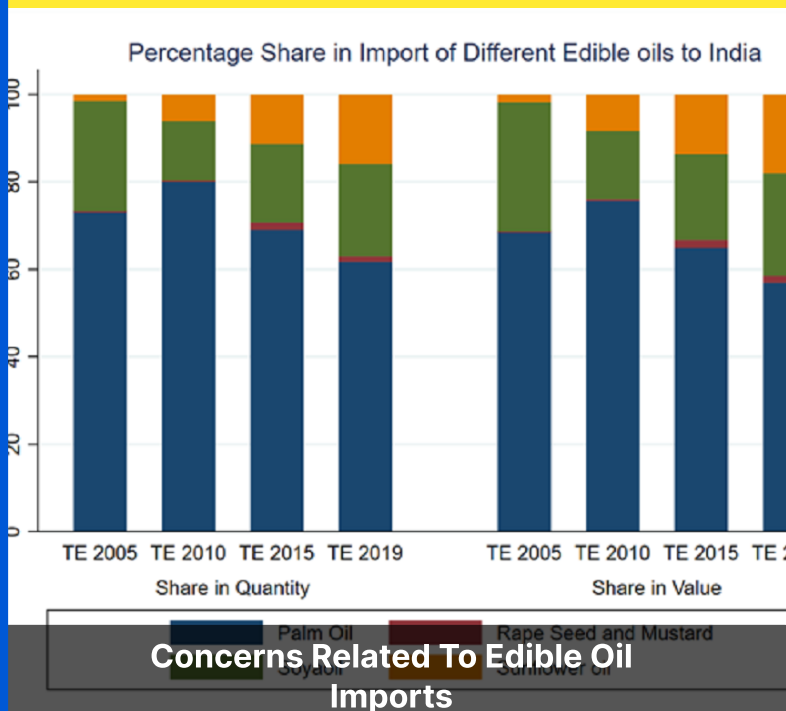


Monthly

prepp IAS

Current Affairs

November 2023



'White Hydrogen' Reserves



Tropical Crops At Risk From Pollinator Loss Due To Climate Change



Indo-Pacific Regional Dialogue

Contents

Constitution, Polity & Governance (GS Paper Prelims) & GS Paper II (Main)

Why Is Bihar Demanding The Special Category Status?	3
Why has the Government Issued a Directive on Deepfakes?	4
Selective Confidentiality in Electoral Bonds May Not Suffice: SC	6
MGNREGS Audit Crosses 50% Local Bodies In Just Six States	8
SC asks Govt to Set Up Fresh Delimitation Commission	10
Public Goods Vs Freebies.....	12
States in Court Against Their Governors.....	13
The Price Of Persistent Federal Frictions	15
Women in Red: On an Optimum Menstrual Hygiene Policy.....	17
Health Ministry releases draft National Pharmacy Commission Bill	19
Split Voting System in New Zealand.....	20

Environment (GS Paper Prelims) & GS Paper III

(Main)	22
Methane: More Potent, Less Persistent	22
What The OECD Report Says Of Climate Finance Ahead Of COP 28	25
Paddy Cultivation In Punjab To Be Phased Out	27
Curbs on Fireworks Binding on all States: SC Why has the Government Issued a Directive on Deepfakes?	29
Climate Solution For Climate Polycrisis	31
Adaptation Gap Report 2023 – Funding to Developing Nations Declines 15% Despite International Pledges, Rising Costs	33

Indian Society (GS Paper Prelims) & GS Paper

I(Main).....	35
Nagaland Nod for 33% Quota for Women in Urban Local Bodies	35

Economy (GS Paper Prelims) & GS Paper III

(Main).....	37
Improving India's Logistics Performance Index (LPI) Ranking	37
Concerns Related to Edible Oil Imports	39
CBAM Will Kill Manufacturing In EU; India To Levy Carbon Tax.....	42
Can Dollarization Save The Economy of Argentina?	43
NHAI Accepts First Insurance Surety Bond as Bid Security for NHAI TOT Bid for Monetization	45
Windfall Profit Tax On Crude Oil, Diesel Exports Cut	46

Agriculture(GS Paper Prelims) & GS Paper III

(Main)	48
Tropical Crops At Risk From Pollinator Loss Due To Climate Change, Shift In Land Use, Finds Study	48
Indian Farmers Taxed \$169 Bn via Export Bans or Restrictions in 2022: OECD Report.....	50
India Becomes Chair of International Sugar Organisation (ISO) for 2024 to Lead Global Sugar Sector.....	53
The Need to Transform Agri-Food System	54

Science & Technology (GS Paper Prelims) & GS

Paper III (Main).....	59
'White Hydrogen' Reserves.....	59
What is tantalum, the rare metal found in Sutej?	62
OneWeb 1st pvt Satcom Firm To Get Regulatory Nod	63

Cryogenic Upper Stage of LVM3 Makes a Re-entry	64	Silkyara-Barkot Tunnel	92
How Was The First Vaccine For Chikungunya Approved?.....	67	Tiau River	92
Trouble With India's Guidelines on Genetically Modified Insects	69	Agartala-Akhaura Rail Link	93
Scientists Fabricate 2D Protein Monolayer That Can Help to Study Diseases like Amyloidosis	72	World.....	93
Geography (GS Paper Prelims) & GS Paper I & III (Main)	74	Seattle	93
Cyclone Midhili	74	Shan State.....	93
Ken-Betwa River Linking	76	Nepal	94
International Relations (GS Paper Prelims) & GS Paper II (Main)	78	Lost City Hydrothermal Field.....	94
Indo-Pacific Regional Dialogue	78	Reykjanes peninsula.....	94
ASEAN India Grassroots Innovation Forum (AIGIF)	80	Rwanda.....	94
Proposed India-UK FTA, Its Politics, And Why The UK May Benefit More	82	Gulf of Guinea	94
Why Peace In West Asia Matters To India	84	Chahbahar	95
India, Bhutan To Discuss New Routes Of Regional Connectivity	86	Avdiivka.....	95
What Is The BDS Movement, Led By Palestinian Groups Against Israel?	88	Democratic Republic of Congo	95
Ethics GS Paper IV (Main)	89	Taiwan.....	95
Case Study: Upholding Ethical Governance in the Face of Bureaucratic Politicization	89	Dubai	96
Places In News	91		
India	91		
Kozhikode	91		
Gwalior	91		
Sutlej River	91		
Malerkotla	92		

Constitution, Polity & Governance (GS Paper Prelims) & GS Paper II (Main)

Why Is Bihar Demanding The Special Category Status?

Priority: High



Primary Source: The Hindu

Relevance: Devolution of powers and finances up to local levels and challenges therein, Mechanisms, laws, institutions, and Bodies constituted for the protection and betterment of these vulnerable sections, Bihar's Request For Special Category Status, its Benefits and Implications

Context

- Recently, the Cabinet of Bihar passed a resolution seeking **Special Category Status (SCS)** for Bihar which would help in the development of the socio-economically disadvantaged state.

What is Special Category Status?

- Special Category Status** is a **classification granted by the Centre to assist the development of States that face geographical or socio-economic disadvantages.**
- Introduced:** It was introduced in 1969 based on the recommendations of the **fifth Finance Commission in 1969.**
- SCS** differs from the **Special status of states** as it is related to economic and financial matters while the Special status is concerned with legislative and political rights.

How is it granted?

- The **Gadgil formula** has been used to determine Special Category Status.
- It has five parameters:
 - Hilly and difficult terrain**
 - Low population density and/or a sizeable share of tribal population**
 - Strategic location along international borders**
 - Economic and infrastructural backwardness**
 - Non-viable nature of state finances.**

Special Category Status States

- In 1969, **Jammu & Kashmir, Assam, and Nagaland** were awarded SCS.
- Later, **Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Tripura, Himachal Pradesh, and Uttarakhand** were made SCS states by the erstwhile National Development Council.

What are the benefits associated with the Special Category Status?

- Central assistance:** According to the **Gadgil-Mukherjee formula**, **roughly 30% of the total central assistance provided to the states having SCS states.**
- Following the abolition of the Planning Commission and the recommendations of the 14th and 15th Finance Commissions, the SCS assistance to the states has been subsumed within the devolution of a divisible pool of funds for all states.

- The divisible pool funds for all States have been increased from 32% to 41% in the 15th Finance Commission.**
- 30% of the Centre's Gross Budget is allocated to SCS states.
- Favorable funding for Central sponsored schemes:** The **SCS states are provided funding in the 90:10 ratio for Centrally Sponsored Schemes** instead of the 60:40 or 80:20 ratio for general category states.
- Other incentives:** The SCS states also gain incentives such as **concessions in customs and excise duties, income tax rates, and corporate tax rates.**
- This will help the SCS states to attract investments to boost their socio-economic development by establishing new industries.
- Moreover, unspent money in a particular financial year carries forward instead of lapsing.

Why is Bihar demanding the Special Category Status?

- Bihar is one of India's poorest states with a per-capita GDP of ₹54,000 with the 2022 Bihar-Caste-based Census revealing that around **one-third of the state's population** was in poverty.
- Various political parties of the State have made regular demands for Special Category Status for the state due to its socio-economic backwardness and poverty.
- The major factors behind the state's demands are:
 - The lack of natural resources and a continuous supply of water for irrigation**
 - Regular occurrence of floods** in the northern region
 - Severe droughts** in the southern part of the State
 - The loss of industries** to Jharkhand following the bifurcation of the state in 2000 and the subsequent **decline in employment and investment.**
- Moreover, Bihar is home to around 94 lakh poor families.
- According to the state government, SCS status for Bihar will gain the state around ₹2.5 lakh crores over the next five years, enabling it to fund various welfare measures for its citizens.

Is Bihar's demand justified?

- Bihar has been denied the SCS primarily because it does not meet the hilly terrain and geographically difficult areas requirement.**
- This is considered to be the primary reason for the states facing difficulty in achieving infrastructural development.
- Alternative method:** In 2013, the **Raghuram Rajan Committee** established by the Union government had ranked Bihar in the **least developed category.**
- It recommended a **multi-dimensional index model** for the devolution of funds in place of the SCS model to address the backwardness of the state.
- In the proposed system, each state would get a fixed basic allocation of 0.3% of overall funds, to which its share stemming from need and performance would be added

Raghuram Rajan Committee

- The Committee was set up by the Union Government to suggest methods for identifying **backwardness of States** using a variety of criteria and recommend how the criteria may be reflected in future planning and devolution of funds from the Centre to the States.
- It developed a "**multi dimensional index**" of backwardness based on **per capita consumption** as measured by the NSSO, the poverty ratio, and a number of other measures based on a multi-dimensional definition of poverty outlined in the 12th Five-Year Plan.

Classification of states:

- Least developed:** States that score 0.6 and above on the Index
- Less developed:** States that score below 0.6 and above 0.4 m
- Relatively developed:** States that score below 0.4
- The Committee had identified the "**least developed**" States as Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Meghalaya, Odisha, Rajasthan and Uttar Pradesh, the finance minister said.
- According to the Committee, these two recommendations, along with the allocation methodology, would **subsume** the "Special Category".

Why has the Union government denied all SCS requests?

- 14th FC report:** The 14th Finance Commission did away with the special category status for states excluding the Northeastern and three hill states.
- It instead recommended an **increase in tax devolution from 32% to 42%.**
- Burden on Centre:** Approval of requests by states for SCS will lead to a **heavy burden on the finances of the Central government.**
- The contribution of the Union to development schemes will increase and tax returns will decrease.
- Increasing demands:** Experts have warned that approval of one state's SCS request would lead to a **rise in requests by other states.**
- For example, the granting of SCS to Telangana in 2014 as a newly created state led to demands from Andhra Pradesh for SCS status as well.

Which other states have demanded Special Category Status?

- Andhra Pradesh:** Andhra Pradesh has been demanding SCS status since the bifurcation of the state into Andhra Pradesh and Telangana in 2014.
- The major grounds for the demand are the loss of revenue of the state due to Hyderabad going to Telangana.
- Odisha:** Odisha has also requested the SCS due to its vulnerability to natural disasters such as cyclones and

the large tribal population which accounts for 22% of the state's population.

- Status of the demands:** The 14th Finance Commission report had recommended that no states be accorded the SCS, based on which the Union government has denied the demands of the states.

Conclusion

- Bihar's call for Special Category Status reflects genuine concerns of socio-economic challenges.
- However, the Union government's denial, consistent with the 14th Finance Commission, underscores the shift away from this classification, emphasizing increased tax devolution for equitable development.

UPSC Mains Practice Questions

Q.1) How is the Finance Commission of India constituted? What do you think about the terms of reference of the recently constituted Finance Commission? Discuss. (UPSC GS2 2018)

Q.2) How have the recommendations of the 14th Finance Commission of India enabled the states to improve their fiscal position? (UPSC GS2 2021)

MCQs

Question: Consider the following:

- Demographic performance
- Forest and ecology
- Governance reforms
- Stable government
- Tax and fiscal efforts

For the horizontal tax devolution, the Fifteenth Finance Commission used how many of the above as criteria other than population area and income distance? (UPSC CSE 2023)

- Only two
- Only three
- Only four
- All five

Answer: (b)

Why has the Government Issued a Directive on Deepfakes?

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Science & Technology, Cybersecurity, Government policies and interventions for development in various sectors and issues arising out of their design and implementation, Deepfakes and Indian and Global Regulations Concerning Them

Context

- Recently, the Government of India has mandated "social media intermediaries" to remove deep fake within 24 hours following a complaint, aligning with the IT Rules 2021.

- This action follows after deep fake videos of actors Rashmika Mandanna and Katrina Kaif emerged online.

What are Deepfakes?

- Deepfakes are highly realistic and often convincing digital forgeries of videos, images, or audio recordings.
- They are generated using artificial intelligence (AI) and machine learning techniques, particularly deep learning, from which the term "deepfake" is derived.
- Deepfakes are made using algorithms called **generative adversarial networks (GANs)**, among other techniques.
- **GAN** consists of two parts: **the generator**, which creates images or videos, **and the discriminator**, which evaluates their authenticity. They work in tandem to improve the quality of the forgeries.
- With deepfake technology, creators can make people appear to say or do things they never did.
- This includes facial expressions, lip movements, voice, and even body language if full-body deepfakes are made.
- A 230% increase in deepfake usage by cybercriminals is noted. Experts predict deepfakes might soon eclipse phishing.

