffna, Northern Sri Lanka.

**Key Points**

- **The New Ferry Service:** The passenger ferry service has been named ‘Cheriyapani’.
- **Rejuvenating an Age-Old Route:** The maritime connection between India and Sri Lanka has a rich history, with the Indo-Ceylon Express (Boat Mail) running from Chennai to Colombo via the Thoothukudi port from the early 1900s until 1982.
- The civil war in Sri Lanka halted these services.
- Before the conflict, one of the popular routes was from Dhanushkodi to Talaimannar, with passengers transferring from a train in Chennai to a coal-powered steam ferry in Dhanushkodi for a two-hour journey to Talaimannar.
- **Past Attempts to Restart Services:** The idea of reinstating ferry services had been in consideration since the end of the Sri Lankan civil war in 2009.
- A Memorandum of Understanding (MoU) on passenger transportation by sea was signed in 2011, and a similar service was launched, but it ceased operations after just six months.
- Various attempts were made to establish services from Rameswaram to Talaimannar and Karaikal to Kankesanthurai, but challenges hindered these proposals.

**Potential Impact of the New Service**

- The passenger ferry service is expected to boost religious tourism in coastal regions of both countries, offering access to significant religious sites in Colombo and southern Sri Lanka from India.
- Pilgrimage centers like Nagapattinam, Nagore, Velankanni, Thirunallar, as well as temple towns such as Thanjavur, Madurai, and Tiruchi, are likely to see an increase in Sri Lankan tourists.
- In addition to religious tourism, the service has the potential to enhance regional commerce and trade.

**India and Tanzania Sign Multiple MoUs to Enhance Bilateral Cooperation**

Recently, during the Tanzanian President’s visit to India, both countries signed several Memorandums of Understanding (MoUs) in various sectors, including digital transformation, maritime, and sports, to strengthen cooperation between the two nations.

- The **Indian Navy and Tanzania Shipping Agencies Corporation** have signed a technical agreement on Sharing White Shipping Information.
- A **Cultural Exchange Programme** for 2023-2027 has been established between the two nations.
- The Sports Authority of India and the National Sports Council of Tanzania have entered into an MoU for cooperation in the field of sports.
- The Ministry of Electronics and IT (India) and the Ministry of Information, Communication and IT (Tanzania) have signed an MoU to collaborate on sharing successful digital solutions for population-scale digital transformation.
- An MoU has been signed between the Jawaharlal Nehru Port Authority (under the Ministry of Ports, Shipping, and Waterways) and the Tanzania Investment Centre for the establishment of an Industrial Park in Tanzania.

Cochin Shipyard Ltd. and Marine Services Co. Ltd. have also signed an MoU to promote cooperation in the maritime industry.

**World Issues****Maria Corina Machado’s Victory and US-Venezuela Relations**

On 22<sup>nd</sup> October, 2023, Maria Corina Machado achieved a significant victory in the Venezuelan opposition primary, coinciding with the Biden administration’s decision to alleviate sanctions on Venezuela’s energy sector.

- Geopolitical shifts due to the **Russia-Ukraine conflict** prompted the U.S. to engage with Venezuela, the country with the largest oil reserves, to address energy crisis concerns.
- **Moscow’s support for Latin American** allies raised regional security apprehensions, contributing to the re-engagement.
- Venezuela endured international isolation under President Maduro, which affected its economy and living standards.
- Sanctions relief may allow Venezuela’s **state-owned oil company** to restart production and potentially access U.S. financial markets.
- The Venezuelan opposition gained momentum since its victory in the 2022 regional polls, but remains fragmented.

- President Maduro faces international criticism for his autocratic leadership, and Venezuela grapples with a severe socio-economic crisis.
- The **International Criminal Court (ICC)** investigates Venezuela for alleged crimes against humanity, including extrajudicial killings.
- Maria Corina Machado’s victory in the opposition primary is significant, but her hardline stances may hinder her electoral prospects.
- Restoring stability in Venezuela remains a top priority for the opposition.

The U.S. links sanctions relief to democratic progress, emphasizing the importance of halting Venezuela’s downward spiral.

### **Israeli Ground Incursion into Gaza**

On 20<sup>th</sup> October, 2023, the Israel Defence Forces (IDF) stated that they are intensifying their ground activity in the Gaza Strip, moving through the stages of the war as outlined in their plan.

Israel Prime Minister announced the “second stage” of the fight against Hamas, in response to the deadly October 7 attack by Hamas.

#### **Key Points**

- **The Objective of the Israeli Ground Incursion:** The Israeli ground operation aims to eliminate Hamas, the radical Islamist organization that has governed Gaza since its electoral victory in 2006.
- **Uncertainty Surrounding the Post-Conflict Phase:** While the military objective is clear, what remains uncertain is how Israel intends to handle the “post-conflict phase” if they succeed in eradicating Hamas.
- **Lessons from History:** In 2005, Israel voluntarily withdrew from Gaza under the disengagement plan led by then-Prime Minister Ariel Sharon.
- The chances of Israel re-assuming an administrative role in a Gaza left in ruins are currently remote.
- **Potential Economic Consequences:** The military engagement’s aftermath could have economic ramifications, particularly in terms of oil prices and global inflation.
- The situation could worsen if the conflict prolongs and the Palestinian humanitarian crisis intensifies.
- **Three Likely Scenarios:** The conflict’s future is uncertain, with three probable scenarios: a limited conflict confined to Gaza, a broader regional conflict involving Iran-backed groups, and the least likely, a full-scale war between Israel and Iran.
- **Global Economic Impact:** In the worst-case scenario of a direct conflict between Iran and Israel, the global economy could face significant challenges, including soaring crude oil prices, increased inflation, and slowed global growth.

- **The Most Likely Scenario:** The conflict staying localized in Gaza would have a limited global economic impact, but it still comes as the world grapples with numerous challenges like inflation and geopolitical uncertainties.

### **China and Bhutan Sign “Cooperation Agreement” After Border Talks**

On 24<sup>th</sup> October, 2023, China and Bhutan signed a “Cooperation Agreement” detailing the responsibilities and functions of the Joint Technical Team (JTT) for boundary delimitation and demarcation following their 25th round of border talks in Beijing.

- In addition to the border discussions, Chinese Vice President and Foreign Minister urged Bhutan to establish diplomatic relations with China and expedite the resolution of the border issue.
- The two sides noted the advancements made through Expert Group Meetings since the 24th Round of Boundary Talks in 2016, emphasizing the positive momentum achieved.
- The Cooperation Agreement builds on the **Three-Step Roadmap**, with both sides agreeing to work together to advance the implementation of all roadmap steps.
- The discussions took place in a friendly atmosphere, reflecting the cooperative and friendly relations between Bhutan and China. They also explored ways to enhance bilateral ties.
- Both sides expressed the commitment to accelerate boundary demarcation and diplomatic relations between the two countries, underlining their common aspirations.
- The restoration of diplomatic relations is viewed as being in the long-term interests of both nations. It can further enhance legal and friendly relations between China and Bhutan.
- While China has resolved boundary disputes with many neighbours, Bhutan and India remain the two countries with which China has not yet signed border agreements.
- The **Doklam standoff in 2017** raised tensions between India and China, impacting the broader region. The issue was ultimately resolved, but it remains a point of contention.
- Bhutan and China maintain regular contact through official visits, with efforts to establish diplomatic relations ongoing.
- China has focused on **developing villages along its borders with India**, Bhutan, and Nepal, demonstrating increased regional engagement.
- The **13th Expert Group Meeting** on the Bhutan-China Boundary took place in Beijing in August.
- Bhutan’s Prime Minister has expressed hopes for rapid progress in border demarcation.
- Bhutan’s close ties with India have also been a focal point, emphasizing their close and trusting relationship.



Bhutan expressed support for China's Global Security Initiative, Global Development Initiative, and Global Cultural Initiative as part of Beijing's strategic plans.

## Armenia's President Signs Rome Statute amid Russian Concerns

Recently, Armenia's President defied Russian warnings and signed the Rome Statute, the treaty establishing and governing the International Criminal Court (ICC). This move comes amid growing tensions in Armenia-Russia relations.

- Armenia's decision to join the ICC comes as its relationship with long-standing ally Russia deteriorates, primarily due to Armenian President's displeasure with perceived Russian inaction during the conflict in Nagorno-Karabakh.
- Ethnic Armenians had maintained autonomy in Nagorno-Karabakh for nearly three decades until Azerbaijan launched a swift offensive in September, leading to the region's loss of control by Armenian fighters.
- Russia had brokered a deal in 2020 to halt the fighting, with Russian peacekeepers deployed to the region. However, when hostilities resumed last month, Russian forces did not intervene.
- Countries that have ratified the Rome Statute theoretically have an obligation to arrest individuals indicted by the ICC, including Russian President should they set foot on their soil.

Moscow does not recognize the ICC's jurisdiction, and it does not extradite its nationals. The indictment of Putin has further strained Russia's relations with the court.

## International Treaties

### India's Abstention in UN Vote on Israel-Hamas Conflict Resolution

On 27<sup>th</sup> October, 2023, India chose to abstain from a United Nations General Assembly vote on a resolution that called for an immediate humanitarian truce in the Israel-Hamas conflict, which passed with 120 votes in favour and 14 against.

#### Key Points

- **Resolution Contents:** The resolution sought an "immediate, durable, and sustained humanitarian truce," with unhindered humanitarian access to Gaza.
- It was drafted by 22 Arab countries, led by Jordan, and had co-sponsors including Bangladesh, Maldives, Pakistan, Russia, and South Africa.
- **Amendment Proposed by Canada:** Canada and the United States co-sponsored an amendment naming Hamas as responsible for the crisis.

- India sided with the majority (87) in favour of this amendment, although it failed to garner sufficient support for adoption.
- **Legal Binding of UNGA Resolutions:** UN General Assembly resolutions, unlike those from the Security Council, are **not legally binding**.
- Despite this, the resolution holds significant moral weight, emphasizing international law and proportionate use of force.

#### Analysis

- **Balancing Act:** India's abstention reflects its effort to balance between the complex geopolitics of the Middle East, the ongoing Israel-Hamas conflict, and its consistent diplomatic approach in world affairs.
- **India's Stance:** India's statement highlights its condemnation of violence and terrorism, while also expressing concern for the humanitarian crisis in Gaza. It advocates restraint, responsibility, and a negotiated resolution to the Israel-Palestine issue.
- **Global Diplomacy:** India's role in negotiating the coming weeks and months in this volatile region will rely on its diplomatic skills and relationships with key actors.
- The country's principled stand on the Israel-Palestine issue and its call for diplomacy and dialogue are central to its position.

### India Re-elected as President of AIBD General Conference

On 6<sup>th</sup> October, 2023, India achieved the rare feat of being elected as the president of the Asia-Pacific Institute for Broadcasting Development (AIBD) General Conference (GC) for the third consecutive time.

- Held from October 2 to 4 in Port Louis, Mauritius, the conference's mandate was to foster a vibrant and harmonious electronic media landscape in the Asia-Pacific region through policy and resource development.
- This remarkable achievement reflects the trust and confidence placed in India by broadcasting organizations across the Asia-Pacific region and the world.
- Established in **1977 under UNESCO's auspices**, AIBD boasts a membership of 92 organizations from 44 countries.
- Its members include 26 government entities represented by 48 broadcasting authorities and broadcasters, as well as 44 affiliated organizations represented by 28 countries and regions across Asia, the Pacific, Europe, Africa, the Arab States, and North America.

India, a founding member of AIBD, is represented by Prasar Bharati, the country's public service broadcaster, as the representative body of the Ministry of Information & Broadcasting, Government of India, at AIBD. ■■

# Prelims

# GS Roundup-3

Dear Readers,

In this **December** issue of *Civil Services Chronicle*, we have come up with the **Prelims GS Roundup-3**. The **Prelims GS Roundup Series** was started from the October issue of the magazine (**CSE Prelims GS Roundup-1, October 2023**). The content published in this section will cater to the needs of the UPSC/State PCS Civil Services Prelims exams.

A careful analysis of the past 10 years Prelims questions reveals that the questions (especially in UPSC CSE) are never repeated but the topics are repeated. Questions are framed from different dimensions of the topics.

Accordingly, the **Prelims GS Roundup-3** covers **46 most important topics of Geography and Indian Economy** from which questions are frequently asked in the Civil Services Preliminary Examination.

**The GS Roundup Series will cover the entire syllabus of the Prelims exam, comprising Indian History, Art & Culture, Geography, Indian Polity & Governance, Economy, General Science & Science & Technology, and Ecology & Environment.**

We hope you find the content helpful in your preparation for the Civil Services Examinations.

We encourage you to send us your feedback at [cscenglish@chronicleindia.in](mailto:cscenglish@chronicleindia.in)

Happy reading!

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# Geography

## **Erosional and Depositional Landforms by Rivers and Wind**

*Erosional landforms are physical features on the Earth's surface that have been shaped and formed primarily through the process of erosion. Depositional landforms, on the other hand, are physical features on the Earth's surface that have been built up and formed by the deposition of sediment or material carried by natural agents like rivers, wind, glaciers, or ocean currents.*

### **Erosional Landforms by Rivers**

#### **Valleys, Gorges, and Canyons**

- Valleys primarily originate from the erosive action of flowing water.
- Rills, initially created by surface runoff, eventually evolve into gullies. Over time, these gullies progressively deepen and broaden, eventually shaping into valleys.
- A gorge is a profoundly deep valley characterized by its exceptionally steep to nearly vertical sides.
- On the other hand, a canyon exhibits steep, terrace-like sidewalls and can reach comparable depths to a gorge.
- Notably, a gorge tends to maintain relatively consistent width from its top to its base and typically forms in areas with durable rock formations.
- Conversely, canyons are wider at their upper portions than at their lower regions, usually taking shape in horizontally layered sedimentary rock formations.

#### **Potholes and Plunge Pools**

- Potholes are essentially circular hollows that develop on the rocky beds of streams in hilly terrain.
- These depressions begin as relatively small and shallow indentations, gradually accumulating pebbles and boulders.
- The flowing water causes these stones to rotate within the depressions, leading to the expansion of the potholes over time.
- Plunge pools, in contrast, are essentially large and deep versions of potholes, typically located at the base of waterfalls.
- They form as a result of the powerful impact of cascading water and the continuous rotation of boulders.

#### **Incised or Entrenched Meanders**

- These are exceptionally deep and broad meanders, resembling loop-like channels, and are typically observed in hard rock formations.

- As time progresses, they undergo a process of deepening and widening, ultimately shaping into gorges or canyons within the resistant hard rock.
- The distinctive feature setting apart incised or entrenched meanders from conventional meanders is their occurrence exclusively in hard rock environments.

#### **River Terraces**

- They are flat surfaces that serve as historical indicators of previous valley floors or flood plains.
- These terraces come into existence through the process of vertical erosion carried out by the rivers.
- When these terraces exhibit an identical elevation on both sides of the river, they are referred to as paired terraces.
- In contrast, if terraces are found only on one side of the river, without any corresponding terraces on the opposite side, or if the elevations differ significantly, they are categorized as unpaired terraces.

### **Depositional Landforms by Rivers**

#### **Alluvial Fans**

- These geological features are typically located in the middle segment of a river, positioned at the base of a slope or mountain.
- As the river transitions from higher elevations and encounters a gently sloping plain, it experiences a reduction in the energy required for transporting a significant portion of its sediment load.
- Consequently, these sediments are deposited and dispersed, forming expansive, cone-shaped accumulations known as alluvial fans.
- Notably, the sediment deposits within alluvial fans tend to exhibit a relatively poor degree of sorting.

#### **Deltas**

- Deltas share similarities with alluvial fans, but they form in distinct locations – specifically, at the mouths of rivers, which represent the final destination for the river's depositional activities.
- Unlike alluvial fans, deltas exhibit well-organized sediment deposits with clear stratification.
- Coarser materials settle out first, while finer materials such as silt and clay are carried away into the sea.

#### **Flood Plains and Natural Levees**

- Much like erosion gives rise to valleys, deposition results in the creation of floodplains.
- The riverbed, composed of sedimentary deposits, constitutes the active floodplain, while the floodplain located beyond the riverbank is known as inactive floodplain.

- Along the banks of large rivers, you will find natural levees – low, linear, and parallel ridges made of coarser deposits.
- These levee deposits are coarser than the sediments distributed by floodwaters away from the river.

### Meanders and Oxbow Lakes

- Meanders represent loop-like channel patterns that form across flood and delta plains.
- They are not standalone landforms but, rather, specific channel patterns that arise due to deposition.
- Three primary factors contribute to their formation: (i) the tendency of water, flowing gently, to work laterally on the banks; (ii) the unconsolidated nature of the alluvial deposits comprising the banks, with numerous irregularities; and (iii) the Coriolis force, which deflects fluid water, akin to the deflection of wind.
- The concave bank of a meander is termed the cut-off bank, while the convex bank is referred to as the slip-off bank.
- As meanders evolve into deep loops, some may get severed due to erosion at the inflection point, forming oxbow lakes.
- For larger rivers, the sediments deposited in a linear fashion on the deposition side of a meander are known as Point Bars or Meander Bars.

### Braided Channels

- When selective deposition of coarser materials results in the development of a central bar, it redirects the river's flow toward the banks, leading to increased lateral erosion.
- With the formation of more central bars, braided channels take shape. Riverine Islands emerge as a consequence of these braided channels.

### Erosional Landforms by Wind

#### Pediaplains

- Pediplains are extensive, relatively featureless plains that result from the wind-driven reduction of high-relief desert structures to low, flat surfaces.

#### Deflation Hollows

- Deflation is the process by which loose particles on the ground are removed due to persistent wind action.
- Deflation hollows are shallow depressions formed as a result of continuous wind erosion.

#### Mushroom Tables

- Ventifacts are rocks that have been sculpted, pitted, etched, grooved, or polished by the abrasive effects of wind-driven sand or ice crystals.
- These geological features are most commonly found in arid regions with limited vegetation, frequent strong winds, and a consistent but not excessive supply of sand.
- Mushroom Tables, also known as Mushroom Rocks, are a particular type of ventifact that takes on the shape of a mushroom.

- In desert environments, the prevalence of sand and rock particles transported close to the ground by the wind leads to greater erosion at the base of overlying rocks than at the top, resulting in the formation of rock pillars resembling mushrooms, with narrow columns and broad top surfaces.

### Depositional Landforms by Wind

#### Sand Dunes

- Arid, hot deserts provide ideal conditions for the formation of sand dunes.
- Various forms of sand dunes exist based on their shapes, including Barchans, Seifs, and others.
- The most common type is the crescent-shaped dune known as a Barchan, while Seifs resemble Barchans but feature just a single wing or point.

#### Loess

- In numerous regions across the world, the surface is blanketed with accumulations of fine silt that have been transported by the wind and settled over thousands of years, primarily as a result of dust storms.
- These wind-blown silt deposits are referred to as Loess.

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## Heat Budget of the Earth

*The balance of incoming and outgoing heat on Earth is referred to as its Heat Budget. As with any budget, to maintain constant conditions the budget must be balanced so that the incoming heat equals the outgoing heat.*

### Heat Budget

- A heat budget represents a state of equilibrium between the incoming heat from the sun (insolation) absorbed by the Earth and the outgoing heat emitted from the Earth's surface in the form of terrestrial radiation.
- When the inflow and outflow of heat are in perfect balance, the Earth maintains a stable temperature, neither becoming excessively warm nor overly cool.
- This equilibrium, characterized by the balance between shortwave insolation and longwave terrestrial radiation, is referred to as the Earth's heat budget.

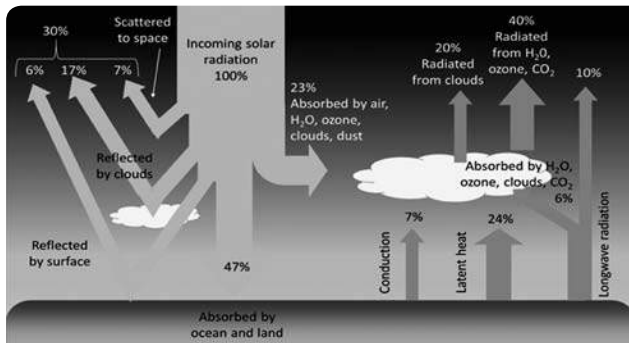
### Example

- Out of all the solar energy that reaches the Earth, approximately 30% is reflected back into space by the atmosphere, clouds, and the Earth's surface.
- Another 23% of this energy is absorbed by substances like water vapour, clouds, and atmospheric dust, where it is transformed into heat.
- Just under half, which is about 47%, of the incoming solar radiation is absorbed by the Earth's land and oceans, resulting in the warming of the Earth's surface.
- The energy that the Earth absorbs is later returned to the atmosphere through three processes: conduction, radiation, and latent heat (phase change).
- Conduction is the transfer of heat through direct contact between the Earth's surface and the atmosphere.



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- However, since air is a relatively poor thermal conductor, representing a good insulator, conduction accounts for only a small fraction of the energy exchange between the Earth and the atmosphere, approximately 7% of the incoming solar energy.
- All objects with a temperature above absolute zero (-273°C) emit heat in the form of longwave infrared radiation.
- The Earth, warmed by the sun, is no exception, and approximately 16% of the original solar energy is radiated from the Earth to the atmosphere.
- Some of this radiated energy escapes into space, but a significant portion is absorbed by the atmosphere. This phenomenon underpins the greenhouse effect.



### Heat Budget Components

- **Insolation:** Insolation refers to the incoming shortwave solar radiation received by the Earth's surface. The processes that contribute to maintaining the planet's heat balance through insolation include:
  - ✓ **Reflection:** This occurs when incoming solar waves bounce back from various surfaces they encounter in the atmosphere, on land, or water, without being converted into heat.
  - ✓ **Absorption:** Radiation absorption involves the transformation of electromagnetic energy from the sun into heat energy.
  - ✓ **Scattering:** Scattering of solar waves occurs when the radiation interacts with small objects in the Earth's atmosphere, such as air molecules, water droplets, or aerosols, causing the solar waves to disperse in all directions.
- **Terrestrial Radiation:** Terrestrial radiation refers to longwave radiation emitted by the Earth's surface or the atmosphere. The processes associated with terrestrial radiation in maintaining the heat balance include:
  - ✓ **Latent Heat Transfer:** This involves the transfer of heat at the point where a substance is poised to change its state, such as transitioning from a solid to a liquid or from a liquid to a gas.
  - ✓ **Sensible Heat Transfer:** Sensible heat transfer is the energy transferred as heat to an object without causing any change in its state.
  - ✓ **Emission by Vapour and Clouds:** Significant amounts of terrestrial radiation are also released by water vapour and clouds.

## Cloudbursts: Causes, Consequences, Prevention and Mitigation

*Cloudburst refers to sudden, unprecedented heavy rainfall that is local in nature and abrupt in action. Rainfall over 100 mm or 10 cm per hour over a region of 20 to 30 square km falls into this category.*

### Causes

- Cloudbursts predominantly occur in mountainous regions when warm air currents ascend from the surface towards the clouds.
- As this warm air rises, it carries raindrops with it, causing rainfall to be erratic and clouds to exhibit excessive condensation. This process leads to a substantial accumulation of water at higher altitudes.
- The rising warm air inhibits the descent of water, weakening the upward current and causing water to cascade over a relatively small area.
- The energy needed for this intense downpour is derived from the upward movement of air.
- Cloudbursts are typically observed at elevations ranging from 1000 to 2500 meters above sea level, with Cumulonimbus clouds being responsible for the heavy precipitation.
- Within cloudbursts, smaller water droplets tend to merge and coalesce, resulting in what's known as the Langmuir precipitation process.
- Langmuir precipitation process is the process in which large droplets of rain coagulate with tiny droplets of rain, which fall down slowly.

### Consequences of Cloudbursts

- **Debris Flows:** Cloudbursts can trigger rapid debris flows, especially in hilly or mountainous regions. The intense rainfall can dislodge rocks, soil, and other debris, leading to dangerous flows of material down slopes.
- **Landslides:** Heavy rainfall from cloudbursts can saturate the soil and destabilize slopes, increasing the risk of landslides. Landslides can pose a threat to human settlements, infrastructure, and transportation routes.
- **Mudslides:** Cloudbursts often result in mudslides due to the combination of heavy rain and soil erosion. These mudslides can be destructive and carry debris and sediment downstream.
- **Flooding:** Cloudbursts can lead to flash floods, which are sudden and intense floods that can inundate low-lying areas. Flash floods pose a significant risk to communities and can cause widespread damage.
- **Mass Movements:** Cloudbursts contribute to various mass movements, including landslides, rockfalls, and debris flows, which can impact communities and infrastructure.
- **Drownings:** Flash floods and the rapid rise of water levels in streams, rivers, and urban areas during cloudbursts can lead to drowning incidents, especially when people are caught off guard.

- **Road Closures:** Cloudbursts can wash out roads and bridges, making them impassable. Landslides and debris flows can also block transportation routes, leading to road closures and transportation disruptions.
- **Accidents:** The slippery road conditions, reduced visibility, and compromised infrastructure during and after cloudbursts can result in accidents and collisions.

### Prevention and Mitigation Measures

- Considering extreme rainfall events in Uttarakhand Himalaya, it is suggested that instead of valleys and along abandoned channel of drains people should inhabit on the hard rock or firm ground of slopes for safety reasons.
- At locations where ground fissures have developed and subsidence has taken place, appropriate measures are required for checking infiltration of rainwater as well as surface water.
- This should precede implementation of permanent treatment measures.
- Indiscriminate and unscientific construction should be banned especially in landslide affected areas. Besides this safe disposal of rainwater needs to be given due importance.
- Both surface and subsurface drainage measures should therefore be planned and executed. For this drain pipes could be provided on debris slope.
- The planned drainage network should be stepped and wide enough to accommodate heavy downpour events.
- The bioengineering technology can be successfully implemented by using specific and local vegetation along with engineering measures to reduce instability and soil erosion.
- Accurate measurement of such events and studies based on different aspects of geology, geomorphology and climatology could help in developing a cloudburst forecasting model. Such studies would at the same time result in efficient landslide risk mitigation.
- At the same time the awareness about the extreme precipitation events and associated disasters among the dwellers of the area is needed.

### Effect of Indian Ocean Dipole and ENSO on Indian Climate

*Indian Ocean Dipole is defined by the difference in sea surface temperatures between two areas (or poles, hence a dipole) – a western pole in the Arabian Sea (western Indian Ocean) and an eastern pole in the eastern Indian Ocean south of Indonesia.*

*The El Niño-Southern Oscillation (ENSO) is a recurring climate pattern involving changes in the temperature of waters in the central and eastern tropical Pacific Ocean.*

### Effects of Indian Ocean Dipole

#### Neutral Indian Ocean Dipole

- The Neutral Indian Ocean Dipole phase initiates during spring when the sun's rays are evenly distributed between the northern and southern hemispheres.

- This leads to the flow of easterly winds between 0 and 30 degrees North and South of the equator.
- These Easterlies, or Trade winds, have a direct influence on the ocean's surface temperature.
- As warm water from the Pacific Ocean interacts with the Indian Ocean's waters, it results in a uniform temperature distribution across both the eastern and western Indian Oceans.
- This phase is referred to as the Neutral Period of the Indian Ocean Dipole (IOD).

#### Positive Indian Ocean Dipole

- During this period, the reduction of westerly winds above the equator allows warm water to flow towards Africa.
- Simultaneously, changes in the winds facilitate the upwelling of cold water from the deeper ocean to the east.
- This leads to temperature variations in the tropical Indian Ocean, with the eastern part experiencing colder-than-normal water and the western part enjoying warmer-than-usual water.
- These conditions are believed to have a favourable impact on the monsoon, resulting in a positive Indian Ocean Dipole.

#### Negative Indian Ocean Dipole

- In the negative phase of the Indian Ocean Dipole, warmer water accumulates near Australia due to the intensification of westerly winds along the equatorial line.
- This leads to temperature differences in the tropical Indian Ocean, with above-average warmth in the eastern region and below-average temperatures in the western region.
- The progression of the monsoon in India is hindered by this phenomenon.

#### Indian Ocean Dipole and Indian Monsoon

- In IOD years, central India typically experiences above-average rainfall.
- Studies have shown that in different ENSO years, a strong positive IOD often counteracts the influence of ENSO, leading to increased monsoon rainfall.
- It has been observed that both the eastern pole of the IOD, near Indonesia, and the western pole, off the coast of Africa, have independent and cumulative effects on the amount of rainfall received by the Indian subcontinent during the monsoon season.
- There is a correlation between below-normal sea surface temperatures (SST) in the eastern Indian Ocean and above-normal rainfall in central India.
- Conversely, a negative IOD, when coupled with El Niño, can lead to severe drought conditions.
- A positive IOD tends to result in an increased number of cyclones in the Arabian Sea, while a negative IOD enhances cyclogenesis in the Bay of Bengal and reduces cyclone activity in the Arabian Sea.

#### Effect of ENSO on Indian Climate

- The El Niño Southern Oscillation (ENSO) has had a greater impact on northern parts of India, lesser impact

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on the central parts and relatively constant impact on the southern parts of the country.

- One of the reasons for this is the impact of global warming.
- ENSO occurs due to the warming or cooling of sea surface temperatures over the equatorial Pacific Ocean beyond long term average.
- The warming phase known as the El Nino is generally known to suppress monsoon rainfall while the cooling phase known as the La Nina generally enhances monsoon rainfall.
- El Nino causes subsidence or downward movement of air which in turn suppresses monsoon rainfall.
- Monsoon rainfall in India gets influenced by both global factors such as the ENSO and localised factors such as the strength of the monsoon trough, which is a line of low pressure areas, and the frequency of low pressure areas that generally form in the Bay of Bengal, known as monsoon depressions, and cause rainfall during the monsoons.
- In recent decades, the El Nino is also forming much later in the year than before. Earlier, it would begin around February or March but now it begins around June or July like it did this year.
- This means that the impact of the El Nino on monsoon rainfall is also delayed and over central India, this has meant the lack of rainfall being compensated by rainfall happening due to warming of the Arabian Sea.
- A warm Arabian Sea, due to global warming, sends moisture across to central India with east-moving winds.
- The compensation is leading to a weakening of the relationship between monsoon rainfall over central India and the El Nino.
- On the other hand, in recent decades, the monsoon depressions have been moving in a more southward direction.
- The monsoon depressions used to move more towards Uttar Pradesh but now they move more towards Madhya Pradesh and Rajasthan.
- This has decreased their influence over northern India which, in turn, has increased the influence of El Nino on the region.

### Characteristics and Causes of Tropical Cyclones in Arabian Sea

*Tropical cyclones, known by various names around the world such as hurricanes, typhoons, and cyclones, are powerful and destructive storms that form over warm ocean waters in tropical and subtropical regions. These storms are characterized by strong winds, heavy rainfall, and low-pressure centres.*

#### Characteristics of Tropical Cyclones

- **Eye:** The centre of a tropical cyclone features a well-defined, calm region known as the “eye.” The eye is typi-

cally clear and cloud-free, with light winds. Surrounding the eye is a circular wall of intense thunderstorms called the eyewall.

- **Eyewall:** The eyewall is where the most intense winds and heaviest rainfall are concentrated. It is the region of the cyclone where the most severe weather conditions are experienced.
- **Saffir-Simpson Scale:** Tropical cyclones are categorized based on their wind speeds using the Saffir-Simpson Hurricane Wind Scale. Categories range from Category 1 (weakest) to Category 5 (strongest).
- **Wind Speed:** Tropical cyclones are characterized by strong wind speeds that can exceed 119 kilometers per hour in tropical storms and reach well over 160 kilometers per hour) in hurricanes.
- **Rainfall:** These storms can produce massive amounts of rainfall, leading to severe flooding, particularly when they make landfall. The combination of storm surge and heavy rainfall can result in extensive coastal and inland flooding.
- **Storm Surge:** When a tropical cyclone makes landfall, it can push a wall of seawater onto the coastline, creating a storm surge. This surge of water can cause coastal inundation and flooding.
- **Path and Track:** The path and track of tropical cyclones are influenced by various atmospheric and oceanic factors, including the Coriolis effect, high-pressure systems, and steering winds.
- **Dissipation:** Tropical cyclones weaken and eventually dissipate when they move over cooler ocean waters, encounter strong wind shear, or make landfall. They can also transition into extratropical cyclones if they move into higher latitudes.

#### Causes of Increasing Frequency and Intensity of Tropical Cyclones in Arabian Sea

- **Rising Sea Surface Temperatures:** There has been an increase in cyclone intensity because of global warming, which has resulted in the rising temperature of seawater. Another reason why the Arabian Sea has more cyclones is because of the instantaneous warming of the ocean.
- **Abundant Energy:** The rising temperature enables the Arabian Sea to supply abundant energy for strengthening the cyclones.
- **Wind Gradient:** The Arabian Sea also nourishes facilitative wind shear or wind gradients for cyclones. For illustration, a higher level easterly wind pushed the crater of Cyclone Ockhi to the Arabian Sea from the Bay of Bengal.
- **Climatic Phenomenon of El Nino Modoki:** The last reason behind the increase in cyclone intensity in the Arabian Sea is the higher occurrence of El Nino Modoki. It is a climatic phenomenon favourable for the formation of cyclones in the Arabian Sea. Conversely, it does not encourage cyclone formation in the Bay of Bengal.

- **Aerosols Emissions:** Since 1930, there has been a six-fold increase in the anthropogenic emissions of aerosols. This has led to the weakening of upper-level easterly winds and lower-level southwesterly winds that determine the movement of precipitation over the Arabian Sea.

### Marine Biotic Resources

*Marine biotic resources refer to the living organisms and biological components found in marine environments, including oceans, seas, and coastal areas. These resources are essential for sustaining life on Earth and have economic, ecological, and cultural significance.*

#### Types of Marine Biotic Resources

##### Plankton

- Plankton comprises a diverse group of organisms that inhabit aquatic environments. They are unable to move against water currents or, in the case of aeroplankton, wind currents.
- Individual organisms within this group are referred to as plankters.
- Plankton is commonly associated with aquatic habitats, but aeroplankton encompasses airborne forms drifting through the atmosphere.
- Plankton plays a crucial role in the aquatic food chain, serving as a vital source of nutrition for various aquatic species, including bivalves, fish, and whales.
- Marine plankton consists of drifting or floating microorganisms like bacteria, archaea, algae, and protozoa, inhabiting both the saltwater of oceans and the brackish waters of estuaries.

##### Algae

- Algae represent a category of predominantly aquatic, photosynthetic organisms with nuclei.
- Unlike land plants, algae lack structures like roots, stems, leaves, and specialized multicellular reproductive organs.
- Various types of algae found in the ocean have diverse applications.
- For example, brown algae produce algin, utilized as a stabilizer in the paint industry, for strengthening ceramics, and thickening jams.
- Red algae contribute agar and carrageenan, with agar being essential for bacterial cultivation in research. It is also used in making desserts and in the manufacturing of pharmaceutical products.
- Carrageenan acts as an ice cream stabilizer and emulsifier in cosmetics and pharmaceuticals.
- Sea lettuce imparts flavour to soups and salads, while kelp can be cultivated to produce methane gas and convert it into energy.

##### Zooplankton

- Zooplankton consists of tiny aquatic microorganisms residing within the water column.

- They can be categorized based on their dietary habits, with primary consumers feeding on free-floating algae, and secondary consumers preying on other zooplankton.
- Together, they constitute the zooplankton community, which plays a pivotal role in the aquatic food web.
- Zooplankton acts as an intermediary in transferring energy from planktonic algae (primary producers) to larger invertebrate predators and fish that feed on them.
- Environmental changes have a substantial impact on zooplankton, manifesting in shifts in species composition, abundance, and body size distribution, making them valuable indicators of ecological disturbances.

##### Nekton Community

- Nekton encompasses actively swimming aquatic organisms within water bodies, with fish being the most prominent group.
- Demersal fish inhabit the ocean bottom or its vicinity, while reef fish are closely associated with coral reefs.
- Pelagic fish, on the other hand, dwell in the open water, neither near the seafloor nor close to the coast.
- The marine pelagic environment, covering vast expanses and harbouring 11% of all known fish species, represents the largest aquatic habitat.

##### Benthos Community

- The benthos community includes organisms that reside on, in, or close to the ocean floor, forming the benthic zone.
- **Types of Benthos**
  - ✓ **Epifauna:** Epifauna inhabits the surface of the ocean floor, often clinging to hard substrates like pebbles, shells, or pilings.
  - ✓ This category includes oysters, sponges, sea squirts, sea stars, and barnacles, among others. An epifaunal benthic community exemplifies this type of population.
  - ✓ **Infauna:** Infauna burrows into the sediments at the ocean bottom, with species like worms and clams constructing their communities.
  - ✓ A healthy infaunal community can host a diverse array of species.

##### Major Fishing Grounds in the World

- **North-East Pacific Region:** This region stretches from the Aleutian Islands to the Philippines in the south and encompasses the eastern coastal waters of Russia, as well as areas in China, South Korea, Japan, and the Philippines. China, Japan, and South Korea collectively account for 13%, 8%, and 3% of the world's total fish catch.
- **North-East Atlantic Region:** Extending along the European coasts from Portugal to Iceland, this region is notable for its significant fishing activities.
- Leading fishing countries in this area include Norway, Great Britain, and Denmark, with the North Sea being a prominent fishing ground.



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- **North-West Atlantic Region:** This region covers the continental shelves along the New England region of the USA and regions in Canada, including New Brunswick, Nova Scotia, and Newfoundland.
- The Grand Banks, known for their high fish productivity, are a key global fishing ground. The region benefits from the convergence of the cool Labrador Ocean current with the Gulf Stream near Newfoundland.
- **South-East Pacific Region:** Encompassing the western coastal areas of South America, particularly the coasts of Chile and Peru, this region is renowned for the consistent upwelling of nutrient-rich water off the coast of Peru.
- The cold water upwelling supplies essential nutrients from below, attracting abundant fish. During strong El Niño events, this region experiences significant fish losses as many species perish.
- **West-Central Pacific Region:** This region extends from the Philippines to the eastern coastal areas of Australia.

### Agro-Ecological Regions in India

*An agro-ecological zone (AEZ) is a geographic area or region characterized by specific environmental and ecological conditions that influence agricultural practices and land use. These zones are defined based on a combination of factors, including climate, soil types, topography, and other ecological features.*

#### Major Agro-Ecological Regions

##### Western Himalayas, Cold Arid Eco-Region

- **Location:** Northwest Himalayas, including Ladakh and Gilgit districts, covering 4.7% of India's total geographical area.
- **Climate:** Mild summers and severe winters, mean annual temperature below 8°C, annual rainfall less than 150 mm.
- **Soil and Terrain:** Acidic, cryic soil temperature, skeletal and calcareous soils.
- **Vegetation:** Sparse forests, with vegetables dominating cultivated areas.
- **Agriculture:** Primarily vegetables, with apple and apricot as major fruit crops.
- **Livestock:** Dominated by mules, followed by sheep, goats, and yaks.

##### Western Plain, Kachchh and Part of Kathiawar Peninsula, Hot Arid Eco-Region

- **Location:** Southwestern Punjab, Haryana, Rajasthan, Kachchh, and northern Kathiawar in Gujarat.
- **Coverage:** 9.78% of India's total geographical area.
- **Climate:** Hot summers, cool winters, mean annual rainfall less than 400 mm.
- **Soil and Terrain:** Sandy, moderately calcareous, alkaline soils.
- **Agriculture:** Rainfed mono-cropping with crops like pearl millet, fodder, and pulses in non-saline areas.

- **Irrigation:** Where water is available, cotton, sugarcane, mustard, gram, and wheat are cultivated.
- **Vegetation:** Sparse tropical thorn forests.

##### Deccan Plateau, Hot Arid Eco-Region

- **Location:** Parts of Karnataka and Andhra Pradesh.
- **Coverage:** 1.5% of India's total geographical area.
- **Climate:** Hot and dry summers, mild winters, erratic rainfall (400-500 mm).
- **Soil and Terrain:** Red loamy soils and deep clayey black soils.
- **Agriculture:** Rainfed farming with pearl millet, sorghum, safflower, and sunflower. Groundnut, sunflower, sugarcane, and cotton are cultivated under irrigated conditions.
- **Vegetation:** Dry deciduous forests.

##### Northern Plain (and Central Highlands), Hot Semi-Arid Eco-Region

- **Location:** Gujarat, northern plains, and central highlands.
- **Coverage:** 9.8% of India's total geographical area.
- **Climate:** Hot summers, cool winters, annual rainfall from 500 to 1000 mm.
- **Soil and Terrain:** Moderately sloping coarse to fine loamy soils.
- **Agriculture:** Both rainfed and irrigated; rice, millets, maize, pulses, wheat, mustard, and sugarcane.
- **Vegetation:** Tropical dry deciduous and thorn forests.

##### Central Highlands (Malwa) and Gujarat Plains, Hot Subhumid (Dry) Eco-Region

- **Location:** Central highlands (Malwa), Gujarat plains, Kathiawar, Madhya Pradesh, Rajasthan.
- **Coverage:** 5.4% of India's total geographical area.
- **Climate:** Hot, wet summers, dry winters, annual rainfall from 500 to 1000 mm.
- **Soil and Terrain:** Gently sloping deep loamy to clayey black soils.
- **Agriculture:** Rainfed with sorghum, pearl millet, pigeonpea, groundnut, soybean, maize, and pulses. Cotton, sugarcane, and wheat where feasible.
- **Vegetation:** Dry deciduous forest.

##### Deccan Plateau, Hot Semi-Arid Eco-Region

- **Location:** Central and western Maharashtra, northern Karnataka, and western Andhra Pradesh.
- **Coverage:** 9.5% of India's total geographical area.
- **Climate:** Hot, humid summers, mild dry winters, annual rainfall from 600 to 1000 mm.
- **Soil and Terrain:** Loamy and clayey soils.
- **Agriculture:** Rainfed with sorghum, pigeonpea, pearl millet, groundnut. Cotton and groundnut in irrigated areas.
- **Vegetation:** Tropical dry deciduous and thorn forests.

##### Deccan Plateau (Telangana) and Eastern Ghats, Hot Semiarid Eco-Region

- **Location:** Telangana, parts of Andhra Pradesh.
- **Coverage:** 5.2% of India's total geographical area.

- **Climate:** Hot, moist summers, mild dry winters, annual rainfall from 600 to 1100 mm.
- **Soil and Terrain:** Black cotton soils and Red soils.
- **Agriculture:** Rainfed with millets, pulses, and groundnut.
- **Vegetation:** Tropical dry deciduous and thorn forests.

### **Eastern Ghats and Tamil Nadu Uplands and Deccan (Karnataka) Plateau, Hot Semiarid Eco-Region**

- **Location:** Eastern Ghats, Tamil Nadu uplands, and western Karnataka.
- **Coverage:** 5.8% of India's total geographical area.
- **Climate:** Hot, semi-arid, annual rainfall from 600 to 1000 mm.
- **Soil and Terrain:** Loamy and clayey soils.
- **Agriculture:** Rainfed with millets, pulses, groundnut; rice, sugarcane, cotton in irrigated areas.
- **Vegetation:** Tropical dry deciduous and thorn forests.

### **Northern Plain, Hot Subhumid (Dry) Eco-Region**

- **Location:** Northern Indo-Gangetic Plain and western Himalayan piedmont.
- **Coverage:** 3.7% of India's total geographical area.
- **Climate:** Hot summers, cool winters, annual rainfall from 1000 to 1200 mm.
- **Soil and Terrain:** Deep and loamy soils on alluvium.
- **Agriculture:** Rice, maize, barley, pigeonpea, and jute in kharif; wheat, mustard, lentil in Rabi. Sugarcane, cotton where water is available.
- **Vegetation:** Tropical dry deciduous forests.

### **Central Highlands (Malwa and Bundelkhand), Hot Subhumid (Dry) Eco-Region**

- **Location:** Malwa plateau, Bundelkhand uplands, Narmada valley, Vindhyan scarplands.
- **Coverage:** 5.8% of India's total geographical area.
- **Climate:** Hot summers, cool winters, annual rainfall from 1000 to 1500 mm.
- **Soil and Terrain:** Loamy Red and Black soils.
- **Agriculture:** Rainfed with sorghum, pigeonpea, soybean; wheat, mustard, gram in irrigated areas.
- **Vegetation:** Tropical moist deciduous forest.