What is the Technology Behind Deepfakes?

- The technology behind deepfakes primarily involves a form of artificial intelligence known as deep learning.
- This is further elaborated using a specific machine learning technique called a **Generative Adversarial Network (GAN)**.
- Deepfake technology uses GANs, which consist of two parts – a generator and a discriminator. These two parts work in tandem to create and refine deepfakes.
- The **generator** creates images or videos that are intended to be indistinguishable from authentic ones.
- The **discriminator** assesses these creations for authenticity, identifying signs of forgery.
- The AI-driven software learns the subjects' movements and facial expressions from source material (such as photos or videos of the person to be deepfaked).
- It then replicates these features in another video or image, creating the deepfake.
- To make the deepfake as realistic as possible, a large database of source images is typically used, especially for public figures, celebrities, and politicians, due to the abundance of available images.
- The fake video or image is continuously refined until the discriminator part of the GAN can no longer detect any signs of forgery.

Laws Against Deepfakes in India

India does not have any specific laws that exclusively address deepfakes. However, various provisions of

existing laws can be applied to tackle issues arising from deepfakes.

- **Section 66E of the IT Act of 2000:** This section applies in cases of deepfake offenses that entail recording, publishing, or sending a person's photographs in mass media, infringing on their privacy.
- Offenders face up to three years in prison or a fine of up to two lakh rupees.
- **Section 66D of the IT Act of 2000:** It allows for the prosecution of those who utilize communication devices or computer resources with the criminal goal of cheating or impersonating someone.
- It is punishable by up to three years in prison and/or a fine of up to one lakh rupees.
- **Copyright Protection:** The Indian Copyright Act of 1957 protects works such as films, music, and other creative content.
- Copyright holders can sue persons who construct deepfakes utilizing copyrighted works without permission.
- Penalties for copyright infringement are set out in Section 51 of the Copyright Act.
- **Government Advisory:** On January 9, 2023, the Ministry of Information and Broadcasting issued a warning to media outlets to be cautious when airing content that could be modified or tampered with.
- The Ministry also suggested that manipulated content be labeled as "manipulated" or "modified" to alert viewers that the content has been altered.

Global Initiatives to Combat Deepfakes

- **European Union:** To combat the spread of disinformation by deepfakes, the European Union amended its Code of Practice on Disinformation in 2022.
- **United States:** The bipartisan Deepfake Task Force Act was introduced in the United States to aid the Department of Homeland Security (DHS) in combating deepfake technology.
- **China:** It will implement comprehensive deep synthesis regulations beginning in January 2023. The law, which aims to reduce deception, mandates unambiguous labeling and traceability of deep synthesis content. Individual consent is required, as is obedience to laws and public morals. Service providers must put in place review systems and work with authorities.

Positive and Negative Aspects of Deepfakes

Positives

- **Assistance for ALS Patients:** Deepfakes have been used positively in cases like the collaboration between the ALS Association and a company to help people with ALS digitally recreate their voices.

Negatives

- **Increase in Criminal Usage:** There has been a 230% rise in the use of deepfakes by cybercriminals and scammers.

- The technology, which is becoming increasingly accessible, allows for the creation of convincing fake content that can be used for malicious purposes.
- **Potential Replacement of Phishing:** Cybersecurity experts predict that deepfake technology could soon replace phishing as a primary method of online fraud and deception.
- **Impersonation and Misinformation:** Deepfakes pose a significant threat in terms of impersonation, potentially leading to political instability, sabotaging elections, unsettling diplomatic relations, and spreading misinformation.
- **Difficulty in Detection:** The technology, particularly through the use of Generative Adversarial Networks (GANs), has evolved to a point where it becomes increasingly difficult for software to detect these fakes.
- **Misuse Against Individuals and Organizations:** There is a risk of deepfakes being used to humiliate or blackmail individuals, as well as attacking organizations by presenting false evidence.

Conclusion

Deepfakes represent a significant technological advancement with potential for both harm and good. The response by the Indian government, alongside international efforts, highlights the need for vigilance and regulation in the age of synthetic media.

UPSC Previous Year Practice Question

Q. Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare? **(2023)**

Q. What are the different elements of cyber security? Keeping in view the challenges in cyber security, examine the extent to which India has successfully developed a comprehensive National Cyber Security Strategy. **(2022)**

Q. Discuss different types of cyber crimes and measures required to be taken to fight the menace. **(2020)**

Q. Data security has assumed significant importance in the digitized world due to rising cyber crimes. The Justice B. N. Srikrishna Committee Report addresses issues related to data security. What, in your view, are the strengths and weakness of the Report relating to protection of personal data in cyber space? **(2018)**

MCQs

Q. With the present state of development, Artificial Intelligence can effectively do which of the following? (UPSC 2020)

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-speech conversion
5. Wireless transmission of electrical energy

Select the correct answer using the code given below:

- (a) 1, 2, 3 and 5 only
- (b) 1, 3, and 4 only
- (c) 2, 4, and 5 only
- (d) 1, 2, 3, 4 and 5

Answer: (b)

Q. In India, it is legally mandatory for which of the following to report on cyber security incidents? (UPSC 2017)

1. Service providers
2. Data centers
3. Body corporate

Select the correct answer using the codes given below:

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

Answer: (d)

Selective Confidentiality in Electoral Bonds May Not Suffice: SC

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Transparency and Accountability, Governance, Electoral Bonds and its Challenges

Context

- Recently, **the Supreme Court** has criticized the **electoral bonds scheme** for providing only "**selective confidentiality**."
- Concerns were raised about the potential for the ruling party to **discover donors to opposition parties**, putting them at risk of being targeted by state investigative agencies.

What are Electoral Bonds?

- Electoral bonds are **financial instruments** introduced by the Government of India with the intent of making political donations more transparent and to ensure the flow of clean money to political parties.
- An electoral bond is like a **promissory note** that can be bought by any **Indian citizen or company** incorporated in India from specified branches of the State Bank of India.
- The citizen or corporate entity can then donate the same to any eligible political party of their choice.
- One of the main features of electoral bonds is that they are meant **to protect the donor's identity**, making the donations anonymous.
 - This is to prevent any potential backlash or undue influence over the donor by other political entities or individuals.
- Electoral bonds can only be encashed by an eligible political party through a designated bank account with the authorized bank.

- Only political parties registered under **Section 29A of the Representation of the People Act, 1951**, and which secured not less than **1% of the votes** polled in the last general election to the House of the People or the Legislative Assembly, are eligible to receive donations through electoral bonds.
- Donations made through electoral bonds are **exempt from tax**, provided the political parties are compliant with the set norms.
- These bonds are valid for a short period from the date of issue.
 - A political party must encash the bonds within this period, failing which the donation is transferred to the **Prime Minister's Relief Fund**.

Supreme Court's Observations

- The electoral bond scheme offers "**selective confidentiality**" which does not protect the identities of donors to opposition parties from the ruling party.
- The ruling party could potentially have ways to uncover the identities of the opposition's donors, putting them at a **disadvantage**.
- There is a concern that the ruling party might not face the same scrutiny regarding its own donors, leading to an **uneven playing field** between the ruling and opposition parties.
- The Court was not convinced that the State Bank of India, or any bank, had a **statutory obligation** to maintain donor confidentiality, questioning the presumption that banks will keep this information confidential by default.
- The Chief Justice of India expressed that the problem with the scheme is its **opacity and the lack of a level playing field** for political parties.

What is the Government's Defense?

- The confidentiality of the donors' identities is a **key element** of the electoral bonds scheme, which is intended to protect donors from potential reprisals.
- Maintaining donor anonymity is essential to prevent political contributions from reverting to the earlier practices where black money featured prominently.
- Prior to the introduction of electoral bonds, contributors were converting legitimate funds into black money to keep political donations anonymous and avoid retribution from rival parties.
- The Government implied that the scheme was designed to clean up the process of political donations, by reducing the flow of **unaccounted cash** into the political system.
- The scheme was portrayed as a step towards **transparency and accountability**, albeit with the emphasis on protecting donor identities to encourage legitimate funding.

What are Concerns Regarding Transparency?

- **Lack of Transparency for Opposition:** The scheme allows the ruling party to potentially access information about the **donors to the opposition** while

keeping their own donors concealed, which could discourage fair political competition.

- **Uneven Playing Field:** The selective confidentiality might give the ruling party an **unfair advantage** by having knowledge of the opposition's funding sources without the opposition having reciprocal information.
- **Statutory Obligations:** Chief Justice of India raised questions about the obligations of the State Bank of India, questioning whether there is a **statutory duty** to ensure the confidentiality of donor identities, which is presumed to be guaranteed by the bank's role as a trustee.
- **Scheme's Opacity:** The scheme was criticized for being **opaque**, suggesting that it hides the flow of money in politics rather than making it more transparent.

Way Forward

Enhancing Transparency

- Establish a statutory framework that mandates transparency and confidentiality in political donations.
- Create or amend laws to require political parties and donors to disclose contributions over a certain threshold.
- Strengthen auditing requirements for political parties and implement robust reporting mechanisms.

Balancing Confidentiality with Accountability

- Design mechanisms that protect donor identities from public disclosure while making them available to an independent regulatory body.
- Set limits on the amount that can be donated anonymously to prevent undue influence by a single or a group of donors.

Strengthening Democratic Institutions

- Establish or empower an independent electoral commission to oversee the electoral bond transactions and ensure adherence to legal requirements.
- Engage in a broader reform of political finance to address not just electoral bonds but also other forms of political contributions.

Judicial Review and Legislative Action

- Continue judicial scrutiny of the electoral bonds scheme to ensure it aligns with constitutional principles and democratic fairness.
- Encourage legislative debate and expert consultations to rethink and redesign the scheme in light of the criticisms.

Public Engagement

- Promote civic education campaigns to inform the public about the importance of transparency in political funding.
- Involve civil society, legal experts, and other stakeholders in discussions about improving the electoral financing system.

Conclusion

- The Supreme Court pointed out the lack of transparency and fairness in the electoral bonds scheme, suggesting it provides the ruling party with an unfair advantage over the opposition.
- The Court suggested the need for a more transparent and accountable system that does not suffer from opacity and offers a level playing field for all political parties.

UPSC Previous Year Practice Question

Q. Discuss the procedures to decide the disputes arising out of the election of a Member of the Parliament or State Legislature under The Representation of the People Act, 1951. What are the grounds on which the election of any returned candidate may be declared void? What remedy is available to the aggrieved party against the decision? Refer to the case laws. **(2022)**

Q. Discuss the role of the Election Commission of India in the light of the evolution of the Model Code of Conduct. **(2022)**

Q. To enhance the quality of democracy in India the Election Commission of India has proposed electoral reforms in 2016. What are the suggested reforms and how far are they significant to make democracy successful? **(2017)**

MCQs

Q. Consider the following statements: (UPSC 2017)

- The Election Commission of India is a five-member body.
- Union Ministry of Home Affairs decides the election schedule for the conduct of both general elections and by-elections.
- Election Commission resolves the disputes relating to splits/mergers of recognized political parties.

Which of the statements given above is/are correct?

- 1 and 2 only
- 2 only
- 2 and 3 only
- 3 only

Answer: (d)

Q. Consider the following statements: (UPSC 2020)

- According to the Constitution of India, a person who is eligible to vote can be made a minister in a state for six months even if he/she is not a member of that state.
- According to the Representation of People Act, 1951, a person convicted of a criminal offence and sentenced to imprisonment for five years is permanently disqualified from contesting an election even after his release from prison.

Which of the statements given above is/are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Answer: (d)

Q. Which one of the following Schedules of the Constitution of India contains provisions regarding anti-defection? (UPSC 2014)

- Second Schedule
- Fifth Schedule
- Eighth Schedule
- Tenth Schedule

Answer: (d)

MGNREGS Audit Crosses 50% Local Bodies In Just Six States

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Government policies and interventions for development in various sectors and issues arising out of their design and implementation, Issues Related to the Social Audit of the MGNREGS

Context

- Recently, the **Management Information System (MIS) on Social Audit** maintained by the **Union Ministry of Rural Development (MoRD)** revealed that only six of the 34 states and UTs have completed social audit of works done under the MGNREGS in more than 50% of gram panchayats.



Social Audits of the MGNREGS scheme in India

- Ministry Involved:** **Social Audit** maintained by the **Union Ministry of Rural Development (MoRD)**, the ministry in charge of the **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)**,

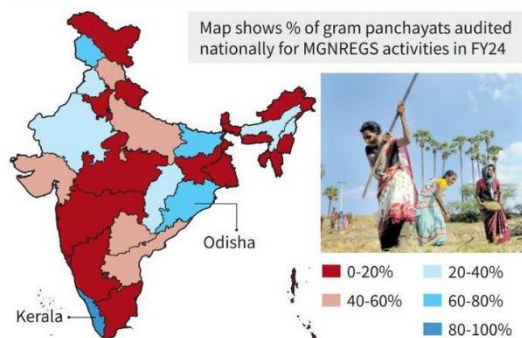
What is the status of social audits of the MGNREGS scheme in India?

- Number of States:** Only **six of the 34 States** and union territories in the country have completed the social audit of works completed under the MGNREGS in more than **50% of gram panchayats**.
- Kerala is the only State in the country to cover 100% of its gram panchayats.**
- The other states that have completed social audits in more than 50% of Gram Panchayats are:
 - Bihar (64.4%)**
 - Gujarat (58.8%)**
 - Jammu and Kashmir (64.1%)**
 - Odisha (60.42%)**
 - Uttar Pradesh (54.97%)**

- **Telangana (40.5%), Himachal Pradesh (45.32%), and Andhra Pradesh (49.7%)** have completed social audits in nearly half of the gram panchayats.
- However, the completion of social audits was very low in **Madhya Pradesh (1.73%), Mizoram (17.5%) Chhattisgarh (25.06%), and Rajasthan (34.74%)**.

Audited panchayats

Kerala is the only State that has completed social audits of all activities done under MGNREGS in each of its Gram Sabhas



What are Social Audits?

- A social audit is an **evaluation of a scheme** that is carried out on a **joint basis by the government and the public**, with an emphasis on people who will be affected by or benefit from the policy.
- It focuses on the social consequences of the scheme or policy.
- It helps **measure, assess, and improve** the performance of the scheme or policy.
- It also encourages effective leadership and strengthens supervision and accountability through evaluation and assessment.

Social Audits in the MGNREGS

- **Section 17:** According to **Section 17 of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)**, the execution of works under the scheme should be monitored by the gram sabha.
- Social audit units that must work independently of the authorities implementing the scheme are set up in each state.
- The **social audit unit is responsible for flagging cases of malpractice but the State government is responsible for recovering the money and reprimanding the officials responsible**.
- In December 2016, the **Comptroller and Auditor General of India** laid down the auditing standards for the MGNREGS scheme.
- **As per these standards, each Social Audit Unit is entitled to funds equivalent to 0.5% of the MGNREGA expenditure incurred by the State in the previous year.**
- Social audits of work done under the scheme involve
 - Quality checks of infrastructure created under the MGNREGA
 - Assessment of financial misappropriation in wages
 - Examination for any procedural deviations.

Why are social audits necessary?

- **Corruption:** The high rate of corruption has been one of the primary complaints against the scheme since its inception in 2005.
 - Examples of corruption in the scheme include the siphoning of funds by officials, the issuance of fake job cards, ghost workers, etc.
 - Corruption leads to a reduction in the overall budget of the country's development programs which has a negative impact on the country's overall growth and development.
 - Moreover, the rampant corruption in the scheme leads to a loss of public trust in the government and its programmes.
 - In order to counter this, the **MGNREGA Act has included social audit as an inbuilt anti-corruption mechanism**.
- **Transparency:** The lack of transparency and accountability in the program has only made things worse.
 - As a result of the misuse of the funds, intended beneficiaries have not been able to access deserved benefits leading to poor quality of work, delays in project completion, etc.
- **Implementation:** Improper implementation of projects has resulted in the loss of employment opportunities and adverse effects on the environment and rural infrastructure.

Why have the social audits not been completed efficiently?

- **Lack of Fund:** According to the states, the **major reason for the incomplete social audits was the lack of funds from the Union to the social audit units in the states**.
- **Delay in disbursal:** The delay in disbursal of funds to the units has led to delays in paying the salaries of the village-level auditors.
- **Misappropriation of Fund:** According to the **Union Ministry of Rural Development, less than 14% of the amount flagged by auditors to recover embezzled funds has been recovered so far in the present FY**.
 - In the ongoing financial year, misappropriation of ₹27.5 crore has been identified by the social audit units.
 - However, only 13.8% of the total embezzled funds have been recovered so far.

Kerala's performance

- According to the state government, **Kerala was the only state to hold periodic Social Audit Public Hearings also known as Janakeeya Sabhas at the panchayat level**.
- **The Janakeeya Sabhas are held so that public scrutiny of the audit reports can be conducted.**
- **In other states public scrutiny is done only at the block level.**
- Kerala has taken numerous measures to make its social auditing mechanism robust such as

encouraging the participation of the public in public hearings.

- A total of 15,962 grama sabhas and 941 Janakeeya Sabhas were organized for the social audit.
- There are 27 lakh people who depend on the scheme in the state.
- The government also plans to hold social audits twice a year with the efficiency of the scheme improved through a transparent process.
- According to the government, digital literacy has played a major role in ensuring the citizens of the state have access to the benefits of developmental activities.
- The state has claimed that the MGNREGS scheme has not been affected despite the drop in central allocation for the scheme.
- The number of working days under the scheme has increased in the state while it has dropped in other states across the country.

MGNREGS

- The **Mahatma Gandhi National Rural Employment Guarantee Act**, previously known as the **National Rural Employment Guarantee Act** was introduced on 7th September **2005**.
- It was aimed at **generating employment and social security for the rural population** in the country.
- As of 2022-23, there are 15.4 crore active workers under the MGNREGA.
- **Objectives:**
 - Provide **100 days of guaranteed wage employment** to rural unskilled labor
 - Ensure economic security for rural poor
 - Decrease rural-to-urban migration of labor
 - Strengthen the Panchayati Raj across India.

Features:

- **Legal Right to Work:** It grants adult members of rural households a legal entitlement to employment and ensures inclusivity.
- **Wages:** In the absence of a centrally notified pay rate, wages align with those stipulated for agricultural laborers under the **Minimum Wages Act of 1948**, not falling below Rs 60 per day.
- **Decentralized nature:** Gram Sabhas play a pivotal role in recommending and executing at least 50% of projects under the scheme.
- **Transparency and Accountability:** Proactive disclosure mechanisms such as wall writings, citizen information boards, management information systems, and social audits have been included to monitor program implementation.
- **Funding:** Financial responsibility is shared between the central government and states.
 - The central government covers 100% of unskilled labor costs, 75% of semi-skilled and skilled labor

costs, 75% of supplies costs, and 6% of administrative expenses.

- **Time-Bound Guarantee of Work:** A time-bound commitment ensures employment within 15 days of demand.
 - In case this commitment is not met, an 'unemployment allowance' will be provided to the beneficiaries.
- **Worksite Facilities:** All worksites must provide essential facilities like crèches, drinking water, and first aid, ensuring the well-being of workers.

To learn more, click the [link](#).

Conclusion

- The MGNREGS social audit status highlights the need for effective implementation and financial support to combat corruption in the scheme. Timely funds and public participation are crucial for ensuring transparency, accountability, and the successful execution of developmental schemes nationwide.

UPSC Mains Practice Questions

Q.1) "Effectiveness of the government system at various levels and people's participation in the governance system are interdependent" Discuss their relationship in the context of India. **(UPSC GS2 2016)**

Q.2) Assess the importance of the Panchayat system in India as a part of local government. Apart from government grants, what sources the Panchayats can look out for financing developmental projects? **(UPSC GS2 2018)**

Q.3) 'Despite the implementation of various programmes for eradication of poverty by the government in India, poverty is still existing'. Explain by giving reasons. **(UPSC GS2 2018)**

MCQs

Question: Among the following who are eligible to benefit from the "Mahatma Gandhi National Rural Employment Guarantee Act"? (UPSC CSE 2011)

- Adult members of only the scheduled caste and scheduled tribe households
- Adult members of below poverty line (BPL) households
- Adult members of households of all backward communities
- Adult members of any household

Answer: (d)

SC asks Govt to Set Up Fresh Delimitation Commission

Priority: Medium



Primary Source: The Indian Express

Syllabus Relevance & Important Keywords: Indian

Constitution; Appointment to various Constitutional posts,

powers, functions and responsibilities of various Constitutional Bodies. Statutory, regulatory and various quasi-judicial bodies, Delimitation Act of 2002

Context

- The Supreme Court of India has directed the central government to establish a new **delimitation commission** to ensure proportional representation for **Scheduled Castes and Scheduled Tribes** in the legislative assemblies, specifically addressing the needs of the **Limbu and Tamang communities** in Sikkim and West Bengal.

Contextual Background

- The court's direction to establish a new delimitation commission was prompted by a plea that the exclusion of **SCs and STs** from adequate representation in legislative bodies would encroach on a legislative domain reserved for them in State Assemblies.
- This plea particularly pertained to the **Limbu and Tamang tribal communities** in the Assemblies of Sikkim and West Bengal.
- Advocate Prashant Bhushan, representing the NGO Public Interest Committee for Scheduling Special Areas (PICSSA), had argued that the increase in the ST population in Sikkim and West Bengal had not been matched by an increase in their representation in the state assemblies, which he claimed **violated their constitutional rights**.

What is the Supreme Court's Directive?

- The Supreme Court's directive is for the Centre to establish a fresh **delimitation commission**.
- The purpose of this commission is to ensure proportional representation for communities designated as Scheduled Castes (SCs) and Scheduled Tribes (STs).
- The directive comes in response to concerns that the current delimitation process **does not adequately represent** these communities and fails to reflect their growing populations, particularly in the **assemblies of Sikkim and West Bengal**.
- The Court noted that the exclusion of these communities from proportional representation could be seen as entering into a legislative domain that lacks the reservation, which the Court cannot direct.
- The Court emphasized the necessity for the Centre to exercise its powers under the **Delimitation Act, 2002**, to readjust the allocation of seats in state assemblies and ensure compliance with **Articles 332** of the Constitution.
- This action is deemed essential to address the proportional representation of Scheduled Tribes, especially in light of the reported increase in their population in the states of Sikkim and West Bengal.

Important Constitutional Provisions

- Article 332:** It deals with the reservation of seats for **Scheduled Castes and Scheduled Tribes** in the Legislative Assemblies of the States. It specifies the manner of such reservation and aims to provide adequate representation to these communities in state governance.

What is the Delimitation Commission?

- A Delimitation Commission in India is a high-power panel or a committee formed by the Government of India with the purpose of **redrawing the boundaries** of the various **Assemblies and Lok Sabha** constituencies based on a recent census.
- Under **Article 82** of the Constitution, the Parliament passes a **Delimitation Act**, and the President of India appoints an independent high-powered panel known as the Delimitation Commission to carry out the task.

Constitutional Provisions	Article 82 states that after each Census, the Parliament passes a Delimitation Act. Article 170 states that after each census, states are divided into territorial constituencies based on the Delimitation Act.
Appointment	The President of India appoints the Delimitation Commission, which collaborates with the Election Commission of India.
Composition	Retired Supreme Court judge, Chief Election Commissioner and Respective State Election Commissioners.
Additional members	To assist the Delimitation Commission in its work, representatives of the parliaments and legislative assemblies of the states for which it was established are proposed as associate members.

- In India, such Delimitation Commissions were established **four times**:
 - in 1952 under the Delimitation Commission Act of 1952;
 - in 1963 under the Delimitation Commission Act of 1962;
 - in 1973 under the Delimitation Act of 1972;
 - in 2002 under the **Delimitation Act of 2002**.

Delimitation Act of 2002

- The **Delimitation Act of 2002** is a law enacted by the Parliament of India to provide for the delimitation of constituencies for the purpose of elections to the **Lok Sabha and to the State Legislative Assemblies**.

- The act establishes a Delimitation Commission, which is tasked with **redrawing the boundaries** of various constituencies based on the latest census and ensuring that the number of seats allocated to each state in the Lok Sabha and the total number of seats in a Legislative Assembly **remain the same**.
- The Commission must use the latest available Census figures as the basis for their work. However, the Delimitation Act of 2002 specifically stated that the **2001 Census** figures would be used for redrawing of boundaries.
- The Delimitation Act of 2002 was enacted after the **84th Amendment to the Constitution of India in 2001**, which froze the allocation of seats for each state in the Lok Sabha and the total number of seats in the legislative assemblies based on the **1971 Census** until the first Census after the **year 2026**.

Conclusion

- The Supreme Court clarified that its decision should not impact the scheduling of elections for Parliament or state Assemblies, which must proceed on time.
- The court's decision underscores the importance of proportional representation and adhering to constitutional mandates for the representation of marginalized communities in legislative bodies.

MCQs

Q. With reference to the Delimitation Commission consider the following statements: (UPSC 2012)

1. The orders of the Delimitation Commission cannot be challenged in a Court of Law.
 2. When the orders of the Delimitation Commission are laid before the Lok Sabha or State Legislative Assembly, they cannot effect any modification in the orders.
- Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (c)

Public Goods Vs Freebies

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Important aspects of governance, transparency and accountability, Salient features of the Representation of People's Act, Representation Of People Act 1951, Model Code of Conduct, Impact of Freebies in Elections in India and Associated Concerns

Context

- The issue of Freebies is very much in the news as elections for five states are in the process and the General election of 2024 is about to happen in the next few months.

What are freebies:

- According to the Reserve Bank of India (RBI) '**freebies**' is a form of public welfare programme that is offered without any cost.
- **Election Freebies** are the offerings/distribution of irrational freebies from political parties as part of electoral promises. E.g., Free electricity, Free Water, Free Rides, Loan Waivers, Allowances, laptops etc.

Difference between freebies/non merit goods and Public Goods/Merit Goods:

- According to the Reserve Bank of India (RBI) freebies can be differentiated from **public or merit goods**, such as education and healthcare, as well as other state expenditures that yield broader and enduring advantages.
- **Merit goods**, such as free or subsidised food, education, shelter, and healthcare contribute in expediting human development and subsequently fostering national economic progress.
- **Freebies** do not necessarily bring tangible social benefit. eg. free distribution of electricity, loan waivers to farmers, free pilgrimages etc.

Arguments in favour of Freebies

- **Social Welfare:** Freebies, often in the form of subsidies and schemes, aim to uplift the economically weaker sections of society.
- **Poverty Alleviation:** By providing essential goods and services at reduced or no cost, freebies can contribute to poverty alleviation.
- **Inclusive Growth:** Freebies can bridge the gap between the rich and the poor, fostering a more inclusive and equitable society.
- **S.Y. Quraishi**, former Chief Election Commissioner said the 'freebie' promises like inexpensive food and free utility items have actually done a lot to advance the **democratic goal**.

Negative impact of Freebies

- **Financial Burden on state exchequer:** Implementing freebies can strain the financial resources of the government, leading to budgetary challenges.
- **Creates culture of dependency:** Continuous reliance on freebies may create a culture of dependency, discouraging self-sustainability and economic growth.
- **Corruption:** The distribution of freebies involves corruption, targeted beneficiaries many times do not receive the full benefits.
- **Populism Over Policy:** Freebies might be seen as populist measures designed for short-term political gains rather than long-term policy solutions.
- **Distort expenditure priorities:** Freebies expenditure impact state revenue which can hamper government's expenditure on infrastructure creation.

Solutions

- Need **clearcut demarcation between freebies and merit goods** like Health, education, PDS etc.

- **Vigilance:** Strengthen the role of the Election Commission in monitoring and penalizing candidates and parties violating election spending norms.
- **Timely Action:** Ensure timely and effective action against those found guilty of violating election expenditure limits.
- **Stringent Laws:** Enforce strict laws and penalties against candidates offering and voters accepting freebies.
- **Transparency:** Mandate transparent reporting of campaign expenses, making it easier to identify and penalize those exceeding limits.
- **Ethical guidelines:** Political parties should adopt ethical guidelines that discourage the distribution of freebies and focus on promoting substantive policies and development agendas.
- **Austerity Measures:** Implement measures to promote frugality in campaigns, such as limiting the number of rallies and advertisements.
- **Awareness generation programmes:** It will help voters to make informed choices based on the candidates' qualifications, policies, and track records, rather than being influenced by freebies.
- **Watchdog Groups:** Support and encourage the role of civil society organizations as watchdogs, monitoring election spending and reporting violations.
- **Community Involvement:** Engage communities in discussions about the importance of responsible voting and the impact of freebies on governance.
- **The Finance Commission:** It can consider freebies expenses, debt burden of states while distribution of resources.