### **Chattisgarh/ Mahanadi Basin Agro-Eco-Region**

- **Location:** The Chattisgarh/Mahanadi Basin Agro-Eco-Region is situated in the eastern plateau, covering the regions of Chhattisgarh and the southwest highlands of Bihar.
- **Coverage:** This region encompasses an area of 14.1 million hectares, representing 4.3% of the total geographical area of the country.
- **Climate:** The climate of this area is characterized by hot summers and cool winters.
- Annual rainfall ranges between 1200 to 1600 mm, with 70-80% received between July and September.
- **Soil and Terrain:** The region's soil comprises red and yellow soils.

- **Agriculture:** Traditional rainfed agriculture is practiced here, with a focus on crops like rice, millets, pigeonpea, moong (green peas), and blackgram (urid) during the kharif season. In some areas, wheat and rice are cultivated under irrigated conditions during the Rabi season.
- **Vegetation:** The natural vegetation in this region primarily consists of tropical moist deciduous forest.

### **Eastern Plateau (Chhotanagpur) and Eastern Ghats, Hot Subhumid Eco-Region**

- **Location:** Chhotanagpur Plateau of Bihar, western parts of West Bengal, the Eastern Ghats (Dandakaranya and Garhjat hills) in Odisha, and the Bastar Region of Chhattisgarh.
- **Coverage:** It occupies an area of 26.8 million hectares, representing 8.2% of the total geographical area of the country.
- **Climate:** The climate is characterized by hot summers and cool winters. Annual rainfall ranges from 1000 to 1600 mm.
- **Soil and Terrain:** Soils in the region are typically fine loamy to clayey, non-calcareous, slightly to moderately acidic. The terrain includes ridges, plateaus, and valleys.
- **Agriculture:** Traditional rainfed farming is practiced with cultivation of rice, pulses (moong, blackgram, and pigeonpea), and groundnut during the kharif season. In the Rabi season, rice and wheat are predominantly grown under irrigated conditions.
- **Vegetation:** The natural vegetation comprises tropical dry and moist deciduous forests.

### **Eastern Plain, Hot Subhumid (Moist) Eco-Region**

- **Location:** Northeastern Uttar Pradesh and northern Bihar, including the foothills of the Central Himalayas.
- **Coverage:** It occupies an area of 11.1 million hectares, representing 3.4% of the total geographical area of the country.
- **Climate:** The region experiences hot, wet summers and cool, dry winters. Annual rainfall falls within the range of 1400-1800 mm.
- **Soil and Terrain:** The soils in the area are represented by level to very gently sloping alluvium-derived soils.
- **Agriculture:** Rainfed agriculture is common with the cultivation of rice, maize, pigeonpea, and moong during the kharif season.
- In the post-rainy (Rabi) season, crops like wheat, lentil, pea, sesame, and groundnut are grown on residual soil moisture with some protective irrigation.
- Cash crops such as sugarcane, tobacco, chillies, turmeric, coriander, and potatoes are grown with supplemental irrigation.
- **Vegetation:** The natural vegetation includes tropical moist deciduous and dry deciduous forests.

### **Western Himalayas, Warm Subhumid (To Humid With Inclusion of Perhumid) Eco-Region**

## Prelims GS Roundup-3

- **Location:** Jammu and Kashmir, Himachal Pradesh, and the northwestern hilly areas of Uttar Pradesh.
- **Coverage:** It encompasses an area of 21.2 million hectares, representing 6.3% of the total geographical area of the country.
- **Climate:** The region features a range of climates, from warm sub-humid to cool humid, including some humid and perhumid pockets. It experiences mild summers and cold winters, with rainfall varying from 1000 to 2000 mm.
- **Soil and Terrain:** The major soils occurring in the region range from shallow to deep, with medium texture and high organic matter content. They are classified as Brown Forest and Podzolic Soils.
- **Agriculture:** Rainfed farming is the traditional practice, with common crops including wheat, millet, maize, and rice. Terraced uplands are cultivated for paddy and horticultural plantation crops such as apples.
- **Vegetation:** The natural vegetation comprises Himalayan moist temperate, subtropical pine, and sub-alpine forests.

### Assam and Bengal Plain, Hot Subhumid To Humid (With Inclusion of Perhumid) Eco-Region

- **Location:** Parts of the States of Assam and West Bengal, including the plains of the Brahmaputra and the Ganga Rivers.
- **Coverage:** It occupies an area of 12.1 million hectares, representing 3.7% of the total geographical area of the country.
- **Climate:** The climate is characterized by hot summers and mild to moderately cool winters. The intensity of precipitation increases in northern and eastern parts, such as the Bengal basin and Teesta Brahmaputra Plain, compared to the southern parts like the Ganga Plain.
- **Soil and Terrain:** The region features a variety of alluvium-derived soils.
- **Agriculture:** Owing to high rainfall, a rice-based cropping system is common in the Brahmaputra, Teesta, and Ganga Plains.
- Major crops grown include rice and jute during the rainy season under rainfed conditions. In the northern foothills of the eastern Himalayas, plantation crops like tea and horticultural crops such as pineapple, citrus, and banana are grown.
- **Vegetation:** The natural vegetation comprises tropical moist and dry deciduous forests.

### Eastern Himalayas, Warm Perhumid Eco-Region

- **Location:** Northern hilly areas of West Bengal, northern parts of Assam, Arunachal Pradesh, and Sikkim States.
- **Coverage:** It covers an area of 9.6 million hectares, accounting for 2.9% of the country's total geographical area.
- **Climate:** The region experiences a warm summer and cool winter. Annual rainfall averages 2000 mm.
- A short period of water stress occurs during the post-rainy season due to seasonal water deficit. It has the longest Length of Growing Period (LGP) lasting more than 270 days annually.

- **Soil and Terrain:** Dominant soils range from shallow to moderately shallow, loamy, brown forest soil to deep, organic matter-rich soils with moderate to low base status.
- **Agriculture:** Traditional farming practices include Jhum cultivation with mixed cropping on steep slopes under rainfed conditions every 3-4 years.
- Millets are cultivated on upland terraces, while rice, maize, millets, and potatoes are grown in valleys. Horticultural crops like pineapple, citrus, apple, pear, peach, banana, and medicinal plants are grown on terraces.
- **Vegetation:** Natural vegetation consists of subtropical pine forests and temperate wet evergreen forests, sub-alpine forests, etc.

### North-Eastern Hills (Purvanchal), Warm Perhumid Eco-Region

- **Location:** The hilly States of Nagaland, Meghalaya, Manipur, Mizoram, and southern Tripura.
- **Coverage:** It covers an area of 10.6 million hectares, accounting for 3.3% of the country's total geographical area.
- **Climate:** The agro-climate is characterized by a warm summer and cool winter. Annual precipitation varies from 2000 to 3000 mm. The Length of Growing Period (LGP) exceeds 270 days annually.
- **Soil and Terrain:** Major soil formations include shallow to very deep, loamy, red and lateritic soils, as well as red and yellow soils.
- **Agriculture:** Jhum cultivation is the traditional farming practice. Rice is the dominant crop grown in valleys and on hill terraces. Millets, maize, and potatoes are cultivated on terraces at higher altitudes.
- Rice and jute are grown in small areas under rainfed conditions. Hill terraces are also used for plantation crops such as tea, coffee, rubber, and horticultural crops like oranges and pineapples.
- **Vegetation:** Natural vegetation comprises wet evergreen and tropical moist deciduous forests.

### Eastern Coastal Plain, Hot Subhumid To Semi-arid Eco-Region

- **Location:** It extends from Kanyakumari to the Gangetic Delta in the southeast.
- **Coverage:** The region covers an area of 8.5 million hectares, representing 2.6% of the country's total geographical area.
- **Climate:** The Eastern Coast, extending from Kanyakumari to the Gangetic Delta, experiences a wide range of climate conditions. The region's climate is marked by significant variations in rainfall.
- The coastal parts between Kanyakumari and south of Thanjavur (Tamil Nadu) and north of Madras to West Godavari (Andhra Pradesh) receive rainfall of 900 to 1100 mm, with about 80% in October to December.
- **Agriculture:** Both rainfed and irrigated agriculture are practiced in the region. The primary crop is rice, cultivated in both kharif and Rabi seasons.

- Coconut is a dominant plantation crop in the region. In some areas, pulses like black gram and lentils, as well as oilseed crops like sunflower and groundnuts, are cultivated after rice.
- Coastal and brackish water fisheries are essential economic activities for the coastal population.

### Western Ghats and Coastal Plain, Hot Humid-Perhumid Eco-Region

- **Location:** It includes the Sahyadris, western coastal plains of Maharashtra, Karnataka, and Kerala States, and Nilgiri hills in Tamil Nadu.
- **Coverage:** It occupies an area of 11.1 million hectares, representing 3.6% of the country's total geographical area.
- **Climate:** The climate is characterized by hot and humid summers and warm winters. The mean annual temperature varies between 25°C and 28°C.
- The mean annual rainfall exceeds 2000 mm in most areas. The region has a longer Length of Growing Period (LGP) ranging from 150 to more than 210 days annually.
- **Soil and Terrain:** Major soils include Red and Lat-eritic Soils along the leeward flank of the Sahyadris and alluvium-derived soils in the coastal plains.
- **Agriculture:** Intensive cultivation of rice, tapioca, coconut, and spices is done.
- **Vegetation:** Natural vegetation comprises tropical moist deciduous forests.

### Islands of Andaman-Nicobar and Lakshadweep, Hot Humid To Perhumid Island Eco-Region

- **Location:** Andaman and Nicobar Islands in the east and the Lakshadweep Islands in the west.
- **Coverage:** It covers an area of 0.8 million hectares, representing 0.3% of the country's total geographical area.
- **Climate:** The climate is typified by tropical conditions with little difference between mean summer and mean winter temperatures. Annual rainfall varies from 1600 to 3000 mm, with the Lakshadweep Islands having a humid climate and the Andaman-Nicobar group of Islands having a per-humid climate.
- **Soil:** Andaman and Nicobar Islands have medium to very deep, Red loamy soils, including marine alluvium-derived soils along the coast. The Lakshadweep Group of Islands has highly calcareous and sandy soils.
- **Vegetation:** Natural vegetation comprises tropical rain (evergreen) and littoral and swamp forests.
- **Agriculture:** Land use is dominated by plantation crops like coconut, areca nut, oil palm, and inter-cultivation of pineapple, tapioca, and pepper.
- In Lakshadweep, rice is mainly grown under lowland conditions, and coconut is the main plantation crop with high yields.
- Marine fishery is an important means of subsistence for the people in addition to agriculture.

## Indian Monsoon and Rainfall Pattern

*The Indian monsoon, often simply referred to as the monsoon, is a seasonal wind and weather pattern that brings significant amounts of rainfall to the Indian subcontinent. It is one of the most crucial climate phenomena for India and the surrounding regions.*

### Indian Monsoon and its Development

#### Onset of Monsoon

- **Shift of ITCZ:** The Inter Tropical Convergence Zone (ITCZ) is a region of low pressure near the equator. It moves north and south of the equator following the apparent path of the Sun. In June, as the Sun's vertical rays move over the Tropic of Cancer, the ITCZ shifts northward.
- **Crossing of Trade Winds:** During this shift, the south-east trade winds of the southern hemisphere cross the equator and change their direction to blow from the southwest to the northeast. This change in direction is influenced by the Coriolis force.
- **Moisture Collection:** As these winds traverse the warm Indian Ocean, they collect moisture, becoming laden with humidity.
- **Position of ITCZ in July:** By July, the ITCZ is typically positioned at 20°-25°N latitude, over the Indo-Gangetic Plain. It is then referred to as the Monsoon Trough.
- **Withdrawal of Westerly Jet Stream:** The westward jet stream that was located south of the Himalayas withdraws from the region. This withdrawal is an essential precursor for the arrival of the monsoon.
- **Eastern Jet Stream (Somali Jet):** The eastern jet stream, known as the Somali Jet, establishes itself at approximately 15°N latitude after the western jet stream has withdrawn. This easterly jet stream plays a crucial role in triggering the monsoon's onset in India.
- **Two Monsoon Branches:** The approaching monsoon winds split into two branches as they reach the Indian landmass:
  - ✓ **Arabian Sea Branch:** Originating over the Arabian Sea.
  - ✓ **Bay of Bengal Branch:** The Arakan Hills along the Myanmar coast divert a substantial portion of this branch towards India. Consequently, West Bengal and Bangladesh receive monsoon winds from the south and southeast, rather than the southwest.
- **Breaks in Monsoon:** The monsoon is characterized by periods of rainfall followed by rainless intervals, known as 'breaks' in the monsoon. These breaks are related to the movement of the monsoon trough, resulting in fluctuations in rainfall.

#### Retreating Monsoon Season

- **Clear Skies and Rising Temperatures:** During this period, there are clear skies, and temperatures start to increase.



## Prelims GS Roundup-3

- **Moist Land:** The land remains moist from the preceding monsoon rains.
- **Oppressive Weather:** The combination of high temperatures and humidity can lead to oppressive weather, often referred to as the 'October heat.'
- **Temperature Decline:** In the latter half of October, temperatures begin to decrease, especially in northern India.
- **Dry Conditions in North India:** North India experiences dry weather during this season.
- **Rain in Eastern Peninsula:** In contrast, the eastern part of the Indian Peninsula, particularly in October and November, receives rainfall. These two months are the rainiest of the year in this region.
- **Cyclonic Depressions:** The rainfall in the eastern Peninsula is associated with the passage of cyclonic depressions. These depressions originate over the Andaman Sea and cross the eastern coast of the southern Peninsula. They have the potential to be highly destructive.
- **Significance for the Coromandel Coast:** The Coromandel Coast receives a significant portion of its annual rainfall from these depressions and cyclones.
- **Importance of Northeast Monsoon:** Unlike the rest of India, which receives its primary rainfall during the southwest monsoon season from June to September, the northeast monsoon is crucial for agriculture and water security in the southern regions of the country.

### Factors Influencing South-west Monsoon

- **Differential Heating and Cooling:** The land and water experience differential heating and cooling during the year. In summer, the landmass of India heats up rapidly, creating a low-pressure area, while the surrounding seas maintain higher pressure. This temperature contrast is a key driver of the monsoon.
- **Inter Tropical Convergence Zone (ITCZ):** The ITCZ is a broad trough of low pressure near the equator where the northeast and southeast trade winds converge. During the summer, it shifts northward to the Ganga plain, around 5°N of the equator, and is known as the monsoon trough. This northward movement is associated with the monsoon's onset.
- **High-Pressure Area over the Indian Ocean:** East of Madagascar, approximately at 20°S over the Indian Ocean, a high-pressure area exists. The intensity and position of this high-pressure zone influence the Indian monsoon. Changes in this area can affect monsoon dynamics.
- **Tibetan Plateau:** The Tibetan plateau gets intensely heated during summer, leading to the formation of strong vertical air currents and a low-pressure system over the plateau, situated at about 9 km above sea level. This low-pressure region has a role in drawing in the monsoon winds.
- **Westerly and Easterly Jet Streams:** The movement of the westerly jet stream to the north of the Himalayas and the presence of the tropical easterly jet stream over the

Indian peninsula during summer are significant. These jet streams affect the direction and intensity of monsoon winds.

- **Tropical Easterly Jet:** Also known as the African Easterly Jet, this high-altitude wind pattern can influence the monsoon's progress, especially in the later stages.
- **Southern Oscillation (SO):** The Southern Oscillation refers to the periodic changes in pressure conditions between the tropical eastern south Pacific Ocean and the eastern Indian Ocean. In normal years, the tropical eastern south Pacific Ocean experiences high pressure, while the eastern Indian Ocean has low pressure.

### Rainfall Pattern in India

#### High Rainfall Areas

- The regions with the highest annual rainfall include the west coast of India, particularly along the Western Ghats, as well as the sub-Himalayan areas in the northeast and the hills of Meghalaya.
- In these areas, annual rainfall exceeds 200 cm, and some parts of the Khasi and Jaintia hills receive exceptionally high rainfall, exceeding 1,000 cm.
- The Brahmaputra valley and its adjacent hills also receive less than 200 cm of rainfall.

#### Medium Rainfall Areas

- Areas with moderate rainfall, ranging from 100 to 200 cm.
- They are found in the southern parts of Gujarat, eastern Tamil Nadu, the northeastern Peninsula encompassing Odisha, Jharkhand, Bihar, eastern Madhya Pradesh, the northern Ganga plain along the sub-Himalayan region, and the Cachar Valley and Manipur.

#### Low Rainfall Areas

- Regions with relatively lower annual rainfall, ranging from 50 to 100 cm.
- It includes western Uttar Pradesh, Delhi, Haryana, Punjab, Jammu and Kashmir, eastern Rajasthan, Gujarat, and the Deccan Plateau.

#### Inadequate Rainfall Areas

- Some parts of the Indian Peninsula, notably in Andhra Pradesh, Karnataka, and Maharashtra, along with Ladakh and most of western Rajasthan receive inadequate annual rainfall measuring below 50 cm.

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## Management of Floods in India

*Flood management refers to the planning, preparation, and implementation of strategies and measures aimed at reducing the adverse impacts of floods on human lives, property, and the environment.*

### Policies for Flood Management in India

#### Policy Statement (1954)

- Following the unprecedented floods of 1954, the Union Minister for Planning, Irrigation and Power, placed

before the Parliament, two statements namely “Floods in India - Problems and Remedies” and “The Floods in the Country”.

- The objective unequivocally set, in the policy statements, was to rid the country from the menace of floods by containing and managing floods and thus solving the problem.

### **High Level Committee on Floods – 1957 & Policy Statement of 1958**

- Some of their important recommendations were -
  - ✓ Flood plain zoning, flood forecasting and warning, and like measures should, therefore, be given due importance, particularly as these do not require large capital investment.
  - ✓ Flood control schemes should fit in with other water related plans to the extent feasible.
  - ✓ Future multi-purpose project should consider flood control aspects simultaneously.
  - ✓ Effects of embankments on river regime be considered, before approving such proposals.
  - ✓ Priorities for soil conservation work relating to flood control should be as under: - Catchment areas of multi-purpose dams; Himalayas with their foothills; Indo-Gangetic plain; and Deccan plateau.

### **National Flood Commission – 1980**

- The report submitted by the Commission contained a total of 207 recommendations covering the entire gamut of flood problem in the country.
- Some of the important recommendations are given below.
  - ✓ Data collection for providing information on their long term performance and their impact on various socio-economic factors.
  - ✓ Legislation and enforcement by States to prevent unauthorized river bed cultivation and encroachments into drains etc.
  - ✓ Separate reporting of flood damage for (i) Unprotected areas (ii) Protected areas and (iii) Areas situated between the embankments.
  - ✓ Legislation for management of flood plains.
  - ✓ A comprehensive dynamic and flexible approach to the problem of floods as a part of a comprehensive approach for the utilization of land and water resources.

### **Expert Committee to Review the Implementation of the Recommendations of National Flood Commission-2003 (R Rangachari Committee)**

- An Experts Committee under the Chairmanship of Shri R Rangachari was set up by Ministry of Water Resources, Government of India, in October 2001 to review the implementation of recommendations of National Flood Commission.
- The Committee suggested emphasis on 25 recommendations.

### **National Water Policy (1987/2002/2012)**

- The Government of India while framing policy has laid

significant emphasis on the management of floods which gets reflected in the National Water Policy as under :

- ✓ The National Water Policy (1987) adopted by the National Water Resources Council, inter alia, recommended that “adequate flood cushion should be provided in water storage projects wherever feasible to facilitate better flood management”.
- ✓ While it recognized that “physical flood protection works like embankments and dykes will continue to be necessary”, it laid emphasis on adoption of non-structural measures for the minimization of losses, such as flood forecasting and warning and flood plain zoning etc.
- The National Water Policy of 2002 adopted by the National Water Resources Council inter alia recommended the following guiding principles:
  - ✓ There should be a master plan for flood control and management for each flood prone basin.
  - ✓ Adequate flood cushion should be provided in water storage projects, wherever feasible, to facilitate better flood management. In highly flood prone areas, flood control should be given overriding consideration in reservoir regulations policy even at the cost of sacrificing some irrigation or power benefits.
  - ✓ While physical flood protection works like embankments and dykes will continue to be necessary, increased emphasis should be laid on non-structural measures such as flood forecasting and warning, flood plain zoning and flood proofing for the minimization of losses and to reduce the recurring expenditure on flood relief.
- The National Water Policy (2012) emphasised on artificial recharge of groundwater, water conservation in house and traditional conservation programme with rooftop conservation, desalination of salty water in the coastal region to convert it into freshwater using low-temperature technique and conventional methods of recharging groundwater.

### **General Flood Management Measures in India**

#### **Engineering/ Structural Measures**

- **Reservoirs:** Reservoirs can moderate the intensity and timing of the incoming flood. They store the water during periods of high discharges in the river and release it after the critical high flow condition is over, so as to be ready to receive the next wave.
- **Detention Basins:** They are usually formed by utilizing natural depressions/ swamps and lakes by improving their capacity by constructing encircling embankments and providing suitable devices for regulating the release of stored waters.
- **Embankments:** Embankments (including ring bunds and town protection works) confine the flood flows and prevent spilling, thereby reducing the damage. These are generally cheap, quick and most popular method of flood protection.

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- **Channelisation of Rivers:** It helps in tackling the extensive meandering problems of the rivers, activating navigational channels and training these rivers into their original courses.
- **Channel Improvement:** The method of improving the channel by improving the hydraulic conditions of the river channels by desilting, dredging, lining etc., to enable the river to carry its discharges at lower levels or within its banks has been often advocated but adopted on a very limited extent because of its high cost and other problems.
- **Drainage Improvement:** Surface water drainage congestion due to inadequacy of natural or artificial drainage channels to carry the storm water discharge within a reasonable period causes damages.
- **Diversion of Flood Waters:** Diversion of flood waters takes a part of the flood discharge to another basin or to the same basin downstream of the problem area or to a depression where it could be stored for subsequent release.
- **Watershed Management:** The watershed management measures include developing and conserving the vegetative and soil covers and also to undertake structural works like check-dams, detention basins, diversion channels, etc.

### Administrative / Non-Structural Measures

- **Evacuation:** Facilitating timely evacuation of the people and shifting of their movable property to safer grounds by having advance warning of incoming flood i.e. flood forecasting, flood warning in case of threatened inundation
- **Preventing Construction:** Discouraging creation of valuable assets/settlement of the people in the areas subject to frequent flooding, i.e., enforcing flood plain zoning regulation.
- **Flood Plain Zoning:** Flood-plain zoning is a concept central to flood plain management. This concept recognises the basic fact that the flood plain of a river is essentially its domain and any intrusion into or developmental activity therein must recognise the river's 'right of way'.
- **Flood Proofing:** Flood proofing measures adopted in India in the past consisted in raising a few villages above pre-determined flood levels and connecting them to nearby roads or high lands.
- **Flood Forecasting:** The work of flood forecasting and warning in India is entrusted with the Central Water Commission (CWC). Presently, there are 878 Hydrological and Hydro-meteorological sites being operated by CWC across the country covering 20 river basins for gauge, discharge, sediment & water quality observations.

## Western Disturbances

*Western disturbances, as defined by the India Meteorological Department (IMD), are weather systems that form in the Caspian or Mediterranean Sea regions. These disturbances are categorized as extra-tropical storms originating in the*

*Mediterranean. They are characterized by low-pressure areas that result in the occurrence of unexpected rainfall, snowfall, and fog in northwest India.*

### Formation

- Western Disturbance originates in the Mediterranean Sea. It is triggered by the movement of cold air from the Polar Regions into an area with relatively warmer air and significant moisture.
- This transition occurs due to the presence of a high-pressure system over regions like Russia and neighbouring countries.
- As this shift from cold to warm air takes place, it leads to the formation of an extratropical depression over the sea, creating favourable conditions for upper-level cyclogenesis.
- The term "extra-tropical storm" implies a low-pressure system. These systems are considered "extra-tropical" because they are outside the tropics.
- The label "extra-tropical" is applied to Western Disturbances because they have their origins in extra-tropical regions.
- These weather systems gradually progress across the Middle East, moving from Iran, Afghanistan, and Pakistan before reaching the Indian subcontinent.

### Western Disturbance: Impact in India

- Western disturbances, while bringing rainfall, also pose challenges such as soil erosion.
- Northern regions of India, where rainfall is sporadic and population density is high, often witness the erosion of the topsoil due to these disturbances.
- These disturbances are responsible for prolonged cloud cover and elevated night temperatures.
- During heavy rainfall, especially when accompanied by thick fog and mist, crops can suffer significant damage.
- Furthermore, intense downpours can trigger substantial landslides and even avalanches in the area.
- Western disturbances are a crucial source of rain for India's northern regions, but they are also associated with a unique and somewhat detrimental environmental phenomenon.
- Their impacts encompass alterations in local climate, effects on crop growth, soil erosion, and other factors.
- Consequently, while these disturbances are integral to India's environmental system, their adverse consequences are more pronounced, particularly because the country primarily experiences non-monsoonal precipitation.
- In North-West India, Western Disturbances are the primary source of winter and pre-monsoon rainfall. Overcast skies, higher night-time temperatures, and atypical rainfall are commonly associated with these weather patterns.
- It is estimated that Western Disturbances contribute to around 5-10% of India's total annual rainfall.

- During the winter season, western winds over the Indian subcontinent bring substantial rain to low-lying areas and heavy snow to mountainous regions.
- While the southwest monsoon covers most of India, it doesn't provide significant rainfall to certain parts of northern India. These regions rely on snow and rain from Western Disturbances between November and March.
- Winter precipitation plays a crucial role in agriculture, particularly for rabi crops like wheat, which holds great importance for India. These crops begin to deteriorate after the winter season.
- In the months of April and May, Western Disturbances traverse North India and occasionally contribute to the onset of the monsoon in some northwest regions.
- Western Disturbances can sometimes bring dense cloud cover and substantial rainfall during the monsoon season. Weak Western Disturbances in North India are associated with water shortages and crop failures.
- Harnessing the potential of strong Western Disturbances can help residents, farmers, and governments mitigate various issues related to water scarcity.

## Structure and Relief Features of Peninsular India

*The Peninsular plateau is a tableland of crystalline, igneous, and metamorphic rocks from the past. The plateau is characterized by vast and shallow valleys and rounded hills. The Central Highlands and the Deccan Plateau are the two major sections of this plateau.*

### Major Structural and Relief Features

#### Geographical Extent

- The peninsular upland encompasses approximately 16 lakh square kilometers.
- It forms the largest physiographic division in India.
- The region takes the shape of an irregular triangle, with its base stretching from the Delhi Ridge to the Rajmahal Hills and its apex located at Kanyakumari.

#### Boundaries

- To the northwest, it is bounded by the Aravalli Range.
- In the north, it extends to the Maikal Range.
- In the north-east, its boundaries include the Hazaribagh and Rajmahal Hills.
- The western boundary is demarcated by the Western Ghats (Sahyadri Mountains).
- The eastern boundary is marked by the Eastern Ghats.

#### Elevation and Peaks

- The general elevation of the region ranges from 600 to 900 meters above sea level.
- The highest peak in the Peninsular Uplands is Anai-Mudi, located in the Nilgiris, which rises to an elevation of 2,695 meters.

### Physiographic Units

- The peninsular upland has been categorised into the following eight macro-physiographic units, each with its unique characteristics:
- **Central Highlands**
  - ✓ **Location:** Central part of the Peninsular Uplands.
  - ✓ **Key Features:** Rolling plateaus, dissected by rivers, and rich in mineral resources.
- **Deccan Plateau**
  - ✓ **Location:** Large portion of central and southern India.
  - ✓ **Key Features:** Vast plateau with lava plateaus, black soils, and numerous hills and ridges.
- **Malwa Plateau**
  - ✓ **Location:** North-central India.
  - ✓ **Key Features:** Rolling topography, fertile soils, and historical significance.
- **Chotanagpur Plateau**
  - ✓ **Location:** Eastern part of the Peninsular Uplands.
  - ✓ **Key Features:** Rich in minerals, undulating landscape, and known for its tribal population.
- **Meghalaya Plateau**
  - ✓ **Location:** Northeastern region.
  - ✓ **Key Features:** Abundant rainfall, cave systems, and known for its biodiversity.
- **Western Ghats**
  - ✓ **Location:** Western boundary of the Peninsular Uplands.
  - ✓ **Key Features:** Biodiversity hotspots, high rainfall, and lush forests.
- **Eastern Ghats**
  - ✓ **Location:** Eastern boundary of the region.
  - ✓ **Key Features:** Rolling hills, coastal plains, and rich in mineral resources.
- **Cardamom Hills**
  - ✓ **Location:** Southern part of the Western Ghats.
  - ✓ **Key Features:** Known for spice cultivation, lush forests, and biodiversity.

### The Central Highlands

- The central highlands of peninsular India encompass several prominent features, including the Aravallis, the Malwa Plateau, and the Vindhyan Range.
- **The Aravallis**
  - ✓ The Aravalli Range extends over approximately 800 kilometers, running from the northeast to the southwest, spanning from Delhi to Palanpur in Gujarat.
  - ✓ It holds the distinction of being one of the world's oldest fold mountain ranges.
  - ✓ Due to extensive erosion, its highest peak, known as Guru Sikhar, reaches a modest height of 1,722 meters.
  - ✓ The geological composition of the Aravallis primarily consists of quartzites, gneisses, and schists from the Precambrian era.
  - ✓ To the northwest of Udaipur, the Aravallis are referred to as the Jarga Hills, with a peak known as Mount Abu (1,431 meters).



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- ✓ The Gurushikar region is separated from Mount Abu by the Goranghat Pass.
- ✓ The Great Boundary Fault (GBF) serves as the demarcation line between the Aravallis and the Vindhyan Mountains.
- **The Malwa Plateau**
  - ✓ The Malwa Plateau is flanked by the Aravallis to the north, the Vindhyan Range to the south, and the Bundelkhand Plateau to the east.
  - ✓ This plateau features two distinct drainage systems.
  - ✓ The first one flows westward, emptying into the Arabian Sea through rivers such as the Narmada and Mahi.
  - ✓ The second system directs its flow eastward, ultimately joining the Yamuna River, and includes rivers like the Chambal, Sind, Betwa, and Ken.
- **The Vindhyan Range**
  - ✓ Stretching across a distance of approximately 1,050 kilometers, the Vindhyan Range extends from Jobat in Gujarat to Chittorgarh in Rajasthan and further east to Sasaram in Bihar.
  - ✓ This expansive range is characterized by an average elevation ranging from 450 to 600 meters.
  - ✓ It also includes the Kaimur Hills in the eastern section and features the Maikal Range as a connecting link between the Vindhyan and the Satpura mountains.
- **The Bundelkhand Plateau**
  - ✓ The Bundelkhand plateau is surrounded by natural boundaries, with the Yamuna River to the north, the Vindhyan to the south, the Chambal River to the northwest, and the Panna-Ajaigarh Range to the southeast.
  - ✓ This upland region encompasses various districts such as Banda, Hamirpur, Jalaun, Jhansi, and Lalitpur in Uttar Pradesh, along with Datia, Tikamgarh, Chhatarpur, and Panna in Madhya Pradesh.
  - ✓ The landscape here exhibits a mature or senile topography, marked by deep gorges, rapids, and waterfalls carved by rivers like Betwa, Dhasan, and Ken.
- **The Vindhychal-Baghelkhand (or Vindhychal) Plateau**
  - ✓ This plateau includes the regions of Satna and Rewa in Madhya Pradesh and Mirzapur in Uttar Pradesh.
  - ✓ The elevation within this plateau varies from 150 to 1,200 meters, creating an uneven terrain.
  - ✓ To the south, it is demarcated by the Narmada-Son trough, which serves as a rift valley characterized by geological features like the Archaeans and Bijwar series.
  - ✓ South of this trough, the eastward extension of the Satpura mountains is observed, featuring radial drainage patterns.
  - ✓ The Singrauli and Dudhi basins, situated among these rivers, possess an elevation ranging from 150 to 300 meters and are rich in coal deposits.
- ✓ The region is drained by the Narmada, Son, Karmansa, Tons, Ken, and Belandare rivers.
- **Satpura Range**
  - ✓ Running parallel to the Vindhyan, between the Narmada and Tapi rivers, is the Satpura Range.
  - ✓ The Satpura Range encompasses the Rajpipla Hills, Mahadev Hills, and the Maikal Range, with the highest peak being Dhupgarh, standing at an elevation of 1,350 meters, located near Pachmarhi.
- **The Chotanagpur Plateau**
  - ✓ The Chotanagpur Plateau extends across regions of West Bengal, Jharkhand, Chhattisgarh, Odisha, and the northeastern part of Andhra Pradesh.
  - ✓ Within this plateau, various meso and micro plateaus are distributed, encompassing areas such as Ranchi, Hazaribagh, Singhbhum, Dhanbad, Palamu, Santhal, Parganas, and Purulia districts of West Bengal.
  - ✓ The plateau is primarily composed of Archaean granite and gneiss rocks, interspersed with patches of Dharwar (mica-schists), the Damuda series from the Gondwana Period, and lava flows from the Cretaceous Period.
  - ✓ Furthermore, the Chhotanagpur Plateau consists of plateaus at different elevations, with the highest general elevation reaching around 1,100 meters in the mid-western part, known as pat lands.
  - ✓ The plateau is drained by several rivers, including the Barakar, Damodar, Subarnarekha, and Koels.
- **The Meghalaya Plateau and Mikir Hills**
  - ✓ The Meghalaya Plateau encompasses the Garo, Khasi, and Jaintia hills, along with the Mikir and Rengma hills situated on the periphery.
  - ✓ This plateau is a distinct geological formation separated from the Indian Peninsula by the Malda Gap.
  - ✓ The Meghalaya Plateau has undergone a complex evolutionary history, marked by periods of emergence, submergence, the development of planation surfaces, multiple phases of erosion, sedimentation, tectonic movements, and intrusions.
  - ✓ Shillong Peak stands as the highest point within the Meghalaya Plateau, soaring to an elevation of 1,823 meters, while the Garo Hills feature Nokrek, the highest peak, reaching 1,515 meters.
  - ✓ The Mikir Hills, situated independently from the Meghalaya Plateau, are encompassed by plains on three sides.
  - ✓ In the southern extent of the Mikir Hills lies the Rengma Hills, with an elevation of around 900 meters.
  - ✓ These Mikir Hills are characterized by a radial drainage pattern, and the primary rivers within this region are the Dhansiri and Jamuna.

### Coal Resources of India

Coal resources refer to the reserves of coal, which is a combustible black or brownish-black sedimentary rock composed primarily of carbon, along with various other elements like hydrogen, sulfur, oxygen, and nitrogen. These resources encompass deposits of coal that can be mined and utilized for various purposes, such as energy generation, industrial processes, and heating.

#### Types of Coals

- **Peat:** This is the precursor to coal and is not considered as true coal. It has low energy content and high moisture levels.
- **Lignite:** Also known as brown coal, lignite is a low-rank coal with relatively low energy content and high moisture levels. It is often used for electricity generation and industrial applications.
- **Sub-Bituminous Coal:** This type of coal has higher energy content than lignite and is used in electricity generation, particularly in power plants.
- **Bituminous Coal:** Bituminous coal is widely used for energy generation and industrial processes. It has higher energy content than sub-bituminous coal.
- **Anthracite:** Anthracite is the highest rank of coal and has the highest energy content. It is used for residential heating and certain industrial applications.

#### Coal Production in India

- In the year 2022-23, total production of raw coal in India was 893.190 MT whereas it was 778.210 MT in 2021-22, showing a growth of 14.77% over the previous year.
- In 2022-23, production of lignite was 44.990 MT against 47.492 MT in 2021-22, showing a negative growth of 5.27% over the year 2021-22.
- In the year 2022-23, production of coking coal was 60.760 MT whereas it was 51.702 MT in 2021-22, showing an increase of 17.52% compared to the previous year.
- In 2022-23, production of non-coking coal was 832.430 MT against 726.508 MT in 2021-22, showing a growth of 14.58 % over the previous year 2021-22.
- In the year 2022-23, production of washed coal (coking) was 5.313 MT against 4.700 MT in 2021-22, thus showcasing an increase of 13.04% over 2021-22.
- In 2022-23, production of middling (coking) was 3.740 MT against 2.442 MT in 2021-22, thus showing a growth of 53.15% over 2021-22.
- In 2022-23, Tamil Nadu was the largest producer of lignite and produced 22.480 MT (49.97%), followed by Gujarat 12.313 MT (27.37%) and Rajasthan 10.197 MT (22.67%).
- In the year 2022-23, Coal India Limited produced 703.204 MT (78.73%) and Singareni Collieries Company Limited (SCCL) produced 67.137 MT (7.52%) of coal.

- During this year, main producer of lignite was Neyveli Lignite Corporation that produced 24.491 MT (54.44%).
- Like previous years, in the year 2022-23, Jharkhand was the highest producer of coking coal and produced 60.418 MT, which was 99.44% of total coking coal production of 60.760 MT.
- As the highest non-coking coal producing state, Odisha produced 218.981 MT (26.31%) of coal, followed by Chhattisgarh 184.647 MT (22.18%) and Madhya Pradesh 145.934 (17.53%).
- Power sector continued to be the largest consumer of coal. In 2022-23, the dispatch of coal to power sector was 786.088 MT (89.60%) and other than the power sector, coal was mainly despatched to steel sector (13.826 MT, i.e., 1.56%), cement sector (8.119 MT, i.e., 0.93%), and sponge iron sector (8.059 MT, i.e., 0.92%), among others.
- In the year 2022-23, coal was mainly imported from Indonesia (109.828 MT), Australia (47.498 MT), Russia (21.342 MT), South Africa (17.445 MT), USA (13.692 MT), Singapore (10.074 MT) and Mozambique (9.174 MT).
- In the year 2022-23, export of coal was 1.163 MT compared to 1.316 MT in 2021-22. Coal was mainly exported to Nepal (0.833 MT) and Bangladesh (0.245 MT).

### Rare Earth Elements in India

Rare earth elements (REEs) are minerals that have unique magnetic, luminescent, and electrochemical properties and thus are used in many modern technologies, including consumer electronics, computers and networks, communications, health care, national defence, clean energy technologies, etc.

#### Characteristics of REEs

- Rare earth metals encompass a group of 17 elements, namely lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, scandium, and yttrium.
- These metals exhibit unique properties, including lustrous silvery-white appearance and soft, heavy characteristics.
- Due to their exceptional fluorescent, conductive, and magnetic attributes, they are highly valuable when combined in small quantities with more common metals like iron.
- It is worth noting that, aside from the highly unstable promethium, rare earth elements are relatively abundant in the Earth's crust.
- These elements are present in various minerals and can be extracted as by-products from processes involving phosphate rock and spent uranium leaching.

#### REEs in India

- In India, monazite serves as the primary source of rare earths and thorium.

## Prelims GS Roundup-3

- The rare earth elements contribute significantly to the Indian economy, with a combined value of nearly \$200 billion.
- India holds the world's fifth-largest reserves of rare earth elements, which are almost double those of Australia. However, it primarily imports its rare earth requirements in finished form from its geopolitical rival, China.
- Both Indian Rare Earths Ltd (IREL), a Government of India Undertaking, and KMML, a Kerala State Government Undertaking, play an active role in mining and processing beach sand minerals extracted from placer deposits.
- According to the Foreign Trade Policy of 2015-2020 and the current export-import regulations, there is a 'free' permission for the import of rare earth metals' ores and concentrates, as well as rare earth oxides, including rutile sand.
- 13.07 million tonnes in-situ monazite (containing ~55-60% total Rare Earth Elements oxide) resource occurs in the coastal beach placer sands in parts of Kerala, Tamil Nadu, Odisha, Andhra Pradesh, Maharashtra and Gujarat and in the inland placers in parts of Jharkhand, West Bengal and Tamil Nadu.
- More than 80 % of the usage of rare earths in value terms is in RE permanent magnets which require Magnetic REE, i.e., Neodymium, Praseodymium, Dysprosium and Terbium. These are precious REEs since they find use in energy transition initiatives.
- Dysprosium and Terbium are not available in extractable quantities in Indian reserves already under exploitation.
- In Indian deposits, only Neodymium and Praseodymium are available and are being extracted at up to 99.9 % purity level.
- Neodymium and Praseodymium occur in the BSM ore of Indian deposits to the extent of 0.0011 to 0.012%. Minability of REE is further constrained due to CRZ regulations, mangroves, forest and inhabitation.

### Global Reserves and Production of REEs

- Global estimates suggest that there are approximately 121 million tonnes of rare earth oxides (REO) in reserves worldwide.
- China stands out with the largest share, possessing around 44 million tonnes, followed by Brazil and Vietnam, each accounting for 18%, and Russia with 15%.
- China is the dominant producer of rare earths, contributing 140 thousand tonnes and covering approximately 90% of the world's production.
- Other significant producers include Australia, the USA, Russia, Malaysia, and Vietnam.
- Concentrates and partially processed intermediate products are further refined at various locations in Europe, the USA, Japan, and China.
- Notably, in 2019, the United States imported 80% of its rare earth minerals from China, while the European Union heavily relies on China for 98% of its supply.

- The demand for rare earths is primarily driven by countries involved in the manufacturing of high-tech products and components such as automotive catalyst systems, fluorescent lighting tubes, and display panels.
- Consequently, the primary demand is expected to originate from regions including Europe, the USA, Japan, China, and the Republic of Korea.

## Geographical Characteristics of the Eastern Ghats

*The Eastern Ghats is a discontinuous range of mountains along India's eastern coast, passing through Odisha and Andhra Pradesh to Tamil Nadu, touching parts of Karnataka and Telangana.*

### Major Geographical Characteristics

- The Eastern Ghats lie between latitudes of 11° 30' and 22° N and longitudes of 76° 50' to 86° 30' E, covering an area of around 75,000 square kilometres.
- The Eastern Ghats travel across Odisha, Andhra Pradesh, and Telangana before ending in Tamil Nadu in the south.
- Deomali, reaching an elevation of 1672 meters, holds the distinction of being the highest peak in Odisha.
- In Andhra Pradesh, Arma Konda, also known as Jindhagada Peak, soars to an impressive height of 1680 meters, claiming the title of the state's highest point.
- Among the Eastern Ghats, the BR (Biligiriranga) hill range in Karnataka stands as the loftiest range, with numerous peaks exceeding 1750 meters.
- Kattahi Betta, located within the BR Hills, boasts the honour of being the tallest mountain in the Eastern Ghats, with an elevation of 1822 meters.
- Thalamalai in Tamil Nadu ranks as the second tallest hill range.
- The Araku range secures its place as the third tallest hill range.

### Major Rivers Passing through Eastern Ghats

- **Brahmani River:** The Brahmani River is a major river in the eastern Indian states of Odisha and Jharkhand, with a total length of approximately 480 kilometers. It has several significant tributaries, including the Sankh, Koel, and Kharkai rivers. The confluence of the Kharkai and the Sankh rivers forms the main Brahmani River.
- **Godavari River:** The Godavari River is the second longest river in India after the Ganges, with a total length of about 1,465 kilometers. It forms one of the largest and most fertile river deltas in India, known as the Godavari Delta.
- This delta is located in Andhra Pradesh and is a major agricultural region.
- **Kaveri River:** The Kaveri River, also spelled as Cauvery, flows through Karnataka and Tamil Nadu. It is a crucial source of water for both states.