Judgements associated with freebies

- **Subramaniam Balaji Vs State of Tamil Nadu (2013):** SC upheld the distribution of TVs or consumer goods because programmes that helped women, farmers, and the poor were in line with the Directive Principles. But it also directed ECI to frame guidelines to check freebies in consultation with political parties.

MCQs

Question: Consider the following statements: (UPSC 2017)

1. The Election Commission of India is a five-member body.
 2. The Union Ministry of Home Affairs decides the election schedule for the conduct of both general elections and by-elections.
 3. Election Commission resolves the disputes relating to splits/mergers of recognized political parties.
- Which of the statements given above is/are correct?

- a. 1 and 2 only
- b. 2 only
- c. 2 and 3 only
- d. 3 only

Answer: (d)

States in Court Against Their Governors

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Functions and Responsibilities of the Union and the States, Issues and Challenges Pertaining to the Federal Structure, Centre-State Relations, Centre-State Relations, Role of Governor, Sarkaria Commission, Issues Related to the Functioning of the Office of the Governor and Related Constitutional Provisions

Context

- Recently, there have been conflicts between **several states in India and their respective Governors** over the delay in the assent of various Bills passed by the state legislatures.
- The states have accused the Governors of withholding Bills on crucial issues like public health, higher education, and Lokayukta without any constitutional basis for such delays.
- The situation has escalated to the point where states have petitioned the Supreme Court to intervene.

Background

- **Tamil Nadu:** The state accuses Governor R.N. Ravi disregarded the citizens' mandate by neither assenting to nor returning the Bills, effectively causing a **constitutional deadlock** by withholding the Bills for an extended period.
- **Kerala:** It points out that eight Bills approved by its Legislative Assembly are pending with the Governor, with some Bills languishing for years, including three Bills that have not been addressed for over two years.
- **Punjab:** The state has complained that seven of its Bills have been stuck with the Governor since June, warning that this delay threatens to bring the state's administration to a standstill.

Court's View

- Mandatory to return the bill for reconsideration if assent withheld– Court has held that under **Article 200**, if the Governor **withholds assent**, he must return the bill **"as soon as possible"** with a message to reconsider the proposed law. A Governor who chooses to withhold a Bill without doing anything further would be acting in contravention of the Constitution.
- It said the expression **"as soon as possible"** conveyed a **"constitutional imperative of expedition"** which means cannot hold indefinitely. The court has thus clarified its position on **'pocket veto'**.
- Governor enjoys no veto power over Bills– After returning the Bill for reconsideration, if the State legislature passes the Bill again, with or without amendment and the Bill is presented to the Governor for assent, the Governor shall not withhold assent (**Article 200**).
- Governor only a **symbolic head; real power with elected representatives**– The Court reaffirmed that the Governor is an unelected Head of the State and

cannot use his constitutional powers to thwart the normal course of lawmaking by the State.

- The Governor, under **Article 168**, is a part of the legislature and is bound by the constitutional regime.

What is Meant by Governor's Discretion?

- The term "Governor's discretion" refers to the capacity of a Governor to make certain decisions independently, without the advice of the state's Council of Ministers.
- Originally, under the **draft Article 175 (which became Article 200)**, the Governor had the discretion to return Bills to the legislature.
- However, this provision was amended in 1949 by the Constituent Assembly, significantly limiting the Governor's discretionary powers.
- Dr. B.R. Ambedkar**, while discussing the amended provision, underscored the incompatibility of discretionary powers for the Governor within the structure of a responsible government.
- The current position, as clarified by **Article 163 of the Constitution of India** and reinforced by judicial interpretations like the **Shamsher Singh case**, is that the Governor has to act on the aid and advice of the Council of Ministers in all matters where the Constitution does not explicitly require them to act in their discretion.
- The Governor's discretionary powers are now confined to a few areas, as explicitly provided by the Constitution. These typically involve situations where the Governor has to act as a constitutional safeguard and might include:
 - Deciding on the formation of a state government when there are **no clear majority post-elections**.
 - Dismissing a government believed to have **lost the majority** but refusing to test the same on the floor of the house.
 - Recommending **President's Rule in the state under Article 356**.
- The Governor's role in granting assent to a Bill **does not involve discretion**. If a Bill is presented to the Governor after being passed by the state legislature, the Governor is expected to either assent to it or send it back for reconsideration.
- If the Bill is passed again by the legislature, the Governor is bound by the constitution to assent to it, reflecting the principle that the Governor is meant to act on the advice of the elected representatives and not impede the legislative process.

What is the Process of Granting Assent?

The process of granting assent to Bills in the context of the Governor's role in a state's legislative process is outlined in **Article 200 of the Indian Constitution**:

- Once a Bill has been passed by both Houses of the state legislature, it is presented to the Governor for his assent.

- Upon receipt of the Bill, the Governor has several options:
 - Grant Assent**: The Governor can assent to the Bill, after which it becomes law.
 - Withhold Assent**: The Governor may withhold assent to the Bill, especially if it is not a Money Bill.
 - Reserve for President's Consideration**: The Governor can reserve the Bill for the consideration of the President of India if the Governor believes that the Bill encroaches upon the judiciary's powers or has other substantial issues.
- If the Governor decides to withhold assent, the Bill must be returned "**as soon as possible**" to the Legislative Assembly with a message requesting reconsideration of the Bill or any specified provisions thereof, and the suggestion of any amendments the Governor may recommend.
- The Legislative Assembly must reconsider the Bill, taking into account the Governor's message.
- If the Assembly passes the Bill again, with or without amendments, the Bill is sent back to the Governor.
- After the reconsideration process, the Governor should not withhold assent. In other words, if the Legislative Assembly passes the Bill again, the constitutional norm is that the Governor accedes to the decision of the legislature.

Important Constitutional Provisions

- Article 154**: It vests the executive power of the state in the Governor and allows him or her to exercise it directly or through officers subordinate to him.
- Article 163**: This article states that the Governor shall **act on the aid and advice of the Council of Ministers with the Chief Minister at the head** in the exercise of his functions, except in so far as he is by or under the Constitution required to exercise his functions or any of them in his discretion.
- Article 166**: It deals with the conduct of business of the Government of a State and provides that orders and other instruments made and executed in the name of the Governor shall be authenticated in such a manner as may be specified in rules to be made by the Governor.
- Article 213**: This allows the Governor to promulgate ordinances during recess of the legislature, which have the same force and effect as laws enacted by the legislature.
- Judicial Reviews and Writ Petition**: The judiciary has the power to review the actions of the Governor if they are challenged as being unconstitutional through writ petitions under Article 32 of the Constitution for violations of fundamental rights, or Article 226 for any other rights.
- Keisham Megha Chandra Singh case**: In the 2020 **Keisham Megha Chandra Singh case**, Justice Rohinton F. Nariman interpreted "as soon as

possible" to mean within a 'reasonable time,' which he quantified as three months.

- **States' Current Plea:** Kerala has asked the court to form a seven-judge bench to review the 1962 judgment, indicating the necessity of considering the governors' holding back bills for an indefinite period.
- **Purushothaman Nambudiri versus State of Kerala:** The Supreme Court in a 1962 judgment (Purushothaman Nambudiri versus State of Kerala) held that Article 200 does not provide for a time limit within which the governor must act on a bill.

What was the suggestion of the Sarkaria Commission?

- The 1988 Sarkaria Commission report on Centre-State relations suggested consulting with the governor while drafting a bill and fixing a deadline for its disposal.

Conclusion

- The states' accusations against their governors for delaying the passing of bills highlight a tension between elected state legislatures and the appointed governors, who represent the central authority.
- the Supreme Court's role is to interpret the Constitution and clarify these provisions to ensure that governance is carried out effectively without undue delays or political deadlocks.

UPSC Previous Year Practice Question

Q. Discuss the role of presiding officers of state legislatures in maintaining order and impartiality in conducting legislative work and in facilitating best democratic practices. **(2023)**

Q. While the national political parties in India favour centralisation, the regional parties are in favour of State autonomy. Comment. **(2022)**

Q. Discuss the essential conditions for exercise of the legislative powers by the Governor. Discuss the legality of re-promulgation of ordinances by the Governor without placing them before the Legislature. **(2022)**

Q. Whether the Supreme Court Judgement (July 2018) can settle the political tussle between the Lt. Governor and elected government of Delhi? Examine. **(2018)**

MCQs

Q. Consider the following statements: (UPSC 2023)

Statement-I: In India, prisons are managed by State Governments with their own rules and regulations for the day-to-day administration of prisons.

Statement-II: In India, prisons are governed by the Prisons Act, 1894 which expressly kept the subject of prisons in the control of Provincial Governments. Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I

(b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I

(c) Statement-I is correct but Statement-II is incorrect

(d) Statement-I is incorrect but Statement-II is correct

Answer: (b)

Q. Which one of the following suggested that the Governor should be an eminent person from outside the State and should be a detached figure without intense political links or should not have taken part in politics in the recent past? (UPSC 2019)

(a) First Administrative Reforms Commission (1966)

(b) Rajamannar Committee (1969)

(c) Sarkaria Commission (1983)

(d) National Commission to Review the Working of the Constitution (2000)

Answer: (c)

Q. Which of the following are the discretionary powers given to the Governor of a State? (UPSC 2014)

1. Sending a report to the President of India for imposing the President's rule

2. Appointing the Ministers

3. Reserving certain bills passed by the State Legislature for consideration of the President of India

4. Making the rules to conduct the business of the State Government

Select the correct answer using the code given below.

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2, 3 and 4 only

(d) 1, 2, 3 and 4

Answer: (b)

The Price Of Persistent Federal Frictions

Priority: Medium

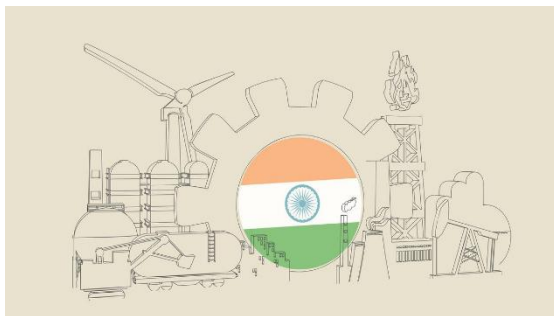


Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein, Centre-State conflict, Disputes between the Centre and the States and their Impact on the Economy

Context

- This article discusses the disputes between the Center and States and their impact on economic policies and on the federal system.



What are the impacts of the perennial Centre-State disputes on the economy?

- The economic relations between the Union and the State have changed from what it was during the 1980s and 1990s.
- The economic reforms implemented continuously since 1991 have led to the relaxation of controls on investments and more room for States.
- However, **state governments still depend on the Union for their revenue receipts as they do not have absolute autonomy regarding their policies of public expenditure.**
- This has resulted in **states pushing back against the “give and take” equation of the Center leading to a stricter position in which neither side are willing to negotiate.**
- The increasingly contentious ties between the Centre and the state have in turn **compromised the idea of cooperative federalism.**

Issues of Centre-State conflict

- Resource sharing
- Homogenization of social sector policies
- Functioning of regulatory institutions and central agencies.
- **Policies in these areas should be ideally left to the discretion of the states with an apex central body to oversee the resource allocation process.**
- However, the apex bodies have been criticized for attempting to grow their influence and forcing the states to adopt actions consistent with the aims of the Centre.
- Disputes have emerged between the Centre and the states over the allocation of resources such as funds, taxes, and other benefits and the revenue-sharing criteria used by the Finance Commissions.

What are the consequences of the Centre's incursions into the roles of the state?

Crowding out of states:

- As a result of the Centre's increasing incursion into the activities ideally performed by the states, the states have been crowded out in terms of investments.
- Consider the example of the [PM Gati Shakti platform](#) which incorporates schemes of various Union ministries and state governments for integrated planning and coordinated implementation of infrastructure connectivity projects.

- **All States and UTs were required to prepare and operationalize a State master plan in line with the national master plan for seamless implementation.**
- However, the **centralization of the planning process and the implementation of the national master plan have affected the flexibility of the States** to formulate their individual state-level master plans.
- A major consequence of this is underinvestment by the states.
- **While the center's capex on roads increased at a CAGR of 32.3% since 2015-16, the growth in States has just been 11.2%.**
- The combined capital expenditure of the 16 large States that account for 80% of the country's GDP on roads and bridges fell to 0.58% of the gross state domestic product.
- Spending has become more concentrated within the three largest States of **Uttar Pradesh, Maharashtra, and Gujarat**, where investment is significant due to its impact on regional economies.
- While investments by the states help leverage local-level linkages, national infrastructure projects help develop more linkages with the global economy.

Fiscal competition between the Centre and states

- **States are engaged in competition with the Centre and the other states.**
- Consider the matter of welfare provisioning.
- The **Centre has more spending power than the states due to its enhanced fiscal space.**
- On the other hand, the **revenues of the states, particularly the non-tax revenues, have been constrained.**
- This has been **due to the states being limited in terms of their ability to raise non-taxes as a result of the Union government provisioning numerous utilities and services.**

Inefficiencies caused by parallel policies

- The disputes between the Centre and the states have resulted in a **duplication of policies at the national and state levels**, with their fiscal costs expected to have long-term consequences on the economy.
- Such parallel schemes have been attributed to the trust deficit between the states and the Centre in the federal structure.
- For example, pension reforms. Under, the **National Pension System (NPS)** the framework for the pension system in **India has transitioned from a defined benefit scheme to a defined contribution scheme.**
- Although most of the states have joined the scheme at different points in time, some states have reverted to the old pension scheme.

Conclusion

- The **Centre depends on the states to help implement many of its laws and policies**, particularly those related to matters in the concurrent list.

- Under **Article 258A**, states may with the consent of the Centre entrust their executive functions to the Union government or its agencies.
- Therefore, it is ideal that the interdependence between the Centre and the states, which is inevitable in a large, diverse, and developing society, is preserved.

Centre-State relations on financial matters

- Allocation of Taxing Powers**
 - The Parliament and State legislature have the exclusive power to levy taxes on subjects incorporated in the Union list and state list, respectively.
 - However, the residuary power of taxation lies with Parliament only.
- Grants-in-aid**
 - According to **Article 275(1)**, Parliament can issue grant-in-aid of the revenues to such states as determined by Parliament.
 - Different sums may be fixed for different states.
 - Under **Article 282**, the Union or a State may make grants for any public purpose.