- **Krishna River:** The Krishna River originates in Maharashtra and flows through Karnataka, Telangana, and Andhra Pradesh. It covers a total distance of approximately 1,400 kilometers.
- **Mahanadi River:** The Mahanadi River originates in Chhattisgarh. It flows through Chhattisgarh and Odisha and eventually drains into the Bay of Bengal.
- **Subarnarekha River:** The Subarnarekha River serves as a natural boundary between Jharkhand and Odisha. It flows for approximately 395 kilometers.
- **Tungabhadra River:** The Tungabhadra River is formed by the confluence of the Tunga and Bhadra rivers at Koodli in Karnataka. The river flows near the historic town of Hampi, a UNESCO World Heritage Site known for its archaeological and cultural significance.
- **Tammileru River:** Tammileru is a tributary of the Krishna River, flowing through Andhra Pradesh.
- **Gundlakamma River:** The Gundlakamma River flows through the Prakasam and Guntur districts of Andhra Pradesh.
- **Pennai Yaru River:** The Pennaiyar River is a tributary of the Palar River, flowing through the states of Tamil Nadu and Andhra Pradesh.
- **Swarnamukhi River:** The Swarnamukhi River flows through Chittoor district of Andhra Pradesh, covering a distance of approximately 100 kilometers.
- **Kundu River:** The Kundu River flows through Andhra Pradesh, contributing to the region's water resources.
- **Vellar River:** The Vellar River is situated in Tamil Nadu, covering a distance of about 150 kilometers before joining the Bay of Bengal.

### Major Rivers Originating in Eastern Ghats

- **Baitarani River:** The Baitarani River is located in the eastern Indian states of Odisha and Jharkhand. It flows for approximately 225 kilometers before emptying into the Bay of Bengal.
- **Budhabalanga River:** The Budhabalanga River primarily flows through Odisha in eastern India. It covers a distance of about 175 kilometers.
- **Rushikulya River:** The Rushikulya River is known for its significant ecological importance as it hosts the mass nesting of olive ridley sea turtles. Thousands of sea turtles arrive at its shores for nesting. It is situated in Ganjam district of Odisha and flows into the Bay of Bengal.
- **Vamsadhara River:** The Vamsadhara River flows through Odisha and Andhra Pradesh in eastern India. Its total length is approximately 254 kilometers.
- **Palar River:** The Palar River originates in Tamil Nadu and flows through Andhra Pradesh before emptying into the Bay of Bengal.
- **Nagavali River:** The Nagavali River has numerous tributaries, including the Suvarnamukhi and Vottigedda rivers, which join the main river in Andhra Pradesh.
- **Champavathi River:** The Champavathi River is located in Andhra Pradesh. It flows for about 250 kilometers and drains into the Bay of Bengal.
- **Gosthani River:** The Gosthani River is a tributary of the Godavari River and flows through Andhra Pradesh.
- **Sarada River:** The Sarada River flows through Andhra Pradesh in southern India. It covers a distance of approximately 100 kilometers.
- **Sabari River:** The Sabari River is a major tributary of the Godavari River. It flows through Chhattisgarh, Odisha, and Andhra Pradesh.
- **Sileru River:** The Sileru River is known for the reservoirs formed by various dams along its course. The Machkund and Balimela reservoirs are significant in the region. It flows through Odisha and Andhra Pradesh, contributing to hydropower generation.

- **Penna River:** The Penna River is one of the major rivers in southern India, flowing through Karnataka and Andhra Pradesh.

### Factors Affecting Ocean Salinity

*Ocean salinity refers to the concentration of dissolved salts in seawater. It is typically measured in parts per thousand (ppt) or practical salinity units (psu). Ocean water contains a variety of dissolved inorganic salts, with sodium chloride (table salt) being the most abundant. Other common salts found in seawater include magnesium, calcium, potassium, and sulfate ions.*

#### Major Factors

- **Evaporation:** The salinity of surface ocean water is primarily influenced by the rate of evaporation. Higher evaporation rates result in greater salinity. For example, the Mediterranean Sea, with its high evaporation, has higher salinity levels.
- **Freshwater Influx:** In coastal areas, the flow of freshwater from rivers, and in the polar regions, freezing and thawing of ice significantly impact surface salinity.
- Higher freshwater input leads to lower salinity. For instance, at river mouths like the Amazon, Congo, and Ganga, etc. surface salinity is lower than the ocean's average.
- **Temperature and Density:** Salinity, temperature, and water density are interconnected. Changes in temperature or density affect the local salinity levels. Typically, regions with high temperatures also have higher salinity.
- **Ocean Currents:** Ocean currents play a vital role in the distribution of dissolved salts in seawater. Warm equatorial currents push salts away from eastern ocean margins and accumulate them near the western margins.
- Temperate region currents increase salinity along the eastern margins. For example, the Gulf Stream in the North Atlantic Ocean raises salinity levels on the western Atlantic margins.



## Prelims GS Roundup-3

- **Precipitation:** Precipitation and salinity have an inverse relationship. Areas with higher precipitation tend to have lower salinity levels.
- This is why the equatorial region, despite its heat, has lower salinity than the sub-tropics due to its heavy daily rainfall.
- **Atmospheric Pressure and Wind Direction:** Anti-cyclonic conditions, characterized by stable air and high temperatures, can increase ocean surface salinity.
- Winds play a role in redistributing salinity, moving saline waters to less saline areas, resulting in changes in salinity levels.

### Salinity of Oceans: Regional Distribution

- **Indian Ocean:** The Indian Ocean maintains an average salinity level of 35 parts per thousand. In the Bay of Bengal, where the Ganga River flows into it, salinity is relatively low, primarily due to the influence of freshwater input.
- **Arabian Sea:** In contrast, the Arabian Sea exhibits higher salinity levels, primarily because of increased evaporation and a limited inflow of freshwater.
- **Pacific Ocean:** Salinity in the Pacific Ocean varies mainly due to its vast area and unique shape. It doesn't follow a uniform pattern.
- **Atlantic Ocean:** Across the Atlantic Ocean, salinity levels range from 20 to 37 parts per thousand, varying by location.
- For instance, near the equator, there is significant rainfall, high humidity, cloud cover, and the calm air of the doldrums.
- **Polar Regions:** Polar regions experience minimal evaporation but receive substantial freshwater from ice melting, resulting in lower salinity levels ranging from 20 to 32 parts per thousand.
- **North Sea:** The North Sea, despite its higher latitude, has elevated salinity due to the influence of more saline water brought by the North Atlantic Drift.
- **Mediterranean Sea:** The Mediterranean Sea features higher salinity levels, attributed to high evaporation rates. Its surface waters have an average salinity of about 38 parts per thousand.
- **Baltic Sea:** The Baltic Sea maintains lower salinity due to the substantial influx of river waters and averages around 35 parts per thousand.
- **Black Sea:** Conversely, the Black Sea has very low salinity because of the massive freshwater input from rivers, with average levels ranging from 13 to 23 parts per thousand.

### Horizontal and Vertical Distribution of Salinity

#### Horizontal Distribution

- Salinity generally decreases from the equator towards the poles.

- It is worth noting that, despite the equatorial region experiencing high temperatures and evaporation, the highest salinity levels are rarely found there.
- This is because the equatorial zone also receives significant rainfall, which dilutes the salt content.
- As a result, the equator contributes only 35 percent to the overall salinity.
- The highest salinity levels are typically observed between 20° N and 40° N, where there are high temperatures, significant evaporation, and relatively low rainfall.
- In the southern hemisphere, an average salinity of 35 is found between latitudes 10° S and 30° S.
- Meanwhile, the zone between 40° and 60° latitudes in both the northern and southern hemispheres generally exhibits lower salinity, with levels around 31 in the northern hemisphere and 33 in the southern hemisphere.

#### Vertical Distribution

- The salinity of the ocean's surface can change due to the addition of freshwater or losses through processes like ice formation and evaporation.
- As a result, we observe both increasing and decreasing salinity trends with increasing depth.
- In high latitudes, salinity tends to increase with greater depth from 300 meters to 1000 meters.
- This is because denser water is typically found below, creating a positive relationship between salinity and depth within this range. However, beyond 1000 meters in depth, salinity remains relatively constant.
- Conversely, in low latitudes, there is a decrease in salinity between 300 and 1000 meters in depth, but it also stabilizes beyond 1000 meters.
- The region within the depth range of 300 meters to 1000 meters, where salinity experiences rapid changes (both increases and decreases), is known as the halocline.
- The uppermost layer of ocean water has the highest salinity, and as you go deeper, salinity tends to decrease.
- The boundary separating the upper zone with maximum salinity from the lower zone with minimum salinity is known as the halocline.
- On average, regions with low latitudes exhibit high salinity above the halocline, while regions with high latitudes have lower salinity.

### Causes and Consequences of Marine Pollution

*Marine pollution is the term used to describe the introduction of substances or agents, whether they are related to agricultural, industrial, or residential activities, such as waste materials, noise, excessive carbon dioxide, particulate matter, invasive species, and more, into aquatic environments, resulting in detrimental effects.*

### Causes

- **Ship or Cargo Discharge:** Ships can harm rivers and oceans in several ways, with oil spills being especially devastating. Polycyclic aromatic hydrocarbons (PAHs) found in crude oil are challenging to clean up and can persist in marine environments for extended periods.
- **Surface Runoff from Paved Areas:** Runoff from paved surfaces like parking lots and roads can alter water temperatures, potentially causing warm water discharges during the summer. If runoff carries pollutants into sewage systems and water bodies, it can lead to marine pollution.
- **Natural Occurrences:** Not all marine pollution is human-induced. Natural factors like geothermal vents, hot springs, and volcanic activity can raise water temperatures. Additionally, lightning can release heat into bodies of water, contributing to temperature fluctuations.
- **Pesticides and Herbicides:** These chemicals are used to control pests that can harm crop yields on agricultural land. When pesticides accumulate in soils, they can affect biological processes, enhance plant uptake, and harm soil organisms, leading to soil pollution.
- **Contaminants from Natural Sources:** Pollution can also occur when naturally occurring chemicals in soil and rocks dissolve in water. These chemicals can include iron, radionuclides, sulfates, manganese, fluorides, arsenic, and chlorides.

### Consequences

#### Harmful Impacts on Marine Species

- Marine animals are often the victims of ocean pollution. Oil spills, for example, can ensnare and suffocate these creatures by entering their gills.
- When oil permeates seabird feathers, it hinders their ability to fly and care for their young. Animals not killed by oil exposure may experience cancer, behavioural changes, and reproductive difficulties.
- Small plastic debris in the ocean is often mistaken for food by marine creatures or leads to entanglement and strangulation in discarded fishing nets and plastic bags.
- Species most vulnerable to harm from plastic pollution include dolphins, fish, sharks, turtles, seabirds, and crabs.

#### Depletion of Oxygen in Seawater

- The gradual degradation of excess debris in the ocean consumes oxygen, leading to reduced oxygen levels in seawater.
- Oxygen depletion in the ocean can result in the death of marine animals, including penguins, dolphins, whales, and sharks.
- Excessive nitrogen and phosphorus in seawater can also contribute to oxygen depletion, creating areas known as “dead zones” where marine life struggles to survive.

#### Threats to Human Health

- Ocean pollutants can find their way back to humans through the food chain.

- Toxins are ingested by small organisms and are subsequently consumed by larger predators, many of which are seafood that humans consume.
- Toxins deposited in human tissues due to contaminated animals can lead to long-term health issues, cancer, and birth defects.
- For instance, methylmercury, which is absorbed by phytoplankton in the ocean, makes its way up the food chain. Zooplanktons consume phytoplankton, small fish consume zooplankton, and larger fish consume smaller fish.
- By the time these toxins accumulate in large fish like swordfish, they can contain high levels of mercury, posing health risks to those who consume them.

## Seismic Zones in India

*A seismic zone, also known as a seismic hazard zone or earthquake zone, is an area on the Earth's surface that is prone to seismic activity, particularly earthquakes. These zones are characterized by a higher likelihood of experiencing earthquakes of varying magnitudes.*

### India's Seismic Zones

- India is divided into four main seismic zones based on its vulnerability to earthquakes. These seismic zones are identified as Zone II, Zone III, Zone IV, and Zone V, with Zone V being the most seismically active and Zone II the least.
- Approximately, 11% of the country falls in zone V, ~18% in zone IV, ~30% in zone III and the remaining in zone II. A total of ~59% of the landmass of India (covering all states of India) is prone to earthquakes of different intensities.

#### Seismic Zone II

- Zone II is considered a low-seismic-risk area.
- It includes parts of Rajasthan, Uttar Pradesh, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Odisha, Andhra Pradesh, Telangana, Karnataka and Tamil Nadu.
- This zone experiences the least amount of seismic activity, and the risk of earthquakes is relatively low.

#### Seismic Zone III

- Zone III is a moderate-seismic-risk area.
- It includes regions of Kerala; Goa; Lakshadweep islands; parts of Uttar Pradesh and Haryana; remaining parts of Gujarat and Punjab; parts of West Bengal, western Rajasthan, Madhya Pradesh; remaining part of Bihar; northern parts of Jharkhand and Chhattisgarh; parts of Maharashtra, Odisha, Andhra Pradesh, Telangana, Tamil Nadu and Karnataka.
- While the seismic activity in this zone is moderate, buildings and infrastructure in this region are typically designed to withstand these earthquakes.

## Prelims GS Roundup-3

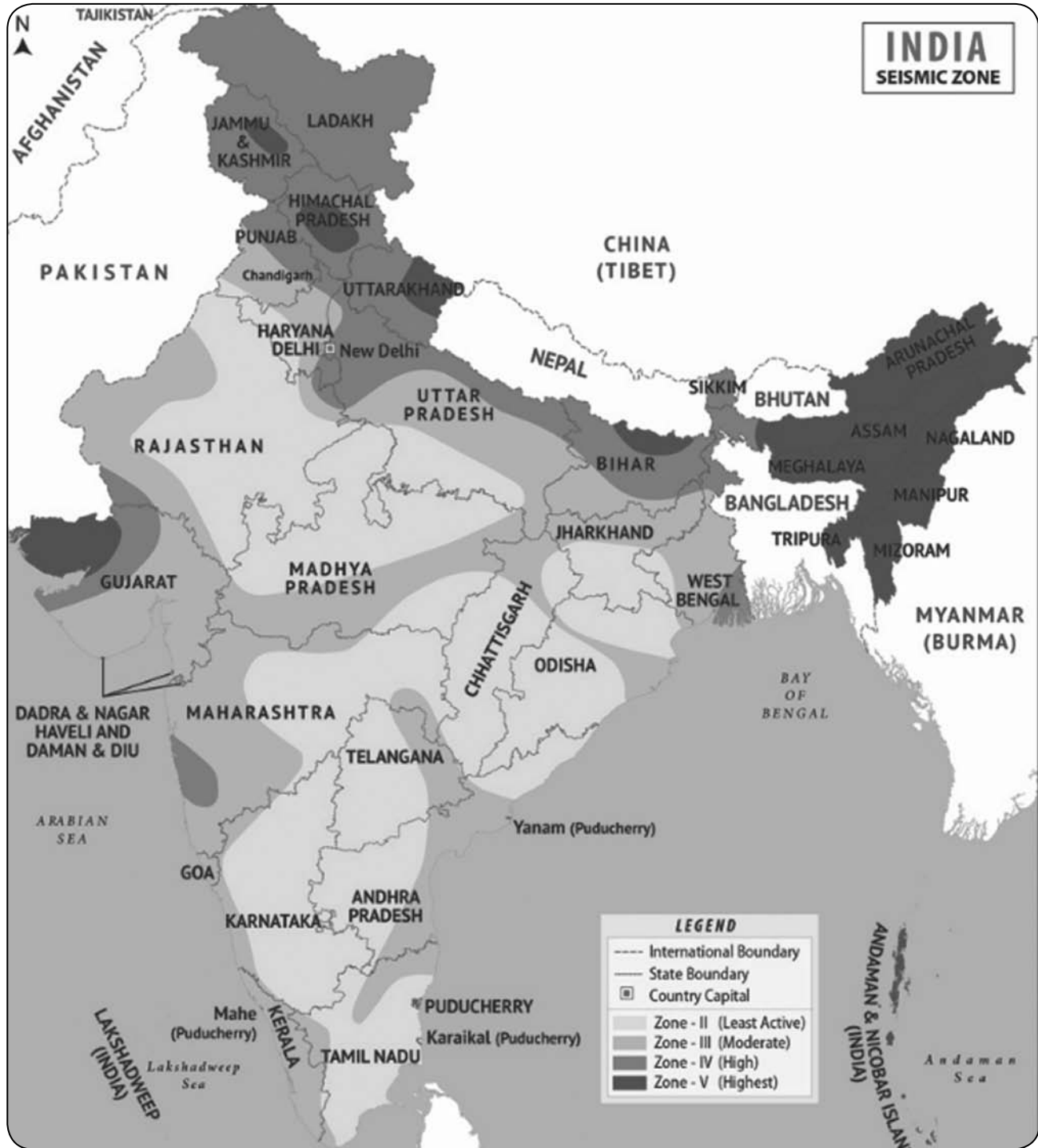
### Seismic Zone IV

- Zone IV is categorized as a high-seismic-risk area.
- It covers regions of Ladakh; remaining parts of Jammu & Kashmir, Himachal Pradesh and Uttarakhand; some parts of Haryana, parts of Punjab; Delhi; Sikkim; the northern part of Uttar Pradesh; small portions of Bihar and West Bengal; parts of Gujarat and small portions of Maharashtra near the west coast and small part of western Rajasthan.

- Seismic activity in this zone is relatively higher, and buildings and infrastructure must adhere to stricter seismic building codes.

### Seismic Zone V

- Zone V is identified as a very high-seismic-risk area.
- It includes parts of Jammu and Kashmir (Kashmir valley); western part of Himachal Pradesh; eastern part of Uttarakhand, Kutch in Gujarat; part of Northern Bihar; all north-eastern states of India and the Andaman & Nicobar Islands.



- This zone is the most seismically active in India and is prone to strong earthquakes. The construction standards for buildings and critical infrastructure in this zone are the most stringent.

### Urbanisation: Geographical Factors and Effect on Natural Resources

*Urbanization is the process of people moving from rural to urban areas, resulting in a decline in the rural population's proportion and necessitating societal adjustments to accommodate this transformation.*

#### Geographical Factors

- **Topography:** The natural terrain and topography of an area can influence urban development. Flat or gently sloping land is often more suitable for construction and urban expansion. Example: Rio de Janeiro, Brazil.
- **Proximity to Water Bodies:** Cities located near rivers, lakes, or coastlines often experience faster urbanization due to the availability of water for drinking, transportation, and industrial use. However, they may also be prone to flooding. Example: Mumbai, India.
- **Climatic Conditions:** Climate can affect the attractiveness of an area for urbanization. Moderate climates are often preferred for city growth, while extreme conditions can deter development. Example: Oslo, Norway.
- **Soil Quality:** Soil characteristics are essential for construction and agriculture. Soil quality can influence the availability of arable land and the stability of buildings. Example: Los Angeles, USA.
- **Natural Resources:** The presence of natural resources like minerals, forests, and fertile land can drive urbanization as industries and agriculture expand around these resources. Example: Cairo, Egypt.
- **Transportation Networks:** Access to transportation routes, including highways, railways, and ports, can stimulate urbanization by facilitating the movement of goods and people. Example: Dubai, UAE.
- **Political Boundaries:** Geopolitical factors such as national borders and state boundaries can influence the growth of cities. Proximity to borders can impact trade and security. Example: Beijing, China.
- **Ecological Factors:** The ecological characteristics of an area, including biodiversity, can influence urban planning and conservation efforts.
- **Geological Conditions:** Geological factors like seismic activity and soil stability can affect construction practices and building safety.
- **Availability of Energy Resources:** Access to energy sources, including coal, oil, natural gas, and renewable energy, can attract industries and population growth. Example: Dubai, UAE.
- **Land Ownership and Land Use Policies:** Ownership patterns and land use regulations can impact the organization and expansion of urban areas. Zoning laws and property rights play a significant role.
- **Ecosystem Services:** The benefits provided by ecosystems, such as clean air, water, and climate regulation, are essential for urban quality of life. Preservation of green spaces can enhance urban living conditions. Example: Shimla, India.
- **Cultural and Historical Significance:** Historical and cultural factors, including heritage sites and landmarks, can influence the development and preservation of urban areas. Example: Varanasi, India.
- **Economic Opportunities:** The availability of job opportunities and economic activities in an area is a major driver of urbanization. Access to markets and industries can lead to population migration. Example: New Delhi, India.

#### Effect on Natural Resources

- **Migration and Population Pressure:** The process of rural-to-urban migration fuels urbanization, but it also leads to excessive population pressure on existing urban infrastructure and services. This, in turn, results in various urban challenges.
- **Pervasive Slum Issues:** Slums are a widespread concern, with approximately 13.7 million slum households accommodating a population of 65.49 million people across the country. These slums are adjacent to many Indian cities, where residents live in cramped, closely-packed houses.
- **Housing Crisis:** Inadequate housing is one of the most distressing social problems associated with urbanization. A significant portion of the urban population lives in poorly sheltered and highly congested spaces. More than 50% of urban households in India occupy single-room dwellings, with an average occupancy of 4.4 individuals per room.
- **Unplanned Urban Development:** Urban development often occurs without proper planning, reinforcing the existing socioeconomic disparities within cities.
- **Impact of the COVID-19 Pandemic:** The COVID-19 pandemic has exacerbated the challenges faced by urban poor and slum dwellers. The sudden implementation of strict lockdown measures severely affected their livelihoods.
- **Non-Inclusive Welfare Schemes:** Welfare schemes intended to assist the urban poor often suffer from exclusivity. Many relief funds and benefits fail to reach slum dwellers, primarily due to the lack of official government recognition of these settlements.
- **Land Use and Habitat Loss:** As urban areas expand, they encroach upon natural habitats, leading to habitat loss and fragmentation. This can result in the displacement and extinction of various plant and animal species.



## Prelims GS Roundup-3

- **Deforestation and Green Space Reduction:** The need for land for construction and infrastructure development often leads to deforestation and the removal of green spaces within and around cities. This diminishes the ability of urban areas to act as carbon sinks and provide a healthy living environment.
- **Water Resources Depletion:** Urbanization increases the demand for freshwater resources for drinking, sanitation, and industrial use. Excessive water extraction can lead to aquifer depletion, altered hydrological patterns, and reduced water availability in surrounding regions.
- **Air and Water Pollution:** Urbanization contributes to higher levels of air and water pollution due to increased industrial and vehicular activities. Polluted air and water negatively impact human health and the health of ecosystems.
- **Waste Generation:** Urban areas generate substantial amounts of solid waste, including plastic, electronic, and hazardous waste. The improper disposal of waste can contaminate soil and water, posing risks to both human health and the environment.
- Indian cities like Delhi and Mumbai often face severe air pollution issues, with high levels of particulate matter and pollutants like PM2.5 and PM10.
- **Energy Consumption:** Urbanization leads to increased energy consumption for heating, cooling, transportation, and industrial processes. Fossil fuels are a primary energy source in many urban areas, contributing to greenhouse gas emissions and climate change.
- **Erosion and Flooding:** Alterations in land use and increased impervious surfaces like roads and buildings can disrupt natural drainage patterns. This can result in increased surface runoff, erosion, and more frequent and severe flooding events.
- **Loss of Biodiversity:** Urbanization can lead to the reduction or extinction of various plant and animal species due to habitat destruction and pollution. This can disrupt ecosystems and decrease biodiversity.
- **Resource Overuse:** The concentration of people in urban areas often intensifies the demand for resources like food, water, and energy. Overuse of these resources can lead to scarcity and increased competition for access.
- **Climate Impact:** Urbanization contributes to the urban heat island effect, which leads to higher temperatures in cities compared to surrounding rural areas. This effect can exacerbate local climate changes.

### Landslides: Types and Causes

*A landslide is the rapid and often destructive movement of a large amount of earth material down a slope or incline. This phenomenon typically occurs when the force of gravity overcomes the internal strength and friction that holds the material in place on a hill or mountainside.*

### Types of Landslides

- **Rockfall:** Involves the rapid falling of individual rocks or rock fragments down a slope.
- **Debris Flow:** A mixture of mud, rock, and water that flows down a slope, often with high speed and destructive force.
- **Mudslide:** A type of landslide consisting mainly of wet, unconsolidated soil and debris.
- **Rockslide:** Involves the movement of larger rock masses or cliffs down a slope.
- **Lahar:** A type of landslide specific to volcanic regions, typically consisting of volcanic ash and debris mixed with water.

### Causes of Landslides

- **Climate:** Prolonged changes in climate can have a significant impact on soil stability.
- **Earthquakes:** Seismic activity has historically been a major factor contributing to landslides worldwide. When tectonic plates shift, the soil covering them can also move.
- **Weathering:** Weathering, the natural process of rock deterioration, can lead to the formation of weak materials that are susceptible to landslides.
- **Erosion:** Erosion, caused by intermittent water flow from sources such as streams, rivers, wind, currents, ice, and waves, can erode slope support, increasing the likelihood of landslides.
- **Volcanoes:** Volcanic eruptions can serve as triggers for landslides. Stratovolcanoes, in particular, are known for their association with landslides on a global scale.
- **Mining:** Landslides are significantly exacerbated by mining activities that employ blasting techniques. The vibrations generated by explosives can damage the soil, increasing the risk of landslides.
- **Timber Harvesting:** Clearcutting, a timber harvesting method involving the removal of all mature trees in an area, poses a hazard because it completely disrupts the local mechanical root system.

### Landslides: Status in India

- India ranks among the top five countries in the world with a high susceptibility to landslides, where at least one fatality per 100 sq km is recorded annually due to landslide events.
- Excluding regions covered by snow, approximately 12.6 percent of the country's total land area (equivalent to 0.42 million sq km) is prone to landslides.
- The breakdown of these landslide-prone areas shows that around 66.5 percent of landslides occur in the North-western Himalayas, approximately 18.8 percent in the Northeastern Himalayas, and roughly 14.7 percent in the Western Ghats.
- The primary cause of landslides in the country is the irregular pattern of rainfall, with regions in the Himalayas and the Western Ghats being particularly susceptible to such incidents.

### Region-wise Distribution

- Slightly under half of India's landslide-prone areas, approximately 0.18 sq km, are situated within the states of Assam, Arunachal Pradesh, Sikkim, Meghalaya, Mizoram, Manipur, Tripura, and Nagaland.
- Parts of Uttarakhand, Himachal Pradesh, and Jammu and Kashmir encompass around 0.14 million sq km of the overall landslide-prone zones.
- Additionally, Maharashtra, Goa, Karnataka, Kerala, and Tamil Nadu collectively make up roughly 0.09 million sq km of these areas.
- Even the Araku region in Andhra Pradesh, located along the Eastern Ghats, has reported instances of landslide events.

### State-wise Distribution

- Between 1998 and 2022, Uttarakhand, Kerala, Jammu and Kashmir, Mizoram, Tripura, Nagaland, and Arunachal Pradesh reported the most significant number of landslides.
- Mizoram took the lead, with a total of 12,385 landslide events over the past 25 years, out of which 8,926 were recorded in 2017.
- In Nagaland, a remarkable 2,071 out of the 2,132 total landslide events during this period occurred during the 2017 monsoon season.
- Manipur exhibited a similar pattern, with 4,559 out of 5,494 landslide events happening during the rainy season of 2017.
- In 2018, Tamil Nadu experienced 603 landslides out of a total of 690.
- The Himalayan state of Uttarakhand encountered the second-highest number, with 11,219 landslides reported since 1998, all of which occurred post-2000.
- Despite fewer occurrences in the Western Ghats, landslides have been a significant threat to inhabitants, particularly in Kerala.

## Factors Affecting Agricultural Productivity in India

*Agricultural productivity refers to the efficiency and output of agricultural processes, particularly the quantity and quality of agricultural products or crops produced per unit of land, labour, or other resources employed in farming.*

### Major Factors

#### Climate and Meteorological Conditions

- India's wide-ranging climatic conditions have a substantial impact on the choice of crops and their productivity.
- The monsoon, for instance, is a pivotal factor for kharif crops, while the productivity of rabi crops is influenced by winter temperatures.
- The success of rice and sugarcane crops in India is largely dependent on high rainfall and humid conditions, which are prevalent in states like West Bengal and Kerala.

### Soil Characteristics

- India's varied regions feature diverse soil types, and these variations influence the suitability and productivity of different crops.
- The black soil, also known as regur soil, found in states like Maharashtra, Gujarat, and Madhya Pradesh is highly suitable for cotton cultivation, making these regions major cotton producers.

### Adoption of High Yield Variety (HYV) Seeds

- The adoption of HYV seeds has brought about significant improvements in crop productivity, particularly in the case of staples like rice and wheat. However, their utilization is not uniform across the nation.
- The Green Revolution in India, which began in the 1960s, led to the widespread adoption of HYV seeds, resulting in significant yield increases. For instance, wheat production in India increased from 11 million tons in the mid-1960s to over 100 million tons today.

### Irrigation Methods

- Despite the implementation of numerous large-scale irrigation projects, a significant portion of India's agriculture remains reliant on monsoons.
- The inadequacy of irrigation facilities has repercussions for productivity.
- In states like Punjab and Haryana, which have well-established irrigation infrastructure, water-intensive crops like rice and wheat are grown more extensively, contributing to their higher productivity.

### Farm Size

- India is characterized by the prevalence of small and marginal farms, a factor that often constrains farmers' ability to invest in modern agricultural techniques, consequently impacting productivity.
- In states like Kerala and West Bengal, where the average farm size is smaller, farmers often focus on high-value crops like spices, vegetables, and fruits rather than staple crops, thereby diversifying their income sources.

### Accessibility to Credit

- Ensuring farmers have access to affordable credit is imperative for them to invest in improved inputs and contemporary farming practices.
- Government initiatives like Kisan Credit Cards (KCC) in India have aimed to provide farmers with easy access to credit at affordable rates, helping them invest in seeds, fertilizers, and modern farming practices to enhance productivity.

## Groundwater Contamination in India

*Groundwater contamination refers to the pollution or degradation of groundwater, which is the water located beneath the Earth's surface in the pores and spaces between rocks and soil particles.*

## Prelims GS Roundup-3

### Major Factors

#### Natural Sources

- Groundwater often contains inherent impurities due to the geological characteristics of the region.
- Natural arsenic contamination occurs when geological formations contain organic matter, creating anaerobic conditions in aquifers, leading to the release of arsenic.
- The presence of fluoride in groundwater is closely linked to the abundance and solubility of fluoride-containing minerals, such as fluorite.
- In India, uranium concentration in groundwater is primarily associated with natural geological conditions.

#### Agricultural Practices

- The intensive use of chemical fertilizers in agriculture can result in the leaching of residual nitrates, leading to elevated nitrate concentrations in groundwater.
- Overuse and improper irrigation methods can further contribute to groundwater contamination.

#### Industrial Activities

- Pollutants from industrial effluents and municipal waste can infiltrate the soil and contaminate groundwater.
- Toxic industrial waste can release traces of heavy metals, including lead, cadmium, zinc, and mercury.
- Various industrial activities, such as brine disposal from the petroleum industry, mine waste disposal, deep-well liquid waste disposal, and leaky underground gas tanks, can all contribute to groundwater pollution.
- Sludge disposal is another factor to consider.

#### Municipal Waste

- Pollution from landfills and septic tanks can seep into groundwater.
- Indiscriminate disposal of human and animal waste on land, as well as issues with faulty onsite sanitation structures, can lead to contamination.
- Leaky sewer lines are another source of groundwater pollution.

#### Indiscriminate Groundwater Extraction

- Excessive groundwater withdrawal for irrigation purposes has resulted in inland salinity problems in parts of Punjab and Haryana.
- Over-pumping of groundwater from coastal aquifers has led to seawater intrusion, resulting in induced pollution. For example, this issue is prevalent in Kachchh, Gujarat.
- The decline in the groundwater table can exacerbate uranium contamination as it induces oxidation conditions, leading to increased uranium enrichment in shallow groundwater.

### Common Groundwater Contaminants

#### Nitrates

- Among the most prevalent groundwater contaminants are dissolved nitrates.

- They are often sourced from various origins such as sewage, fertilizers, air pollution, landfills, and industrial discharges.
- Excessive nitrate levels can accelerate eutrophication in surface waters and lead to a condition known as “blue baby disease” (methemoglobinemia).

#### Pathogens

- Groundwater can become contaminated with harmful bacteria and viruses, leading to waterborne diseases like cholera, dysentery, polio, hepatitis, typhoid, and cholera.
- Common sources of pathogen contamination include sewage, landfills, septic tanks, and the presence of animals in the vicinity.

#### Trace Metals

- This category encompasses metals such as Nickel, Copper, Chromium, Lead, Mercury, and Cadmium, which can be potentially harmful and carcinogenic.
- Sources of trace metal contamination include discharges from industrial and mining activities, as well as leaching from solid waste dumping and ash pond disposal, particularly associated with fly ash from thermal power plants.

#### Inorganic Constituents

- Groundwater used for drinking can accumulate inorganic dissolved salts like SO<sub>4</sub> (sulfate), chloride, along with elements such as Na (sodium) and K (potassium).
- The buildup of high dissolved solids, including a combination of carbonates and bicarbonates along with Ca (calcium) and Mg (magnesium), can result in hard water.
- This can lead to gastrointestinal problems in individuals, transforming soft/sweet water into hard water.

#### Organic Compounds

- These compounds include volatile or semi-volatile organic substances like pesticides, PCBs (polychlorinated biphenyls), and derivatives of petroleum.
- Their sources are diverse, including industrial discharges, accidental spills, sewage contamination, landfills, street drainage systems, and agricultural activities.

### Major Metal Pollutants in States

- **Arsenic:** Found in West Bengal, Bihar, Chhattisgarh, Assam, and Uttar Pradesh. The permissible limit for arsenic in drinking water, according to Indian standards, is 1.5 parts per million (ppm/l).
- **Fluoride:** Prevalent in Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. The permissible limit for fluoride in drinking water, as per Indian standards, is 50 parts per billion (ppb/l).
- **Iron:** Found in Assam, West Bengal, Odisha, Chhattisgarh, and Karnataka, with localized occurrences in Bihar, Uttar Pradesh, Punjab, Rajasthan, Maharashtra, Madhya Pradesh, Jharkhand, Tamil Nadu, Kerala, and the North Eastern states.

- **Uranium:** Prevalent in 16 states in northwestern, southern, and southeastern India, with high prevalence in Rajasthan and Andhra Pradesh.
- The WHO and US Environmental Protection Agency (EPA) standards for safe drinking water specify a uranium level of 30 micrograms per litre. However, India's Bureau of Indian Standards does not include uranium in its list of monitored contaminants for drinking water.
- **Nitrate:** Found in Andhra Pradesh, Bihar, Delhi, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Rajasthan, West Bengal, and Uttar Pradesh. The permissible level for nitrates in drinking water is 45 ppm/l.
- **Salinity:** Inland areas with salinity issues include Rajasthan, Haryana, Punjab, and Gujarat, with lesser occurrences in Uttar Pradesh, Delhi, Madhya Pradesh, Maharashtra, Karnataka, Bihar, and Tamil Nadu.

### Measures taken to Control Groundwater Contamination

#### Central Ground Water Authority (CGWA)

- Established under Section 3 (3) of the Environment (Protection) Act, 1986, the CGWA's primary objective is to regulate and oversee groundwater development and management across the country.
- The CGWA has encouraged states and union territories to formulate policies that promote artificial groundwater recharge and rainwater collection.

#### Central Ground Water Board (CGWB)

- The CGWB introduced the "Master Plan for Artificial Recharge to Ground Water in India" in 2013.
- This master plan outlines the construction of 1.11 crore artificial recharge and rainwater harvesting structures nationwide.
- These initiatives aim to boost groundwater resources, enhancing water availability for purposes like irrigation, residential use, industrial processes, and drinking water.

#### Jal Shakti Abhiyan (JSA)

- The Jal Shakti Abhiyan is a time-bound initiative that employs a mission-mode approach to improve groundwater conditions, primarily in water-stressed blocks within 256 districts across India.
- The "Jal Shakti Abhiyan – Catch the Rain" campaign is also a part of this effort.

#### National Water Policy (2012)

- The National Water Policy, formulated by the Department of Water Resources, underscores the importance of augmenting water availability through the direct utilization of rainwater.
- It emphasizes the need to prevent encroachments and diversions of water bodies and drainage systems. In cases where such actions have taken place, restoration and maintenance are vital.

#### Atal Bhujal Yojana

- The Atal Bhujal Yojana (ABHY) is being implemented, particularly in areas identified as overexploited and facing water shortages.
- This scheme, co-funded with World Bank support, aims to address groundwater management issues in these regions.

#### Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

- Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched on June 25, 2015, in 500 cities and towns across the country.
- The Mission focuses on development of basic urban infrastructure in the AMRUT cities, such as water supply, sewerage & septage management, storm water drainage, green spaces & parks, and non-motorized urban transport.

### Combating Desertification: Major Initiatives

*Desertification is a process of land degradation in arid, semi-arid, and dry sub-humid areas, often resulting from various factors, including climatic variations and human activities. It involves the transformation of fertile and productive land into arid or desert-like landscapes, where the land loses its ability to support vegetation and agriculture.*

#### India's Initiatives to Combat Desertification

##### Command Area Development Programme

- Launched in 1974-75 to enhance irrigation utilization and optimize agricultural production through efficient water management.
- Coordinated by the Ministry of Jal Shakti in collaboration with state governments.

##### Integrated Watershed Management Programme

- Initiated in 2009-10.
- Aims to restore ecological balance by conserving and developing degraded natural resources while creating rural employment opportunities.
- Amalgamated as the Watershed Development Component of Pradhan Mantri Krishi Sinchai Yojana in 2015-16.

##### Desert Development Programme

- Launched in 1977-78 to mitigate the adverse effects of drought and rejuvenate the natural resource base in desert areas.
- Focused on hot desert regions in Rajasthan, Gujarat, Haryana, and cold desert areas in Jammu & Kashmir and Himachal Pradesh.
- Implemented by the Ministry of Rural Development.

##### Soil Conservation in the Catchment of River Valley Projects and Flood-Prone Rivers

- Aims to improve the physical conditions and productivity of alkali soils to restore optimum crop production.
- Managed by the Ministry of Agriculture and Farmers Welfare.



## Prelims GS Roundup-3

### National Afforestation Programme

- Initiated in 2000-02 to afforest degraded forest lands.
- Under the jurisdiction of the Ministry of Environment, Forest and Climate Change.

### National Action Programme to Combat Desertification

- Developed in 2001 to address increasing desertification issues and take appropriate actions.
- Administered by the Ministry of Environment, Forest and Climate Change.

### National Mission on Green India

- A component of the National Action Plan on Climate Change (NAPCC).
- Approved in 2014 with a ten-year goal to protect, restore, and enhance India's diminishing forest cover.
- Overseen by the Ministry of Environment, Forest and Climate Change.

### Desertification and Land Degradation Atlas of India

- Released by ISRO in 2016, focusing on combating desertification and land degradation, a key area of concern.
- ISRO's Space Application Centre (SAC), Ahmedabad, released the latest version of the 'Desertification and Land Degradation Atlas of India' on 17 June, 2021.

### Major Global Initiatives

- **The Bonn Challenge:** The Bonn Challenge aims to restore 150 million hectares of deforested and degraded land worldwide by 2020, with a larger goal of restoring 350 million hectares by 2030.
- **Sustainable Development Goal (SDG) 15, 2030:** SDG 15 is committed to protecting the planet from degradation, emphasizing sustainable consumption and production practices.
- **United Nations Convention to Combat Desertification (UNCCD):** Established in 1994, the UNCCD is the primary international agreement that legally binds environmental and developmental efforts to promote sustainable land management.
- **World Day to Combat Desertification and Drought:** This observance takes place annually on June 17th, serving as a global reminder of the importance of combating desertification and drought.
- **Great Green Wall:** The Great Green Wall is an initiative led by the Global Environment Facility (GEF) involving eleven countries in Sahel-Saharan Africa.
- Its primary focus is on combating land degradation and rejuvenating native plant life across the region's landscape.

### Factors Affecting Industrial Location in India

*An industrial region, also known as an industrial area or industrial district, is a geographic area characterized by a high concentration of industrial and manufacturing activities.*

### Major Factors

- **Proximity to Raw Materials:** Industrial regions tend to develop near sources of raw materials. Availability of resources such as minerals, metals, agricultural products, and energy sources (like coal or hydropower) is essential for various industries.
- **Access to Transportation:** Adequate transportation infrastructure, including roads, railways, ports, and airports, is crucial for the movement of raw materials, goods, and labour. Proximity to transportation hubs and networks facilitates efficient logistics.
- **Skilled and Unskilled Labour:** A readily available workforce with diverse skill sets is vital for industrial growth. Labour availability and its cost play a significant role in the choice of location for industries.
- **Energy Supply:** A stable and affordable energy supply, whether it's electricity, natural gas, or other sources, is essential for industrial operations. Many industries require a consistent energy source for manufacturing processes.
- **Market Access:** Access to a large consumer market or transportation networks that connect to potential markets is a key factor. Industries often seek locations that provide easy access to consumers and distribution channels.
- **Government Policies:** Government policies and regulations can greatly impact industrial regions. Incentives, tax breaks, and supportive policies can attract industries, while stringent regulations may deter them.
- **Infrastructure and Utilities:** Adequate infrastructure, including water supply, sewage systems, and telecommunications, is necessary to support industrial operations. Modern utilities and services are crucial for business continuity.
- **Research and Development Facilities:** Proximity to research and development centres, universities, and technology clusters can be advantageous for industries that rely on innovation.
- **Capital Availability:** Access to financial institutions, venture capital, and funding sources is important for new and expanding industries. Capital availability supports investment and expansion.
- **Political Stability:** Political stability and social conditions influence the attractiveness of a region for investments. Stable regions are often preferred by industries for long-term operations.
- **Environmental Factors:** Environmental considerations, such as air and water quality, waste disposal, and sustainability practices, are becoming increasingly important for both industry and public perception.
- **Competition and Supplier Networks:** The presence of competing and complementary industries (supplier networks) can be beneficial. Clusters of related businesses often emerge to share resources and knowledge.
- **Climate and Geographic Conditions:** Climate can be a factor, particularly for industries sensitive to weather or temperature. Some industries may prefer specific climates or proximity to water bodies for transportation.

- **Connectivity to Global Markets:** Access to global markets through trade routes and international ports is significant for industries engaged in international trade.

### Major Industrial Regions of India

#### The Mumbai-Pune Industrial Region

- This industrial area's growth is closely related to India's history of progress in the cotton textile industry.
- The growth of this industrial area was primarily influenced by the humid climate, natural port facilities, availability of hydropower, skilled labour, and a vast hinterland producing cotton.
- Only the larger Mumbai area has more than 8000 registered factories, 350 of which are cotton textile factories.
- The region's other industries include those that produce engineering products, chemicals, food processing, leather goods, pharmaceuticals, and films.
- The majority of the manufacturing in Mumbai is of light-textured, fine, and ultrafine cotton fabrics.
- Pune is the second-largest manufacturing hub in the area. More than 1200 recognised factories are there. Metallurgical, chemical, engineering, and automotive products are produced by its industries.

#### The Kolkata-Hugli Industrial Region

- It is characterized by its proximity to the Hugli River, which plays a significant role in the industrial landscape of the area. The growth of industries has also extended into the western Midnapur region.
- Several key factors have contributed to the rapid expansion of this industrial region. These include the proximity of coal mines in Raniganj and Jharia, the availability of agricultural raw materials like jute, indigo, and tea, ample water resources, a readily available labour force, and convenient export facilities.
- The industries in this area are diverse and encompass the production of jute, silk, cotton textiles, engineering products, electrical equipment, automobiles, chemicals, pharmaceuticals, transport equipment, leather footwear, iron and steel, food processing, light machinery, locomotives, and various machine spare parts.

#### The Ahmedabad-Vadodara Industrial Region

- This is the country's third-largest industrial area. It has thrived due to its proximity to various power plants, such as petroleum, thermal, hydel (Ukai project), and nuclear power plants.
- Additionally, the availability of cost-effective land and skilled labour, as well as port facilities, has contributed to its growth.
- It is known for its manufacturing of cotton textiles and specializes in engineering products, pharmaceuticals, and chemicals.
- Major industrial cities in this region include Vadodara, Surat, Anand, Ankleshwar, Bhavnagar, Bharuch, and others.

#### The Madurai-Coimbatore-Bangalore Industrial Region

- The region is a primary producer of cotton in the country.

- Factors contributing to its growth include a favourable climate, a skilled labour force, a reliable power supply from various power plants, and proximity to major seaports like Chennai, Kochi, Mangalore, and Tuticorin.