UPSC Mains Practice Questions

- Q.1)** While the national political parties in India favor centralization, the regional parties are in favor of State autonomy." Comment. (UPSC GS2 2022)
- Q.2)** The Indian constitution exhibits centralizing tendencies to maintain the unity and integrity of the nation. Elucidate in the perspective of the Epidemic Diseases Act, 1897; The Disaster Management Act, 2005 and the recently passed Farm Acts. (UPSC GS2 2020)
- Q.3)** Though the federal principle is dominant in our Constitution and that principle is one of its basic features, but it is equally true that federalism under the Indian Constitution leans in favor of a strong Centre, a feature that militates against the concept of strong federalism. Discuss. (UPSC GS2 2014)
- Q.4)** The concept of cooperative federalism has been increasingly emphasized in recent years. Highlight the drawbacks in the existing structure and the extent to which cooperative federalism would answer the shortcomings. (UPSC GS2 2015)

MCQs

Question: The power of the Supreme Court of India to decide disputes between the Centre and the States falls under its (UPSC CSE 2014)

- advisory jurisdiction
- appellate jurisdiction
- original jurisdiction
- writ jurisdiction

Answer: (c)

Question: The distribution of powers between the Centre and the States in the Indian Constitution is based on the Act provided in the (UPSC CSE 2012)

- Morley-Minto Reforms, 1909
- Montagu-Chelmsford Act, 1919
- Government of India Act, 1935
- Indian Independence Act, 1947

Answer: (c)

Women in Red: On an Optimum Menstrual Hygiene Policy

Priority: Low



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Government Policies and Interventions for Development, Welfare Schemes for Vulnerable Sections, Trends and Concerns Associated with Menstrual Hygiene Policy in India

Context

- Recently, the Supreme Court of India has directed the government to finalize an optimal menstrual hygiene policy, emphasizing the distribution of sanitary napkins and the need for adequate girls' toilets in schools.

Current Status of Menstrual Hygiene Policy in India

- Menstruation affects a significant portion of the female population, yet India has only recently begun to formulate a policy on menstrual hygiene.
- Despite over seventy years of independence, a formal policy on this issue is still in the developmental stage.
- The Supreme Court of India, recognizing the importance of menstrual health and hygiene, called for a uniform national policy to ensure menstrual hygiene for girls in schools.
- The Ministry of Health and Family Welfare has prepared a draft for the National Menstrual Hygiene Policy in 2023.
- This draft is open for comments from various stakeholders, indicating a collaborative approach to policy formulation

Menstrual Hygiene - Statistics and Trends

- As per the National Family Health Survey (NFHS) Data:**
 - 73% of rural women** use a hygienic method of menstrual protection.
 - 90% of urban women** use a hygienic method of menstrual protection.
- There's been a notable increase from NFHS4 to NFHS5 in the use of hygienic menstrual protection among women aged 15-24, **increasing from 58% to 78%.**
- Types of Hygienic Methods Used:** The primary methods of menstrual protection mentioned are sanitary napkins, cloth, and locally prepared napkins.
- Link Between Education and Hygiene Preference:** Women with 12 or more years of schooling are more

than twice as likely to use a hygienic method compared to those with no schooling.

- **Menstruation and Education:** An established link between menstruation and dropping out of school is highlighted, attributed to stigma and lack of access to sanitation, including products, toilets, and water.

Challenges Related to Menstrual Hygiene in India

- **Access and Affordability of Menstrual Hygiene Products:** While urbanization has improved the availability of menstrual hygiene products for many young women, affordability remains a significant issue. This is particularly pronounced in semi-urban and rural areas.
- **Educational Link:** There's a direct correlation between education and the preference for hygienic menstrual practices. Women with higher levels of schooling are more likely to use hygienic methods compared to those with no education.
- **School Dropout Rates:** Menstruation is closely linked to school dropout rates among girls. This is attributed to the stigma surrounding menstruation and a lack of access to proper sanitation facilities, including access to menstrual hygiene products, toilets, and water.
- **Policy and Implementation Gap:** While the Indian government is working on a menstrual hygiene policy, it should be noted that policy creation is only a part of the solution. Effective implementation, ensuring access to affordable menstrual hygiene products, clean toilets, and water, is critical.
- **Holistic Approach:** The policy should address the entire lifecycle of menstruation, covering the range of health and social issues that arise from it.

Way Forward

- **Ensuring Accessibility and Affordability:** The policy must ensure that menstrual hygiene products, especially sanitary napkins, are affordable and accessible to all women, particularly in semi-urban and rural areas.
- **Education and Awareness:** Educational initiatives should be a core component of the policy, targeting both men and women to break the stigma around menstruation and educate them about hygienic practices.
- **Infrastructure Development:** There is a need for proper sanitation facilities, including clean toilets and access to water in schools and public places.
- **Addressing Health and Social Implications:** The policy should cover the entire menstrual health lifecycle, addressing health and social issues that arise from menstruation.
- **Stakeholder Engagement:** Collaboration with various stakeholders, including NGOs, healthcare professionals, and educational institutions, is vital for the successful implementation of the policy.
- **Monitoring and Evaluation:** Regular monitoring and evaluation of the policy's implementation will be

crucial to ensure its effectiveness and to make necessary adjustments based on feedback and evolving needs.

- **Role of CSO:** CSO can play an important role in spreading awareness about the issue and acting as a bridge between government and concerned sections of society.

Conclusion

A draft policy is under review with feedback from various stakeholders. The policy should address all aspects of menstruation, including health and social consequences. The government's role is not just policy formulation but also in ensuring practical implementation and accessibility.

UPSC Previous Year Practice Question

Q. "Though women in post-Independent India have excelled in various fields, the social attitude towards women and feminist movement has been patriarchal." Apart from women education and women empowerment schemes, what interventions can help change this milieu? **(2021)**

Q. Which steps are required for constitutionalization of a Commission? Do you think imparting constitutionality to the National Commission for Women would ensure greater gender justice and empowerment in India? Give reasons. **(2020)**

Q. Is the National Commission for Women able to strategize and tackle the problems that women face at both public and private spheres? Give reasons in support of your answer. **(2017)**

MCQs

Q. Consider the following statements in relation to Janani Suraksha Yojana: (UPSC 2023)

1. It is a safe motherhood intervention of the State Health Departments.
2. Its objective is to reduce maternal and neonatal mortality among poor pregnant women.
3. It aims to promote institutional delivery among poor pregnant women.
4. Its objective includes providing public health facilities to sick infants up to one year of age.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (c)

Q. Consider the following statements in the context of interventions being undertaken under Anaemia Mukt Bharat Strategy: (UPSC 2023)

1. It provides prophylactic calcium supplementation for pre-school children, adolescents and pregnant women.
2. It runs a campaign for delayed cord clamping at the time of childbirth.

3. It provides for periodic deworming to children and adolescents.
4. It addresses non-nutritional causes of anaemia in endemic pockets with special focus on malaria, hemoglobinopathies and fluorosis.
- How many of the statements given above are correct?
- (a) Only one
(b) Only two
(c) Only three
(d) All four

Answer: (c)

Health Ministry releases draft National Pharmacy Commission Bill

Priority: Medium



Primary Source: The Indian Express

Syllabus Relevance & Important Keywords: Statutory, Regulatory and various Quasi-judicial Bodies, Government Policies and Interventions for Development in various sectors and Issues arising out of their Design and Implementation, National Pharmacy Commission Bill 2023, Pharmacy Council of India

Context

- The Union Health Ministry has released the draft **National Pharmacy Commission Bill, 2023**, which seeks to repeal the **Pharmacy Act of 1948** and replace the **Pharmacy Council of India** with a **National Commission**.



Important Provisions of Bill:

- Provisions for pharmacy education system:** It seeks to improve access to **quality and affordable pharmacy** or **pharmaceutical education**, ensures availability of adequate and high-quality pharmacy professionals in all parts of the country.
- Periodic Assessment:** It calls for a **periodic and transparent assessment of pharmacy institutions**.
 - facilitating maintenance of a **pharmacy register for India**, and enforcing high ethical standards in all aspects of pharmacy services.
- Research:** It also encourages pharmacy professionals to adopt the latest pharmacy research in their work and to contribute to research.
- Proposes flexibility to adapt to changing needs and seeks to set up an effective grievance redressal mechanism

- Pharmacy Ethics and Registration Board:** It will maintain a National Pharmacy Register which will have details of pharmacy professionals to ensure transparency.
- State pharmacy chapter:** The bill mandates every State Government to establish a state pharmacy chapter within one year from the Act's commencement.
 - Such chapters will operate under State Law and play a pivotal role in executing the Act's provisions.

Structure of new National Pharmacy Commission

The bill proposes the establishment of the **National Pharmacy Commission**, headquartered in New Delhi, which will take the place of the existing Pharmacy Council of India.

- Composition:** The commission will consist of a chairperson, **13 ex-officio members**, and **14 part-time members**.
- Three Key Boards will be constituted under commission:**
 - Pharmacy Education Board**
 - Pharmacy Assessment and Rating Board**
 - Pharmacy Ethics and Registration Board**

Functions of the Commission:

- Standards Setting:** Setting education standards, facilities, assessments, training, research, and tuition fees will be the prime function of commission.
 - The Commission will establish **standards for the pharmacy faculty and clinical facilities**.
- Regulate:** It will implement a uniform admission mechanism, and regulate pharmacy education and training policies.
- Granting Licence:** Commission will evaluate professionals through undergraduate exams to ensure adequate competence of the pharmacy professionals for enrolment in the National Register or State Register, and for granting licence to practise as a pharmacy professional.
- Training:** The Commission will focus on training in soft skills, and will also provide elective courses at educational institutions to harness global opportunities.

The Pharmacy Council of India (PCI):

It is a statutory body under the Ministry of **Health and Family Welfare**, constituted under the **Pharmacy Act, 1948**.

Members

- There are three types of members collectively forms a frame of PCI
- Elected members
- Nominated members
- Ex-officio members

Functions

- To prescribe the minimum standard of education required for qualifying as a pharmacist.
- Framing of Education Regulations prescribing the conditions to be fulfilled by the institutions seeking approval of the PCI for imparting education in pharmacy.
- To ensure uniform implementation of the educational standards throughout the country.
- Inspection of Pharmacy Institutions seeking approval under the Pharmacy Act to verify availability of the prescribed norms.
- To approve the course of study and examination for pharmacists i.e. approval of the academic training institutions providing pharmacy courses.
- To withdraw approval, if the approved course of study or an approved examination does not continue to be in conformity with the educational standards prescribed by the PCI.
- To approve qualifications granted outside the territories to which the Pharmacy Act extends i.e. the approval of foreign qualification.
- To maintain the Central Register of Pharmacists.

Significance of the bill

- **Enhancement of Regulatory Framework** Strengthening the regulatory structure for the pharmacy sector.
- **Quality Assurance:** Implementation of measures to ensure the quality of pharmaceutical products, Standards for manufacturing, storage, and distribution will be focused.
- **Patient Safety and Public Health:** Emphasis on safeguarding public health through stringent pharmacy regulations, measures to prevent counterfeit drugs and substandard medications will be focused.
- **Professional Standards:** Establishment of clear guidelines for the practice of pharmacy, promotion of professional ethics and accountability.
- **Technological Integration:** Bill emphasises incorporation of modern technologies for efficient pharmacy management.

Conclusion

- Draft National Pharmacy Commission of India Bill 2023 signifies a pivotal step towards enhancing the efficiency, transparency, and accessibility of pharmacy services across the nation.
- With careful consideration of feedback and collaborative efforts, the enactment of this bill has the potential to elevate the pharmacy sector, ultimately contributing to the overall improvement of healthcare delivery in India.

Split Voting System in New Zealand

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Comparison of the Indian constitutional scheme with that of other countries, Mixed Member Proportional System and its Advantages and Disadvantages

Context

- **Recently, general elections were conducted in New Zealand based on Mixed Member Proportional (MMP) system** to elect members of the country's legislature. In India **first-past-the-post** voting system is followed. In this article, we will learn about various types of voting systems and their comparison.

About MMP Voting System

- New Zealand uses a **Mixed Member Proportional (MMP) system in which voters cast two votes.**
 - The **first vote is a party vote to determine the overall composition of the Parliament.**
 - The **second vote is an electoral vote in which an MP is elected for the local constituency.**
- The **New Zealand parliament consists of 120 seats of which 72 are electorate seats filled through the second vote.**
- The remaining **48 seats are the list seats that are filled by the parties** from a list prepared by them prior to the elections.
- Voters can give both their votes to one political party, which is known as a **'double tick'**, or **split** their votes among two parties.
- As a result, voters can choose a candidate from a **different party** if they don't like the local candidate from their preferred party.
- In the MMP system, split votes help express the **diverse and mindful voting patterns** of the population.

Allocation of Seats in the MMP System

- Candidates with the **most votes** become the electorate MP.
 - It is not required that the candidate gains more than half the total votes.
 - If a party gets at least 5% of the party vote or wins an electorate, the **Sainte-Laguë formula** is used to decide how many seats it is allocated in the Parliament.
- Each party gets a share of seats based on its share of the party vote.
 - For example, a party with 30% of the party vote gets about 36 seats out of the 120 seats in Parliament.
- Out of the seats allocated to the party, the candidates that won the electorates get the first priority.
- If there are any seats leftover from the party's total allocation, then the seats are allocated to those from the party list as per the order ranked by the party.
 - Consider a situation in which a party wins 30% of the party vote and 20 of its candidates win electorates, 20 out of the 36 seats go to the winning electorate candidates and the remaining 16 seats go to candidates from its party list.

Overhangs

- **A party can win more electoral seats than the total it is entitled to based on the party vote.**
- In this case, the **party can keep the extra seats and the size of Parliament is increased by the extra until the next general election. This is known as an overhang.**
- Eg: A party with 5% of the party vote is entitled to 6 seats.
- If it has, however, won more electorate seats, say seven, then it gets seven electorate MPs and no list MPs and the size of Parliament increases to accommodate the extra electorate MP.
- In the case of an overhang, the number of seats won by other parties is not affected.
- New Zealand has had four Parliaments with overhangs.
- From 2005 to 2008, there were 121 MPs.
- From 2008 to 2011, there were 122 MPs.
- From 2011 to 2014, there were 121 MPs.
- From 2014 to 2017, there were 121 MPs.

Advantages

- **Localized accountability:** The split voting system ensures that elected representatives can be held **accountable on a localized basis** more easily.
- In the MMP system, candidates will not be elected on the basis of a large wave of support for their party alone as voters can split their votes.
- **Policy focus:** Parties do not need to focus merely on the electoral winnability of candidates so they can **highlight their policies and ideologies** to attract voters.
- **Improved representation:** It has been observed that **representation of women, indigenous communities, differently-abled people, and other marginalized groups increases in an MMP system.**
- After the MMP system was introduced in New Zealand, the **share of women as MPs** rose from 21% in 1993 to 51% at present.
- Similarly, the share of the **Maori community** also increased among representatives.
- **Diversified and improved democracy:** In the MMP system, **voters can express their diverse political preferences without wasting their votes.**
- This is because the seats won by a party depend on the party votes gained as well.
- Parties and candidates are chosen by voters in a mutually exclusive manner with no effect on each other.
- **Participation of the youth:** Following the introduction of the MMP system, the average age of an MP in New Zealand has declined to 47.3 years in the 2020 elections.
- Split voting has lowered the entry barrier for young politicians.
- **Coalition governments:** The MMP system will encourage the formation of coalition governments and **foster the spirit of cooperation and compromise** in politics.

- This will help ensure effective governance and fulfill the aspirations of a wider section of the population.

Disadvantages of the system

- **Tactical voting:** Some critics of the MMP system claim that voters would support a party they do not endorse in order to keep another party out of power.
- This could harm the quality of democracy and manipulate election results.
- **Importance of list seats:** In the MMP system, the vote for the local MP can be considered less important than the party vote as it helps determine the overall allocation of parliamentary seats.
- However, voters are not always aware of this which can affect the results.
- **Inequality among MPs:** The MMP can create two classes of MPs – one **elected directly** by the population and others elected by the party based on their prior lists.
- **End of majority governments:** Critics have claimed that the MMP system could mean the end of decisive majority governments due to the split nature of voting

Types of Voting Systems in India

First Past the Post System

- It is also referred to as the **plurality type of voting**. Used for the selection of “**one candidate**”, out of many candidates.
- In this system, each voter chooses only **one candidate**, i.e., he or she has to fill only one choice in the ballot. The candidate with the maximum number of votes is declared the winner.
- It is **not necessary** to get half or more than half the votes. Here the underlying principle is “winner takes all”.
- In India, the election of the State assembly and Lok Sabha MP follow this system.

Proportional representation

- It is also referred to as the **Majority system**. Here not just plurality but the majority is required to win.
- The number of seats occupied by a political party in the elected body is proportional to the percentage of members the party has in the electoral college.
- For example, if out of 100 members of the Electoral College, 60 are of party A, and 40 are of party B; then the same percentage will be indicated in the elected body.
- It can be of three types:
 - i. **Party-list Proportional system:** Parties represent voters with a list of candidates, whom they rank. In this system, how many seats a party will get, is already decided by their share in the electoral college. It can be an open list, closed list, or semi-open list depending upon the choices voters get. In an open list, the voter can write their own candidates.

ii. Single transferable Proportional system: Here voters fill their preferences of candidates belonging to one party. For example, the party puts forward a list of candidates A, B, C, and D, then the voter will indicate their preferences for each. Such as A=1, B=3, C=4, D=2. Further, the votes of losing candidates are transferred to the next preferred candidate. In India, the Election of the President is one such example.

iii. Mixed member proportional representation

(MMP): Here two votes are cast by each voter.

"Party proportional vote" decides the composition of parties at the national/regional level and other "Plurality vote" for local candidates. It is seen in the case of New Zealand.

Is the MMP system applicable to India?

- **India uses a first-past-the-post system in which the candidate in each constituency with the most votes is elected as the representative to the constituency.**
- In the Indian electoral framework, the liberty of voters to express their genuine preference is curtailed by compulsive voting with most voters hesitant to vote outside their party affiliations or electoral winnability.
- **A split voting system would allow voters to choose their candidates based on merit while ensuring their party preferences determine the composition of the legislature.**
 - This would help build a nuanced and mature democracy in which voters can distinguish between the party and its candidates and judge them based on their ability to represent them capably.
- Although the Indian electorate has typically been wary of contemporary political behavior, political behavior in some states has **indicated its feasibility.**
 - Consider the **example of Odisha** which practices simultaneous elections to the Lok Sabha and State Assembly. In 2019, the Biju Janata Dal (BJD) led 88 out of 146 Assembly constituencies in the Lok Sabha while winning 113 of 146 constituencies in the Legislative Assembly.
 - This amounted to a difference of 25 seats and 2% vote share for the BJD.

Conclusion

- The Mixed Member Proportional (MMP) system has several advantages in New Zealand localized accountability, improved representation, and increased flexibility for voters with some drawbacks such as tactical voting and inequality among MPs.
- Therefore, it must be carefully examined to ensure that it is applicable to the unique electoral landscape and voting sensibilities of India.

UPSC Mains Practice Questions

Q.1) In the light of recent controversy regarding the use of Electronic Voting Machines (EVM), what are the challenges before the Election Commission of India to ensure the trustworthiness of elections in India? (UPSC GS2 2018)

Q.2) 'Simultaneous election to the Lok Sabha and the State Assemblies will limit the amount of time and money spent in electioneering but it will reduce the government's accountability to the people' Discuss. (UPSC GS2 2017)

Q.3) To enhance the quality of democracy in India the Election Commission of India has proposed electoral reforms in 2016. What are the suggested reforms and how far are they significant to make democracy successful? (UPSC GS2 2017)

MCQs

Question: Consider the following statements: (UPSC CSE 2020)

1. According to the Constitution of India, a person who is eligible to vote can be made a minister in a State for six months even if he/she is not a member of the Legislature of that State.
2. According to the Representation of People Act, 1951, a person convicted of a criminal offense and sentenced to imprisonment for five years is permanently disqualified from contesting an election even after his release from prison.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (a)

Environment (GS Paper Prelims) & GS Paper III (Main)

Methane: More Potent, Less Persistent

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords:

Environmental pollution and degradation, Methane, COP 28, Challenges Related to Methane Emissions and Initiatives to Lower them

Context

- Recently, a group of philanthropic bodies including the Sequoia Climate Foundation and the Bezos Earth Fund announced they would invest \$450 million in solutions to tackle methane emissions.



What is methane?

- Methane is one of the major greenhouse gases with a greater warming potential than carbon dioxide but a shorter life.
- Methane is a simple organic hydrocarbon.
- One molecule of methane (CH_4) consists of one atom of carbon and four atoms of hydrogen.
- It **occurs abundantly in nature and is the primary component of natural gas**.
- It is a major greenhouse gas, **contributing 16% of the global warming effect**.
- It is the **second largest contributor to climate change**, behind carbon dioxide (CO_2).
- However, there is a lack of clarity regarding the exact amount of methane that has been released into the atmosphere.
- Methane primarily leaves the atmosphere through oxidation, forming water vapour and carbon dioxide.
- Other impacts of methane on the atmosphere:
 - **Formation of tropospheric ozone**
 - **Deterioration of air quality**
 - **Health issues in humans and animals**
 - **Reduced crop yields.**

What are the major sources of methane emissions?

- **60% of methane emissions are due to anthropogenic activities while natural processes account for the remaining 40%.**
- **Natural sources:** According to NASA, **wetlands account for around one-third of global methane emissions**.
- Wetlands are significant carbon sinks as they consist of waterlogged soils and permafrost.
- As a result of global warming, carbon is released into the atmosphere in the form of methane.
- Other natural sources of methane emissions are **fresh waters, geologic seepage, wild animals, termites, wildfires, and vegetation**.

Human activities:

- **Agriculture:** Agriculture accounts for around one-fourth of the total methane emissions, with the major source within the sector being livestock.
- Methane is released by cows and sheep release methane during the digestion process and in their manure.
- **Rice cultivation is the next major source of methane emissions** in agriculture as **waterlogged fields are**

suitable conditions for the survival of methane-emitting bacteria.

- **Energy:** The second largest source of anthropogenic methane emissions is the energy sector, specifically the coal, oil, and gas industries.
- Methane emissions occur both due to leakages in the infrastructure (pipeline) and direct release during maintenance operations.
- **Waste:** The decomposition of household wastes in landfills also acts as a major source of methane emissions.

Why is methane considered potent but less persistent?

- **More potent:** Methane has a Global Warming Potential (GWP) 28 times greater than that of CO_2 over a 100-year timescale and 80 times greater over a 20-year scale.
- **GWP is the measure of warming caused by a substance relative to that caused by the same mass of carbon dioxide.**
- It is therefore more effective at trapping heat in the atmosphere than carbon dioxide.
- In addition to its direct warming potential, methane also contributes indirectly to global warming by releasing carbon dioxide.

Substance	GWP
Carbon dioxide	1
Methane	28
Nitrous oxide	265
Sulfur hexafluoride	23,500

- **Less persistent:** Methane has a much shorter lifespan (around 10 years) in comparison to CO_2 (hundreds of years).

Why is reducing methane emissions significant?

- **Methane is responsible for more than a quarter of the warming that the planet has experienced since the preindustrial era.**
- Therefore, cutting methane emissions is crucial to achieve the goal of limiting global warming to within 1.5°C (as in the Paris Agreement).
- Moreover, **reducing methane emissions will produce a more immediate effect on global warming.**

How much does India contribute to methane emissions?

- **India is the world's fourth largest emitter of methane behind China, the United States, and Russia.**
- The agriculture sector emits five times as much methane as the energy sector.
- According to India's third Biennial Update Report, India's methane emissions in 2016 were 409 million tonnes of CO_2e .
- Of this, 73.96% was from the Agriculture sector, 14.46% from the Waste sector, 10.62% from the Energy sector, and 0.96% was from the Industrial Processes and Product Use sector.

What can be done to reduce emissions from methane?

- **Fossil fuels:** According to the **International Energy Agency**, **rapid cuts in methane emissions from the fossil fuel industry could help prevent up to 0.1°C warming by 2050.**
 - The reduction of warming produced in this manner would be equivalent to that produced by removing all cars and trucks from roads across the world.
- **Industry: Regular maintenance and repair of infrastructure where leakages are likely to occur.**
 - Routine practices like flaring and venting should be avoided when conducting pipeline maintenance to prevent leakages.
 - This would help reduce super-emissions at no cost to the citizens and minimal cost to the producers.
 - Norway has set an example in the extraction and supply of natural gas with minimum leakage that can be replicated by other countries.
- **Agriculture:** Stakeholders must take necessary action to ensure emissions from the agriculture sector, the major source of methane, can be reduced.
 - **Diets of livestock can be modified** in such a manner that the health of the livestock improves while the environment is not adversely affected. For example, Harit Dhara.
 - **Water management techniques can be introduced in rice cultivation** to reduce methane emissions.

Initiatives related to reducing emissions from methane

Global

- **Methane Alert and Response System (MARS):** MARS will integrate data from a large number of existing and future satellites with the ability to detect methane emissions anywhere in the world.
 - It will help send out notifications to relevant stakeholders so that they act on them.
 - The UN's now fully operational methane alert and response system has already notified 127 major methane plumes across four continents.
- **Global Methane Pledge:** Around 100 countries pledged to reduce methane emissions by at least 30% by 2030 in comparison to 2020 levels at the **Glasgow Climate Conference (UNFCCC COP 26).**
 - It is a US and EU-led initiative which was started in 2021.
- **Global Methane Initiative (GMI):** It is an international public-private partnership that aims to eliminate barriers related to the recovery and use of methane as a clean energy source.
 - However, most of these countries have not explained how they plan to achieve these targets.

India

- **'Harit Dhara' (HD):** It is an **anti-methanogenic feed supplement** that has been developed by the **Indian Council of Agricultural Research (ICAR).**
 - It is capable of reducing methane emissions from cattle by 17-20% while ensuring higher milk production as well.

- **India Greenhouse Gas Program:** It is an **industry-led voluntary framework** for measuring and managing greenhouse gas emissions.
 - It is an **initiative led by WRI India (an NGO), the Confederation of Indian Industry (CII), and The Energy and Resources Institute (TERI).**
 - It aims to build comprehensive measurement and management strategies to reduce emissions and ensure the profitability, competitiveness, and sustainability of businesses and organizations in India.
- **National Action Plan on Climate Change (NAPCC):** It was launched in 2008 to create awareness among public representatives, government agencies, scientists, industry, and vulnerable communities.
- **National Mission on Sustainable Agriculture (NMSA):** It is an initiative of the Union Ministry of Agriculture and Farmers Welfare.
 - It involves climate-resilient steps to contribute to reduced methane emissions in the agriculture sector such as methane reduction practices in rice cultivation.
- **National Innovations in Climate Resilient Agriculture (NICRA):** The **Indian Council of Agricultural Research (ICAR)** has developed several technologies that have the potential to mitigate methane emissions - **System for Rice Intensification, Direct Seeded Rice, and Crop Diversification Programme.**
 - **Krishi Vigyan Kendras** are implementing capacity-building programmes on climate-resilient practices across the country.
- **National Livestock Mission:** The Department of Animal Husbandry and Dairying (DAHD) is implementing steps such as **Breed Improvement and Balanced Rationing.**
 - It also includes steps such as **green fodder production, silage making, chaff cutting, and total mixed ration.**
 - This is expected to help reduce methane emissions from ruminants.
- The government is attempting to incentivize cattle waste utilization and produce clean energy in villages through schemes such as
 - **Gobar (Galvanizing Organic Bio-Agro Resources) – Dhan' scheme**
 - **New National Biogas and Organic Manure Programme**

Commitments made to reduce methane at COP-28

- The USA has claimed that it would introduce a rule mandating oil and gas companies to reduce leakages of methane.
 - Consequently, major oil and gas companies pledged to reduce methane leaks from their pipelines by 2030.
 - According to experts, this would **help prevent 58 million tons of methane emissions by 2038.**

- It would also cut the equivalent of 1.5bn metric tonnes of carbon dioxide over the next 15 years.
- **Global Decarbonization Accelerator:** It is a coalition of 50 oil and gas companies — including ExxonMobil; Saudi Aramco; Adnoc; ConocoPhillips and BP — that **pledged to reduce their methane emissions between 80 – 90% by 2030.**
- **Global Methane Pledge:** Five countries – **Angola, Kazakhstan, Kenya, Romania, and Turkmenistan** – **joined the Pledge.**
- This was significant as **Turkmenistan was one of the world's largest methane hotspots** and had emitted 4.4 m tonnes of methane from both its oil fields in 2022.
- The US Climate Envoy, John Kerry announced that the US, EU, and some philanthropic groups had raised \$1 billion in grants to help cut methane emissions.
- The money would go to low and middle-income countries in particular.
- **Philanthropic contributions:** A group of philanthropic bodies including the **Sequoia Climate Foundation, Bloomberg Philanthropies, and the Bezos Earth Fund announced** they would invest **\$450 million in solutions to tackle methane emissions.**
- This will help accelerate the phase-down of methane emissions and other non-carbon dioxide greenhouse gases.