#### The Chotanagpur Industrial Region

- This region covers Jharkhand, Odisha, southern Bihar, and western West Bengal. It is often referred to as the "Ruhr of India" due to its concentration of iron and steel production.
- Abundant mineral resources, including solid and non-metallic minerals, and coal, along with power supplied by the Damodar Valley Corporation, have led to the growth of this sector.
- Key cities in the region like Asansol, Bokaro, Burnpur, Durgapur, and Jamshedpur, are known for their iron and steel production.

#### The Agra-Delhi-Kalka-Saharanpur Industrial Region

- This industrial region encompasses various cities with diverse industrial focuses.
- Agra is known for textiles and tourism, Ambala for scientific instruments, Chandigarh for electronics and strategic goods, Delhi for textiles, chemicals, pharmaceuticals, electronics, and more.
- Faridabad is known for engineering, Ghaziabad for synthetic fibre, chemicals, and electronics, Gurgaon for automobiles, and Kalka for paper, woodwork, sugar, textiles, and food processing.

#### Vishakhapatnam-Guntur Industrial Region

- Extending from the Vishakhapatnam district to Kurnool and Prakasam districts in the south, this region's industrial development relies on the ports of Vishakhapatnam and Machilipatnam, along with agricultural resources and mineral reserves in their hinterlands.
- Energy is supplied from the coalfields of the Godavari basin. Industries in this region include sugar, textiles, jute, paper, fertilizer, cement, aluminum, and light engineering.

#### Kollam-Thiruvananthapuram Industrial Region

- This industrial region encompasses districts like Thiruvananthapuram, Kollam, Alwaye, Ernakulam, and Alappuzha.
- It relies on plantation agriculture and hydropower. Lacking proximity to mineral resources, the region predominantly focuses on agricultural product processing and market-oriented light industries.
- Key industries include cotton textiles, sugar, rubber, matchbox, glass, chemical fertilizer, and fish-based products. Food processing, paper, coconut coir products, aluminium, and cement industries also contribute to the region's economy.
- Major industrial centres include Kollam, Thiruvananthapuram, Alwaye, Kochi, Alappuzha, and Punalur.

# Indian Economy

## Inflation: Measurement and Control Measures

*Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country.*

### Measurement

- The rate of inflation is measured on the basis of price indices which are of two kinds— Wholesale Price Index (WPI) and Consumer Price Index (CPI).
- A price index is a measure of the average level of prices, which means that it does not show the exact price rise or fall of a single good.
- The rate of inflation is the rate of change of general price level which is measured as follows:  
$$\text{Rate of inflation (year } x) = \frac{\text{Price level (year } x) - \text{Price level (year } x-1)}{\text{Price level (year } x-1)} \times 100$$
- This rate shows up in percentage form (%), though inflation is also shown in numbers, i.e., digits.
- A price index is a weighted average of the prices of a number of goods and services.
- In the index the total weight is taken as 100 at a particular year of the past (the base year). This, when compared to the current year, shows a rise or fall in the prices of current year; there is a rise or fall in the '100' in comparison to the base year—and this inflation is measured in digits.
- Inflation is measured 'point-to-point'. It means that the reference dates for the annual inflation is January 1 to January 1 of two consecutive years (not for January 1 to December 31 of the concerned year).

### Wholesale Price Index (WPI)

- It is the most widely used inflation indicator in India.
- Published by the Office of Economic Adviser, Ministry of Commerce and Industry.
- All transactions at the first point of bulk sale in the domestic market are included. Major criticism for this index is that the general public does not buy products at wholesale price.
- The new series of the WPI was released by the Government with the revised base year as 2011–12. The earlier base year was 2004–05.
- The new base year aligns with the base year of other indicators like the Gross Domestic Product (GDP) and Index of Industrial Production (IIP).

### Consumer Price Index (CPI)

- It measures price changes from the perspective of a retail buyer.
- It measures changes over time in the level of retail prices of selected goods and services on which consumers of a defined group spend their incomes.
- Four types of CPI are as follows:
- **Consumer Price Index for Industrial Workers (CPI-IW)**
  - ✓ Basically, this index specifies the government employees (other than banks' and embassies' personnel) income.
  - ✓ The wages/salaries of the central government employees are revised on the basis of the changes occurring in this index; the dearness allowance (DA) is announced twice a year.
  - ✓ When the Pay Commission recommends pay revisions, the base is the CPI (IW).
- **Consumer Price Index for Urban Non-Manual Employees (CPI-UNME)**
  - ✓ An urban non-manual employee is defined as one who derives 50 per cent or more of his or her income from gainful employment on non-manual work in the urban non-agricultural sector.
  - ✓ The current CPI (UNME) series with base 1984-85, introduced in November 1987, derives the weighting pattern from the family living survey conducted during 1982-83 in 59 selected urban centres.
  - ✓ The index is being released by CSO with a time lag of about two weeks.
  - ✓ Some of the State Governments, public and private sector undertakings, foreign embassies, etc. are making use of this index for purposes of regulating Dearness Allowance.
  - ✓ The index is also used for computing the advance tax liability of tax payers from capital gains by the Central Board of Direct Taxes.
- **Consumer Price Index for Agricultural Labourers (CPI-AL)**
  - ✓ A person is treated as an agricultural labourer if he or she follows one or more of the agricultural occupations in the capacity of a labourer on hire, whether paid in cash or kind or partly in cash and partly in kind.
  - ✓ The Consumer Price Index for Agricultural Labourers (CPI-AL) has 1986–87 as its base year.
  - ✓ The data is collected in 600 villages with a monthly frequency and has three weeks time lag.

- ✓ This index is used for revising minimum wages for agricultural labourers in different states.
- ✓ As the consumption pattern of agricultural labourers has changed since 1986–87 (its base year), the Labour Bureau proposes to revise the existing base year of this index.
- ✓ For the revision, the consumer expenditure data collected by the NSSO during its 61 NSS Round (2004–05) is proposed to be used.
- ✓ The governments at the Centre and states remain vigilant regarding the changes in this index as it shows the price impact on the most vulnerable segment of the society.
- **Consumer Price Index for Rural Labourers (CPI-RL)**
  - ✓ A rural labourer is defined as one who does manual work in rural areas in agricultural and non-agricultural occupations in return for wages in cash or kind, or partly in cash and partly in kind.
  - ✓ CPI-RL has 1986-87 as the base year; data is collected at 600 villages on monthly frequency with three weeks time lag.

### Control Measures

#### Demand-side Measures

- Firstly, the consumers are appealed to cut back the consumption of the items which show higher inflation (called austerity).
- This step has generally failed across the world because it does not work in case of essential items (such as wheat, rice, milk, tea, etc.) and as people who have money don't wish to cut down consumption.
- Secondly, the government may tighten flow of money in the system (known as monetary measure)—central bank making money costlier (by increasing repo rate, increasing CRR, etc. in case of India).
- This step also has its own limitations—it is not effective if the items showing inflation are essential ones (such as wheat, rice, onion, potato, etc. because consumers don't borrow money from banks to buy them).
- But it can be quite effective if the items are building materials (interest on home loan can be increased to cut back the demand of these items).

#### Supply-side Measures

- Aimed at increasing the supply of the items showing inflation, the government may go in for upscaling the production or import of the items.
- This measure also has its own limitations—production may not be upscaled in short-run and import may not reach the country in time.
- Rather in medium and long-run, production of these items can be upscaled.

#### Cost-side Measures

- Two steps may be taken under it—in short-run cutting taxes can bring in comfort but in the long-run cutting cost of production is the only way out (by scaling up technology).

## Banking Regulation – Insolvency and NPAs

*Banking regulation refers to the set of rules, laws, and guidelines put in place by government authorities or financial regulatory bodies to oversee and control the operations of banks and financial institutions within a country's financial system.*

### Banking Regulation in India

#### Regulatory Architecture: Overview of Banking Regulators & Key Regulations

- Banking in India primarily operates under the regulatory purview of three key acts:
  - ✓ The Reserve Bank of India Act, 1934.
  - ✓ The Banking Regulation Act, 1949.
  - ✓ The Foreign Exchange Management Act, 1999.
- The Reserve Bank of India (RBI) and the Government of India jointly exercise control over banks, starting from their establishment to their closure, through the authority vested in these statutes.
- **The Banking Regulation Act of 1949** governs the entire life cycle of banking institutions in India.
- The objectives behind the Banking Regulation Act, 1949 are twofold:
  - ✓ To consolidate and amend the laws related to banking companies.
  - ✓ To curb any misuse of authority by bank managers and safeguard the interests of depositors and the nation as a whole.

#### Types of Banks in India

- **Central Bank (Known as Banker's Bank):** The Reserve Bank of India (RBI) is the central bank of India. It holds the responsibility of directing and overseeing the nation's banking system.
- While it primarily serves as a government bank and does not engage significantly with the general population, it offers guidance to other banks when they encounter difficulties.
- **Commercial Banks:** Commercial banks accept deposits from clients and provide short-term loans, as well as long- and medium-term loans to businesses. They also offer long-term housing loans to individuals. Commercial banks can be categorized into three groups -
  1. **Public Sector Banks:** These are majority-owned by the Indian Government or Reserve Bank, including institutions like the State Bank of India, Bank of Baroda, etc.
  2. **Private Sector Banks:** Private individuals hold the majority of the stock in banks like ICICI Bank, HDFC Bank, etc.
  3. **Foreign Banks:** These banks are headquartered abroad but have branches in India, such as Hong Kong and Shanghai Banking Corporation (HSBC), Citibank, among others.



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- **Cooperative Banks (Established by cooperative societies to provide financing to small borrowers):** When a cooperative society engages in banking activities, it becomes a “Cooperative Bank.” These banks must obtain a license from the Reserve Bank of India.
- **Institutionalized Banks:** Examples include the Life Insurance Corporation of India (LIC), General Insurance Corp of India (GIC), and Unit Trust of India (UTI).
- **Specialized Banks:** Specialized banks focus on providing support for business establishment in specific sectors. Notable specialized banks include the Export-Import Bank of India (EXIM) and the National Bank for Agriculture & Rural Development (NABARD).
- **Development Banks:** Development banks raise funds through market borrowings, bonds, and the National Industrial Credit Fund of the RBI.
- They provide medium and long-term capital for machinery and equipment purchase, technology adoption, expansion, and modernization.
- Development banks can be categorized into two types - All India Development Banks and State-Level Development Banks. Examples of development banks include IDBI, IFCI, etc.

### Insolvency and NPA Resolution

#### Securitization & Reconstruction of Financial Assets & Enforcement of Security Interest Act 2002 (SARFAESI Act)

- This act empowers financial institutions to assume control of collateralized assets, oversee these assets, and sell or lease the borrower’s business, either in part or in full.
- It applies exclusively to secured borrowers and cases where the security interest for a financial asset’s repayment exceeds INR 1 lakh.
- Notably, it does not pertain to agricultural loans.

#### Asset Reconstruction Companies (ARCs)

- Asset reconstruction companies in India are established under the provisions of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act of 2002.
- They were proposed by the Committee on Banking Sector Reforms (Narasimham Committee II) to facilitate the transfer of non-performing assets (NPAs) from banks.
- ARCs are created for the acquisition of NPAs from banks and financial institutions.
- The Reserve Bank of India issues various guidelines to regulate the operations of these ARCs.

#### Debt Recovery Tribunals (DRTs) & Debts Recovery Appellate Tribunals (DRATs)

- Before the enactment of the SARFAESI Act, the Recovery of Debts Due to Banks and Financial Institutions (RDDBFI) Act of 1993 was in effect and continues to be implemented.
- The RDDBFI Act established Debt Recovery Tribunals (DRTs) with original jurisdiction and Debts Recovery

Appellate Tribunals (DRATs) with appellate jurisdiction to handle NPAs of both secured and unsecured borrowers.

- These tribunals deal with loan amounts of INR 20 lakh or more, providing a mechanism for the speedy recovery of money and case resolution. In cases where individuals or entities are dissatisfied with DRT decisions, they can appeal to DRATs.

#### Lok Adalats

- Lok Adalats operate under the Legal Services Authorities Act of 1987 and offer banks an alternative means of asset recovery.
- In addition to pursuing resolution through tribunals, banks also explore out-of-court settlements.
- In certain instances, the tribunal itself may refer a case to the Lok Adalat.
- These are conducted by State Legal Service Authorities to facilitate swift settlements.

#### Prompt Corrective Action (PCA)

- The PCA framework consists of a set of guidelines used by the Reserve Bank of India to assess banks if they fall below specific norms on three key parameters: capital ratios, asset quality, and profitability.
- PCA serves as an early intervention and resolution guideline employed by the RBI when a bank exhibits weaknesses in terms of these identified indicators.
- The RBI initiated the PCA scheme in 2002 to instil discipline in banks when they report poor and high-risk financial performance.

## Marketing of Agricultural Produce: Mechanisms in Place

*Marketing of agricultural produce refers to the process of planning, executing, and managing various activities involved in the distribution and sale of agricultural products, from the farmer’s fields to the end consumers or intermediary buyers.*

### Major Marketing Mechanisms

#### Rural Primary Markets

- Rural primary markets mainly comprise seasonal markets, commonly known as haats, shandies, painths, and fairs.
- Despite the growth of permanent stores, these markets continue to play a crucial role in the rural economy as traditional trading hubs.
- They facilitate the purchase of consumer goods and the sale of surplus agricultural and related commodities.

#### Secondary/ Assembly Markets

- While primary markets primarily serve local needs, secondary markets play a significant role in meeting demand from distant regions.

- These markets attract potential buyers and traders who assemble and consolidate truckloads of produce for sale in urban wholesale markets.
- These operations are often informal, involving traders and transporters who establish collection points in production areas.

### Wholesale Markets

- Wholesale markets serve as central hubs for acquiring large volumes of food from various sources, which are then divided into smaller lots to meet the demands of retailers across the country.
- Government entities also utilize these markets to procure agricultural products.
- Most wholesale markets, often referred to as regulated markets, operate under the purview of the Agriculture Produce Marketing Committee Acts.

### Terminal Markets

- Terminal markets, a concept more commonly seen in affluent countries, are anticipated to gain prominence in India.
- Unlike primary and secondary markets, terminal markets often involve merchants as sellers rather than farmers.
- The Indian approach to terminal markets aims to connect farmers to these markets through collecting centres.
- The government initiated the establishment of eight terminal market complexes for perishable goods in various cities.
- These markets offer farmers multiple options for selling their products and are expected to reduce post-harvest losses while enhancing farmer profitability.

### Retail Markets

- Retail markets are clusters of retail stores concentrated in specific areas or purpose-built structures.
- Food retail markets play a vital role in the food distribution chain, especially for catering to low and middle-income consumers.
- These markets cater to the specific needs of local populations and represent the final links in the marketing chain, directly serving the general public.
- Retailers in these markets are instrumental in delivering food products to consumers across the country.

### Livestock Markets

- India is the world's largest milk producer and the sixth-largest egg producer, and the livestock industry holds the potential to become a pivotal component of the agricultural economy.
- Livestock products are produced through a wide-spread, multi-location system that involves millions of farmers.
- These products primarily cater to domestic demand, and surplus is sold in nearby markets due to their perishable nature. Cattle marketing is a profitable sector for farmers and livestock traders.

### Agricultural Produce Market Committee (APMC)

- As agricultural marketing falls under the purview of individual states, the Agricultural Produce Market Committee (APMC) operates under state governments' jurisdiction.
- APMCs manage yards or mandis in market regions, overseeing registered agricultural commodities and livestock.
- APMCs were established to protect farmers from distress sales, ensuring they receive fair and timely payments for their produce.

## Indigenous Seeds: Infrastructure & Management

*Indigenous seeds are seed varieties that grew naturally or were cultivated in a particular place over generations. These can thrive in native conditions without the help of chemical pesticides and fertilizers. These are comparatively manageable and make agriculture more sustainable.*

### Key Infrastructure & Aspects of Management

- **Traditional Knowledge:** Indigenous seed management is rooted in the traditional knowledge of Indian farmers. It involves the selection, saving, and sharing of seeds that have been adapted to local agro-climatic conditions over generations.
- **Community Seed Banks:** Many communities and farmer groups in India maintain community seed banks. These are decentralized repositories where traditional seeds are stored and shared among local farmers. These community seed banks play a crucial role in preserving indigenous crop diversity.
- **Seed Exchange Networks:** Farmers participate in seed exchange networks, allowing them to trade traditional seeds with others in their region. These networks are an essential means of conserving and sharing indigenous seeds.
- **On-Farm Seed Saving:** Farmers often save seeds from their own harvest to replant in the following seasons. This practice helps in maintaining genetic diversity and conserving indigenous varieties.
- **Biodiversity Act:** The Biological Diversity Act, 2002, provides a legal framework for conserving biological diversity, which includes traditional crop varieties. It recognizes the rights of local communities over their biological resources.
- **Regulation and Policies:** The seed sector in India is regulated by the Ministry of Agriculture and Farmers Welfare. The government sets policies and regulations related to seed production, certification, and distribution to ensure quality standards are met.
- **National Seeds Corporation (NSC):** NSC is a government-owned company responsible for the production and distribution of certified seeds. It plays a vital role in providing quality seeds to farmers across the country.

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- **State Seeds Corporations:** Each state in India has its State Seeds Corporation responsible for seed production, processing, and distribution. These corporations work under the guidance of the central government's policies.
- **National Seed Association of India (NSAI):** NSAI is an organization that represents the Indian seed industry. It works to promote a favourable policy environment for the seed industry and advocates for the rights of seed producers.
- **Seed Village Program:** The government has introduced the Seed Village Program to promote the production of quality seeds at the grassroots level. Under this program, clusters of farmers are trained to produce certified seeds.
- **Seed Banks:** Some organizations and research institutions maintain seed banks to preserve indigenous and endangered plant varieties.

### Seed Production System in India

#### Breeder Seed

- Breeder seed is the progeny of nucleus seed of a variety and is produced by the originating breeder or by a sponsored breeder.
- Breeder seed production is the mandate of the Indian Council of Agricultural Research (ICAR).
- ICAR also promotes sponsored breeder seed production programme through the National Seeds Corporation (NSC)/State Farms Corporation of India (SFCI), State Seeds Corporation (SSCs), Krishi Vigyan Kendras (KVKs) etc.

#### Foundation Seed

- Foundation seed is the progeny of breeder seed and is required to be produced from breeder seed or from foundation seed which can be clearly traced to breeder seed.
- The responsibility for production of foundation seed has been entrusted to the NSC, SFCI, State Seeds Corporation, State Departments of Agriculture and private seed producers, who have the necessary infrastructure facilities.
- Foundation seed is required to meet the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards, both at the field and laboratory testing.

#### Certified Seed

- Certified seed is the progeny of foundation seed and must meet the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards, 1988.
- In case of self-pollinated crops, certified seeds can also be produced from certified seeds provided it does not go beyond three generations from foundation seed stage-I.
- The production and distribution of quality/certified seeds is primarily the responsibility of the State Governments.
- Certified seed production is organized through State Seed Corporation, Departmental Agricultural Farms, and Cooperatives, etc.

## Agro-based Industries in India

*Agro-based industries, also known as agro-processing industries, are industrial activities that use agricultural raw materials to produce a wide range of products. These industries add value to agricultural products through various processes and manufacturing techniques.*

### Major Types of Agro-based Industries

- **Food Processing Industries:** These industries are involved in the processing and transformation of agricultural products into various food items, such as rice milling, flour milling, sugar refining, and edible oil extraction.
- **Beverage Industries:** These include the production of beverages like fruit juices, soft drinks, and alcoholic beverages, using fruits and grains as raw materials.
- **Dairy Industries:** These industries process milk and milk products to produce items such as milk, cheese, yogurt, and butter.
- **Sugar Industry:** Sugar mills process sugarcane or sugar beets to extract sugar and produce various sugar-based products.
- **Cotton and Textile Industry:** Cotton is a primary agricultural product used in the textile industry to manufacture fabrics, clothing, and other textile products.
- **Flour Milling Industry:** Wheat and other cereals are processed into flour, semolina, and other grain-based products for human consumption.
- **Oilseed Processing Industry:** This industry processes oilseeds like soybeans, sunflower seeds, and groundnuts to extract vegetable oils used in cooking, and the by-products are used for animal feed.
- **Tea and Coffee Processing Industries:** These industries process tea leaves and coffee beans to produce tea and coffee products for consumption.
- **Tobacco Industry:** Tobacco leaves are processed to manufacture various tobacco products like cigarettes and cigars.
- **Wood and Paper Industries:** Timber and wood are processed in these industries to produce various wood-based products like furniture and paper.
- **Silk and Jute Industries:** Silkworms and jute plants are used to produce silk and jute products like textiles and fabrics.

### Agro-based Industries in India: Key Facts

- According to the NSSO Report, about 48.9 % of livelihood support of major workers comes from agriculture.
- **Record-Breaking Agricultural Exports:** In the fiscal year 2021-22, India set a new record with agricultural exports reaching an impressive USD 50 billion.
- **Milk Production Dominance:** India proudly holds the title of the world's leading milk producer, contributing a remarkable 23% to global production.

- **Projected Growth of Food Processing Sector:** Projections indicate that India's food processing sector is set to surpass the \$500 billion mark by 2025.
- **Booming Online Grocery Retail:** The online grocery retail sector in India has witnessed exceptional growth, with a Compound Annual Growth Rate (CAGR) of over 50%. It is anticipated to reach a valuation of \$10 billion to \$12 billion by 2025.
- **Sugar Export Success:** During the fiscal year 2021-22, India's sugar exports reached 110 Lakh Metric Tons (LMT), solidifying its position as the world's second-largest sugar exporter. This endeavour earned the country approximately INR 40,000 crore in foreign exchange.

### Agro-based Industries in India: Initiatives and Schemes

- **Foreign Direct Investment (FDI) in Food Processing:** Indian regulations allow 100% FDI in food processing through the automatic route, further encouraging investment in the sector.
- **Pradhan Mantri Kisan Sampada Yojana (PMKSY):** PMKSY has played a pivotal role in fostering the growth of the food processing sector, offering support through various initiatives.
- **Mega Food Park Scheme:** Mega Food Parks, based on a "Cluster" approach, aim to create modern food processing facilities with established supply chains. The scheme is implemented through Special Purpose Vehicles (SPVs) and focuses on connecting farmers, processors, and retailers.
- **Agro Processing Cluster:** The Agro Processing Cluster scheme, part of PMKSY, encourages the establishment of food processing units through a cluster approach, equipped with modern infrastructure.
- **Creation/ Expansion of Food Processing/ Preservation Capacities:** This scheme focuses on boosting processing and preservation capacities, modernizing existing food processing units, increasing value addition, and reducing waste. It aims to raise the level of food processing and enhance farmers' income.

### Road & Water Transport Network & Infrastructure

*The road transport network refers to the interconnected system of roads, highways, and streets that facilitate the movement of goods and people within and between various locations. On the other hand, the water transport network encompasses the interconnected system of waterways, including rivers, canals, backwaters, and other navigable bodies of water, that enable the movement of goods and people via boats, ships, and other watercraft.*

#### Road Transport Network

- India boasts the world's second-largest road network, covering a vast expanse of 5.89 million kilometres (kms).

- This extensive road network plays a pivotal role in the transportation of goods, with 64.5% of all cargo in the country and facilitates the commute of 90% of India's total passenger traffic.

#### Classification of Roads in India

- **National Highways:** National Highways form the backbone of India's road network, connecting major cities and towns throughout the country.
- The National Highways Authority of India (NHAI) is responsible for their maintenance, and these roads are identifiable by a unique four-digit number. The total length of National Highways in India spans approximately 145,240 km.
- **State Highways:** State Highways link major cities and towns within individual states and are under the jurisdiction of respective state governments.
- They are recognized by a distinctive two-digit number.
- **District Roads:** District Roads serve as connectors between smaller towns and villages within a district. Maintenance responsibilities for these roads lie with district authorities, and they are identified by a unique three-digit number.
- **Rural Roads:** Rural Roads act as crucial links between individual villages and hamlets and the broader national network. Local Panchayats are responsible for their maintenance, and they are recognized by a unique four-digit number.

#### Government Initiatives for Road Infrastructure and Network

- **Bharatmala Pariyojana:** Launched in 2017, the Bharatmala Pariyojana is a flagship initiative of the Ministry of Road Transport and Highways, with the goal of enhancing road connectivity across India.
- This ambitious project aims to develop approximately 34,800 kilometers of National Highways at an estimated cost of INR 5.35 lakh crore (USD 73 billion).
- **Pradhan Mantri Gram Sadak Yojana (PMGSY):** Initiated in 2000, PMGSY is a centrally sponsored scheme focused on connecting rural areas with all-weather roads.
- It has successfully linked around 1,25,000 habitations to roads, greatly improving access to essential services such as healthcare, education, and markets in these regions.
- **India's Gati Shakti Program:** As part of the Gati Shakti program, 81 high-impact projects have been identified, with road infrastructure projects taking precedence.
- These include significant highway projects like the Delhi-Mumbai expressway (1,350 kilometers), Amritsar-Jamnagar expressway (1,257 kilometers), and Saharanpur-Dehradun expressway (210 kilometers).
- **Road Asset Management System (RAMS):** Launched in 2020, RAMS is a web-based platform designed for the efficient management of road assets, encompassing National Highways and State Highways. RAMS aims to enhance the effectiveness of road maintenance activities and ensure optimal resource utilization.



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- **Road Safety:** The government has initiated multiple endeavours to enhance road safety throughout the country. These measures include the enforcement of the Motor Vehicles (Amendment) Act, 2019, which stipulates higher penalties for traffic violations, the installation of speed cameras and red light cameras, as well as awareness campaigns and training programs to promote road safety.

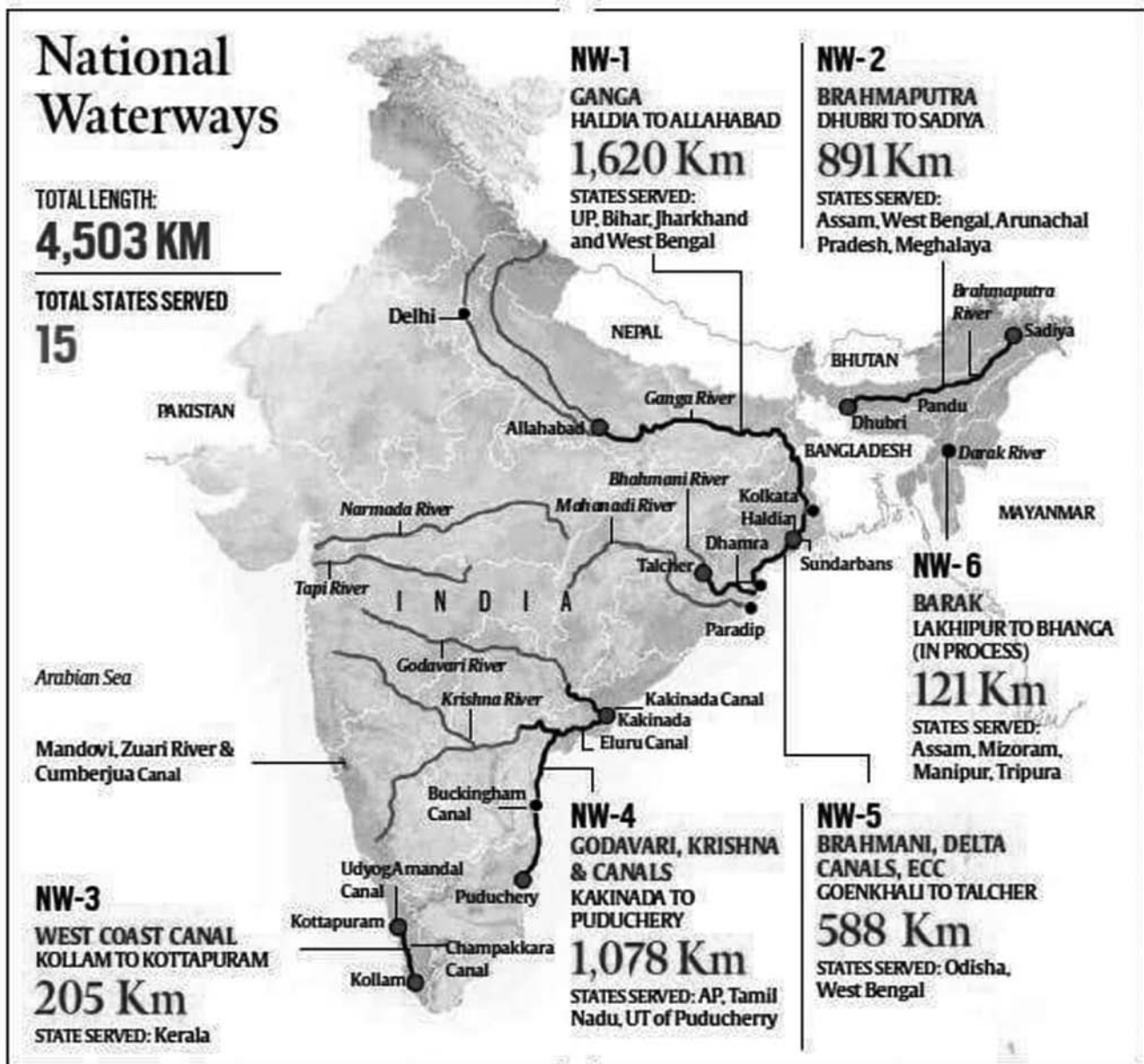
### Water Transport Network

- India boasts approximately 14,500 kilometers of navigable waterways, albeit their contribution to the nation's transportation remains modest, at approximately 1%.
- This extensive network encompasses canal backwaters, rivers, creeks, and various other types of water bodies.
- While around 3,700 kilometers of major rivers are navigable by mechanized flat-bottom vessels, a mere 2,000 kilometers are presently operational.

- Out of the 4,800 kilometers of navigable length within the canals, mechanized vessels are currently confined to just 900 kilometers.
- These canals collectively facilitate the movement of approximately 180 lakh tonnes of goods.
- Major Waterways of India are given below -

### Government Initiatives

- **The Inland Waterways Authority of India Act, 1985:** This Act establishes the Inland Waterways Authority of India, which manages and develops inland waterways for shipping and navigation purposes.
- **The Indian Vessels Act of 1917 (as revised in 2007):** This act primarily deals with the survey and registration of inland vessels, removal of navigation barriers, carriage of goods and passengers, pollution prevention, and related matters.



- **Inland Water Transport Policy 2001:** This policy recognizes inland water transport (IWT) as a cost-effective, environmentally friendly mode of transportation. It encourages substantial private sector involvement in infrastructure development and fleet operations within the IWT sector.
- **Jal Marg Vikas Project (JMVP):** JMVP aims to augment the navigational capacity of National Waterway-1 (NW-1) along the Ganga River. This project, costing Rs 5369.18 crore, receives technical assistance and investment support from the World Bank. It is anticipated to conclude by March 2023.
- **Project Arth Ganga:** This project focuses on reengineering the Jal Marg Vikas Project (JMVP) with the participation of local communities and an emphasis on promoting economic activities along the Ganga River. The project aims to construct small jetties along the Ganga to boost local economic endeavors in Uttar Pradesh, Bihar, Jharkhand, and West Bengal.
- **The National Waterways Act of 2016:** This legislation designates 111 rivers, river sections, creeks, and estuaries as National (inland) Waterways, granting the Central Government authority to regulate their development for shipping, navigation, and transport using mechanically propelled vessels.
- **Inland Vessels Bill 2021:** This bill proposes to replace the Inland Vessels Act of 1917 and establish a comprehensive national regulatory framework for inland vessel transportation.
- **Sagarmala Project:** In addition to enhancing coastal trade routes, the Sagarmala project focuses on expanding inland waterways to drive industrial development. It aims to reduce logistical costs by increasing the share of domestic waterways in the modal mix from the current 6%.
- It focuses on the development of 3 sectors of essential infrastructure facilities like water supply, sewerage/drainage, solid waste management coupled with Reforms to enhance the delivery of services with respect to the benchmarks set out.

### Satellite Towns Development Scheme

- This initiative offers central financial assistance to facilitate the development of small and medium towns, alleviating the strain on major cities.

### Smart Cities Mission

- Launched in 2015, the Smart Cities Mission is a notable endeavour.
- While its primary focus is on major cities, it indirectly fosters the advancement of satellite towns through comprehensive urban revitalization.
- For example, the 'Area-Based Development' approach within the mission has contributed to the emergence of smart satellite towns in proximity to selected cities.

### Pradhan Mantri Awas Yojana (Urban)

- Satellite towns have significantly benefitted from the Pradhan Mantri Awas Yojana (Urban).
- Many of the housing projects have been established in satellite towns, leveraging advantages such as lower land costs and enhanced infrastructure.

### Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

- AMRUT, a government initiative, is geared towards ensuring that every household in satellite towns has access to a tap with a dependable water supply and a sewerage connection.
- This is aimed at enhancing the overall quality of life in these areas.

### National Urban Housing Fund (NUHF)

- Operating under the Ministry of Housing and Urban Affairs, the NUHF offers financial support for the Pradhan Mantri Awas Yojana (Urban) and has played a pivotal role in facilitating the growth of satellite towns by providing affordable housing alternatives.

## Satellite Towns: Infrastructure Development Programmes

*Satellite towns, also known as satellite cities or commuter towns, are urban areas located in proximity to a major city but not directly adjacent to it. These towns are often developed to address the challenges of congestion, overcrowding, and high costs of living in the central city.*

### Major Development Programmes

#### Urban Infrastructure Development Scheme for Satellite Towns

- This flagship scheme was launched for satellite towns around 7 Megacities.
- 7 Towns were covered under the scheme namely: Pilkhuwa and Sonapat (near Delhi), Sanand (near Ahmedabad), Vasai-Virar (near Mumbai), Vikarabad (near Hyderabad), Sriperumbudur (near Chennai), and Hosakote (near Bengaluru)

## Types of Tax in India

*A tax is a compulsory financial charge or levy imposed by a government on individuals, businesses, or other entities to fund public expenditures and government activities.*

### Types of Tax

#### Direct Tax

- Direct taxes are taxes that are imposed on individuals or entities directly by the government. These taxes are paid directly to the government by the person or organization on whom they are levied.

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### Types of Direct Tax

- **Income Tax:** Income Tax in India applies to individuals, Hindu undivided families, unregistered businesses, and other groups. The tax system is progressive, meaning the tax rate increases with higher income levels.
- **Corporation Tax:** Corporation Tax, also known as Corporate Tax, is levied on the profits of companies and business firms. Businesses registered under the Companies Act 1956, both public and private, are subject to corporate tax.
- **Minimum Alternate Tax (MAT):** The Minimum Alternate Tax (MAT) was introduced to ensure that companies with significant profits and substantial dividends to shareholders pay a minimum fixed percentage of book profit as tax, even if they benefit from various tax incentives and exemptions.
- **Capital Gains Tax:** Capital Gains Tax is imposed on the profits or gains resulting from the sale of capital assets, including land, buildings, houses, jewellery, patents, and copyrights. The tax rates differ for short-term and long-term capital gains.
- **Securities Transaction Tax (STT):** Securities Transaction Tax (STT) is a tax applied to gains from transactions on the domestic stock exchange involving securities such as equities, options, and futures.
- **Commodities Transaction Tax (CTT):** The Commodities Transaction Tax (CTT) is imposed on buyers and sellers of exchange-traded non-agricultural commodity derivatives in India.
- **Alternate Minimum Tax (AMT):** Similar to MAT for corporations, the Alternate Minimum Tax (AMT) applies to limited liability partnerships (LLPs) in India. Other types of commercial organizations, like partnership firms and sole proprietorships, are not subject to this tax.
- **Estate Duty:** Estate Duty, introduced in 1953, is a tax levied on a person's entire estate upon their death. However, this tax has been discontinued since 1985.
- **Wealth Tax:** Wealth Tax, initiated in 1957, was imposed on individuals, joint Hindu families, and businesses with excess net worth. Wealth Tax was abolished in 2015.
- **Gift Tax:** Gift Tax, introduced in 1958, was applicable to all gifts except those made by charitable institutions, the government, and private enterprises. This tax was discontinued in 1998.

### Indirect Tax

- Indirect taxes are taxes imposed on goods and services, and they are not paid directly to the government by the consumer or business that uses the goods or services. Instead, these taxes are collected by intermediaries, such as manufacturers or retailers, and then passed on to the government.

### Types of Indirect Tax

- **Customs Duty:** Customs Duty is a tax or tariff imposed when goods are transferred across international borders.

Its primary objective is to protect the domestic economy. Different types of customs duties, including Basic Duty, Countervailing Duty, Protective Duty, Anti-Dumping Duty, and Export Duty, are applied under customs regulations.

- **Goods and Services Tax (GST):** GST, or Goods and Services Tax, is a national indirect tax applicable to the production, sale, and consumption of goods and services. It has replaced all previous indirect taxes levied by both the central and state governments on goods and services.
- **Sales Tax:** Sales tax in India is a government-imposed tax on the sale or purchase of specific commodities within the country. It was formerly levied by both the central and state governments but has been replaced by Integrated Goods and Services Tax (IGST).
- **Excise Duty:** Excise duty is a tax on manufactured products in India, not on the sale of the product. The central government imposes excise duty, except for alcoholic drinks and narcotics. It has been replaced by Central Goods and Services Tax (CGST).
- **Service Tax:** Service tax in India was imposed on all services rendered. Initially, it was levied on telephone services, general insurance, and stockbroking in 1994-95. The service tax rate was 15% before being replaced by the Goods and Services Tax (GST).
- **Value Added Tax (VAT):** VAT is designed to eliminate distortions in the taxation of goods. All states and union territories in India (except Andaman Nicobar and Lakshadweep) have implemented VAT. State VAT replaced the previous State Sales Tax and has been replaced by State Goods and Services Tax (SGST).
- **Dividend Distribution Tax (DDT):** DDT is a tax imposed by the Indian government on domestic corporations based on the dividends paid to shareholders. In the 2020 Budget, the Finance Minister eliminated DDT, shifting the tax burden from corporations to individuals.

### Socio-economic Welfare: Important Indicators

*Socio-economic welfare refers to the overall well-being and quality of life of individuals and communities, considering both social and economic factors. It encompasses various aspects of people's lives, such as their access to basic needs (like food, shelter, and healthcare), education, employment opportunities, income levels, social support systems, and overall living conditions.*

### Key Indicators

#### Literacy Rate

- The literacy rate in India refers to the percentage of people aged 7 and above who can read and write with understanding.
- It is a key indicator of educational attainment and the ability to access and understand written information.

- As per the census of 2011, the literacy rate of India is 74.04%. Literacy rate among the males is 82.14% and among females is 65.46%.

### Employment Rate

- The employment rate indicates the percentage of the working-age population (usually defined as 15-59 years) that is currently employed or engaged in some form of productive work.
- It reflects the extent of labour force participation and employment opportunities in the country.
- **Important Periodic Labour Force Survey Annual Report 2022-2023 Data**
  - ✓ **India's Unemployment Rate:** India's unemployment rate for individuals aged 15 and above reached a six-year low of 3.2 per cent during the period from July 2022 to June 2023.
  - ✓ **Usual Status Unemployment Rate Decline:** The Unemployment Rate (Usual Status) decreased to 3.2 per cent in 2022-23 from 4.1 per cent in 2021-22.
  - ✓ **Rural and Urban Unemployment Rates:** In rural regions, the unemployment rate decreased from 5.3 per cent in 2017-18 to 2.4 per cent in 2022-23. In urban areas, it decreased from 7.7 per cent to 5.4 per cent.
  - ✓ **Labour Force Participation Rate (LFPR):** The Labour Force Participation Rate (LFPR) in usual status for individuals aged 15 and above increased to 57.9 per cent from 49.8 per cent in 2017-18.
  - ✓ **Rural and Urban LFPR Growth:** For rural areas, LFPR increased from 50.7 per cent in 2017-18 to 60.8 per cent in 2022-23, while for urban areas, it increased from 47.6 per cent to 50.4 per cent.
  - ✓ **Worker Population Ratio (WPR):** The Worker Population Ratio (WPR) in usual status for persons aged 15 and above also increased to 56 per cent in 2022-23 from 46.8 per cent in 2017-18. WPR is defined as the percentage of employed persons in the population.
  - ✓ **Rural and Urban WPR Increase:** For rural areas, WPR increased from 48.1 per cent in 2017-18 to 59.4 per cent in 2022-23, while for urban areas, it increased from 43.9 per cent to 47.7 per cent. The WPR for males in India increased from 71.2 per cent in 2017-18 to 76.0 per cent in 2022-23.

### Per Capita Income

- Per capita income is the average income earned by an individual in a given time frame, typically calculated on an annual basis.
- In India, it is usually measured as the average income earned per person per year and is a crucial indicator of the country's economic well-being.
- As per latest provisional estimate published on 31st May, 2023, India's per capita Net National Income (NNI) at constant (2011-12) prices increased by 35.12 percent from Rs. 72,805 in 2014-15 to Rs. 98,374 in 2022-23.

### Type of Housing

- This indicator assesses the quality and condition of housing facilities where people live.
- It considers aspects like housing structure, access to basic amenities, and living conditions, differentiating between categories such as rural and urban housing.
- Households were further distributed by the Census-2011 of India in terms of the habitable conditions of houses into 'good condition', 'livable condition' and 'dilapidated condition'.
- Among the 246.69 million total households living in residential and residence-cum-other use occupied census houses, 131.02 (53 percent) million households were living in 'good condition' houses, 102.47 million (42 percent) were living in 'livable condition' houses while households living in 'dilapidated' houses were 13.20 million (5 percent).

### Households with Drinking Water

- This indicator measures the percentage of households in India that have access to safe and clean drinking water.
- It reflects the availability of potable water sources within or near households, which is essential for public health.
- According to 2011 Census, taps, hand-pumps and tube-wells together constituted the major sources of drinking water in India.
- At the national level, 107.41 million households (43 percent) accessed taps as the source of drinking water, 103.52 million households (42 percent) had both hand-pumps and tube wells, while 27.18 million households (11 per cent) used well for drinking water. Around 4.93 million (2 percent) households made use of spring, river, canal, tank, pond & lake, etc. as sources of drinking water.

### Availability of Toilet

- This indicator gauges the percentage of households with access to sanitation facilities, including toilets.
- It reflects the provision of adequate sanitation infrastructure, which is vital for public health and hygiene.
- Recently, Swachh Survekshan Grameen 2022 covered 17,559 villages in 709 districts in 33 States/UTs across India.
- Around 1,75,521 Households were interviewed in these 17,559 villages.
- Based on this survey, 95.4% of surveyed households have access to toilet and 95.4% of those having toilet have been using it regularly.

### Women's Participation in Decision Making

- This indicator evaluates the extent to which women are involved in the decision-making processes within their households and communities.
- It encompasses their participation in matters related to family, community, and public life, highlighting gender empowerment and equality.



## Prelims GS Roundup-3

- As per data of Periodic Labour Force Survey, among the officials working at managerial positions in India, 18.8% were women in 2020 and 18.1% in 2021.
- In 2021, the highest percentage is seen in Mizoram (41.5%) followed by Sikkim (32.5%), Manipur (31.1%), Meghalaya (30.9%) and Andhra Pradesh (30.3%).

### Measurement of Economic Growth: Key Indicators

*Economic growth signifies a favourable transformation in economic indicators, denoting an expansion in the quantity of goods and services generated by an economy. This expansion translates to a rise in the actual national income and national production.*

#### Important Indicators

##### Gross Domestic Product (GDP)

- Gross Domestic Product (GDP) represents the aggregate worth of ultimate goods and/or services manufactured within a country's borders during a fiscal year (from April 1st to March 31st).
- GDP encompasses the production carried out by foreign citizens within the nation's geographical confines.
- This metric is evaluated at market prices and termed as GDP at market rates.
- It comprises various components, including wages and salaries, interest, rent, undistributed profits, depreciation, mixed-income, direct taxes, and dividends.
- Net Domestic Product (NDP) results from deducting depreciation from the Gross Domestic Product. Depreciation pertains to the deterioration or decline that transpires during the production process.

##### Gross National Product (GNP)

- Gross National Product (GNP) signifies the value of final goods and/or services generated by a nation's citizens within a fiscal year.
- The GNP calculation involves adding the income stemming from abroad to the Gross Domestic Product (GDP) and then subtracting the income departing from the economy.
- This figure encompasses the net income originating in a country from foreign trade.
- The GNP comprises four key elements:
  - ✓ Consumer goods and services
  - ✓ Gross private domestic income
  - ✓ Income arising from abroad
  - ✓ Goods produced or services rendered
- Net National Product is calculated by subtracting depreciation from the Gross National Product.

##### Per Capita Income

- The money made per person in a country or region is expressed as Per Capita Income.

- The average per-person income for an area is calculated using Per Capita Income, which is also used to assess the population's well-being and standard of life.

#### Formula

- ✓ The entire income made by every person and the whole population makes up the majority of the Per Capita Income calculation.
- ✓ Therefore, per capita income formula is first determined by dividing the region's total revenue by the total number of people.

### Cottage Industries in India

*Cottage industries are characterized by manufacturing processes that heavily rely on manual labour. India is renowned for its rich cultural diversity, traditional handicrafts from cottage industries, and a wide array of food products, among other offerings.*

#### Cottage Industry Types

##### Cotton Weaving

- Given the widespread use of cotton clothing across the country, this craftsmanship has deep-rooted traditions.
- Cotton garments are celebrated for their traditional designs, vibrant colours, and handwoven fabrics.
- The skilled weavers employ handlooms for crafting these textiles. Gujarat, Tamil Nadu, and Maharashtra are among the top cotton-producing states in India.

##### Silk Weaving

- The country is a major producer and exporter of silk, both for domestic consumption and international markets.
- Karnataka stands out as the leading silk-producing state, contributing to over 70% of the nation's silk weaving industry.
- Various types of silk, including Mulberry, Tassore, Muga, and Eri silks, are manufactured in India.

##### Carpet Weaving

- The art of carpet weaving was introduced to India during the Mughal era.
- Indian carpets, such as durries and coir carpets, are renowned for their exceptional quality and texture, much like Kashmiri carpets.
- Although carpet weaving is widespread throughout the nation, it is predominantly concentrated in regions like Kashmir, Rajasthan, Punjab, Uttar Pradesh, Andhra Pradesh, and Punjab.
- To promote various types of knotted rugs and floor coverings from across India, the Indian government established the Carpet Export Council.

##### Leather Production

- India plays a significant role in leather production, contributing to approximately 10% of the global demand.

- The leather industry is one of the top export earners for India and provides employment to nearly 2.5 million workers.
- Leading states for leather production include Uttar Pradesh, West Bengal, and Tamil Nadu.

### Metal Works

- Metal has been employed in India for crafting figurines, jewellery, utensils, and various other items.
- India's metal handicrafts are highly regarded internationally and make a substantial economic impact on the nation.
- These intricate metal handicrafts are fashioned using manual tools rather than advanced machinery.

### Handicraft Industry

- The handicraft industry is a pivotal component of India's economy and encompasses a diverse range of products.
- Handicrafts comprise various items such as metal products, wooden artefacts, hand-painted textiles, embroidered goods, imitation jewellery, jute products, bamboo creations, and more.

## Poverty: Measurement and Eradication Programmes

*Poverty can be defined as a condition in which an individual or household lacks the financial resources to afford a basic minimum standard of living. However, the perception regarding what constitutes poverty may vary over time and across countries.*

### Measurement of Poverty

#### Poverty Measurement: Absolute Poverty

- Absolute poverty, as defined by the United Nations World Summit for Economic Development, signifies a state of extreme deprivation concerning fundamental human requirements.
- This deprivation encompasses essential elements such as food, safe drinking water, sanitation facilities, health-care, housing, education, and access to information. It is contingent on both income levels and access to social services.
- **Poverty Threshold:** The poverty threshold, in the context of absolute poverty measurement, is determined by assigning a monetary value to a basket of essential goods necessary for meeting basic needs. Any household with an income below this specified value is classified as living in poverty.
- **Limited Scope:** The absolute measurement of poverty, employed by entities like the World Bank and developing nations like India, employs a fixed poverty line that remains consistent across different regions and over time.
- **Critique:** Critics of absolute poverty measurement argue that it fails to consider disparities in living conditions within countries or the varying costs of living in developed nations.

#### Poverty Measurement: Relative Poverty

- Relative poverty is defined as a situation where a household's income falls below the median income level within a specific country.
- This term is primarily used in developed countries. Individuals experiencing relative poverty may not lack all basic necessities but do not attain the same living standards as the majority of the society.
- In other words, they face relative deprivation.
- **Poverty Threshold:** In the context of relative poverty, this method involves categorizing a certain percentage of the economically disadvantaged population as residing below the poverty line.
- **Critique:** Critics of this approach argue that it overlooks the significance of an absolute standard of living and presupposes that relative income is the sole determinant of well-being.

#### Data Collection Method

- **Uniform Resource Period (URP)**
  - ✓ Prior to 1993-94, the poverty line was determined based on URP data.
  - ✓ This method involved gathering information about individuals' consumption expenditure over a 30-day recall period.
  - ✓ This means that the data relied on people's recollection of their consumption expenditures in the preceding 30 days.
- **Mixed Reference Period (MRP)**
  - ✓ Starting from 1999-2000, the National Sample Survey Office (NSSO) transitioned to the MRP approach for poverty measurement.
  - ✓ Under the MRP method, the consumption of five low-frequency items (such as clothing, footwear, durables, education, and institutional health expenditure) is assessed over the past year, while all other items are evaluated based on consumption in the previous 30 days.
  - ✓ In essence, respondents are asked about their consumption of the five specific items over the last year, and for all other items, their consumption over the past 30 days is considered.

#### Poverty Eradication Programmes

- **Integrated Rural Development Programme (IRDP):** Introduced in 1978-79 and universalized from October 2, 1980, this initiative aimed to assist rural individuals living in poverty by providing subsidies and bank credit for creating productive employment opportunities. It has been a continuous effort through various plan periods.
- **Jawahar Rozgar Yojana/ Jawahar Gram Samridhhi Yojana:** The JRY was designed to generate meaningful employment in rural areas for both the unemployed and underemployed. It focused on building economic infrastructure and community and social assets to create jobs.

## Prelims GS Roundup-3

- **Rural Housing – Indira Awaas Yojana:** The Indira Awaas Yojana (IAY) program's goal was to offer free housing to families below the poverty line (BPL) in rural areas, with a particular emphasis on households from Scheduled Castes (SC) and Scheduled Tribes (ST).
- **Food for Work Programme:** This program aimed to improve food security by providing wage employment opportunities. While food grains are supplied to states at no cost, there have been challenges with the supply from Food Corporation of India (FCI) warehouses.
- **National Old Age Pension Scheme (NOAPS):** Administered by the central government, the implementation of this scheme is carried out by panchayats and municipalities in states and union territories.
- **Annapurna Scheme:** Initiated in 1999–2000, this scheme provided 10 kg of free food grains per month to senior citizens who are unable to care for themselves and are not covered by the National Old Age Pension Scheme (NOAPS). It targets the “poorest of the poor” and “indigent senior citizens.”
- **Sampoorna Gramin Rozgar Yojana (SGRY):** The primary aim of this scheme was to create wage employment, build durable economic infrastructure in rural areas, and ensure food and nutrition security for the impoverished.
- **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) 2005:** This act guarantees 100 days of employment each year to rural households. One-third of the jobs are reserved for women.
- The central and state governments establish National Employment Guarantee Funds and State Employment Guarantee Funds, respectively, to implement the scheme.
- **Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM):** This mission addresses the need to diversify livelihood options for the rural poor, offering them regular monthly income through the formation of self-help groups at the village level.
- **Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM):** It focuses on organizing the urban poor into self-help groups, providing skill development opportunities leading to market-based employment, and assisting them in establishing self-employment ventures while ensuring access to credit.
- **Pradhan Mantri Kaushal Vikas Yojana:** This scheme targets fresh entrants to the labour market, especially those who dropped out of class X and XII, and focuses on skill development.
- **Pradhan Mantri Jan Dhan Yojana:** Launched with the aim of facilitating direct benefit transfers of subsidies, pensions, insurance, and more, this scheme successfully opened 50 crore bank accounts and particularly targeted the unbanked population.

## Food Processing Industry: Role in Agricultural Growth

*The food processing industry involves a wide range of activities related to the transformation and preparation of raw food materials into consumable and marketable food products.*

### India's Food Processing Industry: Present Status

- The Indian food processing industry has grown rapidly with an average annual growth rate of 8.3% in the past 5 years.
- With a market size of US\$ 866 billion in 2022, the food industry will play a vital role in the economy's growth.
- The domestic food market is projected to grow by over 47% between 2022 and 2027, reaching US\$ 1,274 billion.
- In 2023, the food market will generate US\$ 963 billion in revenue and the market is anticipated to expand at a CAGR of 7.23% between 2023 and 2027.
- India's agricultural exports surged by nearly one-fifth (19.92%), crossing the US\$ 50 billion milestone, covering 50% of the world's rice market in FY22.
- Exports of processed food climbed from US\$ 8.56 billion in 2020-21 to US\$ 10.42 billion in 2021-22. Furthermore, in 2021-22, processed food exports accounted for 22.6% of the overall agri-food exports.
- The Indian food processing sector has attracted more than US\$ 6 billion worth of foreign direct investment (FDI) since 2014-15.
- Moreover, the food processing industry has attracted FDI equity worth US\$ 709.72 million during 2021-22.
- The total FDI received in the food processing sector is US\$ 11.79 billion from April 2000 till December 2022.
- India's food processing sector is one of the largest in the world and it is expected to reach US\$ 535 billion by 2025-26.

### Government Schemes

#### Pradhan Mantri Kisan Sampada Yojana (PMKSY)

- A centrally sponsored scheme, it is a comprehensive package which will result in the creation of modern infrastructure and efficient supply chain management from the farm gate to the retail outlet.

#### Mega Food Parks (Implemented under PM Kisan Sampada Yojana)

- Integrated cold chain and value addition infrastructure
- Creation/ expansion of food processing/ preservation capacities (Unit Scheme)
- Infrastructure for agro-processing clusters
- Creation of backward and forward linkages
- Food safety and quality assurance infrastructure
- Human resources and institutions

#### PM Formalisation of Micro Food Processing Enterprises Scheme

- Under the Aatma Nirbhar Bharat Abhiyaan, the centrally sponsored scheme, the Pradhan Mantri Formalisation of Micro food processing Enterprises (PMFME) Scheme was launched on June 29, 2020.

- This scheme is currently being implemented in 35 states and union territories with the goal of improving the existing micro-enterprises in the unorganized segment of the food processing industry and the formalisation of the sector.
- It also includes US\$ 487.61 (Rs. 40,000) in financial assistance for working capital and the purchase of small tools for each member of the Self Help Group (SHG) involved in food processing operations.
- Over 1 lakh SHG members have been identified and a total of US\$ 24.74 million (Rs. 203 crore) has been granted.

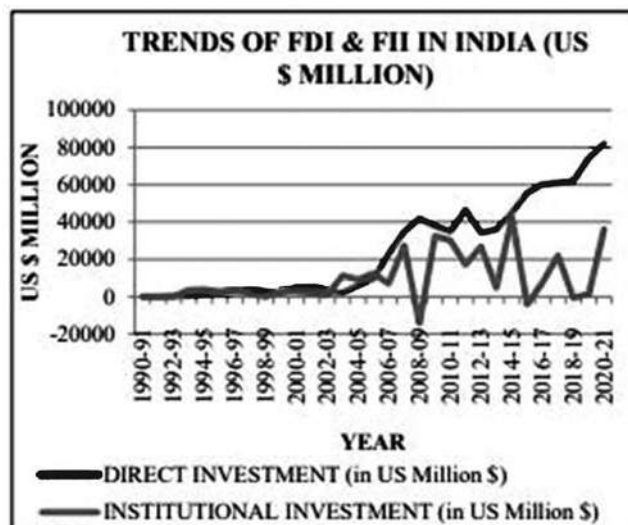
### Production Linked Incentive Scheme for Food Processing Industry (PLISFPI)

- The Production Linked Incentive Scheme for Food Processing Industry (PLISFPI), a central sector scheme has been allocated a financial outlay of US\$ 1.32 billion (Rs. 10,900 crore) for the period of 2021-22 to 2026-27.
- It aims to assist the emergence of global food manufacturing champions commensurate with India's natural resource endowment and to encourage Indian brands of food products in foreign markets.
- By 2026-27, the scheme's implementation would enable an increase in processing capacity, resulting in a processed food output of US\$ 4.07 billion (Rs. 33,494 crore) and the creation of roughly 2.5 lakh jobs.

### FDI: Role in Economic Growth

*Foreign Direct Investment (FDI) is the investment of funds by an organisation from one country into another, with the intent of establishing 'lasting interest'. According to OECD (Organisation for Economic Co-operation and Development), lasting interest is determined when the organisation acquires a minimum of 10% of voting power in another organisation.*

### FDI's Role in Economic Growth: Indian Perspective



SOURCE: RBI BULLETIN

- The inflow of FDI has shown a consistent upward trajectory, notably since 2014-15 when it stood at \$45,148 million. The highest recorded FDI inflow occurred in 2020-2021, reaching \$81,973 million, despite the prevailing pandemic situation.
- The positive and upward trend in FDI inflow has significantly impacted India's economic growth during these years.
- India's regulatory environment for foreign investments has significantly improved since 1991, positioning it as one of the top ten most appealing destinations for inbound investments.
- FDI directly contributes to growth through capital formation, infrastructure enhancement, productivity gains, and the creation of employment opportunities.
- India continues to attract foreign capital due to the favourable policy framework established by the Indian government.
- Recent governmental initiatives include relaxing FDI restrictions in sectors like defence, public sector undertakings, oil refineries, telecommunications, and stock exchanges.
- The Indian government has introduced multiple measures to boost FDI inflow, such as streamlining scrutiny for certain foreign direct investments from bordering countries, revising FDI policies in the insurance sector, enabling up to 20% FDI in India's LIC, and implementing initiatives like PM Gati Shakti, single window clearance, and GIS-mapped land banks.
- If India successfully increases the FDI to GDP ratio to the range of 3% to 4% by 2025, it is anticipated that the country could attract an annual FDI of \$120 billion to \$160 billion.
- This has the potential to elevate India's GDP growth rate back to the 7% - 8% range, supported by recent structural reforms, expanded FDI limits in various sectors, and the Indian government's Aatmanirbhar Bharat program.
- Foreign Institutional Investment (FII) faced negative figures in 2015-16 with -\$4,130 million and in 2018-19 with -\$618 million. While it displayed an upward trend in 2020-21, recent data from 2021-22 indicates a renewed decline due to substantial withdrawals by foreign institutional investors.
- FII has demonstrated both positive and negative impacts on the country's economy. However, when considering its long-term influence, it becomes evident that FII does not have a profound and enduring positive impact on the economy.
- Capital flows from FIIs are often seen as a double-edged sword. On one hand, FII investments enhance market efficiency and reduce the cost of capital in emerging economies undergoing liberalization.
- Conversely, policymakers and experts argue that FII trades can exacerbate volatility in the host country's stock markets.



## Prelims GS Roundup-3

- FIIs are drawn to investments not only by domestic and global economic conditions but also by short-term expectations influenced by market sentiment.
- These short-term expectations lead to a degree of speculation and significant mobility in FII capital flows, contributing to volatility in the host country's stock market. While some level of volatility can be beneficial for revealing changing values in economic activity and facilitating resource allocation, volatility stemming from FII fund flows can be detrimental to stock markets and investors.
- This volatility adversely affects investors' decisions regarding efficient resource allocation, leading to reduced stock market investment.
- As a result, investors demand a higher risk premium to compensate for the added risk due to market volatility. This, in turn, increases the cost of capital, reduces physical investment, and has a negative impact on economic growth.

### FDI: Advantages

- **Increased Employment and Economic Growth:** FDI contributes significantly to job creation, particularly in developing nations. It stimulates manufacturing and services sectors, reducing unemployment rates among the educated, skilled, and unskilled labour force. This boosts income levels, enhancing overall economic prosperity.
- **Human Resource Development:** An often overlooked benefit of FDI is its role in human resource development. Through training and experience, the workforce's knowledge and skills are honed, elevating the country's education and human capital. These enhanced human resources can subsequently train others, creating a positive ripple effect.
- **Development of Backward Areas:** FDI plays a pivotal role in transforming underdeveloped regions into thriving industrial hubs. This transformation contributes to the socio-economic growth of these areas.
- **Provision of Finance & Technology:** Foreign investors provide access to cutting-edge financial instruments, technologies, and operational practices. These innovations gradually disseminate throughout the local economy, resulting in increased industry efficiency and effectiveness.
- **Increase in Exports:** FDI-backed products are not solely intended for domestic consumption. Many are designed for global markets. The establishment of 100% Export Oriented Units and Economic Zones further facilitates the export capabilities of FDI investors.
- **Exchange Rate Stability:** Continuous FDI inflow ensures a steady stream of foreign exchange, bolstering the central bank's foreign exchange reserves and promoting exchange rate stability.
- **Stimulation of Economic Development:** FDI acts as a wellspring of external capital and revenue for a country. During the construction phase, local resources are employed, and once operational, these factories hire local workers and utilize local materials and services. This cycle enhances job opportunities, tax revenue, and infrastructure development.

- **Improved Capital Flow:** Inflow of capital is especially beneficial for countries with limited domestic resources and limited access to global capital markets.
- **Creation of a Competitive Market:** FDI fosters a competitive environment by introducing foreign entities to the domestic market, breaking domestic monopolies. This healthy competition drives companies to continually enhance their processes and product offerings, fostering innovation and offering consumers a wider range of competitively priced products.

## India's Livestock Resources

*Livestock resources refer to the animals that are raised by humans for various purposes, including food production, agricultural work, transportation, and other uses. Livestock resources typically encompass domesticated animals, which are distinct from wild animals.*

### 20<sup>th</sup> Livestock Census: Key Facts

- The total Livestock population is 535.78 million in the country showing an increase of 4.6% over Livestock Census 2012.
- Total Bovine population (Cattle, Buffalo, Mithun and Yak) is 302.79 Million in 2019 which shows an increase of 1.0% over the previous census.
- The total number of cattle in the country is 192.49 million in 2019 showing an increase of 0.8 % over previous Census.
- The Female Cattle (Cows population) is 145.12 million, increased by 18.0% over the previous census (2012).
- The Exotic/Crossbred and Indigenous/Non-descript Cattle population in the country is 50.42 million and 142.11 million respectively.
- The Indigenous/Non-descript female cattle population has increased by 10% in 2019 as compared to previous census.
- The population of the total Exotic/Crossbred Cattle has increased by 26.9 % in 2019 as compared to previous census.
- There is a decline of 6 % in the total Indigenous (both descript and non-descript) Cattle population over the previous census. However, the pace of decline of Indigenous Cattle population during 2012-2019 is much lesser as compared to 2007-12 which was about 9%.
- The total number of buffaloes in the country is 109.85 million showing an increase of about 1.0% over previous Census.
- The total milch animal population (in-milk and dry) in cows and buffaloes is 125.34 million, an increase of 6.0 % over the previous census.

- The total sheep in the country is 74.26 million in 2019, increased by 14.1% over previous Census.
- The Goat population in the country in 2019 is 148.88 million showing an increase of 10.1% over the previous census.
- The total Pigs population in the country is 9.06 million in the current Census, declined by 12.03% over the previous Census.
- The total Mithun population in the country is 3.9 Lakhs in 2019, increased by 30.0% over previous Census.
- The total Yak population in the country is 58000 in 2019; it decreased by 24.67% over previous Census.
- The total Horses and Ponies in the country is 3.4 Lakhs in 2019, decreased by 45.6% over previous Census.
- The total population of Mules in the country is Eighty Four Thousand in 2019, decreased by 57.1% over previous Census.
- The total population of Donkeys in the country is 1.2 Lakhs in 2019, decreased by 61.23% over previous Census.
- The total Camel population in the country is 2.5 Lakhs in 2019, decreased by 37.1% over previous Census.
- The total Poultry in the country is 851.81 million in 2019, increased by 16.8% over previous Census.
- The total Backyard Poultry in the country is 317.07 million in 2019, increased by 45.8% over previous Census.
- The total Commercial Poultry in the country is 534.74 million in 2019, increased by 4.5% over previous Census.

### Government Measures

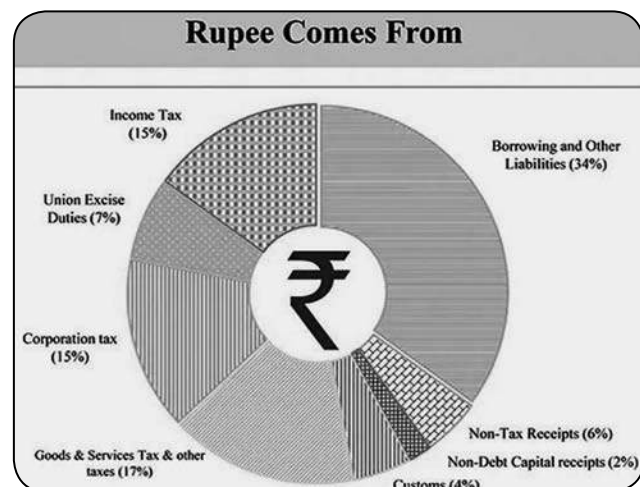
- **Rashtriya Gokul Mission:** This program focuses on the development of cattle and buffalo breeds.
- **National Programme for Dairy Development (NPDD):** This initiative is aimed at promoting dairy development.
- **National Livestock Mission (NLM):** The NLM seeks to enhance the development of sheep, goat, pig, poultry, and feed and fodder resources.
- **Livestock Census and Integrated Sample Survey (LC & ISS):** This program is designed for conducting livestock censuses and sample surveys.
- **Livestock Health and Disease Control (LH&DC) Scheme:** This program is implemented to support state and union territory governments in preventing, controlling, and managing economically significant animal diseases, including zoonotic diseases, through vaccination.
- **National Animal Disease Control Programme (NADCP):** NADCP aims to control Foot & Mouth Disease and Brucellosis by vaccinating cattle, buffalo, sheep, goats, and pigs against Foot & Mouth Disease. Additionally, it focuses on vaccinating female bovine calves aged 4-8 months against brucellosis.
- **Animal Husbandry Infrastructure Development Fund (AHIDF):** This fund supports the development of infrastructure related to animal husbandry.

- **Dairy Infrastructure Development Fund (DIDF):** DIDF encourages the development of dairy infrastructure.
- **Support to Dairy Cooperatives and Farmer Producer Organizations:** This support is directed towards dairy activities and strengthening the infrastructure for dairy processing, value addition, meat processing, animal feed production, and breed multiplication farms, incorporating technological advancements.
- **E-Pashu Haat Portal:** The E-Pashu Haat Portal serves as a platform connecting breeders and farmers to facilitate access to high-quality bovine germplasm.

### Sources of Government Revenue

Government revenue, also known as public revenue or government income, refers to the total amount of money collected by a government from various sources to finance its operations, programs, and services.

### Revenue Sources



- **Income Tax:** Income tax is a direct tax imposed by the government on the income earned by individuals, businesses, and other entities within its jurisdiction.
- It is calculated based on the total income or profits earned and is typically paid annually. Income tax is designed to fund government operations, social programs, and public services.
- **Union Excise Duties:** Union excise duties are indirect taxes levied by the central government of India on the production or manufacture of goods.
- These duties are paid by the manufacturers or producers of goods and are included in the price of the final products, ultimately borne by consumers. Union excise duties are a source of revenue for the central government.
- **Corporation Tax:** Corporation tax is a direct tax imposed on the profits earned by companies and corporations. It is calculated on the income generated from business activities.

## Prelims GS Roundup-3

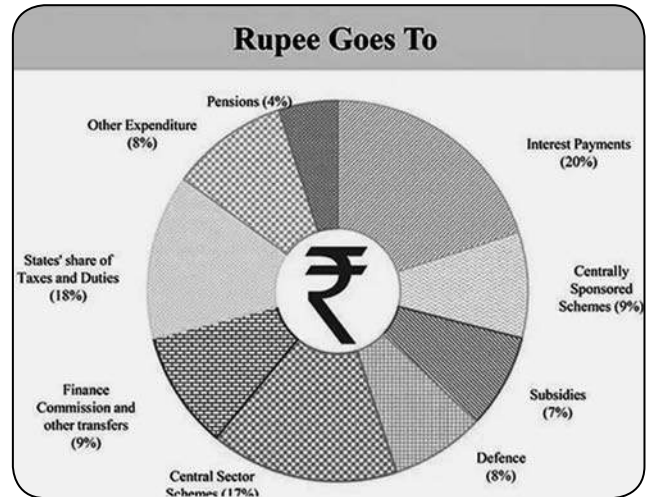
- Corporation tax is levied at a specific rate on the taxable income of businesses and is an important source of government revenue.
- **Goods and Services & Other Taxes:** Goods and Services Tax (GST) is an indirect tax that applies to the supply of goods and services in many countries, including India. It is designed to replace multiple taxes and create a uniform taxation system. GST simplifies tax compliance for businesses and is an important source of indirect revenue for the government.
- **Borrowing and Other Liabilities:** Borrowing and other liabilities refer to the funds raised by the government through the issuance of government bonds, treasury bills, and other debt instruments.
- Governments borrow money from financial markets to finance public expenditures, infrastructure projects, and address budget deficits.
- **Non-Tax Receipts:** Non-tax receipts include revenue generated by the government from sources other than taxation. These sources can include dividends from state-owned enterprises, income from the use of government assets, royalties from natural resource extraction, and various fees and charges. Non-tax receipts contribute to government income diversification.
- **Non-Debt Capital Receipts:** Non-debt capital receipts refer to capital investments and revenue generated from the sale of government assets or privatization of state-owned enterprises.
- These receipts represent non-borrowed capital and can be used for capital expenditure, asset sales, and public project financing.
- **Customs:** Customs refers to the taxes and duties imposed on the importation of goods into a country. These import duties are collected by customs authorities and are designed to generate revenue for the government.
- Customs duties can also serve trade policy objectives, such as protecting domestic industries and regulating international trade.

### Areas of Government Expenditure

Government expenditure refers to the total amount of money that a government spends to fund its various programs, services, and activities during a specific period, typically a fiscal year. It encompasses all the financial transactions in which the government is involved, including payments for public goods and services, transfer payments, debt service, and capital investments.

#### Expenditure Areas

- **Pension:** Pension expenditure refers to the funds allocated by the government for providing retirement benefits to eligible individuals, typically government employees, military personnel, or other public servants. These benefits may include regular pension payments, gratuity, and other post-retirement financial support.



- **Interest Payments:** Interest payments constitute the funds used by the government to pay interest on outstanding government debt, such as bonds, treasury bills, and loans.
- These payments are made to creditors, including individuals, institutions, and foreign governments, as compensation for lending money to the government.
- **Centrally Sponsored Schemes:** Centrally Sponsored Schemes (CSS) are government programs or initiatives where both the central and state governments share the financial responsibility.
- The central government provides a portion of the funding, and the state government contributes the remainder to implement these schemes, which cover various sectors like health, education, and infrastructure.
- **Subsidies:** Subsidies are financial aids provided by the government to specific sectors or individuals to reduce the cost of goods, services, or essential commodities.
- These subsidies are intended to support specific industries, agriculture, consumers, or vulnerable populations and can include food subsidies, fuel subsidies, and more.
- **Defence:** Defence expenditure represents the government's budget allocation for national defence and security. It covers the funding required for the military, armed forces, defence infrastructure, research and development, and other defence-related expenses to ensure the security and protection of a country.
- **Central Sector Schemes:** Central Sector Schemes (CSS) are government programs that are entirely funded and implemented by the central government.
- These schemes typically cover areas or sectors that are under the exclusive jurisdiction of the central government and do not require financial contributions from state governments.
- **Finance Commission and Other Transfers:** Finance Commission and Other Transfers refer to the allocation of financial resources from the central government to state governments and other entities as per the recommendations of the Finance Commission.



- These transfers are aimed at promoting fiscal federalism and addressing regional disparities.
- **States' Share of Taxes and Duties:** States' Share of Taxes and Duties represents the portion of tax revenue collected by the central government that is allocated to state governments as per revenue-sharing arrangements.
- This allocation helps states finance their expenditures and meet their fiscal requirements.
- **Other Expenditure:** Other Expenditure encompasses government spending that does not fall under the categories mentioned above. It may include various expenses related to administrative costs, maintenance, public works, and other miscellaneous expenditures not covered by specific categories.

### Types of Subsidy and Their Effects

*A subsidy is a financial benefit or support the government gives to institutions or individuals. It can be either a direct or indirect subsidy. Direct subsidy refers to the support given in the form of cash. The indirect subsidy, conversely, refers to the assistance offered through tax cuts or low-interest loans.*

#### Subsidy Types and Effects

##### Food Subsidy

- **Objective:** The primary goal of food subsidy is to provide essential food items to a significant portion of the population living below the poverty line in India. These subsidized food products are distributed through the Public Distribution System (PDS).
- **Effects:** Food subsidies help alleviate hunger and malnutrition among economically disadvantaged populations. By ensuring access to staple foods like wheat, rice, sugar, milk, and cooking oil, these subsidies contribute to food security and improved overall health.

##### Export Subsidy

- **Objective:** Export subsidies are designed to enhance the competitiveness of Indian products in the international market and facilitate the entry into new markets for domestic products.
- **Effects:** Export subsidies stimulate international trade by making Indian products more attractive to foreign buyers. This promotes economic growth, increases foreign exchange earnings, and boosts employment in export-oriented industries.

##### Fertilizer Subsidy

- **Objective:** Fertilizer subsidies aim to support farmers by providing fertilizers at discounted prices. The government offers fertilizers at a fixed Maximum Retail Price (MRP) lower than the actual cost, with the government covering the price difference.
- **Effects:** Fertilizer subsidies help increase agricultural productivity by ensuring affordable access to essential nutrients for crops. This results in higher crop yields, improved farm income, and food production.

##### Irrigation Subsidy

- **Objective:** The government provides irrigation facilities at reduced rates compared to market rates. It involves maintaining and operating irrigation infrastructure, including canals, tube wells, and dams. The government either offers these services for free or at low prices to farmers.
- **Effects:** Irrigation subsidies enable farmers to access essential water resources for crop cultivation. This leads to increased agricultural production, reduced dependence on rainfall, and enhanced water management practices.

##### Power Subsidy

- **Objective:** Power subsidies involve providing electricity to farmers at lower rates, primarily for irrigation purposes. The government subsidizes the cost of generating and distributing power to the agricultural sector.
- **Effects:** Power subsidies incentivize farmers to invest in modern irrigation equipment like borewells and pumping sets. This leads to increased crop production, reduced water wastage, and improved agricultural practices.

##### Agriculture / Farm Infrastructure Subsidy

- **Objective:** These subsidies are directed toward improving agricultural infrastructure, such as roads, power supply, storage facilities, market information, and transportation.
- **Effects:** Investments in farm infrastructure subsidies contribute to increased agricultural production and access to markets. They help improve transportation, reduce post-harvest losses, and enable farmers to access vital services and resources.
- These public goods benefit all farmers in a region, enhancing overall agricultural development.

### Tax Authorities and Tribunals

*Taxes are levied by the Central Government and the State Governments in India. Some minor taxes are also levied by the local authorities such as the Municipality and the Local Governments.*

#### Important Authorities and Tribunals

##### Income Tax Appellate Tribunal

- ITAT is a quasi-judicial institution set up in January, 1941 and specializes in dealing with appeals under the Direct Taxes Acts.
- The orders passed by the ITAT are final; an appeal lies to the High Court only if a substantial question of law arises for determination.

##### Central Board of Direct Taxes

- The Central Board of Direct Taxes is a statutory authority functioning under the Central Board of Revenue Act, 1963.
- The officials of the Board in their ex-officio capacity also function as a Division of the Ministry dealing with matters relating to levy and collection of direct taxes.



## Prelims GS Roundup-3

### Central Board of Indirect Taxes and Customs

- It is a part of the Department of Revenue under the Ministry of Finance, Government of India.
- It deals with the tasks of formulation of policy concerning levy and collection of Customs, Central Excise duties, Central Goods & Services Tax and IGST, prevention of smuggling and administration of matters relating to Customs, Central Excise, Central Goods & Services Tax, IGST and Narcotics to the extent under CBIC's purview.
- The Board is the administrative authority for its subordinate organizations, including Custom Houses, Central Excise and Central GST Commissionerates and the Central Revenues Control Laboratory.

### GST Council

- The GST Council, consisting of the Union Finance Minister and representatives from all States and Union Territories, was established to make decisions on various aspects of GST, including tax rates, exemptions, and administrative procedures. It played a crucial role in shaping the GST framework in India.
- On July 1, 2017, GST laws were implemented, replacing a complex web of Central and State taxes. Under the Indian GST, goods and services are categorized into different tax slabs, including 5%, 12%, 18%, and 28%.
- Some essential commodities are exempted from GST, Gold and job work for diamond attract low rate of taxation. Compensation cess is being levied on demerit goods and certain luxury items.
- GST Network (GSTN), a not-for-profit company, was created to provide the IT backbone for the GST system, including taxpayer registration, return filing, and tax payments.

## Types of International Free Trade Agreements

*A free trade agreement (FTA) is a pact between two or more nations to reduce barriers to imports and exports among them. Under a free trade policy, goods and services can be bought and sold across international borders with little or no government tariffs, quotas, subsidies, or prohibitions to inhibit their exchange.*

### Types of FTAs

- **Free Trade Area (FTA):** This is the most basic form of free trade agreement. In an FTA, countries agree to eliminate or significantly reduce tariffs and trade barriers on a wide range of goods traded between them. However, each country retains its own trade policies regarding non-member countries.
- **Customs Union:** A Customs Union goes a step further by not only removing trade barriers within the member countries but also establishing a common external trade policy.

- Member countries agree to adopt a unified tariff and trade policy towards non-member countries, while trade among member countries remains duty-free. For example, India and Bhutan have a bilateral agreement known as the India-Bhutan Customs Union.
- **Common Market:** A Common Market builds on the foundation of a Customs Union. In addition to free trade and a common external tariff, a Common Market allows for the free movement of factors of production, such as labour and capital, within member countries. It aims to create a single economic space.
- **Economic Union:** An Economic Union goes even further by harmonizing economic policies among member countries. This may involve coordinated fiscal, monetary, and regulatory policies.
- For example, while India does not have an economic union with any specific country, it is a member of the South Asian Economic Union (SAEU) through its participation in SAARC.
- **Single Market:** A Single Market, often used in the context of the European Union, aims to remove not only tariff and non-tariff barriers to trade but also all other obstacles to the free movement of goods, services, capital, and people within the union.
- It creates a unified regulatory framework and common standards to facilitate trade and commerce. Example: India is part of the South Asian Free Trade Area (SAFTA), a regional single market within the SAARC framework.
- **Bilateral Free Trade Agreement:** This is an FTA between two countries. It typically covers a wide range of goods and services and aims to reduce or eliminate trade barriers. Example: India has entered into bilateral FTAs with countries like Sri Lanka, Nepal, Bhutan, and Afghanistan.
- India is also a member of regional trade blocs like the South Asian Association for Regional Cooperation (SAARC) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).
- **Regional Free Trade Agreement:** An FTA involving a group of countries within a specific region. These agreements promote trade and economic cooperation among neighbouring nations.
- Examples include the North American Free Trade Agreement (NAFTA) and the African Continental Free Trade Area (AfCFTA).
- **Multilateral Free Trade Agreement:** It refers to FTA involving multiple countries from various regions. These are often global trade agreements negotiated under the auspices of international organizations, such as the World Trade Organization (WTO).
- The General Agreement on Tariffs and Trade (GATT) is an example of a historic multilateral trade agreement.
- **Preferential Trade Agreement (PTA):** In PTAs, member countries offer preferential access to each other's markets by granting lower tariffs or other trade advantages.

- These agreements are typically less comprehensive than FTAs. Example: India signed the India-ASEAN Trade in Goods Agreement as part of its engagement with the Association of Southeast Asian Nations (ASEAN).
- **Sector-Specific Agreements:** Some trade agreements focus on specific sectors, such as agriculture, textiles, or information technology, rather than covering all aspects of trade.

### India's New Industrial Zones

*An industrial zone, often referred to as an industrial area or industrial park, is a designated geographic area that is specifically planned, zoned, and developed for industrial and manufacturing activities.*

#### Economic Exclusive Zones

- **Exclusive Economic Zone (EEZ) Defined by UNCLOS:** The 1982 United Nations Convention on the Law of the Sea (UNCLOS) outlines the definition of an Exclusive Economic Zone (EEZ).
- An EEZ is a designated area that extends up to 200 nautical miles from the baselines and is measured from the breadth of the territorial sea.
- **India's EEZ:** India possesses the 18th largest Exclusive Economic Zone (EEZ) in the world. It encompasses various regions, including the Lakshadweep island group in the Laccadive Sea, the Andaman and Nicobar Islands situated in the Bay of Bengal and the Andaman Sea.
- **Borders of India's EEZ:** India's EEZ shares its boundaries with neighbouring countries. To the west, it is bordered by Pakistan. In the south, it is adjacent to the Maldives and Sri Lanka. In the east, it is delineated by Bangladesh, Myanmar, Thailand, Malaysia, and Indonesia.
- **Legal Framework for India's EEZ:** India has legally defined the concept of an EEZ through the "Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976."
- According to this Act, India's EEZ extends beyond and adjacent to its territorial waters, reaching a limit of two hundred nautical miles from the baseline.
- **Powers within India's EEZ**
  - ✓ **Sovereign Rights:** The government possesses sovereign rights for the purpose of exploring, exploiting, conserving, and managing natural resources, including both living and non-living resources. This extends to the production of energy from sources like tides, winds, and currents.
  - ✓ **Exclusive Rights and Jurisdiction:** The government has exclusive rights and jurisdiction over various matters, including the construction, maintenance, or operation of artificial islands, offshore terminals, installations, and other structures.

- ✓ **Scientific Research:** The government has exclusive jurisdiction to authorize, regulate, and control scientific research activities within the EEZ.
- ✓ **Marine Environment:** The government holds exclusive jurisdiction to preserve and protect the marine environment and to prevent and control marine pollution.
- ✓ **Recognition under International Law:** India's EEZ is also recognized for other rights as per international law.
- ✓ **Regulations for Activities in India's EEZ:** Any individual or foreign government is prohibited from exploring, exploiting, conducting research, or excavation within India's EEZ without the appropriate license or letter of authority issued by the Central Government.

#### Coastal Economic Zones

- A Coastal Economic Zone (CEZ) is a designated coastal region with specific economic regulations that include tax incentives and reduced tariffs to encourage foreign direct investment.
- CEZs are akin to Special Economic Zones (SEZs) but have a primary focus on fostering coastal development projects, including the promotion of economic activities and infrastructure development in coastal areas.
- CEZs are comprised of a collection of coastal districts or districts closely linked to regional ports, strategically harnessed to leverage synergies with planned industrial corridor projects.
- CEZs are envisioned as robust, business-friendly ecosystems, focusing on simplifying procedures for conducting business, facilitating the import and export of goods, expediting environmental clearances, and ensuring reliable access to essential resources such as water and electricity.
- The development of CEZs is an integral part of a comprehensive plan that aims to establish 14 industrial clusters, driving manufacturing growth and employment opportunities.
- The initial phase of this plan entails a substantial investment of Rs 15,000 crore, with the potential to create over 1.5 lakh job opportunities.

#### Special Economic Zones

- A Special Economic Zone (SEZ) is a designated area within a country that typically offers fiscal concessions, including duty-free benefits, and has distinct business and commercial laws.
- The primary purpose of SEZs is to incentivize investment and job creation. They also streamline the administration of these regions, ultimately enhancing the ease of conducting business.

#### SEZs in India

- The inception of Export Processing Zones (EPZs) in Asia dates back to 1965 with the establishment of Kandla, Gujarat, as the first EPZ in the region.

## Prelims GS Roundup-3

- The Indian government initiated the creation of SEZs in 2000 under the Foreign Trade Policy to address infrastructure and bureaucratic challenges that hindered the success of EPZs.
- The Special Economic Zones Act was enacted in 2005, coming into effect in 2006. India's SEZs have closely modelled China's successful SEZ model.
- Currently, India has 378 notified SEZs, with 265 of them in operation. Notably, around 64% of these SEZs are situated in five states: Tamil Nadu, Telangana, Karnataka, Andhra Pradesh, and Maharashtra.
- The apex body responsible for SEZs is the Board of Approval, led by the Secretary of the Department of Commerce under the Ministry of Commerce and Industry.
- A committee, headed by Baba Kalyani and appointed by the Ministry of Commerce and Industry, aimed to evaluate India's SEZ policy. The committee submitted its recommendations in November 2018.
- The core objectives of the SEZ Act include stimulating economic activity, boosting exports of goods and services, generating employment, attracting domestic and foreign investments, and developing essential infrastructure facilities.

### Incentives and Facilities Available to SEZs

- SEZs offer a range of incentives and facilities to promote economic activities and investments, including:
  - ✓ Duty-free import and domestic procurement of goods for the development, operation, and maintenance of SEZ units.
  - ✓ Exemptions from various taxes, such as Income Tax and minimum alternate tax.
  - ✓ The allowance for SEZ units to engage in external commercial borrowing up to US \$500 million annually without maturity restrictions through recognized banking channels.
  - ✓ Streamlined single window clearance for approvals at both the Central and State levels.

### Performance of SEZs in India

- Exports from SEZs have shown substantial growth, increasing from Rs. 22,840 Crore in 2005-06 to Rs. 7,59,524 Crore in 2020-21.
- Investment in SEZs has also risen significantly, surging from Rs. 4,035.51 Crore in 2005-06 to Rs. 6,17,499 Crore in 2020-21.
- Employment opportunities within SEZs have expanded, with the number of employees increasing from 1,34,704 in 2005-06 to 23,58,136 in 2020-21.

## Multi-modal Logistics Parks

*Multi-modal logistics parks (MMLPs) are expansive areas equipped with both rail and road connections, designed to facilitate the smooth transfer of incoming goods to various modes of transportation in a hub-and-spoke configuration.*

### MMLPs: Transforming India's Logistics sector

- **Cost-Efficiency:** Through offering value-added services like customs clearance, labelling, repackaging, and packaging, these parks aim to reduce the overall logistics cost from the current 14% of GDP to below 10% of GDP.
- **Enhanced Productivity:** Multi-modal logistics parks (MMLPs) will expand the nation's warehouse capacity, boosting the efficiency of transporting goods and decreasing the cost of freight transportation.
- **Reduced Handling Expenses:** Thanks to state-of-the-art, mechanized handling facilities, MMLPs are anticipated to cut secondary freight expenses by co-locating large warehouses and value-added services.
- **Demand Aggregation:** These parks will ensure better train services, the use of modern equipment, and electronic data interchange, streamlining the movement of goods from production centres to ports.
- **Container Transportation:** MMLPs won't just facilitate the export of goods but also enable the transportation of containers to seaports to meet inland demand. Presently, inland goods movement is typically not conducted via containers.
- **Cost-Effective Warehousing and Reduced Pollution:** Located outside city boundaries where land costs are lower, these parks will lead to reduced warehousing charges and decreased pollution. Furthermore, decreasing freight movement on congested city roads and employing larger trucks will lower the overall freight costs.

### MMLPs: Design and Characteristics

#### Government Approval for Multi-Modal Logistics Parks (MMLPs)

- In October 2017, the Cabinet Committee on Economic Affairs (CCEA) granted the Ministry of Road Transport and Highways (MoRT&H) authorization to establish 35 Multi-Modal Logistics Parks (MMLPs) across the country.
- These MMLPs are being implemented under the Design, Build, Finance, Operate, and Transfer (DBFOT) model of Public-Private Partnership (PPP).