UPSC Mains Practice Questions

- Q.1)** The adoption of electric vehicles is rapidly growing worldwide. How do electric vehicles contribute to reducing carbon emissions and what are the key benefits they offer compared to traditional combustion engine vehicles? (UPSC GS3 2023)
- Q.2).** Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by India in this conference? (UPSC GS3 2021)

MCQs

Question: Among the following crops, which one is the most important anthropogenic source of both methane and nitrous oxide? (UPSC CSE 2022)

- (a) Cotton
- (b) Rice
- (c) Sugarcane
- (d) Wheat

Answer: (b)

Question: Consider the following:

- 1. Carbon monoxide
- 2. Methane

- 3. Ozone
- 4. Sulfur dioxide

Which of the above are released into the atmosphere due to the burning of crop/biomass residue? (UPSC CSE 2019)

- (a) 1 and 2 only
- (b) 2, 3, and 4 only
- (c) 1 and 4 only
- (d) 1,2,3 and 4

Answer: (d)

Question: "System of Rice Intensification" of cultivation, in which alternate wetting and drying of rice fields is practiced, results in:

- 1. Reduced seed requirement
- 2. Reduced methane production
- 3. Reduced electricity consumption

Select the correct answer using the code given below: (UPSC CSE 2022)

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

Answer: (d)

What The OECD Report Says Of Climate Finance Ahead Of COP 28

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords:

Conservation, environmental pollution and degradation, Important International institutions, agencies and for-a-their structure, mandate, OECD, Climate Finance, Challenges in Financing Climate Adaptation and Mitigation

Context

- Recently, a report prepared by the Organization for Economic Cooperation and Development (OECD) revealed that Developed countries have not fulfilled their commitments to mobilize funds for the climate adaptation and mitigation requirements in developing countries even after the 2020 deadline.
- The goal is politically symbolic and failure to meet it has stoked mistrust in past talks, hampering deals to tackle climate change as developing countries argue the world's economic powers are abandoning them.



COP 15 Copenhagen Climate finance Commitment

- At COP 15 in Copenhagen in 2009, developed countries committed to mobilize \$100 billion every

year to help developing countries cut carbon emissions.

What are the highlights of the OECD Report?

- **Progress on \$100 Billion Goal:** Developed countries have only been able to mobilize \$89.6 billion of funds in 2021 despite the commitment to achieve \$100 billion per annum since 2020 (**Copenhagen COP**).
- This amounted to a 7.6% increase over 2020.
- **Public climate finance:** Public climate finance, including both bilateral and multilateral sources, rose from \$38 billion to \$73.1 billion between 2013 and 2021.
- It accounted for the majority of the \$89.6 billion mobilized in 2021.
- This funding had so far failed to mobilise substantial private capital, which is needed to cover the climate investment gap
- **Adaptation finance:** Adaptation finance fell by 14% (around \$4 billion) in 2021 from 2020 levels.
- As a result, the share of adaptation finance in total climate finance dropped from 34% to 27%
- However, cross-cutting finance increased to \$11.2 billion in 2021 from USD 6 billion in 2020.
- **Private finance:** Private climate finance accounted for 16% of the total i.e. 14.4 billion in 2021.
- According to the OECD, developing countries will require around \$1 trillion per annum in climate investments by 2025 and around \$2.4 trillion per annum between 2026 and 2030.

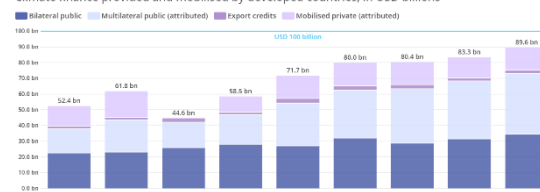
Criticism of the report

- **Loans:** The OECD report considers loans at face value instead of the grant equivalent when calculating total climate finance figures.
- This means that the loans are counted as climate finance provided by developed countries despite the developing countries having to repay the principal and interest, which defeats the purpose of climate finance assistance.
- **Additionality:** According to the UNFCCC, developed countries must provide new and additional financial resources to meet the full costs incurred by the developing country to meet its obligations.
- They cannot cut their overseas development assistance (ODA) to finance climate needs.
- Moreover, developed countries are not permitted to double-count i.e. a project that contributed to overall development and emissions reduction cannot be categorized as both ODA and Climate finance as it violates the "new and additional" clause of the Convention.
- However, many developed countries including those from the EU have been practicing double-counting in order to artificially inflate their climate finance contributions.
- **Lack of definitional clarity:** Generally, the developed countries have campaigned against any attempts to develop an explicit definition of 'climate finance'.

- This allows countries to reroute their climate finance funds while indicating large expenditures on climate finance and the use of practices like double-counting.
- Therefore, an assessment of the actual flows of climate finance needs to be conducted to understand their incidence.

Climate finance for developing countries

Climate finance provided and mobilised by developed countries, in USD billions



Why is the OECD report notable?

- The report provides a clear insight into the likely approach to be adopted by the OECD countries regarding climate finance at COP28.
- Since the OECD consists of rich economies like the U.S., the U.K., Germany, France, Switzerland, and Canada, the report provides a perspective of the developed countries regarding the inadequacies in climate finance.
- Moreover, the developed countries had expressed regret for not meeting the \$100 billion target by 2020 at the 26th COP in Glasgow and had committed to doubling adaptation finance.
- The acknowledged failure of the developed countries to mobilize climate finance has a severe impact on developing countries.
- It has compromised their ability to address
- Climate mitigation i.e. implementing renewable energy systems to reduce emissions
- Adaptation requirements such as investments in developing and incentivizing the use of climate-resilient agriculture products and techniques
- Furthermore, it has led to a trust deficit between the developing and developed countries regarding their commitment to fighting the challenge of climate change.

How is climate finance accounted for?

- According to the report, \$49.6 billion of the \$73.1 billion mobilized by the public sector was in the form of loans.
- This indicated that rich countries were highly dependent on loans at commercial rates to fulfill their climate finance obligations.
- Consider the Global Landscape of Climate Finance 2021 report prepared by the American not-for-profit Climate Policy Initiative, 61% of climate finance was provided as loans, of which only 12% was at concessional interest rates.
- The OECD report claims that since around two-thirds of public climate financing was provided as loans, the conditions associated with these loans could lead to

debt stress and economic distress in developing countries.

- This would further impact their ability to adapt to and mitigate climate change.

What is included as climate finance in OECD figures?

- OECD figures capture four distinct components of climate finance provided and mobilized by developed countries:
- **Bilateral public climate finance:** It is provided by institutions of developed countries such as bilateral aid agencies and development banks.
- **Multilateral public climate finance:** It is provided by multilateral development banks and multilateral climate funds which are attributed to developed countries.
- **Climate-related officially supported export credits:** They are provided by the official export credit agencies of developed countries.
- **Private finance:** It refers to local, national, or transnational financing drawn from private sources attributed to developed countries.

How much do developing countries need?

- Although a report by the OECD claims that the \$100 billion target was achieved in 2022, no verifiable data has been published as evidence.
- According to the OECD, developing countries will need around \$1 trillion a year in climate investments in 2025, and around \$2.4 trillion a year between 2026 and 2030.
- This highlights the insufficiency of the \$100 billion target, which has been criticized for its unscientific formulation and the lack of proper assessment of the needs of the developing countries.
- The developing countries have also raised concerns about this in light of the failure of the developed countries to meet the much smaller target of \$100 billion.

What role can the private sector play?

- U.S. Climate envoy John Kerry and the President of the World Bank, Ajay Banga have suggested that private sector finance can be a solution to the shortfall in public finance.
- However, the OECD report revealed that private sector finance for climate has remained stagnant over the last decade.
- This has been mainly due to the fact that climate finance has not been able to generate returns on investment that are attractive enough to bring in large investors.
- In comparison mitigation activities like solar farms, and windmills are attractive options for private investors due to their higher return potential.
- As a result, the private sector has been on the whole reluctant to scale up its investments in climate finance.

Conclusion

- The OECD report highlights the persistent shortfall in climate finance by developed countries which has in turn impacted the ability of developing nations to address climate challenges.
- The reluctance of the private sector to invest in climate finance has meant that the governments in the developed world and multilateral development banks are the major source of funds for the struggling developing countries that face the worst effects of climate change.

OECD

- The Organization of Economic Cooperation and Development is an international organization of 38 countries committed to democracy and the market economy.
- It was established in 1960, by 18 European nations, the United States and Canada.
- Headquarters: Paris, France.
- **Members:**
- Its membership is mainly made up of democratic countries that support free-market economies.
- Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, South Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States
- **Aim:**
- Shape policies that foster prosperity, equality, opportunity and well-being for all.
- Eliminate bribery and other financial crimes
- **Functions:**
- Publishes economic reports, statistical databases, analyses, and forecasts on global economic growth.
- Maintains a "black list" of nations that are considered uncooperative tax havens.
- Gives recommendations to help the world's economy grow

To learn more, click the [link](#).

Paddy Cultivation In Punjab To Be Phased Out

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords:

Environmental Pollution and Degradation, Major crops-cropping patterns in various parts of the country, - different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers, Paddy cultivation, Stubble burning, Issues Related to Paddy Cultivation in Punjab, Associated Challenges and Measures taken by the Government

Context

- Recently, the Advocate-General of Punjab proposed that paddy cultivation in the state be phased out and replaced with other crops.
- The Supreme Court directed the Union government to consider the suggestion in order to check air pollution caused by stubble burning and water table depletion due to the cultivation of water-intensive crops like rice.
- The Supreme Court ordered the State governments of Punjab, Haryana, Uttar Pradesh and Rajasthan to ensure that stubble burning is stopped as an immediate measure to protect the lives and health of people.
- The Court directed the Union government to seriously consider the **proposal to phase out paddy cultivation in Punjab**.
- It also recommended that the government consider incentivizing paddy farmers to shift to other crops.
- The Court observed that paddy grown in adjacent states is illegally smuggled into Punjab in order to claim **Minimum Support Price (MSP)** and **Punjab which was the granary of India could not be allowed to turn into a desert**.

Ideal Agro-climatic conditions for paddy

- Hot and humid climate
- Extended period of sunshine and water supply.
- An average temperature of 21–37°Celsius.
- Annual rainfall of between 150 to 300 cm.

Agro Climatic condition of Punjab

- Punjab falls in the **Agro Climatic Zone-VI**, also known as the **Trans-Gangetic Plains Region**.
 - It covers Punjab, Haryana, Delhi, Chandigarh and Ganganagar in Rajasthan.
 - Temperature in the summer is between 26°C and 42°C and in winter it ranges from 7°C to 22°C
 - It displays semi-arid characteristics with average annual rainfall between 70 cm and 125 cm.
 - The principal means of irrigation are private tube wells and canals.
 - Important crops: Wheat, sugarcane, cotton, rice, gram, maize, millets, pulses and oilseeds etc.
- The net irrigated area in the state is 4.019 million hectares.
 - Of this 26.2% is irrigated by canals, 72.5% by tube wells, and the remaining 1.3% by other sources.
- The gross irrigated area is 7.442 million hectare and the percentage of net irrigated sown area is 96.17%.

What is the crisis faced by Punjab?

- Decline in water table:** The cultivation of paddy in Punjab has led to a significant decline in the water table level in the state.
- According to Punjab Agriculture University (PAU), the paddy cultivation area increased eleven-fold to 32 LH between 1966–67 and 2023.

- As **a result, the rate of groundwater extraction in Punjab exceeded the rate of replenishment**.
- According to experts, Punjab requires around 48 to 52 billion cubic meters (BCM) of water to irrigate its rice crop alone.
- Groundwater meets over 50% of Punjab's water demand** with Punjab's net annual groundwater availability decreasing from 21.58 BCM in 2017 to 17.07 BCM in 2022, according to a report by the **Central Ground Water Board (CGWB)**.
- In a majority of villages, the **water table has gone down to around 200 to 300 feet from 150 feet**.
- Air pollution:**
 - According to environmentalists, **paddy straw burning in Punjab and Haryana is one of the major reasons behind the spike in air pollution levels in Delhi, Punjab, Haryana, and Uttar Pradesh in October and November every year**
 - According to data from the Punjab Remote Sensing Center, 49,922 stubble burning incidents were recorded in Punjab in 2022, 71,304 in 2021, 76,590 in 2020, 55,210 in 2019, and 50,590 in 2018.
 - Punjab has reported a total of 19,463 farm fires from September 15 till November 6 and it was 35% less than 29,999 such cases in the corresponding period last year.
 - Punjab produces around 180–200 lakh tonnes of paddy straw every year across 31 lakh hectares of paddy area.
 - Out of this, **120 lakh tonne was being managed through in-situ and around 30 lakh tonne through ex-situ management methods like stubble burning**.
 - The kind of **paddy grown in Punjab produces stubble as a byproduct while other states prefer to cultivate Basmati which produces less stubble**.

Why is paddy water intensive?

- The rice plant 'uses' water through **transpiration**, which cools the plant and drives the upward sap flow from roots to leaves which carries the essential nutrients.
- This is a **'real' water use** as the amount of water taken and released by the plant into the atmosphere through transpiration is not available for reuse by the same plant in the same growth cycle anymore.
- Therefore, water is ponded in rice fields to ensure there is plenty for the crop to take up.
- Besides evapotranspiration, outflows of water from a field are by seepage and percolation i.e. the downward and sideward water flows through the soil and buns out of the fields.
- This means that rice requires more water at the field level. However, it is more water-use efficient at the irrigation system level since these outflows can be captured and reused.
- According to pot experiments and greenhouse studies carried out at the **International Rice Research**

Institute (IRRI), rice plants cultivated under a range of water applications transpired 500–1,000 liters of water to produced 1 kg of rough (unmilled) rice¹¹.