#### Public-Private Partnerships for Development

- The majority of these projected MMLPs will be developed through public-private partnerships (PPPs), as overseen by the National Highways and Logistics Management (NHLML), a Special Purpose Vehicle (SPV) wholly owned by the National Highways Authority of India (NHAI).
- The funding strategy for these logistics parks follows a 50:50 funding ratio, ensuring a collaborative approach to their development.

#### Nationwide Expansion of MMLPs

- These MMLPs will be strategically located in key regions such as North Gujarat, Jaipur, Kolkata, Ambala, Jagat-singhpur, Nashik, Kota, Panaji, Hisar, Visakhapatnam,

Bhopal, Sundargarh, Bathinda, Solan, Rajkot, Raipur, Jammu, Kandla, Cochin, Delhi-NCR, Bangalore, Indore, Mumbai, Hyderabad, Coimbatore, Pune, Surat, Sangrur, and a second site in Delhi-NCR, ensuring comprehensive coverage and accessibility.

### Digital Public Infrastructure

*Digital public infrastructure (DPI) encompasses building blocks or platforms like digital identity systems, payment infrastructure, and data exchange solutions, which assist nations in providing vital services to their citizens, thus empowering individuals and enhancing quality of life through the promotion of digital inclusivity.*

#### Key Elements for Inclusive DPI

- **User-Centric Approach:** Giving top priority to meeting user requirements and preferences, minimizing technological risks, and accommodating diverse demographics, including individuals with limited smartphone access or limited digital proficiency.
- **Policy Integration:** Introducing inclusivity as a central policy goal within the regulatory framework, guaranteeing data protection and privacy for all users, and preventing information disparities among regions or communities.
- **Development of Use Cases:** Identifying marginalized segments and crafting specific use cases that cater to their unique needs. Continuously assessing the impact on disadvantaged consumers through the collection of detailed data and feedback mechanisms.

#### Pillars of India's DPI Ecosystem

##### Aadhaar

- Aadhaar serves as a strategic policy instrument for fostering social and financial inclusion, driving improvements in public sector service delivery, effective fiscal budget management, enhancing convenience, and advancing governance focused on people's needs.
- Individuals holding Aadhaar can willingly employ it for private sector activities, and private entities are not obliged to obtain specific permissions for such utilization.

##### DigiYatra

- DigiYatra offers a Biometric Enabled Seamless Travel (BEST) journey, powered by a Facial Recognition System (FRS).
- In the fiscal year 2022, the total air passenger traffic in India surpassed 188 million, encompassing airports throughout the country. Within this figure, more than 22 million passengers were of international origin.

##### DigiLocker

- DigiLocker has amassed a user base of 150 million individuals and successfully stored an impressive six billion documents.

- Users have the convenience of storing various documents, including insurance records, medical reports, PAN cards, passports, marriage certificates, school certificates, and more, in a digital format.

#### UPI

- The Unified Payment Interface (UPI) has surged past the impressive milestone of eight billion transactions each month, translating to a monthly value of USD 180 billion. This astonishing figure accounts for approximately 65% of India's annual GDP.
- Among the systems managed by the National Payments Corporation of India (NPCI), UPI currently stands as the largest, outperforming others like the National Automated Clearing House (NACH), Immediate Payment Service (IMPS), Aadhaar enabled Payment System (AePS), Bharat Bill Payment System (BBPS), RuPay, and more.

#### India Stack

- India Stack comprises a collection of Application Programming Interfaces (APIs) designed to provide governments, businesses, startups, and developers with a unique digital infrastructure for addressing complex challenges in India, with a focus on achieving service delivery that is free from geographical constraints, paperless, and cashless.
- The vision of India Stack extends beyond a single country; it is adaptable and applicable to any nation, whether it is a developed economy or an emerging one. ■■

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# Competition CHRONICLE

For General Competitive Examinations

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*From this issue of Civil Services Chronicle, we are starting this special section called 'Competition Chronicle'. This section has been conceptualized to cater to the needs of aspirants preparing for general competitive examinations. It has been designed keeping in mind the questions related to general knowledge and current events asked in competitive examinations.*

*In this section, contemporary developments will be presented for the examinations conducted by State Public Service Commissions, Staff Selection Commissions, State Subordinate Commissions and other equivalent graduate level examinations like CDS, Railway, Banking, etc.*

*The nature of current affairs questions asked in the UPSC Civil Services Examination has seen a drastic change over the years; now these questions are asked from the general studies background of current events. Therefore, there is a need to study current affairs as per the interdisciplinary and multidisciplinary nature of questions for UPSC-CSE. Keeping this in mind, the initial part of the magazine covering Articles, In Focus, Regular Columns and Special Section has been dedicated exclusively to UPSC-CSE.*

*Current affairs questions asked in general competitive examinations are directly related to current events and the nature of these questions is factual. For these examinations, point-wise and factual study of general knowledge and contemporary events is required, not analytical study. Keeping this need of the candidates in mind, we have started this new section.*

# News Snippets

## India Watch

### Poorvottar Sampark Setu

- Recently, the Ministry of Development of North Eastern Region launched “Poorvottar Sampark Setu”, an online tool to monitor development in northeast.
- Poorvottar Sampark Setu is a powerful tool designed to streamline and enhance monitoring of fortnightly visits of Union Ministers to North Eastern Region (NER).
- The dashboard provides valuable insights and graphical information about State-wise/ District-wise visits to the NER by Union Ministers to be used by all the stakeholders in one place.
- The portal generates an organized list of Ministers who can be nominated for visit to NER in the upcoming months.
- This list is dynamic and takes into account several factors to streamline the visits.
- After the visit, the Minister can submit their tour reports along with their recommendations online.

### Special Leave Petitions

- Recently, the Supreme Court (SC) highlighted that Special Leave Petitions (SLPs) in criminal cases often lacked crucial information including number of bails asked, complete chargesheet and number of witnesses examined.
- The Special Leave Petitions provides the aggrieved party a special permission to be heard in SC as an appeal against any judgment or order given by any court or tribunal in Indian territory (except military tribunal and court martial).
- It has been provided as a “residual power” to the SC and can be exercised only in cases when any substantial question of law is involved, or gross injustice has been done.
- Article 136 of Indian Constitution vests the SC with a special power to grant special leave, to appeal against any judgment or order or decree in any matter or cause, passed or made by any Court/tribunal in the territory of India.
- It is discretionary power of SC and the SC may in its discretion refuse to grant leave to appeal and hence it is not a right of aggrieved party to be heard in SC.

### Section 106 of the Indian Evidence Act (1872)

- Recently, the Supreme Court held that Section 106 of the Indian Evidence Act does not inherently impose a burden on the accused but comes into play when the accused fails to provide any explanation regarding facts that should be within their knowledge.
- Section 106 deals with the burden of proof in cases where a fact is within the special knowledge of a person.
- This section applies to civil and criminal cases alike and lays down an important principle of evidence.
- The section states that when any fact is especially within the knowledge of any person, the burden of proving that fact is upon that person.
- This means that if a fact is known to a particular person and not to others, it is the responsibility of that person to prove it in court.
- The burden of proof under Section 106 is not absolute, and the person who has the special knowledge of the fact is only required to prove it to the extent that is reasonable in the circumstances.

### Mandatory Penny-Drop Verification for NPS

- Recently, the Pension Fund Regulatory and Development Authority (PFRDA) has introduced mandatory ‘penny drop’ verification for National Pension System (NPS) subscribers, ensuring timely fund transfers during withdrawals.
- The penny drop verification process involves Central Recordkeeping Agencies (CRA) verifying the active status of the savings bank account and cross-referencing the name in the account with the subscriber’s Permanent Retirement Account Number (PRAN) or submitted documents.
- The verification success, inclusive of name matching, is vital for processing exit/withdrawal requests and modifying subscriber bank account details.
- Failure in the penny drop verification prohibits any such requests, prompting CRA to collaborate with nodal offices for rectification.

## Economy Watch

### **Vizhinjam International Seaport**

- Recently, the Chief Minister of Kerala welcomed the first ship at the Vizhinjam International Seaport in Thiruvananthapuram.
- It is an International Transshipment Deepwater Multipurpose Seaport designed primarily to cater container transshipment besides multi-purpose and break-bulk cargo.
- It was commenced in 2015 as a landlord model with a Public Private Partnership (PPP) component on a design, build, finance, operate and transfer (DBFOT) basis.
- It is located in Vizhinjam, near Thiruvananthapuram, Kerala.
- It is India's first deep-water container transshipment port and the first automated port in India under construction.
- It will be an all-weather port with minimal tidal range variation.
- The port is connected by India's third-longest railway tunnel (under construction).
- When fully commissioned, it will cater to 75% of India's container transshipment needs.

### **National Turmeric Board**

- Recently, the Union Government notified the constitution of the National Turmeric Board.
- The Board shall have a Chairperson to be appointed by the Central Government, members from the Ministry of AYUSH, Departments of Pharmaceuticals, Agriculture & Farmers Welfare, Commerce & Industry of the Union Government, senior State Government representatives from three states (on rotation basis), select national/state institutions involved in research, representatives of turmeric farmers and exporters, and have a Secretary to be appointed by the Department of Commerce.
- India is the largest producer, consumer and exporter of turmeric in the world.
- India has more than 62% share of world trade in turmeric.
- In the year 2022-23, an area of 3.24 lakh ha was under turmeric cultivation in India with a production of 11.61 lakh tonnes (over 75% of global turmeric production).
- More than 30 varieties of Turmeric are grown in India and it is grown in over 20 states in the country.
- The largest producing states of Turmeric are Maharashtra, Telangana, Karnataka and Tamil Nadu.
- The leading export markets for Indian Turmeric are Bangladesh, UAE, USA and Malaysia.

### **Automatic 'Status Holder' Certificates**

- Recently, the Union Minister of Commerce & Industry unveiled an initiative involving the issuance of automatic 'Status Holder' certificates under the Foreign Trade Policy (FTP) 2023.
- This system eliminates the need for exporters to apply for a Status Certificate manually, relying instead on an IT system's assessment based on available merchandise export data and risk parameters from the Directorate General of Commercial Intelligence and Statistics (DGCIS).
- This shift reduces compliance burdens and fosters ease of doing business.
- This initiative, recognizing about 20,000 exporters as Status Holders, is poised to significantly boost the export ecosystem and help achieve India's export target of USD 2 Trillion by 2030.

### **Card-on-File Tokenization (CoFT)**

- Recently, RBI has introduced new channels for CoFT.
- The tokenization process is used to replace card details by a unique token or code.
- It allows secure online purchases without exposing sensitive details like card number, card verification value (CVV), etc.
- It has been implemented since 2022 and at present, a CoFT token can only be created through merchant's application or webpage. It is now proposed to introduce CoF token directly at the issuer bank level.
- The new step aims to eliminate the duplication of tokenization process at each app along with increased transaction security, resulting in reduced card-data-related frauds.

### **Arunachal Yak Churpi**

- Recently, Arunachal Yak Churpi becomes the first ever Yak milk product to get a Geographical Indication (GI) tag.
- Yak Churpi is a naturally fermented cheese prepared from milk of Arunachali yak reared in the high Altitude areas in Arunachal Pradesh.
- Rich in protein, used as a substitute of vegetables or mixed in meat curry or eaten with rice as a staple food.
- Arunachali Yaks are reared by tribal yak pastoralists known as Brokpas.

**One CGIAR Global Initiative**

- Recently, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) joined the One Consultative Group on International Agricultural Research (CGIAR) global initiative.
- One CGIAR global initiative aims to build a unified approach to transforming food, land, and water systems to address the challenges posed by climate crisis.
- This initiative involves the CGIAR System Organisation and 12 One CGIAR research centres.
- The CGIAR is a publicly-funded network of agrifood systems research centres, works for transforming food, land, and water systems in a climate crisis.
- It is working in over 80 countries.

**Kisan Rin Portal**

- Recently, the Union Finance Minister launched the Kisan Rin Portal along with the weather information Network Data Systems (WINDS) portal.
- It aims to give farmers subsidised loans under the Kisan Credit Card (KCC) scheme to revolutionise the agriculture sector in the country.
- It will offer a comprehensive view of farmer data, scheme utilisation progress, loan disbursement specifics, and interest subvention.
- It claims to increase seamless integration with banks for more effective and efficient agriculture credit.

**Gems and Jewellery Export Promotion Council (GJEPC)**

- Recently, the Gems and Jewellery Export Promotion Council (GJEPC) appealed to diamond industries to stop importing rough diamonds.
- GJEPC is an apex body of the Gem and Jewellery industry in India, sponsored by the Ministry of Commerce & Industry, Government of India.
- It is primarily involved in introducing Indian gem and jewellery products to the international market and promotes their exports.
- The Council provides market information to its members regarding foreign trade inquiries, trade and tariff regulations, and rates of import duties.

**Overnight Index Swap (OIS)**

- Recently, Indian overnight index swap (OIS) rates rose to their highest levels in 10 months due to offshore paying and triggering of stop losses.
- It is a derivative instrument where returns under a fixed-rate asset are swapped against a predetermined published index of a daily overnight reference rate for an agreed period of time.
- The primary purpose of an OIS is to manage interest rate risk, particularly the risk associated with fluctuations in the overnight lending rate.
- An overnight index swap rate is calculated each day.
- This rate is based on the average interest rate institutions with loans based on the overnight rate have paid for that day.

**Small Savings Instruments (SSIs)**

- Recently, the government raised the rates offered for most small savings instruments (SSIs) in the range of 40 basis points (bps) to 150 bps over the last five quarters.
- The Small Savings Instruments (SSIs) are government-managed savings tools that aim to encourage regular saving, regardless of age.
- They offer higher returns as compared to bank fixed deposits, along with a sovereign guarantee and certain tax benefits.
- Interest rates on them are adjusted quarterly.
- All amounts raised by it are pooled in the National Small Savings Fund, which is utilized by the government in order to address its fiscal deficit.
- SSIs are divided into 3 categories-
  - \* Postal deposits- savings account, recurring deposits, time deposits, and monthly income scheme.
  - \* Savings certificates- National Small Savings Certificate VIII and Kisan Vikas Patra.
  - \* Social security schemes- public provident fund and Senior Citizens' Savings Scheme.



**National Waterways 44**

- The Ministry of Ports, Shipping, and Waterways has initiated a significant dredging project on National Waterways 44, which includes the Ichamati River in West Bengal.
- This project aims to increase the navigational depth of the Ichamati River, ultimately boosting its capacity to manage tidal influences.
- The Ichamati River, serving as a boundary between India and Bangladesh, flows through both countries and has three distinct sections.

**Udangudi Panangkarupatti**

- Recently, Udangudi Panangkarupatti (palm jaggery/ gur) from Tamil Nadu received a Geographical Indication (GI) tag.
- The palm jaggery preparation procedure in this area is traditional till date without inclusion of any additional modern strategies.
- The karupatti prepared from the palm sap from the region around Udangudi in Tiruchendur taluk in Thoothukudi district has some uniqueness.
- This is due to the presence of red sand dune soil found in the region.
- This soil holds less groundwater. The moisture content in the atmosphere is less because of the dry climatic condition, which leads to high sucrose content, in turn adding taste.
- The region's dry climate is also suitable for storage of karupatti for a longer duration.
- No chemical additives like Triple super phosphate and phosphoric acid are used in its preparation.

**Society Watch****Civil Union**

- Recently, Supreme Court's verdict on same-sex marriages raised divided opinions on adoption rights and civil unions.
- Civil Union is the legal status that grants same-sex couples certain rights and responsibilities which are normally given to married couples.
- Civil Union resembles a marriage and brings with it employment, inheritance, property and parental rights.

**Periodic Labour Force Survey (PLFS) Report 2022-2023**

- Recently, the sixth Periodic Labour Force Survey (PLFS) report 2022-23 has been released by National Sample Survey Office (NSSO), which uses the data collected during July 2022 to June 2023.
- The report covered both rural and urban areas, giving estimates of all important parameters of employment and unemployment in both usual status (ps+ss) and current weekly status (CWS).
- The estimate of the labour force in the usual status (ps+ss) includes:
  - \* The persons who either worked or were seeking work for a period of 365 days preceding the date of the survey.
  - \* Those persons from among the remaining population who had worked at least for 30 days during the reference period of 365 days preceding the date of survey.

**Saras Aajeevika Mela**

- Recently, the union Minister of State for Rural Development, Consumer Affairs, Food, and Public Distribution inaugurated the popular SARAS Mela in Gurugram.
- It is an initiative by the Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM) of Ministry of Rural Development.
- It aims to bring the rural women Self Help Group members under one platform to showcase their skills, sell their products, and help them build linkages with potential market players.
- It is organised by the Ministry of Rural Development, National Institute of Rural Development and Panchayati Raj (NIRDPR).

**UMEED Scheme**

- Recently, a self-help group (SHG) launched a flower nursery as part of the UMEED scheme in Budgam district (J& K).
- The UMEED scheme under the Jammu and Kashmir Rural Livelihoods Mission (JKRLM) is a centrally sponsored scheme to encourage women to be self-dependent and self-sufficient.
- The main objective of the scheme is to help the rural poor across Jammu and Kashmir.
- It also encourages women to make small savings so that their Self-Help Groups (SHGs) eventually become bankable at a reduced rate of interest. It helps women entrepreneurs exhibit and market their products.
- It is implemented by the Jammu & Kashmir State Rural Livelihoods Society.

**Jehovah's Witnesses**

- Recently, multiple blasts occurred outside the Zamra International Convention and Exhibition Centre during a religious gathering of Jehovah's Witnesses in Kochi (Kerala).
- Jehovah's Witnesses are a Christian sect, but do not believe in the Holy Trinity (the doctrine that God exists in three equal persons of the Father, the Son (Jesus Christ) and the Holy Spirit).
- They worship Jehovah as "the one true and Almighty God, the Creator", who is "the God of Abraham, Moses, and Jesus".
- They believe Jesus Christ to be the "King of God's Kingdom in heaven", but not as the Almighty God.
- They don't celebrate Christmas or Easter, because they believe such festivals to be inspired by Pagan traditions.

**Art & Culture****Basohli Pashmina**

- Recently, Basohli Pashmina, a more than 100-year-old traditional craft from Jammu and Kashmir's Kathua district, has got the Geographical Indication (GI) tag.
- It is a hand-spun product known for extreme softness, fineness and light-weight, has insulating properties and extended life.
- Pashmina products include shawls for men and women, mufflers, blankets and basket.
- Pashmina refers to a fine variant of spun cashmere (the animal-hair fibre), that is derived from the downy undercoat of the Changthangi.
- It is obtained from a breed of mountain goats (*Capra hircus*) found on the Changthang Plateau in Tibet and parts of Ladakh.
- A traditional producer of pashmina wool in the Ladakh region are a people known as the Changpa (nomadic people inhabit the Changthang plateau of Tibet).

**Pichwai Painting**

- Recently, artists in Chennai hosted an art exhibit showcasing Pichwai, some dating back 350 years.
- Pichwai painting is a traditional style of painting that originated in the state of Rajasthan.
- It is believed to have originated in the town of Nathdwara in Rajasthan.
- It mainly features the various stages of Lord Krishna's life.
- The artists use stone pigments, especially for gold and silver tones. The brighter orange, red, chrome yellow and kesari colours come from vegetable dyes.
- The paintings are often filled with details, such as flowers, animals, and geometric patterns, which are arranged in a symmetrical and balanced composition.

**Bekal Fort**

- The first public sector caravan park in Kerala will come up at Bekal fort of Kerala.
- Bekal Fort is exquisitely designed and built with dark maroon laterite stones.
- It was built in the 17th century.
- While the bastions are equipped with several large and small openings for guns, the walls are interspersed with windows and peepholes. These were used to spot the enemy from afar in the past
- A unique and eye-catching feature is a lone bastion, projecting out into the sea.
- This historic monument offers a superb view of the Arabian Sea from its tall observation towers, which were occupied by gigantic cannons till a few centuries ago.
- Originally constructed by the rulers of the ancient Kadampa Dynasty, the fort changed hands over the years to the Kolathiri Rajas, the Vijayanagara Empire, Tipu Sultan and finally, the British East India Company.
- The most prominent structure inside the fort is the observation tower built by Tipu Sultan.

**Jageshwar Temples**

- Recently, Prime Minister visited Jageshwar Temples in Uttarakhand.
- The Jageshwar Temples are a group of 125 ancient Hindu temples dated between 7<sup>th</sup> and 14<sup>th</sup> century.
- Also known as Jageshwar Valley Temples, it mainly has Nagara style of architecture with a few exceptions that show South and Central Indian designs.
- It is mainly dedicated to God Shiva, but it also includes God Vishnu, Shakti goddesses and Surya traditions of Hinduism.
- The site is protected under Indian laws, and managed by the Archaeological Survey of India (ASI).

**Jaderi Namakatti**

- Recently, the Jaderi namakatti was given the GI tag by the Geographical Indications Registry in Chennai.
- Jaderi namakatti are clay sticks that are white in colour, usually available in finger-like shape with a smooth texture.
- Jaderi is a small village in Tiruvannamalai district of Tamil Nadu.
- Namakatti is made up of the rich deposit of hydrous silicate minerals that form fine grain particles of clay.
- The clay is processed and shaped in a finger like structure.
- The production of namakatti depends on the climatic condition as it needs a lot of sunlight to dry.
- It is used to adorn the foreheads of idols, men, and temple elephants as well as traditionally to treat stretch marks caused by childbirth.

**Neolithic Age**

- Recently, a rock art dating back to the Neolithic period was recently found in the Palnadu district of Andhra Pradesh.
- The Neolithic Age, also called the New Stone Age, is the final stage of cultural evolution or technological development among prehistoric humans.
- It was characterised by stone tools shaped by polishing or grinding, dependence on domesticated plants or animals, settlement in permanent villages, and the appearance of such crafts as pottery and weaving.
- Towards the end of the Neolithic era, copper metallurgy is introduced, which marks a transition period to the Bronze Age, sometimes referred to as the Chalcolithic or Eneolithic Era.

**Science & Technology****Orionid Meteor Shower**

- The Orionids meteor shower, an annual celestial event, peaked over the northern hemisphere on October 20-21, delighting sky gazers.
- This meteor shower is created when Earth passes through the debris left behind by Halley's Comet and is visible to sky watchers in both the Northern and Southern Hemispheres.
- The name "Orionids" is derived from the fact that the meteors seem to originate from the Orion constellation.
- The Orionid meteors travel at an incredible speed of 41 miles (66 kilometers) per second, making them unique and moving at about 148,000 mph into Earth's atmosphere.
- Meteor showers occur when Earth crosses the path of a comet and collides with leftover comet particles and asteroid bits, which then burn up in the atmosphere.

**X-ray Polarimeter Satellite (XPoSat)**

- ISRO's next significant space launch is the X-ray Polarimeter Satellite (XPoSat), following Chandrayaan-3 and Aditya L-1 missions.
- XPoSat's primary objective is to study the dynamics of bright astronomical X-ray sources in extreme conditions.
- It is anticipated to be launched using a Polar Satellite Launch Vehicle (PSLV) in the coming months and is designed for a mission life of at least five years.
- XPoSat is India's first polarimetry mission and the world's second, after NASA's Imaging X-ray Polarimetry Explorer (IXPE), launched in 2021.
- XPoSat was created to better understand complex emissions from astronomical sources like black holes and neutron stars, which are challenging to comprehend with existing space observatories.

**BlueWalker 3**

- BlueWalker 3, a next-generation communications satellite, has become one of the brightest objects in the night sky, leading to concerns about light pollution.
- The satellite was launched on September 10, 2022, and shines as brightly as the most luminous stars in certain constellations.
- Satellites can reflect sunlight to Earth, potentially covering astronomical objects and affecting sensitive astronomical equipment.
- This significant brightness poses a challenge for astronomers using ground-based telescopes to observe the night sky.
- Companies may need to adjust their satellite designs to emit less light to mitigate the issue.

**Vikram-I**

- Skyroot Aerospace, an Indian startup aerospace company, has unveiled Vikram-I, a multi-stage rocket with advanced orbital satellite deployment capabilities.
- Vikram-I is designed to carry payloads of approximately 300 kg to Low Earth Orbit (LEO) and has a unique all-carbon-fiber body for durability in space.
- Vikram-I is capable of placing multiple satellites into orbit simultaneously, making it a significant achievement for India's space sector.
- The rocket features 3D-printed liquid engines and an orbital adjustment module with re-start capability.
- Skyroot Aerospace claims that Vikram-I can be assembled and launched within 24 hours from any launch site.

**ImmunoACT**

- ImmunoACT, supported by IIT-Bombay and Laurus Labs, has received approval from the Central Drugs Standard Control Organization (CDSCO) for India's first CAR-T cell therapy, NexCAR19 (Acalycabtogene autoleucel), designed for the treatment of relapsed/refractory (r/r) B-cell lymphomas and leukemia.
- NexCAR19 is a humanized CD19-targeted Chimeric Antigen Receptor T cell (CAR-T cell) therapy, the first of its kind to be developed in India, representing a significant advancement in cell-and-gene therapies.
- Laurus Labs, a pharmaceutical company, invested over \$18 million in ImmunoACT to support its research and development, aiming to make CAR-T therapy accessible and affordable in India and other resource-constrained settings.
- The approval of NexCAR19 is a significant achievement in the field of cell therapy and positions India as one of the select countries with access to CAR-T therapy.

**Bright Transient Survey Bot (BTSbot)**

- It is a machine-learning algorithm which has been trained by using over 1.4 million images from nearly 16,000 sources.
- This algorithm successfully identified the newly discovered supernova, named SN2023tyk, within data obtained from the Zwicky Transient Facility (ZTF).
- This innovative system not only enables the automation of the entire process for locating new supernovae in the night sky but also eliminates the possibility of human error, significantly enhancing the speed of the discovery process.
- It also manages the detection, confirmation, classification, and announcement of findings, all without the need for human intervention.

**Iron Dome**

- The Iron Dome is a short-range, ground-to-air, air defense system used by Israel to intercept rockets, missiles, and other aerial threats aimed at Israeli targets.
- It was developed in response to rocket attacks by Hezbollah during the 2006 Israel-Lebanon war.
- The system's deployment began in 2011 and has achieved a claimed success rate of over 90%, although experts estimate it to be over 80%.
- The Iron Dome operates as a three-part system, consisting of a detection and tracking radar, a battle management and weapon control system (BMC), and a missile firing unit.
- The radar detects incoming threats, the BMC manages the interception process, and the missile firing unit launches interceptor missiles.
- This system can operate effectively in all weather conditions, including during the day and at night.
- The interceptor missile is equipped with a proximity fuse, a laser-controlled mechanism that detonates the missile when it is within ten meters of the target, releasing shrapnel to destroy the threat.

**Ecology & Environment****Marine Cloud Brightening**

- Australia's Reef Restoration and Adaptation Program is investigating cloud brightening to reduce coral bleaching in the Great Barrier Reef.
- British cloud physicist John Latham proposed cloud brightening in 1990 to counteract global warming by brightening clouds over susceptible ocean regions.
- The technology involves spraying microscopic seawater droplets into the air, mimicking sea salt aerosol generation by wind and waves.
- Sea salt enhances cloud brightness and provides additional shade by scattering light.
- Unintentional aerosol releases from human activities currently offset around 30% of the warming effect from greenhouse gases.



**Mytella strigata**

- The Southern Bench of the National Green Tribunal (NGT) has directed the Fisheries Department and the Tamil Nadu State Wetland Authority to submit a detailed report on the removal of invasive mussel species (*Mytella strigata*) from the Ennore-Pulicat wetland.
- These mussels have covered the riverbed, hindered prawn grazing and affecting locally prevalent and commercially valuable yellow clams (*Manja matti*) and green mussels (*Pachai aazhi*).
- The petitioner requested government intervention to address the spread of these invasive mussels to protect the wetland ecosystem and livelihoods.
- The government pleader argued that *kaaka aazhi* is not an alien species, as it is listed in the Wildlife Protection Act, 1972 (WPA).

**Green Energy Corridor**

- The Cabinet Committee on Economic Affairs, approved GEC Phase-II – ISTS for a 13 GW renewable energy project in Ladakh, India.
- The project aims to be completed by fiscal year 2029-30 with an estimated cost of Rs. 20,773.70 crore.
- Central Financial Assistance (CFA) will cover 40% of the project cost, amounting to Rs. 8,309.48 crore.
- Power Grid Corporation of India Limited (POWERGRID) will be the Implementing Agency.
- The transmission line will run through Himachal Pradesh and Punjab to Kaithal in Haryana, integrating with the National Grid.
- An interconnection from Leh to the existing Ladakh grid and the Leh-Alusteng-Srinagar line is planned.
- The project supports India's goal of achieving 500 GW of non-fossil fuel capacity by 2030, enhancing energy security, and reducing carbon emissions.

**Climate Smart Villages**

- ICAR-Central Marine Fisheries Research Institute (CMFRI) proposes the establishment of climate smart villages in coastal regions to address climate risks.
- CMFRI is prioritizing the development of climate smart villages by providing training and resources to fishers and farmers in vulnerable areas.
- Challenges posed by climate change in these regions include flooding, shoreline changes, and disease outbreaks.
- CMFRI suggests various solutions, including water clinics, AI and satellite-based harvest prediction, species distribution models, and exploration of deep-sea resources.
- Increased frequency of cyclones, storm surges, and coastal flooding are affecting coastal communities, making them highly vulnerable to climate emergencies.
- The impact includes threats to fishers' safety, livelihoods, income, property, health, and employment.

**Urban Flooding**

- A study led by the World Bank found that rapid urban expansion into flood-prone areas has exacerbated the flood risks in India.
- The study revealed that middle-income countries like India have more urban settlements in flood-prone zones compared to low- and high-income countries.
- India is not among the 20 countries with the highest exposure to flood hazards, but it still faces significant risks.
- Climate change, including worsening monsoons, has contributed to more frequent floods in India.
- The study underscores the need to account for flood-related risks in urban expansion planning.
- Proper scientific mapping of flood-prone areas and improved storm-water management plans are essential.
- Housing in flood-prone areas should be made more resilient to floods and low-income housing should be upgraded and protected.

**Tiger Census**

- Odisha government questions accuracy of the All-India Tiger Estimation (AITE) 2022; plans its own tiger census.
- AITE reported a significant decrease in Odisha's tiger count, stating only 20 tigers in the state, down from 45 in 2006.
- Odisha alleges AITE's sampling intensity was low, leading to inaccuracies in tiger population estimates.
- The state plans to conduct a census using camera traps, pugmarks, and other methods for better monitoring and protection.
- It aims for more frequent tiger population assessments for accurate counts, especially including sub-adult tigers.
- Survey will cover all regions except coastal districts, categorizing areas into tiger reserves and non-reserve forest blocks.

**Mother Nature Campaign**

- Apple has positioned itself as an environmental steward through its viral ‘Mother Nature’ campaign, earning praise for its commitment to sustainability.
- This move aligns with Apple’s legacy of innovation, marketing excellence, and operational efficiency.
- Apple initiated environmental efforts earlier and more earnestly than its tech rivals, including Microsoft, Alphabet, Amazon, and Meta.
- Since 1994, Apple has operated a ‘green’ gadget-recycling programme.
- In 2005, the programme offered a discount on new iPods when customers swapped an old one at an Apple retail store.
- Apple must affirm the transgenerational fundamental rights and self-determination of peoples and species and natural processes.

**World Watch****India and Vietnam**

- On 16<sup>th</sup> October, 2023, Indian External Affairs Minister met with his Vietnamese counterpart to explore opportunities for collaboration in trade, energy, defence, and maritime security.
- During the meeting, Indian External Affairs Minister and his Vietnamese counterpart jointly unveiled commemorative stamps commemorating the 50th anniversary of diplomatic relations between India and Vietnam.
- These stamps portray the Indian martial art Kalaripayattu and Vietnam’s martial art Vovinam, symbolizing the shared passion for sports and highlighting the strong cultural and people-to-people ties between the two nations.
- Discussions during the meeting encompassed various aspects of cooperation, including defence, maritime security, judiciary, trade, investment, energy, development, education, training, science, technology, and culture.
- Both ministers expressed their confidence in the enduring strength of the Comprehensive Strategic Partnership between India and Vietnam.

**World Cooperative Economic Forum (WCEF)**

- Recently, in an effort to bolster the global cooperative movement, leaders and experts from the cooperative sector have come together to establish the World Cooperative Economic Forum (WCEF).
- The forum is headquartered in New Delhi and aims to represent the interests of over three million cooperatives across the world.
- The WCEF’s primary objectives include promoting cooperative thinking and the cooperative movement on a global scale.
- Additionally, the forum will address and advocate for issues and concerns within the cooperative sector to governments and other stakeholders worldwide.
- The forum will provide non-partisan, well-researched analyses and inputs to sensitize decision-makers in governments, academia, civil society, and cooperative sector stakeholders across the world.

**Operation Ajay**

- As ongoing hostilities between Israeli forces and Hamas militants persist in Israel, India has initiated “Operation Ajay” to facilitate the return of its citizens from the conflict-ridden region.
- External Affairs Minister announced the operation and revealed that special charter flights and other arrangements are being organized for the evacuation.
- External Affairs Minister expressed India’s unwavering commitment to the safety and well-being of its nationals abroad, underlining the priority placed on ensuring the security of Indian citizens in the region.
- The Ministry of External Affairs (MEA) established a round-the-clock control room in Delhi to closely monitor the situation and provide information and assistance to Indians in need.

**The Rafah Crossing**

- Following Israel’s blockade of the Gaza Strip after the October 7 attack by Hamas, the Rafah border crossing with Egypt has become essential for people entering or leaving Gaza.
- The Rafah crossing is not under Israel’s control, unlike other crossings.
- Egypt, however, has kept the Rafah crossing closed since October 10, leading to diplomatic negotiations to allow the passage of individuals and supplies.
- The situation has escalated as Israel prepares for a potential ground invasion of Gaza, and living conditions in the Strip worsen due to Israeli airstrikes.

# Terms in Vogue

## **Cheget**

- Recently, rare footage was shown of Russian President in Beijing accompanied by officers carrying the so-called nuclear briefcase known as the “Cheget”.
- Cheget is a “nuclear briefcase” (named after Mount Cheget).
- It is a part of the automatic system for the command and control of Russia’s Strategic Nuclear Forces (SNF) named Kazbek.
- The cheget was developed during the early 1980s.
- It is connected to the special communications system, code-named Kavkaz.
- Kavkaz supports communication between senior government officials while they are making the decision whether to use nuclear weapons.

## **Gravity Battery**

- A gravity battery is a type of electricity storage device that involves lifting (charging) and lowering (discharging) a heavy weight.
- When there is plenty of green energy, the batteries use the power to lift a heavy weight (or blocks) either high into the air or to the top of a deep shaft.
- When electricity demand picks up, the blocks are lowered one by one, releasing kinetic energy that is used to rotate a motor and generate electricity.

## **Protein Binders**

- Recently, Food Safety and Standards Authority of India (FSSAI) have clarified that addition of protein binders or any other additives in dairy products are not permitted.
- Protein binders are biological research reagents which bind to a specific target protein to manufacture a wide range of new food products.
- Protein binding can enhance or detract performance.
- Protein binding is known to affect the digestibility of the protein-bond and thus can affect the biological and nutritive value of milk protein.

## **Watermeal**

- Thailand’s scientists are exploring the potential of watermeal as a source of nutrition and oxygen for astronauts.
- Watermeal (Wolffia species) is world’s smallest flowering plant.
- It is a rootless, stem less plant and floats on water bodies.
- Its simplicity and rapid growth rate make it an ideal candidate for studying the effects of altered gravity on plant development. It’s a prolific producer of oxygen through photosynthesis and a rich source of protein.

## **Iron Beam**

- Videos have recently surfaced online allegedly showing Israel testing its new laser-based missile defence system, known as Iron Beam.
- The Iron Beam is also known as Magen or Light Shield.
- It is a directed-energy weapon air defence system that fires powerful beams of light that can destroy fast-moving projectiles.
- Built by Rafael Advanced Defense Systems, Iron Beam was first unveiled in 2014.
- The system can intercept hostile rockets, drones, artillery, and even mortar shells.
- Its operational range extends up to 7 km (4.3 miles).

## **Kibbutz**

- Kibbutz refers to the intentional communities of Jews in Israel, which began by combining utopian ideals of socialism and Zionism.
- While traditionally established by Jewish settlers in Palestine as agricultural communities, the economy of the Kibbutzim today is highly diversified, and includes industrial and tertiary occupations.

# STATE WATCH

## Kerala

### Kasaragod: First District in India to Declare Official Tree, Flower and Bird

- Kasaragod becomes first district in India to declare official tree, flower and bird.
- The official tree of the district is 'Kanjiram' (Strychnos nux-vomica Linn), a species deriving its name from 'kasara', meaning wormwood, from which the name of the district originates.
- The district bird is the White Bellied Sea Hawk, which is native to the region spanning from Mahe to Manjeswaram. Notably, it is listed under Schedule I of the Wildlife Protection Act.
- The Cantor's Giant Softshell Turtle, locally known as 'Bheemanama', has been chosen as the district species. This rare species is listed on the Red List of Endangered Freshwater Turtles.
- The district flower, 'Periya Polathali' or Crinum malabarica, with its distinctive white flowers tinged with red, is another remarkable addition to the list. This plant is found exclusively in the streams originating from the laterite hills in Kasaragod, emphasising its significance.

### Kerala Becomes First State With Hallmarking Centres In Every District

- With the inauguration of a hallmarking centre in Idukki, Kerala became the first state in India to have hallmarking centres in all 14 districts.
- The inauguration of these hallmarking centres is a significant step in ensuring the quality and reliability of gold ornaments for consumers.
- The gold business in Kerala is valued at over Rs. 1 lakh crore, with annual sales of around 250 tonnes.

### Kerala Gets Its First 3D-Printed Building

- Kerala has unveiled its first 3D-printed building, named Amaze-28, which is situated within the Kerala State Nirmithi Kendra (Kesnik) campus in PTP Nagar, Thiruvananthapuram.
- The project was undertaken by Kerala State Nirmithi Kendra with the collaborative support of Tvasta, a Chennai-based construction technology start-up founded by IIT-Madras alumni.
- 3D printing is a cutting-edge manufacturing technique that relies on layer-by-layer printing. It involves three key processes: data processing, material processing, and robotic printing.

## Punjab

### PUSA-44

- Recently, Punjab Chief Minister announced that the state will ban the cultivation of the PUSA-44 paddy variety from next year onwards.
- PUSA-44 is a paddy variety which was developed in 1993 by the Indian Council of Agricultural Research (ICAR).
- By the end of 2010s, it had gained widespread popularity among farmers across the Punjab, covering approximately 70 to 80% of the area under paddy cultivation.
- Farmers claim that PUSA-44 yields nearly 85 to 100 mann (34 to 40 quintals) per acre, while other varieties' yield average is 28 to 30 quintals per acre.
- It is a long-duration variety, taking around 160 days to mature.
- This is around 35 to 40 days more than other varieties, requiring 5-6 extra cycles of irrigation.
- Moreover, this variety is also known to exacerbate the long-running issue of stubble burning in the state.
- This variety generates around 2 per cent more stubble than short varieties, which becomes a significant concern when cultivated on a large scale.



**Goa****Goan Cashews**

- Recently, Goan cashew was granted the geographical indication (GI) tag.
- Goan cashew derived from the Portuguese name 'caju' or 'kaju' in Konkani.
- It has unique identity, flavour and taste.
- The overall climatological conditions of Goa and traditional farming practices is the reason for the uniqueness of the cashews.
- Cashew feni (brew) was awarded Geographical Indication registration in 2009 as a specialty alcoholic beverage from Goa.

**Jharkhand****First State To Take Steps To Ensure Minimum Wages For Workers**

- Jharkhand made history by becoming the first state in India to take steps towards including gig workers, such as Swiggy, Zomato, Ola, Uber, and Rapido employees, under the ambit of minimum wages.
- This initiative is a significant move towards ensuring fair compensation for those in the gig economy.
- Jharkhand's groundbreaking move to consider minimum wages for gig workers and review minimum wage standards for other labourers is a significant step toward ensuring fair compensation for workers in various sectors.
- It also highlights the state's commitment to both local employment and social justice.

**Jammu & Kashmir****J&K Achieves 100% Open Defecation Free Plus Model Status**

- All 6,650 villages of Jammu and Kashmir have been declared Open Defecation-Free (ODF) Plus Model under the Swachh Bharat Mission.
- When a village demonstrates visual cleanliness with minimal litter, stagnant water, effective solid and liquid waste management, and sufficient information, education, and communication (IEC) activities, it is declared as an ODF Plus Model.
- The achievement of this milestone was made possible through coordinated efforts. The rural sanitation department developed a comprehensive plan that involved all stakeholders before its execution.
- Village Sanitation Saturation Plans (VSSP) were created for each village to ensure that the necessary infrastructure and resources for solid and liquid waste management were available.

**Telangana****Healthway: India's First Solar Cycling Track**

- In a remarkable stride towards promoting eco-friendly and active mobility, Hyderabad, India, proudly inaugurated its first solar roof cycling track, Healthway.
- Healthway aims to encourage cycling as a means of transportation while incorporating sustainability and technological innovation.
- Notably, Healthway is the second of its kind globally, emphasizing Hyderabad's commitment to embracing innovative and sustainable solutions for urban mobility. Situated on the bustling Outer Ring Road (ORR) between the main carriageway and the service road, this track is designed to be accessible 24/7.

**Bihar****Rhino Task Force**

- The Bihar government decided to constitute 'Rhino Task Force' for suggesting measures for the reintroduction of rhino conservation scheme in 'Valmiki Tiger Reserve' in West Champaran district.
- Currently, there is only one rhino in VTR and 14 in Patna Zoo, but with the establishment of the 'Rhino Task Force', the authorities aim to bring back more rhino to the reserve.
- The Valmiki Tiger Reserve has been selected as a potential site under the National Rhino Conservation Scheme, where rhino from other reserves across the country may be brought in.
- The plan aims to increase the rhino-bearing areas in VTR by 5% over the next two years. This will involve shifting of rhinos from crowded habitat to identified areas in the reserve, such as Ganauli and Madanpur, to provide more space for breeding and multiplication.

# News Notes

Appointments	
Person	Brief Description
<b>Muneesh Kapur</b>	• The Reserve Bank of India (RBI) has announced the appointment of Muneesh Kapur as an Executive Director (ED) starting from October 3, 2023.
<b>Indra Mani Pandey</b>	• He has been appointed as the secretary general of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).
<b>Navneet Munot</b>	• The Association of Mutual Funds in India (AMFI) has recently elected Navneet Munot, the Managing Director and CEO of HDFC Asset Management, as the Chairman.
<b>Lieutenant General Raghu Srinivasan</b>	• He has been appointed as the 28th Director General (DG) of the Border Roads Organisation (BRO).
<b>Dr. Bijay Kumar Mohanty</b>	• He officially assumed the role of Director (Finance) at the Indian Renewable Energy Development Agency Ltd. (IREDA).
<b>Ipsita Dasgupta</b>	• Hewlett-Packard (HP) appointed Ipsita Dasgupta as Senior Vice President & MD for Indian market.
<b>Sanjay Kulshrestha</b>	• He has joined as the Chairman & Managing Director of the Housing and Urban Development Corporation Limited (HUDCO) from 16th October, 2023.
<b>Dr. Meenesh Shah</b>	• He has been elected to the Board of the International Dairy Federation (IDF) during the General Assembly of IDF.
<b>Arindam Bagchi</b>	• He has been appointed as India's next Ambassador/ Permanent Representative to the United Nations and other International Organisations in Geneva.
<b>Justice Siddharth Mridul</b>	• He has been appointed as the chief justice of Manipur High Court.
<b>Ramaswamy N</b>	• On October 4, 2023, the General Insurance Corporation of India made a significant announcement regarding the appointment of Ramaswamy N as its new Chairman and Managing Director (CMD).
<b>K.N. Shanth Kumar</b>	• He has been elected as the Chairman of the Press Trust of India's Board of Directors for a one-year term.
<b>Sanjay Kumar Jain</b>	• He has been appointed as the Chairman and Managing Director (CMD) of the Indian Railway Catering and Tourism Corporation (IRCTC).
<b>Ashok Vaswani</b>	• He has been named as the new Managing Director and Chief Executive Officer of Kotak Mahindra Bank.
<b>Rajkumar Rao</b>	• Election Commission of India (ECI) on 26 Oct, 2023 appointed Rajkumar Rao as it's 'National Icon' for voter awareness and education.

Person in News	
Person	Why in news
<b>MS Dhoni</b>	• Reliance Retail's JioMart has roped in Indian cricket icon, Mahendra Singh Dhoni as a brand ambassador ahead of their festive campaign.
<b>Katrina Kaif</b>	• Japanese clothing giant Uniqlo has announced its partnership with Bollywood actress Katrina Kaif, marking her as the brand's first ambassador in India.
<b>Mohammed Shami</b>	• Puma, the renowned sports brand, has announced the inclusion of Mohammed Shami, a prominent Indian fast bowler, as its brand ambassador.

## CURRENT AFFAIRS

Places in News	
Place	Why in News
<b>Lao People's Democratic Republic (Capital: Vientiane)</b>	<ul style="list-style-type: none"> <li>Recently, Lao People's Democratic Republic has become the second country in 2023 after Bangladesh to eliminate lymphatic filariasis.</li> </ul> <p><b>Location</b></p> <ul style="list-style-type: none"> <li>It is a landlocked country in northeast-central mainland Southeast Asia.</li> <li>It is the only landlocked country in Southeast Asia.</li> <li>It is bordered by Myanmar and China (Northwest), Vietnam (East), Cambodia (Southeast), and Thailand (West and southwest).</li> </ul> <p><b>Geographical Features</b></p> <ul style="list-style-type: none"> <li>Its thickly forested landscape consists mostly of rugged mountains, the highest of which is Phou Bia at 2,818 metres (9,245 ft), with some plains and plateaus.</li> <li><b>Major River:</b> Mekong River.</li> <li><b>Tributaries:</b> Tha, Beng, Ou, Ngum, Kading, Bangfai, Banghiang, and Kong.</li> <li><b>Plateaus:</b> There are two plateaus, the Xiangkhoang in the north and the Bolaven Plateau at the southern end. Laos can be considered to consist of three geographical areas: north, central, and south.</li> </ul>
<b>Sinai Peninsula</b>	<ul style="list-style-type: none"> <li>Recently, aid from multiple countries has gathered in Egypt's Sinai Peninsula, awaiting a deal for safe delivery to Gaza and the evacuation of foreign passport holders via the Rafah crossing. Rafah Crossing Point is the sole crossing point between Egypt and the Gaza Strip.</li> </ul> <p><b>About Sinai Peninsula</b></p> <ul style="list-style-type: none"> <li>Sinai Peninsula is a triangular peninsula linking Africa with Asia.</li> <li>It is the only part of Egypt located in Asia.</li> <li>It is the northeastern extremity of Egypt and adjoins Israel and the Gaza Strip in the (East).</li> <li>It lies between the Mediterranean Sea (North) and the Red Sea (South).</li> <li>It is surrounded by Gulf of Suez (west), Suez Canal (West) and Gulf of Aqaba (east).</li> <li>Mount Katrina and Mount Sinai are principal regions in Sinai.</li> </ul>

Obituary	
Person	Brief Description
<b>Manohar Singh Gill</b>	<ul style="list-style-type: none"> <li>The former Chief Election Commissioner passed away at the age of 86.</li> <li>He was the Chief Election Commissioner from 1996 till 2001.</li> </ul>
<b>Mankombu Sambasivan Swaminathan (M.S. Swaminathan)</b>	<ul style="list-style-type: none"> <li>Father of India's 'Green Revolution,' M.S. Swaminathan passes away aged 98.</li> <li>In 1987, he was honored with the first-ever World Food Prize for his role in introducing high-yielding wheat and rice varieties to India.</li> <li>Additionally, he was the recipient of the Ramon Magsaysay Award in 1971 and the Albert Einstein World Science Award in 1986.</li> </ul>
<b>Bishan Singh Bedi</b>	<ul style="list-style-type: none"> <li>Bishan Singh Bedi, one of India's most iconic cricketers, passed away at the age of 77.</li> <li>A left-arm spinner and former captain of the Indian cricket team, Bedi's contributions to the sport left an indelible mark on the cricketing world.</li> </ul>

Important Days/Weeks		
Date	Day	Theme
<b>11<sup>th</sup> October</b>	International Day of the Girl	<ul style="list-style-type: none"> <li>Invest in Girls' Rights: Our Leadership, Our Well-being</li> </ul>
<b>Every Second Thursday in October</b>	World Sight Day	<ul style="list-style-type: none"> <li>Love your eyes at work</li> </ul>
<b>13<sup>th</sup> October</b>	International Day for Disaster Risk Reduction	<ul style="list-style-type: none"> <li>Fighting inequality for a resilient future</li> </ul>

<b>15<sup>th</sup> October</b>	World Student's Day	<ul style="list-style-type: none"> <li>• First Attempt in Learning (FAIL)</li> </ul>
<b>16<sup>th</sup> October</b>	World Spine Day	<ul style="list-style-type: none"> <li>• Move Your Spine</li> </ul>
<b>16<sup>th</sup> October</b>	World Food Day	<ul style="list-style-type: none"> <li>• Water is life, water is food. Leave no one behind</li> </ul>
<b>16<sup>th</sup> October</b>	World Anaesthesia Day	<ul style="list-style-type: none"> <li>• Anaesthesia and Cancer Care</li> </ul>
<b>17<sup>th</sup> October</b>	International Day for the Eradication of Poverty	<ul style="list-style-type: none"> <li>• Decent Work and Social Protection</li> </ul>
<b>20<sup>th</sup> October</b>	International Chefs Day	<ul style="list-style-type: none"> <li>• Growing A Healthy Future</li> </ul>
<b>20<sup>th</sup> October</b>	World Osteoporosis Day	<ul style="list-style-type: none"> <li>• Step Up for Bone Health – Build Better Bones</li> </ul>
<b>22<sup>nd</sup> October</b>	International Stuttering Awareness Day	<ul style="list-style-type: none"> <li>• One Size Does NOT Fit All</li> </ul>
<b>29<sup>th</sup> October</b>	World Stroke Day	<ul style="list-style-type: none"> <li>• Greater than Stroke</li> </ul>
<b>Observed from October 24 to 31 Every Year</b>	Global Media and Information Literacy Week	<ul style="list-style-type: none"> <li>• Media and Information Literacy in Digital Spaces: A Collective Global Agenda</li> </ul>

### Military Exercises

Name of Exercise	Brief Description
<b>KAZIND-2023</b>	<ul style="list-style-type: none"> <li>• A contingent from the Indian Army and Indian Air Force, comprising 120 personnel, embarked on a mission to Kazakhstan.</li> <li>• Their objective is to participate in the 7th edition of the Joint Military 'Exercise KAZIND-2023' in Otar, Kazakhstan, from October 30 to November 11, 2023.</li> <li>• The Indian Army contingent, led by a Battalion from the DOGRA Regiment, consists of 90 personnel, while 30 Air Force personnel from both sides will also actively partake in this year's Exercise, emphasizing the holistic nature of this bi-service exercise.</li> </ul>
<b>India-EU Joint Naval Exercise</b>	<ul style="list-style-type: none"> <li>• India and the European Union (EU) collaborated in a significant maritime security effort by conducting their inaugural joint naval exercise in the Gulf of Guinea.</li> <li>• On October 24, 2023, the Indian Navy's INS Sumedha, along with ships from three EU member states (ITS Foscari, FS Ventôse, and Tornado), participated in tactical maneuvers in international waters off the Ghanaian coast.</li> <li>• This joint naval exercise, which followed the EU-India Maritime Security Dialogue in Brussels, represents a milestone in their partnership to enhance maritime security in the region.</li> </ul>
<b>2023 Cambrian Patrol Competition</b>	<ul style="list-style-type: none"> <li>• The Indian Army secured a gold medal at the prestigious Cambrian Patrol Competition held in Wales, the UK.</li> <li>• The competition is renowned as a gruelling test of endurance and teamwork, often referred to as the "Olympics of Military Patrolling."</li> <li>• The Indian Army team competed against a total of 111 teams, including 38 international teams, marking a significant achievement for the Indian Army.</li> </ul>
<b>Annual Joint HADR Exercise 2023 (AJHE-23) – CHAKRAVAT 2023</b>	<ul style="list-style-type: none"> <li>• AJHE, known as CHAKRAVAT, is a significant multi-agency endeavour that includes India's armed forces, paramilitary forces, disaster response organizations, NGOs, academic institutions, and international organizations.</li> <li>• The 2023 edition of AJHE, hosted by the Indian Navy in Goa from October 9 to 11, promised to further synergize national efforts and expand its scope by involving eight countries from the Indian Ocean Region.</li> <li>• The exercise is conducted on a rotational basis by India's three armed services: the Indian Army, Indian Navy, and Indian Air Force.</li> </ul>
<b>SAMPRITI</b>	<ul style="list-style-type: none"> <li>• India and Bangladesh commenced the 11th edition of their annual joint military exercise, SAMPRITI, in Umroi, Meghalaya.</li> <li>• This collaborative endeavour, organized alternately by both countries, highlights their robust bilateral defense cooperation initiatives.</li> <li>• SAMPRITI-XI, spanning 14 days and engaging approximately 350 personnel from both sides, emphasizes the significance of enhancing interoperability, sharing tactical drills, and promoting best practices in defense cooperation.</li> </ul>



<b>Organisations in News</b>	
<b>Organisation</b>	<b>Brief Description</b>
<b>SCO Council</b>	<ul style="list-style-type: none"> <li>Indian External Affairs Minister visited Kyrgyzstan, discussing cooperation in banking, defense, and energy sectors with Kyrgyz President Sadyr Zhaparov.</li> <li>He also participated in the Shanghai Cooperation Organisation (SCO) meeting in Kyrgyzstan, engaging with counterparts from SCO member states.</li> <li>The visit aimed to strengthen bilateral collaboration and participation in the SCO.</li> </ul>
<b>IOC Session</b>	<ul style="list-style-type: none"> <li>India's Prime Minister inaugurated the 141st IOC session at Mumbai's Jio World Centre on October 14, marking India's second time hosting the event.</li> <li>The IOC session is crucial for making decisions regarding the Olympic Games' future and promoting knowledge exchange among sports stakeholders.</li> <li>Key participants include IOC President Thomas Bach, other IOC members, Indian sports figures, and sports federation representatives.</li> </ul>

<b>Summit/Seminar/Conference</b>	
<b>Name</b>	<b>Brief Description</b>
<b>Dark Patterns Buster Hackathon 2023</b>	<ul style="list-style-type: none"> <li>The Department of Consumer Affairs (DoCA) in India partnered with IIT-BHU to launch the 'Dark Patterns Buster Hackathon 2023.'</li> <li>This initiative aims to combat dark patterns, which are deceptive design practices in digital interfaces designed to mislead users.</li> <li>The hackathon runs until February 17, 2024, with a focus on developing AI-based solutions compatible with various web browsers and user-friendly extensions and applications.</li> </ul>
<b>16<sup>th</sup> Urban Mobility India Conference &amp; Exhibition</b>	<ul style="list-style-type: none"> <li>The 16<sup>th</sup> Urban Mobility India Conference &amp; Exhibition 2023 was inaugurated by Union Housing and Urban Affairs Minister in New Delhi.</li> <li>It focuses on expanding India's metro network, promoting e-mobility with plans for electric buses, and building integrated and resilient urban transport systems.</li> <li>The event addresses critical aspects of urban transportation and brings together leaders and experts to discuss urban transport improvements.</li> </ul>
<b>G20 Parliamentary Speakers' Summit</b>	<ul style="list-style-type: none"> <li>The Parliament of India, in collaboration with the International Parliamentary Union (IPU), hosted the Ninth P20 Summit in New Delhi from October 13-14, 2023, with a Pre-Summit Parliamentary Forum on October 12.</li> <li>The summit's theme, "Parliaments for One Earth, One Family, One Future," reflects the interconnectedness of the world.</li> <li>Summit agenda included accelerating Sustainable Development Goals (SDGs) and promoting a sustainable energy transition with a focus on renewable energy sources and international cooperation.</li> </ul>
<b>Shramdaan Event</b>	<ul style="list-style-type: none"> <li>The Ministry of Micro, Small and Medium Enterprises (MSME) organized a 'Shramdaan' event in alignment with the vision of a "Garbage Free India."</li> <li>The event aimed to foster collective responsibility and engage participants from MSME offices across India.</li> <li>It highlighted the importance of cleanliness and proactive measures for a cleaner and healthier nation.</li> </ul>
<b>World Health Summit 2023</b>	<ul style="list-style-type: none"> <li>The 2023 World Health Summit took place in Berlin, Germany, under the theme "A Defining Year for Global Health Action."</li> <li>Key themes included learning from COVID-19, universal health coverage, sustainable health, digital technologies, and more.</li> </ul>
<b>Global Maritime India Summit 2023</b>	<ul style="list-style-type: none"> <li>India's Prime Minister virtually inaugurated the third edition of the Global Maritime India Summit 2023 (GMIS) held in Mumbai.</li> <li>The summit focused on topics such as the role of ports in the future, decarbonization of the maritime industry, and coastal shipping and inland water transport.</li> </ul>

<b>Awards</b>	
<b>Name of the Award</b>	<b>Awardee/Brief Description</b>
<b>Rohini Nayyar Prize</b>	<ul style="list-style-type: none"> <li>• Engineer-turned-social worker Deenanath Rajput was honoured with the second Rohini Nayyar Prize for his exceptional contributions to rural development.</li> <li>• The award, presented in memory of economist-administrator Dr. Rohini Nayyar, includes a trophy, citation, and a cash prize of Rs 10 lakh.</li> <li>• Deenanath Rajput’s work focuses on empowering tribal women in Bastar, Chhattisgarh, benefiting over 6,000 women in the region.</li> </ul>
<b>Ballon d’Or 2023</b>	<ul style="list-style-type: none"> <li>• Lionel Messi and Aitana Bonmati were named the 2023 Ballon d’Or recipients.</li> <li>• Messi secured his eighth Ballon d’Or, setting a new record by leading Argentina to their first World Cup victory since 1986.</li> </ul>
<b>Award For Global Leadership</b>	<ul style="list-style-type: none"> <li>• Chief Justice of India D.Y. Chandrachud received the ‘Award for Global Leadership’ from Harvard Law School, recognizing his contributions to law and justice.</li> <li>• The award marks his association with Harvard Law School, where he pursued graduate degrees, and coincided with the school’s 100th-anniversary celebration of the Graduate Law Program.</li> </ul>
<b>Durga Bharat Samman</b>	<ul style="list-style-type: none"> <li>• Hindustani classical vocalist and composer Pandit Ajoy Chakrabarty was honoured with the ‘Durga Bharat Samman’ for his contributions to music, while the award was also presented to ISRO and GRSE.</li> <li>• The award acknowledges excellence across diverse domains and inspires future generations to excel in their fields.</li> </ul>
<b>UNWTO’s Best Tourism Village 2023</b>	<ul style="list-style-type: none"> <li>• Dhordo village in Gujarat achieved international recognition by being listed among the 54 best tourism villages by the UNWTO.</li> </ul>
<b>EU’s Sakharov Prize 2023</b>	<ul style="list-style-type: none"> <li>• The European Parliament President, Roberta Metsola, awarded the 2023 Sakharov Prize to Jina Mahsa Amini and the Iranian “Woman, Life, Freedom” movement.</li> <li>• Mahsa Amini’s tragic story, including her death while in custody for a dress code violation, brought global attention to the movement.</li> </ul>
<b>Best Tourism Village of India 2023</b>	<ul style="list-style-type: none"> <li>• The scenic Nawanpind Sardaran village in Gurdaspur, Punjab, was recognized as the “Best Tourism Village of India 2023” by the Union Ministry of Tourism.</li> <li>• The Sangha sisters’ dedicated efforts in preserving their ancestral homes, Kothi and Pipal Haveli, and promoting sustainable tourism led to this prestigious recognition.</li> </ul>
<b>Satyajit Ray Excellence in Film Lifetime Award</b>	<ul style="list-style-type: none"> <li>• Hollywood icon Michael Douglas will be honoured with the Satyajit Ray Excellence in Film Lifetime Award at the 54th International Film Festival in Goa.</li> <li>• The award acknowledges Douglas’s significant contributions to cinema, and the festival will also feature the presence of Catherine Zeta Jones and their son, promising a star-studded event.</li> </ul>
<b>Saraswati Samman 2022</b>	<ul style="list-style-type: none"> <li>• Tamil writer Sivasankari received the “Saraswati Samman” in 2022 for her memoirs titled “Surya Vamsam.”</li> <li>• The award, presented by the K.K. Birla Foundation, includes a citation, plaque, and a prize of Rs.15 lakh, and the memoir reflects the author’s life journey and societal changes.</li> </ul>
<b>Dutch Spinoza Prize</b>	<ul style="list-style-type: none"> <li>• Dr. Joyeeta Gupta, an Indian-origin professor at the University of Amsterdam, was honoured with the prestigious Dutch Spinoza Prize for her groundbreaking work in the field of climate change.</li> <li>• She intends to allocate the substantial prize fund for further scientific research and knowledge utilization in her field.</li> </ul>
<b>Nobel Prize in Literature 2023</b>	<ul style="list-style-type: none"> <li>• The Nobel Peace Prize for 2023 was awarded to Narges Mohammadi for her courageous advocacy against the oppression of women in Iran and her fight for human rights and freedom.</li> <li>• Mohammadi has faced numerous arrests, convictions, and harsh sentences, demonstrating her unwavering commitment to her cause.</li> </ul>
<b>Nobel Peace Prize 2023</b>	<ul style="list-style-type: none"> <li>• Norwegian author Jon Fosse, known for his innovative plays and prose that give voice to the unsayable, received the Nobel Prize in Literature 2023.</li> <li>• The prize, awarded by the Swedish Academy, is valued at SEK 11.0 million for this year.</li> </ul>

# GS PT Pointers

## Subject-wise Content based on RAS Prelims Exam 2023

*In the GS PT Pointers section, instead of solved paper, we have provided important facts related to the topics of the questions asked in the recently held Rajasthan State and Subordinate Services Combined Competitive Exam – 2023. We have categorized the information subject-wise and topic-wise. We will publish content related to similar examinations in future. We hope you find the content useful in your preparation for upcoming examinations.*

### History

- **Nathmal Ki Haveli:** Nathmal Ki Haveli is located in Jaisalmer, Rajasthan. It was built in 1885 by Maharawal Berisal of Jaisalmer. Its chief architects were two Muslim artisans named Hathi and Lulu.
- **Archaeological Site:** In the excavation from Raidh in Rajasthan, information about a huge collection of iron material of Malava dynasty has been found. Raidh is situated in Tonk district of Rajasthan.
- **Vigraha Raja IV:** Vigraha Raja IV included Delhi in his empire.
- Vigraha Raj ruled between 1150 and 1164. He is also known as Visaldeva. The play Harakeli was written by him in Sanskrit language. A poet named Somdev lived in his court, who wrote Lalit Vigraha Raj.
- **Arab Traveller Suleman:** Arab traveler Suleman came to India during the time of Vatsaraja. It described the Rashtrakuta ruler Amoghavarsha as one of the four most powerful emperors of the world.
- **Prajamandals:** Kanhaiyalal Mittal, Mangilal Bavya, Maqbool Alam belonged to Jhalawar Rajya Praja Mandal.
  - ✓ Prajamandals were organisations of the people in the Indian princely states during the British rule.
  - ✓ Jhalawar Prajamandal was established in 1946.
- **Formation of Greater Rajasthan:** Matsya Sangh was merged into Greater Rajasthan on May 15, 1949. It was formed on March 18, 1948 by merging four princely states of Alwar, Bharatpur, Dholpur and Karauli.
- **Eki Movement:** Before the Eki movement, Motilal Tejawat was working as a Kamdar in Jhadol. Eki movement was started in 1920s by the tribals in protest against the Jagirdar system.
- **Deposition of Copper in Rajasthan:** Deposits of copper mineral have been found from Jhadol (Udaipur), Kurada (Nagaur), Sabadiya (Bikaner).
- **Famous Painter:** Famous painter Mohammad Shah was the court painter of Maharaja Sawai Jai Singh of Jaipur. Had given him the title of 'Raj Rajeshwar Shri Rajadhiraj Sawai'.
- **Folk Dance:** Agni dance is performed by the men of Jasnathi Siddha sect of Rajasthan. Agni dance is performed in honor of Saint Jasnath who belongs to the spiritual Siddha Nath of Bikaner.
- **Kuvalayamala:** Native languages are mentioned in the book named Kuvalayamala. Udyotan Suri is the author of Kuvalayamala. This book is written in Campu style.
- **Author:** The author of 'Achaldas Khichi Ri Vachanika' is Gadan Shivdas. This is a book written in Dingal language. It describes the war that took place between 1430-35 between Sultan Hosangshah of Mandu and Achaldas Kheri, the ruler of Gagraun.
- **Lok Sant:** There is a Samadhi of Baba Ramdevji in Ramdevra, which is situated in Jaisalmer district of Rajasthan.
  - ✓ Mallinath was born in Mithila, and attained salvation at Sammed Shikhar.
  - ✓ Kharnal is the birthplace of Saint Tejaji, located in Nagaur district of Rajasthan.
  - ✓ Pabuji was born in the house of Durgapati of Kolugarh, he is worshiped as the protector deity of animals.
- **Fort:** Gagron Fort is located at the confluence of Kali Sindh and Ahu rivers in Jhalawar district of Rajasthan.
  - ✓ Chittorgarh, Jalore and Siwana forts are situated on mountains.
- **Archaeological Site-Surkotada:** Surkotada was discovered by Jagapati Joshi in 1964. This is an important site related to the Harappan culture, from where evidence of dwellings and a city surrounded by defensive walls has been found. It is located in the Kutch region of Gujarat.
- **Prabhavati Devi:** Chandragupta II married his daughter Prabhavati Devi to the Vakataka ruler Rudrasena II. This marriage took place in around 380 AD. After the death

of Rudrasena in 390 AD, Prabhavati became the patron of the Vakataka dynasty.

- **Bharhut Stupa:** Bharhut Stupa is located in Satna district of Madhya Pradesh, which was built by Pushyamitra Shunga. Bharhut was discovered by Cunningham in 1873.
- **Lalit Vighraharaja:** The play Lalit Vighraharaja was composed by Somdev. Somdev lived in the court of Chauhan ruler Vighraharaja IV (Bisaldev).
- **Andhra Kavita Pitamah:** Allasani Peddana is called the 'Andhra Kavita Pitamah'. This title was given to him by Krishnadev Rai. He was a famous poet of Telugu language.
- **Panch Mahal:** Buddhist architecture has been followed in the Panchmahal built by Akbar in Fatehpur Sikri. This four-storey building is inspired by Buddhist temples.
- **Maharaja Man Singh II:** Maharaja Man Singh II was made the first head of Rajasthan. He was the last ruler of the Kachwaha dynasty. He served as the Rajpramukh of Rajasthan from 1949 to 1956.
- **Servants of India society:** Servants of India society was formed on June 12, 1905 in Pune by Gopal Krishna Gokhale. This organization campaigned for education, health care, reducing untouchability and discrimination.
- **Special Session of Congress:** The special session of Congress held in Calcutta in 1920 was presided over by Lala Lajpat Rai. In this session, resolutions demanding Swaraj and Non-cooperation movement were passed. Gandhiji had said that if the non-cooperation movement was successful, Swaraj would be achieved within a year.
- **Suhrawardy Sect:** Suhrawardy sect spread mainly to Sindh, Punjab and Multan. The founder of Suhrawardy sect was Sheikh Shihabuddin Suhrawardy. Its originator in India was Sheikh Bahauddin Zakaria.

## Geography

- **Corridors:** The East-West Corridor connects Silchar (Assam) to Porbandar. North-South Corridor connects Srinagar to Kanyakumari. Both these corridors intersect each other in Jhansi.
- **Hilly Places in Rajasthan:** Santoor is a place situated in Hadauti hill region. Katada is an important place situated in Southern Aravalli.
  - ✓ Durmaryaji is situated in central Aravalli. Mahoharpur is an important centre of Northern Aravalli.
- **Monsoon Rainfall in Rajasthan:** The descending order in receipt of monsoon rain is - Dholpur, **Rajsamand and Jalore**. Maximum rainfall in Rajasthan occurs in the southern and south-eastern districts.
  - ✓ The district with the highest rainfall in Rajasthan is Jhalawar and the highest rainfall variability is found in Jaisalmer district.

- **Triveni in Rajasthan:** Triveni is the meeting place of three rivers **at four places in Rajasthan**.
  - ✓ Banas, Bedach and Menaal - Bhilwara district
  - ✓ Som, Mahi and Jakham – Dungarpur district
  - ✓ Chambal, Banas and Seep – Sawai Madhopur district
  - ✓ Banas, Rawari and Doi - Tonk
- **Forest Cover in Rajasthan:** Percentage of forest cover in the total geographical area of Rajasthan is 4.87%. Total percentage of Forest and tree cover in Rajasthan is 7.42%.
  - ✓ According to Rajasthan Forest Policy-2023, the target is to increase forest cover to 20% of the geographical area in the next 20 years.
- **Production of Minerals:** In India, maximum production of bauxite takes place in the states of Odisha followed by Gujarat and Jharkhand respectively. Maximum production of mica takes place in Andhra Pradesh followed by Rajasthan.
- **Sugar industry in Rajasthan:** The first beetroot based sugar industry was established in Sriganganagar district in 1968. Sriganganagar Sugar Mill was established in 1937 in the private sector. It was included in the public sector in 1956.
- **River Project:** Mahi Bajaj Sagar Project located on Mahi River is a joint project of Gujarat and Rajasthan states. Rajasthan has 45% stake in this and Gujarat has 55% stake. Its foundation was laid by Morarji Desai in 1972. It is named after the famous freedom fighter Jammalal Bajaj.
- **Census of Rajasthan:** The district of Rajasthan with the minimum decadal population growth between 2001 and 2011 is Sriganganagar (10%). District with maximum decadal growth is Barmer (32.5%). The decadal population growth of Rajasthan is 21.3%.
- **Manganese Producing Areas of Rajasthan:** Kalakhuta, Lilwani, Nardiya and Timmamori are manganese producing areas of Rajasthan. Kala Khuta, Lilwani, Timmamori are located in Banswara district. Nardiya is situated in Chittaurgarh district.
  - ✓ Maximum manganese is produced in Banswara followed by Udaipur and Rajsamand.
- **Power Stations of Rajasthan:** Kalisindh Thermal Power station is located in Jhalawar district of Rajasthan. There are two plants with capacity of 600 MW each. It was established in 2014. Here water is obtained from Kalisindh Dam reservoir and coal is obtained from Chhattisgarh.
- **Wildlife Sanctuaries in Rajasthan:** Shergarh Wildlife Sanctuary was established in 1983 in Baran district.
  - ✓ Bassi Wildlife Sanctuary was established in Chittorgarh in 1988.
  - ✓ Ramsagar Wildlife Sanctuary was established in 1955 at Dholpur.
  - ✓ Sitamata Wildlife Sanctuary was established in 1979 in Pratapgarh, and Chittorgarh.



## CURRENT AFFAIRS

- ✓ Sitamata Wildlife Sanctuary was established in 1979 in Pratapgarh, and Chittorgarh.
- ✓ There are total 27 wildlife sanctuaries in Rajasthan, of which the largest is National Desert Park and the smallest is Sariska.
- **Hybrid Crop Centre:** Mahi Kanchan is a hybrid variety of maize developed at Agricultural Research Center, Banswara. RCB 911 is a hybrid variety of millet developed by National Seeds Corporation.
- **Coarse Grains:** Jowar, Kodo, Kangni and Ragi are coarse grains. Rajasthan is leading in the production of coarse grains. The United Nations has declared 2023 as the National Year of Millets.
- **Tiger Reserves in Rajasthan:** The National Tiger Conservation Authority has declared Dholpur-Karauli Sanctuary as the fifth tiger reserve of the state. It is the 54th tiger reserve of India.
  - ✓ Mukundara Hills, Ramgarh Vishdhari, Ranthambore and Sariska are other tiger reserves of Rajasthan.
- **Cattle Fair:** Chandrabhaga fair is organized every year in the month of Kartik in Jhalra Patan. It is situated in Jhalawar district. A grand cattle fair is also organized here.
- **Elbe River and Rhine River:** The Elbe River and the Rhine River drain into the North Sea. The Elbe originates in the Czech Republic and flows through Germany to the North Sea. The Rhine River originates from the Alps and falls into the North Sea.
- **Desertification:** The problem of desertification is the least in the European continent. The reason for this is the Mediterranean climate and geographical location here.
- **Karewa, Nalagarh Dun, Namcha Barwa and Valley of Flowers:** Karewa is a deposit of alluvial soil, which is famous for the cultivation of Saffron.
  - ✓ Nalagarh dun is located in Himachal Pradesh whereas the biggest dun is Dehradun.
  - ✓ Namcha Barwa is the eastern border of Himalayas, which is located in Arunachal Pradesh.
  - ✓ Valley of Flowers is situated in Uttarakhand.
- **Rainfall from the North-east Monsoon:** Tamil Nadu coast, southern Andhra Pradesh, south-east Karnataka receive rainfall from the north-east monsoon.
  - ✓ The Gujarat coast receives rainfall from the south-west monsoon.
- **Lakes:** Bhimtal is one of the seven lakes located in Nainital (Uttarakhand).
  - ✓ Pulicat Lake is a salt water lake located in Tamil Nadu.
  - ✓ Loktak is a freshwater lake located in Manipur.
  - ✓ Roopkund is a glacial lake located in Chamoli, Uttarakhand.
- **Industrial Region:** The Midlands region is an industrial region located in England, which has been the center of the Industrial Revolution.

- ✓ Cincinnati, Great Kanawha Valley and Lake Michigan are industrial areas located in United States.

## Polity

- **Constitution of India:** The last meeting of the Constituent Assembly was held on January 24, 1950, on this day Dr. Rajendra Prasad was elected as the President of India. The first meeting of the Constitution was held on December 9, 1946 and the objective resolution was presented on December 13, 1946.
- **Schedule of the Constitution:** The 9th Schedule of the Constitution was added by the First Constitutional Amendment. The laws included in this schedule are not subject to judicial review.
- **Maneka Gandhi Case 1978:** In Maneka Gandhi case 1978, the Supreme Court ruled that right to life and personal liberty can be curtailed only by the procedure established by law. The right to life is not merely a physical right but it includes right to live with human dignity and other aspects related to it.
- **Chairman of Rajya Sabha & Joint Sitting of Parliament:** Apart from Dr. S. Radhakrishnan, Hamid Ansari was also the Chairman of Rajya Sabha for two consecutive terms.
  - ✓ Till now, joint sitting of both the houses of parliament has been called three times on the occasion of passing the Dowry Prohibition Bill 1960, Bank Service Commission Bill 1977 and Terrorism Prevention Bill 2002.
- **No-confidence Motion:** No-confidence motion is introduced in the Lok Sabha with the support of 50 members. It is not necessary to give reasons for accepting it in the Lok Sabha.
- **Directive Principles of State Policy:** Provision for equal justice and free legal aid has been made in Article 39A.
  - ✓ The right to work is enshrined in Article 41. It is enforced under MGNREGA.
  - ✓ Provision for protection of environment and protection of forest animals has been made in Article 48A.
  - ✓ Provision for protection of monuments and places and objects of national importance has been made in Article 49.
- **Right to Information Act, 2005:** There is a provision related to the formation of Information Commission in Section 12 of the Right to Information Act, 2005. Functions and powers are mentioned in Section 18, 19, 25 of the RTI Act.
- **Inter State Council:** The Sarkaria Commission constituted in 1983 had recommended the formation of a permanent Inter-State Council called inter-governmental council. The provision for Inter State Council is in Article 263 of the Constitution.

- **Lok Sabha Elections (1989):** Due to lack of majority in the 1989 Lok Sabha elections, coalition governments started and the Congress system came to an end. In 1989 Lok Sabha elections, Congress became the largest party by winning 197 seats but the government was formed by Janata Party led by V.P. Singh.
- **Comptroller and Auditor General (CAG) of India:** There is a provision for the appointment of CAG in Article 148. Article 149 provides for the duties and powers of CAG. Article 150 provides for the form of accounts of the Union and of the States. There is a provision for audit report in Article 151.
  - ✓ Chief Minister of Rajasthan: Hiralal Devpura was the Chief Minister of Rajasthan for the shortest period of 15 days. Mohanlal Sukhadia was the Chief Minister of Rajasthan for the longest period.
- **Council of Ministers of Rajasthan:** The minimum number of members of the Council of Ministers of Rajasthan can be 12 and maximum of 30.
- **Value of Vote in Presidential Election:** The vote value of the member of the Rajasthan Legislative Assembly in the 2022 Presidential election was 129. Value of vote of each MP was 700.
- **Appointment of Chief Justice:** According to Article 217 (1) of the Constitution, other than the Chief Justice of Rajasthan, judges of high court will be appointed by the President in consultation with the Governor of Rajasthan, the Chief Justice of India and the Chief Justice of Rajasthan high court.
- **State Reorganization Commission (1956):** By the State Reorganization Commission 1956, the post of Rajpramukh was abolished in Rajasthan and a Governor was appointed. For this the 7th constitutional amendment act was passed.
  - ✓ Sardar Gurmukh Nihal Singh became the first Governor of Rajasthan.
- **Gram Panchayat Officer:** By amending Section 89 of the Rajasthan Panchayati Raj (Amendment) Act, 2021, Gram Panchayat Officer was substituted in place of 'Gram Sevak'. The post of Gram Sevak was created by the Rajasthan Panchayati Raj Act 1994 under Section 89.
- **Appointment of Rajasthan Public Service Commission Members:** The Chairman and members of Rajasthan Public Service Commission are appointed by the Governor under Article 316. The Chairman and members of the Commission are removed by the President under Article 317.
- **Appointment of Tehsildar:** Tehsildar is appointed by the Revenue Board as per administrative convenience. Tehsildar were first appointed as Naib Tehsildar after successful completion of a state Service Exam. Tehsildar is selected by Rajasthan Public Service Commission.
- **Lokayukta in Rajasthan:** In 2014, Narpatmal Lodha Committee was formed to amend the Lokayukta Act and

make it stronger and effective. In Rajasthan, provision of Lokayukta was made through Lokayukta Act 1973. Presently the Lokayukta of Rajasthan is Justice Pratap Krishna Lohra.

- **73rd Constitutional Amendment:** By the 73rd Constitutional Amendment, provision was made in Schedule XI of the Constitution for local self-government. Provision for State Election Commission was made under Article 243K, it was formed in Rajasthan in July 1994.
- The State Election Commission is a one-member commission headed by the Commissioner.
- **State Information Commission:** In April 2023, the Rajasthan government approved the establishment of a bench of the State Information Commission in Jodhpur. The main bench of the State Information Commission is located in Jaipur.
  - ✓ The State Information Commission was constituted by the Right to Information Act 2005.
- **Human Rights Commission of Rajasthan:** According to the provisions of Rajasthan Human Rights Protection (Amendment) Act 2006, the Commission consists of a Chairman and two members. At present Justice Gopal Krishna Vyas is the Chairman and Shri Ramchandra Singh Jhala and Mahesh Goyal are the members.
- **The States Reorganization Commission:** The States Reorganization Commission formed in August 1953 included Justice Fazal Ali, K.M. Pannikar and Hridaynath Kunzru. The Commission submitted its report in 1955, on the basis of which the States reorganization act 1956 was passed which led to formation of 14 states and 6 union territories.

## Economy

- **Gross Fiscal Deficit:** Gross fiscal deficit reflects the net liabilities of the government.
  - ✓ Gross Fiscal Deficit = Net Domestic Borrowing + Borrowing from RBI + Foreign Borrowing
- **Public & Private Goods:** Public goods mean goods which are created by the government. Cars are private goods while government administration, roads and government security are public goods.
- **Inflation:** This inflation is based on the consumer price index, which includes food items and fuels.
  - ✓ **Core Inflation:** This inflation is based on the Consumer Price Index, excluding food and fuel.
- **Policies of Government:** Selective credit control includes changes in credit limits, credit rationing and moral suasion.
  - ✓ Selling government securities comes under fiscal policy.
- **Fiscal policy & Monetary Policy:** Fiscal policy is decided by the Finance Ministry, it includes public expenditure, income, taxation etc.

## CURRENT AFFAIRS

- ✓ Monetary policy is made by RBI, it includes repo rate, bank rate, interest rate etc.
- **Gross Domestic Product:** According to advance estimates for 2022-23, Rajasthan's contribution to India's GDP is estimated to be 5.18%.
  - ✓ Maharashtra followed by Tamil Nadu have the highest contribution in India's GDP
- **Contribution of GSVA:** The sub-sectors that contribute to GSVA in the prevailing prices of service sector of Rajasthan are-
  - ✓ Business, hotel, cruise ship – 27.67%
  - ✓ Real estate, ownership of residential houses, professional services- 24.62%
  - ✓ Transportation, storage and communication- 11.78%
  - ✓ Financial services – 9.27%
  - ✓ Public Administration Services- 7.07%
- **Sectoral Growth:** The service sector is estimated to have the highest growth in gross value added in Rajasthan in 2023-23.
  - ✓ After service sector, there will be growth in industry and agriculture sector.
- **Rajasthan Fiscal Responsibility and Budget Management Act 2005:** The Government of Rajasthan enacted the Rajasthan Fiscal Responsibility and Budget Management Act 2005. This Act prescribes limiting the fiscal deficit to 4% and limits externalities.
- **Mission Vatsalya Yojana:** The objective of Mission Vatsalya Yojana is to make provisions to improve the health and nutritional status of pregnant and lactating women and their infants. Under the Mission Vatsalya Scheme, Vatsalya Matru Amrit Kosh and National Human Milk Bank have been established.
- **Indira Mahila Shakti Udaan Yojana:** The main objective of Indira Mahila Shakti Udaan Yojana is to create awareness about menstrual health and hygiene management. Under this, 12 sanitary napkins are distributed every year completely free of cost to women up to 45 years of age.
- **Shyama Prasad Mukherjee Rurban Mission:** Shyama Prasad Mukherjee Rurban Mission is an effort to empower rural areas with social, economic and physical infrastructure facilities. It was started in 2016 by the Ministry of Rural Development.
- **Mera Gaon Meri Dharohar:** 'Mera Gaon Meri Dharohar' is related to the Union Ministry of Culture. Its objective is to revive India's cultural heritage.
- correct this, a concave lens is used. Convex lens is used to correct farsightedness and to treat hypermetropia.
- **Unit of Information:** The units of measurement of digital information are Bit < Byte < Kilobyte < Megabyte < Gigabyte < Terabyte
- **Astra Missile:** Astra is a beyond visual range air-to-air missile. Its strike range is approximately 150 km. It was successfully launched from Tejas on 23 August.
- **Satellites:** TeLEOS-2 and Lumelite-4 have been launched by PSLV-C55 on April 23, 2023. It was a completely commercial vehicle of ISRO 's New Space India. Both satellites belonged to Singapore.
- **Nano Range Material:** Quantum Well: One dimension of a substance has been reduced to the nano range and other two dimensions remain the same.
  - ✓ Quantum Dots: These are man-made nanoscale crystals that transmit electrons from one place to another.
  - ✓ Quantum Wire: It is a very narrow structure, where electron transport is possible in very few transverse modes.
- **File Format:** MP3 is audio file format. MP4, MOV, AVI are video file formats.
- **Components of Human Body:** 17% of human body weight is made up of proteins, 15% of lipids and 1% of carbohydrates. Protein is made from amino acid. Proteins are obtained from both animals and plants.
- **Blood Group:** Both A and B antigens are not found in a person with blood group 'O'. 'O' is called the universal donor blood group. **AB** is called universal receiver blood group.
- **Disease:** Diphtheria and plague are caused by bacteria. Dengue is caused by virus.
- **Malaria:** The Falciparum species of Plasmodium causes fatal malaria. Malaria is spread by the bite of female Anopheles mosquitoes. Vivax and ovale are other species of Plasmodium.
- **Nephelometric Turbidity Unit (NTU):** NTU is the unit of Turbidity of water.
- **Lichen:** Lichen does not grow in polluted places. Lichen is a measure of air pollutants. Lichen is a combination of algae and fungus.
- **Rajiv Gandhi Center for Biotechnology:** Rajiv Gandhi Center for Biotechnology was established in 1990 in Thiruvananthapuram. This institute is especially dedicated to molecular biology and biotechnology.
- **National Camel Research Center:** National Camel Research Center is located in Bikaner, Rajasthan. It was established in 1984 under the aegis of ICAR and was upgraded as National Camel Research Center in 1995.
- **Rajasthan Knowledge Corporation Limited:** Rajasthan Knowledge Corporation Limited was established in 2008. Its aim is to enrich Rajasthan with information technology skills in the 21st century.

## General Science/ Science & Technology

- **Morphine:** Morphine is a narcotic analgesic. Morphine is made by separating it from opium.
- **Myopia and Hypermetropia:** In myopia, nearby objects are visible and distant objects are not visible clearly. To

- **Rajasthan Veterinary and Animal Sciences University:** The second Rajasthan Veterinary and Animal Sciences University has been established in Jobner. The first Veterinary and Animal University is located in Bikaner.
- **Energy:** Fossil fuel is a non-renewable resource. Solar energy & wind energy are renewable resources.
- **Artificial Intelligence:** Artificial Intelligence of Things Innovation Hub in Rajasthan will be established in Jodhpur. It will promote research and development of artificial intelligence in the state.
- **3D-printed Post Office:** India's first 3D printed post office has been inaugurated in Bengaluru.

## Environment

- **Amazon Forest:** 20% of the total oxygen present in the Earth's atmosphere is produced by photosynthesis in the Amazon forest. Amazon forests are called the lungs of the earth.

## Current Affairs

- **Indira Rasoi Yojana:** The slogan 'No one should sleep hungry' is related to Indira Rasoi Yojana. Indira Rasoi Yojana has been started by the Rajasthan Government in August- 2023 to provide nutritious thali in Rs 8. Each thali will cost Rs 25 in which Rs 17 will be borne by the government and Rs 8 by the beneficiary.
- **Indira Gandhi Urban Employment Guarantee Scheme:** Indira Gandhi Urban Employment Guarantee Scheme has been launched by Rajasthan Government on the lines of MNRGA in 2023. It guarantees 125 days of employment every year to families living in urban areas. After registration, eligible candidates are provided employment within 30 days.
- **Medicines Production in India:** India accounts for 60% of global production in vaccine manufacturing.
  - ✓ India is the largest provider of generic medicines.
  - ✓ India ranks 14th in terms of value in pharmaceutical production.
- **Global Happiness Index 2023:** India ranks 126th among 146 countries in the Global Happiness Index 2023 released by the United Nations Sustainable Development Solutions Network. In this index, Finland is at first place and Denmark is at second place.
- **Atal Bhujal Scheme:** Atal Bhujal Scheme is being operated by the Government of India under Jal Jeevan Mission.
  - ✓ The focus of this scheme is to improve ground water management and arrest its declining levels.
- **Chief Minister Small Industries Promotion Scheme:** Rajasthan Chief Minister Small Industries Promotion Scheme has been launched in 2023. Under this, loan

subsidy of 5 to 8 percent will be given on loans ranging from Rs 25 lakh to Rs 10 crore.

- **Rajasthan Highway Development Program:** Under Rajasthan Highway Development Program II. 11 highways of 801 km will be upgraded. This program is funded by the World Bank.
- **PM Kusum Yojana:** PM Kusum Yojana was launched in 2019 by the Ministry of New and Renewable Energy. Under this, solar power plants ranging from 0.5 to 2 MW are established. In Rajasthan, it is being implemented by Rajasthan Renewable Energy Corporation Limited.
- **UDGAM Portal:** UDGAM portal launched by Reserve Bank of India. It was launched in August 2023 to help and make it easier for people to locate their unclaimed deposits across different banks at one place.
- **Time Magazine:** Time magazine has listed SS Rajamouli in the Pioneers category and Shahrukh Khan in the Icons category in 2023. Time magazine nominates 100 influential people in 6 categories – Leader, Titan, Pioneer, Artist, Icon and Innovator
- **The United Nations General Assembly:** The United Nations General Assembly has elected Dennis Francis as the President for the 78th session. Dennis Francis is a former diplomat from Trinidad and Tobago.
- **Urea Gold:** The new variety of urea, Urea Gold, was launched by the Prime Minister in Sikar, Rajasthan in July 2023. Urea gold is made by mixing 37% nitrogen and 17% sulfur. Neem coated urea, liquid nano urea are other urea varieties.
- **AI for Good Global Summit 2023:** AI for Good Global Summit 2023 has been organized in Geneva Switzerland. The two-day conference focused on achieving sustainable development goals through AI.
- **Sahitya Akademi Youth Award:** Sahitya Akademi Youth Award in Rajasthani language for 2023 was given to poet Devi Lal Mahiya. The name of his work is 'Antas Ro Olmo'.
  - ✓ In 2022, this award was given to Ashish Purohit for his work 'Aunaan'.
- **Conference of the Commonwealth Parliamentary Association:** The 9th conference of the Commonwealth Parliamentary Association was held in Udaipur from 21 to 22 August. It was inaugurated by Lok Sabha Speaker Om Birla.
- **FISU World University Games 2023:** FISU World University Games 2023 was organized in Chengdu, China. In this, China got first position while India got 7th position.
- **Asian Championship Trophy:** The 4th Asian Championship Trophy of Hockey was held at Mayor Radha Krishnan Stadium, Chennai. India won the championship by defeating Malaysia 4-3.
- **Gymnastic Player:** Rajeshwari Kumari is related to gymnastics. She has qualified for the Paris Olympics by finishing 5th in the championship held in Baku, Azerbaijan. ■■



# Exam Pointers

## Yojana (October 2023)

### Infrastructure

#### PM Vishwakarma

- Traditional artisans and craftsmen in the informal or unorganized sector who follow the 'Guru-Shishya Model' are called 'Vishwakarma'.
- 'PM Vishwakarma' aims to improve the quality of their products and services and include them in the domestic and global value chain.
- 'PM Vishwakarma' will be fully funded by the Central Government and its initial outlay has been earmarked at Rs 13,000 crore.
- This scheme will be jointly implemented by the Ministry of Micro, Small and Medium Enterprises; the Ministry of Skill Development and Entrepreneurship, Department of Financial Services and the Ministry of Finance.
- Initially this scheme will be implemented for 5 years till 2027-28.
- PM Vishwakarma Certificate and ID card, Skill Upgradation, Toolkit Incentives, Credit Support, Incentives for Digital Transactions and Marketing Support are the major components of the scheme.
- A three-tier structure has been set up for the implementation of this scheme. This includes the National Steering Committee, State Monitoring Committee and District Implementation Committee.

#### Voyage to Study the Earth's Sun

- Aditya L1 mission was launched from Satish Dhawan Space Center in Sriharikota, Andhra Pradesh on September 02, 2023.
- This is the first space-based Indian mission to study the Sun.
- The spacecraft carries seven payloads to observe the Photosphere, Chromospheres, and Outermost layers of the Sun (Corona) using electromagnetic and particle detectors.
- The spacecraft will be placed in a halo orbit around the Lagrange point (L1) of the Sun-Earth system, approximately 1.5 million km from Earth.
- The satellite installed in the coronal orbit around the L-1 point can observe the Sun without any obstruction/eclipse.
- The 'Lagrange point' for a two-body gravitational system is a place in space where, if a small object is placed, it can be located there.

- For two-body systems such as the Sun and Earth, these points in space are used by spacecraft to remain in these locations with less fuel consumption.
- Technically, the gravitational pull of two larger objects on a Lagrange point is equal to the 'centripetal force' required for a smaller object moving along them.
- There are a total of five Lagrange points for two-body gravitational systems, denoted as L1, L2, L3, L4 and L5.
- 'Lagrange point' L-1 (L1) is located between the Sun and the Earth line. The distance of L1 from Earth is about 1% of the Earth-Sun distance.
- Another Lagrange point, L5, is a good vantage point for studying Earth-directed 'Coronal Mass Ejection (CME)' events and assessing space weather.

#### Space Infrastructure

- Space activities in India started in the year 1962 with the establishment of 'Indian National Committee for Space Research' (INCOSPAR).
- Similarly, in August 1969, 'Indian Space Research Organization' (ISRO) was established and 'INCOSPAR' was merged into it. In June 1972, the Space Commission and the Department of Space were formed and in September 1972, ISRO was brought under the Department of Space.
- Antrix Corporation Limited and New Space India Limited are two central public sector enterprises formed to commercialize the research and development activities of the Department of Space.
- Vikram Sarabhai Space Center (BSSC), located in Thiruvananthapuram, has the responsibility of designing and developing the launch vehicle technology.
- The 'U.R. Rao Satellite Centre' (URSC) in Bengaluru is involved in the design and development of communications, navigation, remote sensing, scientific and small satellite missions.
- Satish Dhawan Space Center (SDSC)-Sriharikota Range (SHAR) provides core infrastructure facilities for the Indian space programme.
- The Liquid Propulsion Systems Center's two campuses located at Bengaluru and Thiruvananthapuram look after the design, development and supply of propulsion systems for spacecraft.
- The 'Space Applications Centre' (SAC) based in Ahmedabad has the responsibility for the development of space-borne and air-borne instruments and payloads.
- The 'Human Space Flight Centre' (HSFC) located at ISRO Headquarters in Bengaluru conducts research and development work based on flight activities.

- The **National Remote Sensing Center (NRSC), Hyderabad** performs a variety of responsibilities ranging from receiving satellite data and producing data to providing geospatial services.
- **Indian Institute of Remote Sensing, Dehradun** aims to build capacity in applications of remote sensing and geoinformatics through education and training at the postgraduate level.
- **ISRO Propulsion Complex (IPRC), Mahendragiri (Tamil Nadu)** is responsible for the assembly, integration and testing of liquid propulsion systems.
- **Physical Research Laboratory (PRL), Ahmedabad** is an autonomous unit under the Department of Space and conducts research in the fields of astronomy and physics, solar physics and Astro-chemistry.
- **Bengaluru-based Antrix Corporation Limited (ACL)** is a wholly owned Government of India company under the administrative control of the Department of Space.
- **New Space India Limited (NSIL)** was incorporated in 2019 as a wholly owned government undertaking under the Department of Space.
- The **Indian National Space Promotion and Authorization Center (In-Space), Ahmedabad** grants and monitors the activities of private enterprises and startups.

### Road Infrastructure Getting Smarter

- According to the **2022-23 annual report** of the Ministry of Road Transport and Highways, **India ranks second** in the world in terms of length of roads, **United States is at first place**.
- According to the above report, the **compound annual growth rate (CAGR) of total road length** from the year 1991 to 2019 has been **3.64 percent**.
- As of 31st March, 2023, the **length of national highways and state highways** across the country has been recorded at **1,44,955 kilometers and 1,67,079 kilometers respectively**.
- Rural roads constitute more than 70% of the total road length in India.
- **Maharashtra was the first state** to create an organizational institution to improve the development of state highways and established the '**Maharashtra State Road Development Corporation Limited**' in August 1996.
- The **National Highway Development Project (NHDP)** started under NHA in the year **1998**.
- The development of '**Golden Quadrilateral**' and '**North-South**' and '**East-West**' corridors was initiated under NHDP.
- The **first expressway** was opened in **2002** between **Mumbai and Pune** for faster and streamlined movement.
- **As of 2023**, about **5000 km of expressways are in operation**, 9000 km are under construction and about 20,000 km of expressways are under proposal across the country.
- **National Highway Logistics Management Limited (NHLML)** was established in **2020** to develop Multi Modal Logistics Parks (MMLP) and port-connectivity projects.

### Rail Infrastructure

- At present, Indian Railways has grown to a **route length of 68,043 kilometers with 13,215 locomotives**.
- As of **31<sup>st</sup> March, 2022**, the locomotive stock fleet of Indian Railways consisted of **39 steam, 4747 diesel and 8429 electric locomotives**.
- 74.06% route kilometres, 80.38% running kilometres and 78.46% track kilometres are **electrified** across the country.
- The '**Research Design and Standards Organization (RDSO)** located in **Lucknow** is the research and development wing of the Indian Railways.
- **RDSO** acts as an **advisor to Indian Railways** on technical matters and as an advisory body to other organizations involved in railway construction and design.
- From 1924–25 the Railway Budget was being presented separately in Parliament. The government decided to **include the Railway Budget in the General Budget** from the budget year **2017-18**.
- '**Bharat Gaurav Train (BGT) Policy**' was launched by Indian Railways with the aim of showcasing India's rich cultural heritage and magnificent historical sites.
- A '**National Railway Plan-2030**' (NRP-2030) has been prepared by Indian Railways to develop a 'future ready' railway system.
- **As of 28 July 2023**, **50 'Vande Bharat Train'** services have started operating by Indian Railways.

### Port Infrastructure in Gujarat

- '**Gujarat Maritime Cluster**' aims to bring together maritime service providers, financial institutions, relevant government agencies and academia to accelerate the development of an integrated maritime sector.
- There are **49 ports in Gujarat**. These include **one major port Deendayal Port Authority** and 48 non-major ports.
- Gujarat is the **first state in India** to create a **legal framework for public-private partnership** in the infrastructure sector.
- **Over Rs 1000 crore has been allocated** to Gujarat from the Central Government for **12 port projects under the 'Sagarmala'** port development projects for the financial year 2023-24.
- Out of 174 port connectivity projects in India, **23 projects will be constructed in Gujarat**.
- To Simplify the investment mechanism, government has allowed **100% Foreign Direct Investment (FDI)** in the shipping sector.
- **100% Foreign Direct Investment (FDI)** has been permitted under the automatic route for construction and maintenance projects of ports and harbours.
- **Tax exemption from customs duty and excise duty** is also provided on inputs used in shipbuilding.

## Unity Malls

- The establishment of 'Unity Mall' in every state of the country was announced in the **budget speech for the financial year 2023-24**.
- **States have been given the freedom to choose** either their **financial capital or major tourist centres** to establish 'Unity Mall'.
- These have been specially designed for **'One District One Product' (ODOP)**, Geographical Indication (GI) tagged products and locally made handloom and handicraft items.
- Each mall will have a separate store for each district to showcase the rich palette of unique produce from particular districts of the state.
- To ensure uniformity and harmonious branding, comprehensive **guidelines have been issued** to the States regarding construction of Unity Mall **by the Department of Expenditure, Ministry of Finance**.
- To ensure the sustainability of Unity Mall, they will be operated and maintained under a **Public-Private Partnership (PPP) model**.
- The initiative to set up Unity Malls across the country is **inspired by the successful 'Ekta Mall' in Kevadiya, Gujarat**.

## Agri Infrastructure

- The **total food grain production (cereals and pulses)** in the country has increased from 51 million tonnes in 1950-51 to more than **330 median tonnes in 2022-23**.
- The **production of coarse cereals** has increased from 15.38 million tonnes in 1950-51 to **55 million tonnes in 2022-23**.
- On India's proposal, the United Nations has declared the year **2023 as 'International Year of Millets'**.
- India is the **largest producer and consumer of pulses** in the world.
- The **production of pulses** in the country has increased from 8.4 million tonnes in 1950-51 to **27 million tonnes in 2022-23**.
- India is highly dependent on imports of edible oils to meet its domestic demand. **Import dependence** in the year 2022-23 was about **55% of the total requirement**.
- To make the country self-reliant in edible oils, domestic oilseed production is being promoted under the **'National Food Security Mission-Oilseeds' (NFSM-OS) scheme** from **2018-19**.
- The **net area under sowing of crops** was 118.75 million hectares in 1950-51 which increased to **139.90 million hectares in 2019-20** (1.17 times increase).
- At present, the recommended **ratio of fertilizer application (N: P: K) is 3:2:1**.
- To encourage farmers to use fertilizers, a **'Nutrient Based Subsidy Scheme'** was launched in the year **2010**, which was revised in May 2023.
- Programs such as the **Command Area Development Program (1974-75)** and the **Accelerated Irrigation Benefit Program (1997)** have played an important role in providing water to dry farms in India.

- Due to the development of irrigation facilities, **India's net irrigated area** has increased from 17.55% in 1950-51 to **53% in 2019-20**.

## G-20: Global Startup Ecosystem

- The G-20 is a group of **19 countries and the European Union** that represent nearly two-thirds of the world's population, 75% of global trade and 50% of GDP.
- The G-20 was **established in 1999** in response to the financial crises of the late 1990s to promote international financial stability.
- India's G-20 chairmanship is based on the theme **'Vasudhaiva Kutumbakam' or 'One Earth, One Family, One Future'**.
- **India's G-20 presidency** began from December 1, 2022 and will continue **till November 30, 2023**.
- To ensure the annual presidency of the G-20, a **three-member 'Troika'** is formed consisting of the past, present and next year's chairs.
- After completion of India's presidency, a **new 'Troika'** has been formed in the form of **'India-Brazil-South Africa'**.
- **Startup-20** is the latest engagement group launched under the Indian G-20 Chairmanship.
- Startup-20 **aims** to harmonize the global startup ecosystem and collaborate across diverse areas of work.
- **India has emerged as the world's third largest startup ecosystem** with **108 unicorns** (startups valued at \$1 billion or more) and over 98,000 recognized startups.

## Kurukshetra (October 2023)

### Clean and Green Villages

#### Vision for Green and Clean Rural India

- The Ministry of Panchayati Raj is **striving to achieve 17 Sustainable Development Goals** under **nine themes** with the active participation of Panchayati Raj Institutions.
- These **nine themes include** - Poverty-free and enhanced livelihoods village, Healthy village, Child-friendly village, Water-sufficient village, Green and clean village, Self-sufficient infrastructure in village, socially secured village, Village with good governance and Women-friendly village.
- About **52% of the villages in the country are ODF Plus**; it means these villages have achieved Open Defecation Free (ODF) status with implemented solid or liquid waste management systems.
- Under the **'Gram Urja Swaraj Abhiyan'**, around 2080 Gram Panchayats have initiated and implemented renewable energy projects across the country.
- **Mission LiFE**, launched at **CoP-26**, promotes sustainable living by encouraging eco-friendly actions globally.

## **Preserving the Green Cover of Indian Villages**

- The spread of urban lifestyle in villages and development of urban infrastructure is called **‘Organic growth of urbanization’**.
- Across the country, efforts are being made to meet the social goals set by the United Nations for sustainable development by linking **278000 Panchayati Raj Institutions (PRIs)** with the Revised Rashtriya Gram Swaraj Yojana (RGSY).
- Padmashree awardee **‘Laurie Baker’** is known as the **‘Gandhi of Architecture’**.
- **‘Laurie Baker’ advocates for creating low cost and energy efficient building** by reviving regional construction practices and local materials.

## **Rural India towards Green Development**

- **‘Green development’** is not envisioned as a replacement for ‘sustainable development’ but as a **key ‘means’** to achieve sustainable development.
- The motto of the new **‘Gram Panchayat Development Plan’ (GPDP)** ‘No one is left behind’ reflects an inclusive and participatory idea.
- In the year **2022**, the renewable energy sector provided **employment to 70 lakh** people globally, and **India accounted for 7%** of it.
- **‘Solar Trap Light’** is a **pest control device**, which is used in place of chemical pesticides to eliminate insects that damage crops.
- Under **‘Solar Hydroponic Fodder System’** crops are grown in **‘trays’** without soil to grow high protein rich fodder for cattle.
- The **‘Integrated Watershed Development Programme’ (IWDP)** aims to maintain groundwater and soil fertility by adopting **‘green agronomic practices’**.
- The **‘National Rural Drinking Water Program’ (NRD-WP)** aims to meet the minimum demand of safe water for all rural household and livestock on sustainable basis.
- The draft notification of **‘Green Credit Program Implementation Rules-2023’** was issued by the ‘Ministry of Environment, Forest and Climate Change’ on June 27, 2023.
- **‘Green Credit Programme’** has been launched to encourage voluntary environmental actions taken by individuals, private sector, small scale industries and farmer producer organisations.
- Under the **‘Partnership on Women Entrepreneurship in Clean Energy’ (wPower)** program, women are trained to become clean energy entrepreneurs or Sakhis at the local level.
- These women promote the use of technologies like **solar lamps and clean cook-stoves**.
- Under the **‘Hariyali Green Village’** initiative, the use of clean energy and environment-friendly technologies is being promoted under the leadership of women.

## **Green Village: New Identity of New India**

- **‘Green Village Initiative’** is an initiative to promote tree plantation and conservation of rural ecosystems and renewable energy sources. It comes under the **Ministry of Drinking Water and Sanitation**.
- The special campaign **‘Sujlam’** launched under the **‘Drinking Water and Sanitation Department’**, about 22 lakh soak pits have been built across the country for the management of dirty water under this campaign.
- Inspired by the success of ‘Sujlam’ 1.0 and 2.0, the ‘Drinking Water and Sanitation Department’ has started **‘Sujlam 3.0’ campaign from May 2023**.
- The **‘Green India Mission’**, launched in **February 2014**, aims to combine adaptation and mitigation strategies to respond to climate change.
- **‘Green India Mission’** is **one of the 8 missions** defined under the National Action Plan on Climate Change.
- Under the **‘Green Village Rating System’**, waste management, use of green energy and conservation of natural resources are promoted in a competitive manner.
- The concept of **Mission LiFE** (Lifestyle for the Environment) was presented by India at the summit in **Glasgow during CoP26** of the UNFCCC.

## **Leveraging Agro-ecological Approaches for Clean and Green Villages**

- **Agro-ecology** is an **integrative approach** that applies ecological and social concepts to the design and management of food and agricultural systems.
- **Organic and natural farming methods** are based on agro-ecological principles and do not involve the use of synthetic or chemical substances.
- Organic farming has been widely promoted through the **‘Paramparagat Krishi Vikas Yojana’ (PKVY)** and **‘Mission Organic Value Chain Development for North-Eastern Region’ (MOVCNDR)** scheme.
- Under PKVY, the **Ministry of Agriculture and Farmers Welfare** has planned to **convert 6 lakh hectares of land into organic farming** by the year 2025-26.
- **‘Gobar Dhan’** (Galvanizing Organic Bio-Agro Resources Dhan) program was started in the year 2018 under **‘Swachh Bharat Mission-Gramin’** for the development of clean and green rural areas.
- **‘Gobar Dhan’** is a **‘waste to wealth’** initiative, in which the waste generated in the village is used to prepare biogas as well as fertiliser.
- The **‘Sustainable Alternatives to Affordable Transport’ (SATAT)** initiative ensures promotion of Bio CNG/Compressed Biogas after purification through Oil Marketing Companies for sale as automotive fuel.

## **Water Park Clean and Green Villages**

- **‘Green village’** refers to a village which can be developed economically by using natural resources like solar energy, wind energy etc. without affecting the natural environment.



## CURRENT AFFAIRS

- According to a recent report by the ‘**World Health Organisation**’, improving access to water, sanitation and hygiene could save **1.4 million lives every year**.
- ‘**Swachh Bharat Mission**’ was launched on **October 2, 2014**. Under this mission, it was decided to **achieve the target of Clean India by 2019** on the occasion of the 150th birth anniversary of Mahatma Gandhi.
- ‘**Jal Jeevan Mission**’ was launched on **August 15, 2019**. It aims to provide clean, safe and adequate drinking water through functional tap connections to all rural households, schools, anganwadis and community centers by 2024.
- Under the Jal Jeevan Mission, **by August 15, 2023**, functional tap connections have been provided to **12.85 crore households** (66.8%) out of a total of 19.23 crore households across the country.
- ‘**Jal Shakti Abhiyan: Catch the Rain**’ (JSA: CTR) was launched on the occasion of World Water Day on **March 22, 2021**.

### Integrated Solar Villages Scheme for Inclusive Development

- India’s new national commitments to achieve **net-zero by 2070** are focused on adopting a **people-centric approach** to climate change while achieving the Sustainable Development Goals.
- **Decentralized Renewable Energy (DRE) technology** enables us to take advantage of opportunities that improve various aspects of lives and livelihoods.
- **Using DRE** can increase access to health facilities, education, internet, livelihood opportunities in rural areas as well as bring necessary resilience to the grid to withstand extreme climate events.
- Adoption of decentralized solar energy requires more workers, so **DRE technology also has the potential to create additional jobs**.
- **Under Phase-II of the ‘Grid Connected Rooftop Solar Programme’** launched in 2019, the **Ministry of New and Renewable Energy** provides **capital subsidy** for installation of rooftop solar up to **10 kW to residential houses**.
- About **11 GW** of rooftop solar has been installed **by August 2023**. In October 2022, this scheme has been extended till 2026.
- Having **access to electricity is a necessity** according to the ‘**Energy Plus**’ framework of the **United Nations Development Program (UNDP)**.

## Dream 2047 (September 2023)

### Progress in Science and Technology

#### National Supercomputing Mission

- The **National Supercomputing Mission (NSM)** aims to install a vast supercomputing grid comprising of more than 70 high-performance computing facilities.
- These supercomputers will also be networked on the National Supercomputing grid over the **National Knowledge Network (NKN)**.
- The NKN connects academic institutions and R&D labs over a high-speed network.
- **NSM is steered jointly by the DST and MeitY** and implemented by the **Centre for Development of Advanced Computing (C-DAC), Pune** and the Indian Institute of Science (IISc), Bengaluru.
- **NSM** has its server based on Intel Cascade platform called Rudra.

#### National Mission on Interdisciplinary Cyber-Physical Systems (NMICPS)

- Keeping in view the need of R&D in the emerging areas, Department of Science & Technology (DST) launched **NMICPS in 2018**.
- **NMICPS aims at the development of technology platforms** to carry out Research and Development, Incubating and Supporting start-ups as well as commercialization.
- **IHUB NTIHAC Foundation (C3iHub) at IIT Kanpur** is working in the Technology Vertical ‘Cyber Security and Cyber Security for Physical Infrastructure’.
- **E-Agris by TIH Foundation for IoT and IoE at IIT Bombay** is a multi-parameter remote controlled energy autonomous smart Agri-station to record soil, weather and crop parameters.
- **Block chain-based Land Registry by IHUB NTIHAC Foundation at IIT Kanpur** enables Tamper-proof, Secure and Transparent Management of Land Records.

#### Science and Technology for the Progress of the Country

- ‘**Million Minds Augmenting National Aspirations and Knowledge**’ (MANAK) is an initiative of DST launched in 2018, which attracts young students to study science and pursue research.
- DST in collaboration with Vigyan Prasar, an autonomous institute of the DST, conceived the ‘**Augmenting Writing Skills for Articulating Research (AWSAR)**’ initiative in 2018.
- **AWSAR program aims** to encourage PhD and Post-Doctoral Fellows (PDFs) to communicate their research in a way that is engaging and easily understandable for non-scientific audiences.
- **Innovation in Science Pursuit for Inspired Research (INSPIRE)** is a flagship scheme of DST to attract talent to study science from an early age and build the required human resource pool for strengthening and expanding the R&D base in the country.
- **National Research Framework (NRF)** is one of the key recommendations of the **New Education Policy (NEP)-2020**.

- **Science and Engineering Research Board (SERB)** is a statutory body of DST (established in 2008) to promote basic research in Science and Engineering and to provide financial assistance to persons engaged in R&D.

### Ensuring Gender Equity in Science

- The ‘Research and Development Statistics of 2019-2020 of the Department of Science & Technology (DST)’ reports that **only 16.6% of researchers** who are directly involved in R&D activities are women.
- The **Women Scientists Programmes** of DST support an inclusive and diverse STEM (Science, Technology, Engineering, and Mathematics) landscape in India by encouraging women to seek advanced degrees and actively participate in research.
- The Programmes and Schemes are carried out under the umbrella programme Knowledge Involvement in Research Advancement through Nurturing (KIRAN). Major Programmes are:
  - ✓ **Women Scientist Scheme-A (WOS-A)** for pursuing Research in Basic/Applied Science.
  - ✓ **Women Scientist Scheme-B (WOS-B)** focuses on S&T interventions for Societal Benefit.
  - ✓ **Women Scientist Scheme-C (WOS-C)** provides an Internship in Intellectual Property Rights (IPRs) for Self-Employment.
- DST supports the **Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE)**.
- **Vigyan Jyoti**, a unique programme of DST was introduced in the year 2019-2020 at the school level to encourage rural girls to take up higher education and research in Science, **Technology, Engineering and Mathematics (STEM)**.

### Water Technology Initiative of DST

- **Water Technology Initiative (WTI)** of DST is in line with SDG 6 (Clean Water and Sanitation), which seeks to guarantee universal access to and sustainable management of water and sanitation.
- The program is also pertinent to the national ‘**Swachh Bharat**’, ‘**NamamiGange**’, and ‘**Jal Jeevan Mission**’ initiatives.
- Water Technology Initiatives started with an emphasis on the detection, monitoring, and mitigation of arsenic, iron, and fluoride.
- **The Mission on Desalination (NMD), 2017** by the DST at the behest of NITI Aayog, to ensure water security of the country and provide clean and safe drinking water to water scarce areas of the country.
- The Government of India, in partnership with States, is implementing **Jal Jeevan Mission-Har Ghar Jal Yojana (HHJY) since 2014** to provide safe drinking water by 2025.

### Combating Climate Change

- **Department of Science & Technology** has been implementing **two national missions** on Climate Change- **the National Mission for Sustaining the Himalayan Ecosystem (NMSHE)** and **National Mission on Strategic Knowledge for Climate Change (NMSKCC)**.
- **Ministry of Science and Technology** has been designated as nodal agency to implement the above two national missions to fight climate change.
- The **primary goal of NMSHE** is to develop the capacity to scientifically assess the Himalayan region’s vulnerability to climate change and to continuously assess the health of the Himalayan ecosystem.
- **NMSKCC focuses on** developing human and institutional S&T capacities in climate change and strategic knowledge in the key areas of climate change science, adaptation, and mitigation.

### Empowering Societies through S&T Interventions

- The **DST** through the Science for Equity Empowerment and Development (SEED) Division is providing grant-in-aid **support** to several **Knowledge Institutions (KIs)** and Science and Technology (S&T) based **Non-Governmental Organizations (NGOs)** for the holistic development of SC and ST communities.
- In order to improve the **quality of life for SC/ST communities** and integrate them into society, the SEED Division supported **500 S&T projects under the Tribal Sub-Plan (TSP)** and **Scheduled Caste Sub Plan (SCSP)** Schemes over the past two decades in various states.
- DST has established **75 Science Technology and Innovation (STI) hubs** across the country to foster scientific talent and improve the socio-economic status of the disadvantaged (SC/ST, Women etc.) sections.
- **S & T Application for Weaker Sections (STAWS)** initiative focuses on specialized S&T inputs for the advancement of rural craftsmen, landless laborers, and so on.
- The SEED division of the DST is implementing the ‘**Technology Interventions for Disabled and Elderly**’ (TIDE) program to promote applied research and development of assistive technologies for the empowerment of the country’s Elderly population and Divyangjan.
- **S&T for Women Scheme** aims to promote research, development and adaptation of technology to improve the quality of life, and working conditions for women, provide newer opportunities for gainful employment of women.
- **Strengthening, Up-scaling & Nurturing Local Innovations for Livelihood (SUNIL)** Programme aims to enhance the technology delivery system and developing social entrepreneurial models for the Economically Weaker Section (EWS) of society. ■■

# Current Affairs based Prelims 2024

## Model MCQs

**1. Consider the following statements with reference to the production and consumption of crude oil:**

1. India is the world's third-largest consumer of crude oil and depends on imports to meet over 85 percent of its requirement.
2. OPEC+ produces around 40 percent of the world's crude oil.
3. Saudi Arabia is the largest producer of the crude oil in the world.

**Which of the statement(s) given above is/are incorrect?**

- (a) Only 1
- (b) 2 and 3
- (c) Only 3
- (d) 1 and 3

**2. Consider the following statements about "Seethakali" folk art of South India:**

1. It is a modern folk art form that originated in Thiruvananthapuram.
2. It is performed as part of the harvest festival Onam.
3. This art form was first performed some 150 years back by the people of Vedar and Pulayar communities.

**Which of the statement(s) given above is/are correct?**

- (a) 1 and 3
- (b) Only 2
- (c) Only 3
- (d) 2 and 3

**3. Consider the following:**

1. Mainpuri Conspiracy of 1918
2. Kakori Train Action of 1925
3. Foundation of Hindustan Republican Association

**Which of the following freedom fighters mentioned below was associated with all the three above events?**

- (a) Surya Sen
- (b) Bhagat Singh
- (c) Ram Prasad Bismil
- (d) Lala Lajpat Rai

**4. The Amazon rainforest was in the news due to a powerful drought made worse by global warming and deforestation. Which of the following pairs is correct regarding the distribution of the amazon rainforest?**

- (a) Brazil (60%), Peru (13%), Colombia (10%)
- (b) Colombia (60%), Brazil (13%), Peru (10%)
- (c) Peru (60%), Colombia (13%), Brazil (10%)
- (d) None of the above

**5. Recently, the Union government has constituted a committee to explore the possibility of 'one nation one election'. The committee is headed by:**

- (a) Dr. Manmohan Singh
- (b) Ram Nath Kovind
- (c) Amitabh Kant
- (d) Veerappa Moily

**6. With reference to the LVM-3, consider the following statements:**

1. This launch vehicle can deploy GSAT series satellites in the 4-tonne class into Geosynchronous Transfer Orbits.
2. It operates as a two-stage rocket for its missions.
3. It relies exclusively on solid propellants for its propulsion.

**How many of the statements given above is/are correct?**

- (a) Only 1
- (b) Only 2
- (c) All 3(d)
- (d) None

**7. According to the Wildlife Trust of India, which amphibian genus is the most critically endangered in India?**

- (a) Dancing Frog
- (b) Fish Frog
- (c) Western Ghats Frog
- (d) Water Frog

**8. The "National Carbon Registry" has gained recent accreditation as a digital public good (DPG), enabling effective management of national data and processes for carbon credit trading. The registry was launched by:**

- (a) The Global Alliance on Health and Pollution
- (b) The Intergovernmental Panel on Climate Change
- (c) The United Nations Environment Programme
- (d) The United Nations Development Programme

**9. Scientists at IISER have pinpointed a Circular RNA virus known as?**

- (a) ciTRAN
- (b) iRNA
- (c) iDNA
- (d) ciTRON

10. Consider the following countries:

1. Israel
2. Saudi Arabia
3. United Arab Emirates
4. Bahrain

Which of the countries given above has/have signed the Abraham Accords?

- (a) 1 and 2
- (b) 2 and 3
- (c) 1, 2, and 3
- (d) 1, 2, 3 and 4

11. In which state can the Baiga tribal group, recently featured in the news, be found?

- (a) Bihar
- (b) Tamil Nadu
- (c) Chhattisgarh
- (d) Kerala

12. With reference to the India-UN Development Partnership Fund, consider the following statements:

1. Its establishment was driven by the goal of collaborating with other developing nations through South-South cooperation, offering assistance to projects aimed at advancing the realization of the Sustainable Development Goals (SDGs).
2. It upholds the values of South-South cooperation as its guiding principles.
3. The Fund backs projects that align with the objectives outlined in the 2030 Agenda.
4. The designated manager of the Fund is the United Nations Office for South-South Cooperation.

How many of the statements given above is/are correct?

- (a) 1 and 2
- (b) 2 and 3
- (c) 1, 2, and 3
- (d) 1, 2, 3, and 4

13. Which organisation launched the 'Sagar Maitri' initiative'?

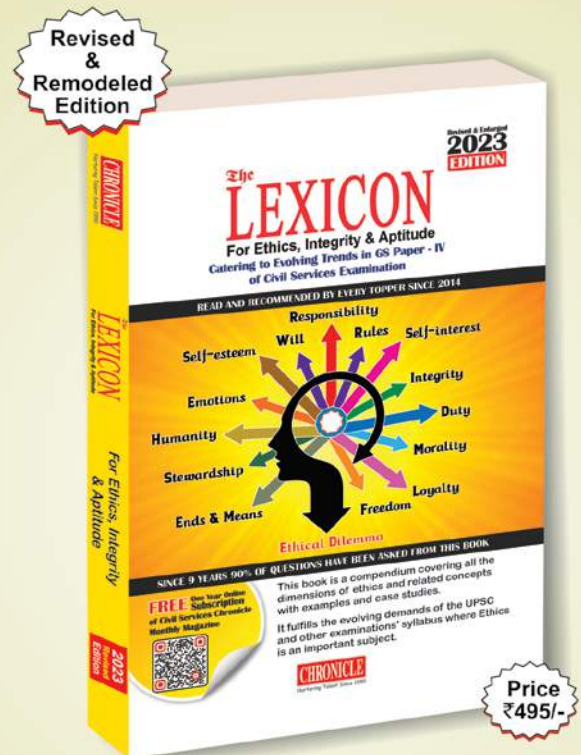
- (a) ISRO
- (b) DRDO
- (c) Indian Navy
- (d) Indian Coast Guard

### Answers

1. (c) 2. (d) 3. (c) 4. (a) 5. (b) 6. (a)
7. (a) 8. (d) 9. (a) 10. (c) 11. (c) 12. (d)
13. (b)

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# Parliament Q & A

## **Tribute to Sardar Vallabhbhai Patel**

- Lok Sabha Speaker Shri Om Birla paid tribute to Sardar Vallabhbhai Patel on his birth anniversary by placing flowers at his portrait in the new Parliament. The birth anniversary is celebrated on 31<sup>st</sup> October.
- Lok Sabha Speaker highlighted Sardar Patel's significant role in shaping modern India and credited him for his contributions to the robust Indian Constitution.
- Lok Sabha Speaker acknowledged Sardar Patel's instrumental role in unifying the diverse princely states into a single nation during India's independence, earning him the title of the "Architect of Modern India".
- The significance of Samvidhan Sadan's Central Hall in India's nation-building and transition to democracy from foreign subjugation was underlined by Shri Birla.

## **India's G20 Presidency**

- In line with India's G20 Presidency, the 9th P20 Summit's theme was 'Parliaments for One Earth, One Family, One Future'.
- The New Delhi P20 Summit witnessed record participation, represented by 37 Speakers/Chairpersons and Deputy Speakers/Deputy Chairpersons. The number of countries participated were 29.
- Pan-African Parliament participated in the P20 summit for the first time, representing the African Union as a member of the G20.
- Lok Sabha speaker informed that the P20 summit was inaugurated by Prime Minister Shri Narendra Modi on 13 October, 2023 at the state-of-the-art international conference centre YashoBhoomi.
- Last year, joint declaration of P20 could not be agreed upon in Indonesia.
- All the Presiding Officers welcomed the bill passed by the Indian Parliament, known as 'Nari Shakti Vandan Bill 2023'.
- Speaker informed that India has taken several initiatives to deal with the threat of climate change during the discussion on the concept of Lifestyle for Environment (LiFE).

## **Implementation of the National Education Policy 2020 in Higher Education**

- The parliamentary panel's recommendation for the year 2030 is that every district in India should have at least one Multidisciplinary Higher Education Institute (HEI).

- The Gross Enrolment Ratio in higher education, including vocational education, is targeted to be increased from 26.3% in 2018 to 50% by 2035.
- The panel urged the Union Government and State Governments to allocate suitable funds for the education of Socially and Economically Disadvantaged Groups (SEDGs).
- Recommendations included providing more financial assistance and scholarships to SEDGs in both Public and Private Higher Education Institutes.
- They also recommended enhancing the inclusivity of admission procedures and curricula, as well as boosting the Employability Prospects.
- The panel recommended the development of more degree courses taught in regional languages and bilingually.

## **"Indefinite Suspension" of MPs**

- Chief Justice of India commented on the "death of sense of humour in public life" while questioning the "indefinite suspension" slapped on Raghav Chadha.
- The MP was suspended on August 11, the last day of the Monsoon session for "gross violation of rule, misconduct, defiant attitude and contemptuous conduct".
- A suspended MP cannot attend the house proceedings or participate in the meeting of Parliamentary Standing Committees.

## **Lok Sabha Ethics Committee's Proceedings**

- If an MP takes money for putting questions up in Parliament, they will be guilty of breach of privilege and contempt of the House. Such complaints are invariably referred to the Committee of Privileges for investigation.
- The committee, after a proper investigation, submits its findings in a report along with the recommendation for action against the MP in question. If a case involving illegal gratification for conducting parliamentary work is proven, the MP may even be expelled from the House.
- In the first such case, in 1951, H.G. Mudgal, an MP, was found guilty of promoting the interests of a business association in return for financial benefits by putting questions up, and moving amendments to a Bill which affected the interests of that business association.
- The Ethics Committee of the Lok Sabha is a relatively new committee which was set up in 2000. ■■

# Fact Sheet

## Renewable Energy Sector in India

India stands 4th globally in Renewable Energy Installed Capacity (including Large Hydro), 4th in Wind Power capacity & 4th in Solar Power capacity (as per REN21 Renewables 2022 Global Status Report).

- It is the 3rd largest energy consuming country in the world.
- India has set a target to reduce the carbon intensity of the nation's economy by less than 45% by the end of the decade, achieve 50 percent cumulative electric power installed by 2030 from renewables, and achieve net-zero carbon emissions by 2070.
- India aims for 500 GW of renewable energy installed capacity by 2030.
- This is the world's largest expansion plan in renewable energy.
- As of July 2023, Renewable energy sources, including large hydropower, have a combined installed capacity of 179.322 GW.
- The following is the installed capacity for Renewables:
  - ✓ Wind Power: 42.8 GW
  - ✓ Solar Power: 67.07 GW
  - ✓ Biomass/Co-generation: 10.2 GW
  - ✓ Small Hydro Power: 4.94 GW
  - ✓ Waste To Energy: 0.55 GW
  - ✓ Large Hydro: 46.85 GW

### Non-fossil Fuel

- India's installed non-fossil fuel capacity has increased 396% in the last 8.5 years and stands at more than 179.322 Giga Watts (including large Hydro and nuclear), about 43% of the country's total capacity (as of July 2023).
- India saw the highest year-on-year growth in renewable energy additions of 9.83% in 2022.

### Solar energy

- The installed solar energy capacity has increased by 24.4 times in the last 9 years and stands at 67.07 GW as of July 2023.
- The installed Renewable energy capacity (including large hydro) has increased by around 128 % since 2014.

### Green Hydrogen

- India aims to produce five million tonnes of green hydrogen by 2030. This will be supported by 125 GW of renewable energy capacity.
- 57 solar parks with an aggregate capacity of 39.28 GW have been approved in India. Wind Energy has an off-shore target of 30 GW by 2030, with potential sites identified.

## India's Fisheries Sector

The fisheries sector plays a crucial role in ensuring nutritional security for the world's growing population.

- India is home to more than 10% of the world's fish and shellfish species, contributing to the sector's vitality.
- The fisheries sector is poised to contribute substantially to Agriculture Gross Value Added (GVA), with an expected 9% share by 2024-25.

### India's Standing and Achievements in the Fisheries Sector

- **1st Inland Capture Fish Production (2021-22):** India leads in inland capture fish production for the year 2021-22.
- **2nd Largest Aquaculture Producing Country:** India holds the second position globally in aquaculture production and contributes to 68% of the nation's total fish production.
- **3rd Largest Fish Producing Country:** India ranks third in terms of overall fish production worldwide, with India accounting for 8% of the global fish production.
- **4th Largest Fish Exporting Country:** India is the fourth largest fish-exporting country, with marine exports reaching USD 7.76 billion in the year 2021-22. This sector has maintained an impressive average annual growth rate of 14% from 2011 to 2021.
- **87.5% Annual Growth Rate of Fish Production (2011 to 2021):** The Indian fish production sector achieved substantial growth with an annual growth rate of 87.5% from 2011 to 2021.
- **22-Fold Increase in Fish Production Since 1950:** There has been an exceptional 22-fold increase in fish production in India since 1950, reflecting the industry's remarkable growth.
- **8% Average Annual Growth Rate of Fisheries Sector in India (2013-14 to 2021-22):** The fisheries sector in India has demonstrated steady progress with an average annual growth rate of 8% from 2013-14 to 2021-22.
- **6.72% Contribution of Fisheries Sector to Agriculture GVA:** The fisheries sector significantly contributes to India's Gross Value Added (GVA) in agriculture, accounting for 6.72%.
- **Inland and Aquaculture Growth:** The production from inland fisheries and aquaculture has doubled, progressing from 61.36 lakh tons in 2013-14 to 121.12 lakh tons in 2021-22.
- **Fish Per Capita Consumption:** India aims at increasing fish per capita consumption from 5 kg to 12 kg by FY 2024-2025. ■■

# PIB/AIR/PTI Info Bytes

- Which initiative has been recently launched by the Ministry of Education, Government of India?  
**-One Nation One Student ID Card**
- Where was a conference of the Association of Indian Economists and Allied Sciences held recently?  
**-Srinagar**
- How many votes approved the 'Gaza Resolution' in the recent United Nations General Assembly? **-121**
- How many cities were recently included in the Swadesh Darshan 2.0 scheme in India? **-30**
- Which international network did the Competition Commission of India recently become a member of?  
**- International Competition Network**
- Who was recently elected as the new Speaker of the US House of Representatives? **-Mike Johnson**
- Which country recently experienced the arrival of hurricane 'Otis'? **-Mexico**
- Where was the International Travel Exhibition Asia recently held? **-Singapore**
- In which country was the 'North East India' festival recently organized? **-Vietnam**
- Which Indian company is set to manufacture Apple's iPhone in the country? **-Tata**
- Who became the first Indian woman to participate in the British Endurance Championship recently?  
**-Humaira Mushtaq**
- Who won the gold medal at the World U-23 Wrestling Championships? **-Ritika Hooda**
- How many medals did India win in the recently concluded Asian Para Games? **-111**
- Who has recently been appointed as the new King of Malaysia? **-Sultan Ibrahim Iskander**
- In which country was the world's highest nuclear research reactor recently installed? **-Bolivia**
- Where was "Shri Anna Mahotsav" recently inaugurated? **-Lucknow**
- Which country's court has sentenced eight former Indian marines to death? **-Qatar**
- What amount of investment has the Central Government approved for the expansion of the Prime Minister's Crop Insurance Portal?  
**-30 thousand crore rupees**
- Which celebrity has been recently made the icon of Election Commission of India? **-Rajukumar Rao**
- Where did 'Aadi Mahotsav', an annual initiative of the Tribal Cooperative Marketing Development Federation Limited recently start? **-Ahmedabad**
- Where was the National Conference on Improved and Traditional Seed Production in Cooperative Sector held recently? **-New Delhi**
- In which country was the 'Future Investment Initiative' recently organized? **-Saudi Arabia**
- What partnership did India recently sign with Japan in the business and economics sector?  
**-Semiconductor supply chain**
- Where did the 37th National Games recently begin? **-Goa**
- Who has been appointed as the head coach of the Indian women's cricket team? **-Amol Majumdar**
- What is the focus of the National Hackathon 'Vimarsh-2023', recently being organized?  
**-5G in police**
- Which country is set to become the second largest economy in Asia by 2030? **-India**
- Where was the world's first liquid DAP plant recently inaugurated? **-Gujarat**
- Where will the e-prix formula be held in 2024?  
**-Hyderabad**
- Who recently became the first player in the world to score the fastest 2000 runs in ODIs? **-Shubman Gill**
- Who recently became the Director General of Military Hospital Service, making history as the first woman in the role? **-Sadhna Saxena**
- What award was recently received by Udhampur Military Station? **-'Best Green Military Station'**
- What did space startup company Skyroot recently introduce? **-Vikram-1 rocket**
- What was the name of the joint military exercise between the armies of India and Malaysia?  
**-'Harimau Shakti'**
- Which species was recently discovered in Himachal Pradesh? **-Paintbrush Swift butterfly**
- Where was Uttar Pradesh's first 'Mission Shakti Cafe', run by self-help group members, opened? **-Gonda**
- Who has been appointed as the Managing Director and CEO of Kotak Mahindra Bank recently? **-Ashok Vaswani**
- Where will the country's first Naval Bravery Museum be built? **-Lucknow ■■**