- This was the high end of comparable cereals such as wheat and barley.

What has Punjab proposed to handle the crisis?

- **Replace paddy with other crops:** Punjab has proposed to **replace the water-intensive paddy with other crops like millets which are less water-intensive.**
- **Paddy is not a native crop to Punjab** and was introduced in the state by the Union government under the **Food Security Act** for use in the public distribution scheme.
- **Incentivize farmers:** Farmers must be incentivized to cultivate alternate crops similar to how paddy cultivation was incentivized.
- It has been proposed to **provide MSP on these crops** since imposing a ban on MSP on paddy would be counterproductive.
- **Need for a progressive solution:** It was pointed out that arresting marginal farmers for stubble burning was not a practical solution.
- The Advocate General claimed that farmers were hesitant to use technology to clear stubble because of the **large expenses associated with it despite the 50% subsidy provided by the government.**

Other solutions to solve stubble burning

- **Bio Enzyme-PUSA:** The **Indian Agriculture Research Institute** has developed a **bio-enzyme called PUSA** as a solution to stubble burning.
- It enables the decomposition of the stubble in 20–25 days and turns it into manure.
- This helps **increase organic carbon and soil health** while reducing fertilizer expenses for the next cropping cycle.
- **Use of pellets:** Paddy straw can be dried and converted into pellets.
- These **pellets can be mixed with coal for use in thermal power plants and industries as fuel.**
- This will reduce carbon emissions by reducing the use of coal.
- **Happy Seeder:** The **Happy Seeder** can be used as a substitute for stubble burning as it cuts and lifts straw and then deposits the straw over the sown area as mulch.
- **Chhattisgarh Innovative Model:** Chhattisgarh government has proposed to set up **gauthans or five-acre plots owned by each village.**
- Unused stubble or parali is collected through **parali daan (people's donations)** and turned into organic fertilizer by mixing cow dung with natural enzymes.
- **Miscellaneous:** Stubble can also be used as cattle feed, compost manure, roofing in rural areas, packing materials, for preparation of papers, and for preparation of bioethanol as well.

Conclusion

In conclusion, the Supreme Court's directives, emphasizing the need to address environmental challenges posed by paddy cultivation in Punjab, underscore the urgency for innovative solutions. Shifting to less water-intensive crops and incentivizing farmers present promising avenues for sustainable agricultural practices, reducing water depletion and air pollution.

Curbs on Fireworks Binding on all States: SC Why has the Government Issued a Directive on Deepfakes?

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Science & Technology, Cybersecurity, Deepfakes and Indian and Global Regulations Concerning Them

Context

- The Supreme Court of India has stated that its directives to reduce air and noise pollution from firecrackers are applicable to all states, not just the Delhi National Capital Region, especially with the approach of Deepavali.

Contextual Background

- Diwali celebrations have historically been linked to significant increases in air and noise pollution, especially in urban areas like the Delhi National Capital Region, due to the widespread use of firecrackers.
- The Supreme Court has previously issued orders aimed at minimizing the environmental impact of firecrackers. These orders were initially perceived to be specifically targeting the Delhi NCR region, which faces acute air pollution problems.
- The Supreme Court clarified that its orders to minimize pollution are not limited to the Delhi NCR but are binding on all states across India.
- The court's clarification comes just days before Deepavali, suggesting an urgent need to reinforce the rules to prevent a surge in pollution during the festival.

Supreme Court's Observations

- **Celebration vs. Environment:** Justice M.M. Sundresh, has expressed that while celebrations are important, they should not come at the cost of environmental health. This indicates a clear stance that the joy of festivities cannot override the need for environmental conservation.
- **Awareness and Behavior:** Justice A.S. Bopanna pointed out the paradox in awareness levels between children and adults. He noted that despite children being more aware and restrained due to education, adults tend to engage more in bursting crackers without considering the pollution they cause.
- **Circumventing Restrictions:** The court observed that given a time limit, like 10:30 p.m., people rush to burst all their crackers beforehand, focusing on using up

their stock rather than adhering to the spirit of the restriction.

- **Importance of Sensitization:** The court underlined the need for sensitizing the population about the importance of reducing fireworks to mitigate pollution. This suggests a push for public education and consciousness-raising efforts.
- **Hope for Improved Consciousness:** Reflecting a positive outlook, the court, through Justice Sundresh's remark "We live on hope," implies an expectation that societal attitudes towards environmental protection will improve.

Major Chemicals/Pollutants Used in Fireworks

Chemicals	Pollutants
• Gunpowder (Black Powder) • Metal Salts and Oxides - Strontium salts (e.g., strontium carbonate) for red color - Barium salts (e.g., barium nitrate) for green color - Copper salts (e.g., copper chloride) for blue color - Sodium salts (e.g., sodium nitrate) for yellow color - Calcium salts (e.g., calcium chloride) for orange color - Magnesium or aluminum for white or silver sparks • Binding Agents (Dextrin) • Chlorates and Perchlorates (Potassium chlorate (KClO₃) and potassium perchlorate (KClO₄)) • Stabilizers (potassium nitrate) • Plasticizers (PVC (polyvinyl chloride))	• Particulate Matter (PM) • Toxic Metals • Combustion of firecrackers produces gases such as: - sulfur dioxide (SO₂) - carbon dioxide (CO₂) - carbon monoxide (CO) - nitrogen oxides (NO_x) • Noise Pollution • Unburned Residues • Dioxins and Furans

Responsibilities of Individuals

- **Awareness and Education:** Individuals should educate themselves and others about the harmful effects of firecrackers on air quality and noise levels.
- **Moderation:** Celebrations can occur but should be with moderation. Individuals should limit the use of firecrackers or opt for eco-friendly alternatives that are less harmful to the environment.

- **Compliance with Time Restrictions:** Respecting and adhering to the time restrictions set by authorities for bursting firecrackers can greatly reduce noise pollution and its associated discomforts.
- **Collective Action:** Cultivating a collective consciousness about the environment by encouraging communities to celebrate with fewer or no firecrackers.
- **Public Campaigns and Petitions:** Participate in or initiate campaigns that support the ban or limitation of firecrackers, and sign petitions that advocate for environmentally friendly practices.
- **Reporting Violations:** If there are clear violations of the restrictions imposed by the court, individuals should report them to the authorities for appropriate action.
- **Personal Responsibility:** Taking personal responsibility for one's actions and their impact on the environment, understanding that environmental protection is not solely the government's responsibility.

Responsibilities of Government

- **Enforcement:** Enforcing the Supreme Court's orders strictly and ensuring that violators are penalized.
- **Public Awareness Campaigns:** Organizing awareness campaigns through various media to educate the public about the harmful effects of firecrackers and promoting alternative ways to celebrate festivals.
- **Policy Implementation:** Creating and implementing policies that regulate the production, sale, and use of firecrackers, possibly incentivizing the manufacture and purchase of green crackers or other eco-friendly alternatives.
- **Research and Development:** Supporting the development of less polluting firecrackers or alternative celebration tools through research funding and subsidies.
- **Setting and Monitoring Quality Standards:** Establishing and monitoring standards for permissible noise and emission levels for firecrackers.
- **Infrastructure for Monitoring:** Developing infrastructure to continuously monitor air and noise pollution levels, especially during festive seasons.
- **Healthcare Preparedness:** Ensuring the healthcare system is prepared for any spike in respiratory and other health issues that may arise due to increased pollution.
- **Legal Framework:** Crafting a robust legal framework that empowers local authorities to act decisively and ensures accountability.
- **Inter-departmental Coordination:** Coordinating between various departments and levels of government to enforce rules effectively.
- **Community Engagement:** Engaging with community leaders and groups to promote compliance with pollution-curbing measures at the grassroots level.

Conclusion

The Supreme Court's orders are binding for all states, emphasizing the inclusive responsibility for environmental conservation. It highlights that states should enforce measures to curb pollution year-round, not just during festive seasons.

UPSC Previous Year Practice Question

Q. Discuss in detail the photochemical smog emphasizing its formation, effects and mitigation. Explain the 1999 Gothenburg Protocol. **(2022)**

Q. Describe the key points of the revised Global Air-Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve these revised standards? **(2021)**

Q. What are the key features of the National Clean Air Programme (NCAP) initiated by the Government of India? **(2020)**

MCQs

Q. In the context of WHO consider the Air Quality Guidelines, consider the following statements: (UPSC 2022)

1. The 24-hour mean of PM_{2.5} should not exceed 15 $\mu\text{g}/\text{m}^3$ and annual mean of PM _{2.5} should not exceed 5 $\mu\text{g}/\text{m}^3$.

In a year, the highest levels of ozone pollution occur during the periods of inclement weather.

3. PM₁₀ can penetrate the lung barrier and enter the bloodstream.

4. Excessive ozone in the air can trigger asthma.

Which of the statements given above are correct?

- (a) 1, 3 and 4
- (b) 1 and 4 only
- (c) 2, 3 and 4
- (d) 1 and 2 only

Answer: (b)

Q. How is the National Green Tribunal (NGT) different from the Central Pollution Control Board (CPCB)? (UPSC 2018)

1. The NGT has been established by an Act whereas the CPCB has been created by an executive order of the Government.

2. The NGT provides environmental justice and helps reduce the burden of litigation in the higher courts whereas the CPCB promotes cleanliness of streams and wells, and aims to improve the quality of air in the country.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (b)

Climate Solution For Climate Polycrisis

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords:

Environmental Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment, Climate change, Carbon Accounting System, Climate Polycrisis, Issues Related To Carbon Accounting and Concerns Related To Climate Change

Context

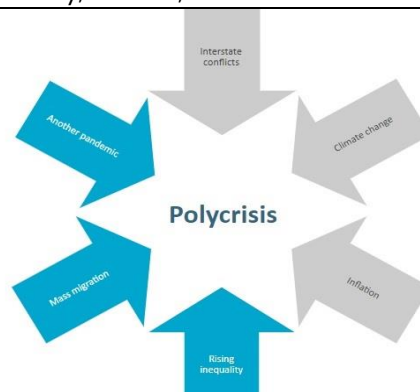
- This article is about the **"climate polycrisis," which refers to the interconnected and compounding crises related to climate change** affecting various sectors and domains.

What is Climate Polycrisis?

- The term **"climate polycrisis" refers to the complex and interconnected crises that arise from climate change.**
- It encompasses a wide range of challenges and impacts, both physical and societal, resulting from climate change.
- These crises **extend beyond environmental concerns and include social, economic, and political challenges.**
- Hence, the climate polycrisis is a multifaceted and intertwined set of problems that stem from the effects of climate change, affecting various sectors and domains of society.
- In India**, it can be seen that the interconnections between seemingly different sectors such as energy, infrastructure, health, migration and food production are being impacted by climate change.

Example:

Extreme temperatures can lead to wildfires that can release stored carbon, contributing to further climate change. Climate change can lead to extreme climatic events such as drought and floods. Resource scarcity in such situations can lead to displacement, and economic hardships. Which can contribute to political instability, conflict, and social unrest in affected region



The Need for a Holistic Approach

- Addressing the climate polycrisis requires a holistic approach that considers diverse perspectives and**

priorities of stakeholders, while ensuring resilience, equity, and justice. Sectoral solutions can lead to unintended consequences in such a complex crisis.

- To combat the climate polycrisis, there is a **need for a profound transformation that establishes a new economy sensitive to the planet.**
- Just as digital infrastructure enables new startups and public services, it involves the creation of **"carbon infrastructure" that integrates carbon considerations into policy-making at all levels, from households to nations.** This approach aims to build a sustainable future carbon regime.

How can a Carbon Infrastructure be built?

- **Measuring Carbon Emissions:** The first step in building a carbon infrastructure is to measure carbon emissions. This involves quantifying the amount of greenhouse gases, such as carbon dioxide (CO₂), that are released into the atmosphere.
- **Carbon Accounting:** This accounting system is designed to track carbon emissions, carbon removal efforts (like afforestation and carbon capture), carbon storage (such as in forests or soil), and carbon offsetting (compensating for emissions through actions like investing in renewable energy projects).
- **Carbon Books:** Just as businesses and individuals maintain financial records to track their income, expenses, and assets, the proposed carbon infrastructure encourages entities to keep "carbon books" alongside their financial records. This allows for a more comprehensive understanding of an entity's carbon footprint.
- **Visibility of Carbon Flows:** The primary goal of building a carbon infrastructure is to make the flows of carbon emissions and removals visible and transparent. This visibility enables better decision-making and policy formulation. It also allows for the identification of carbon surpluses and deficits.
- **Mandatory Reporting:** Under the carbon infrastructure, it would be mandatory for businesses and individuals to report their carbon emissions and removal activities. This reporting would create a comprehensive picture of how carbon moves within society.
- **Policy and Target Setting:** With a robust carbon infrastructure in place, policymakers can set targets for emissions reductions and track progress toward these goals. It facilitates evidence-based decision-making and supports the development of policies aimed at reducing carbon emissions.

Why is there a need for National Carbon Accounting (NCA)?

- The lack of such tracking **currently hinders the implementation of a progressive carbon tax.**
- An NCA would **require businesses and individuals to report their carbon emissions, making carbon circulation visible.** It could lead to the creation of a

carbon budget, parallel to economic GDP, which countries aim to reduce.

- This system **could help India achieve its net-zero emissions goal by 2070 and foster new economic and societal models** focused on ecological sustainability.

How is National Carbon Accounting a Polysolution for Climate Polycrisis?

- **Comprehensive Understanding:** NCA provides a comprehensive understanding of the carbon emissions and carbon flows within a nation, from individual citizens and households to businesses and industries.
- **Accountability:** By making individuals and entities accountable for their carbon emissions and carbon footprint, NCA encourages responsible behavior. It can help identify major sources of emissions and encourage carbon reduction efforts at all levels, from individuals to businesses and government entities.
- **Informed Decision-Making:** It offers a data-driven basis for policy and decision-making. It allows policymakers to set clear carbon reduction targets, allocate resources effectively, and make informed choices about carbon taxes, subsidies, and incentives.
- **Progress Tracking:** With NCA, it becomes possible to track progress toward carbon reduction goals over time. This helps in assessing the effectiveness of climate policies and initiatives and making necessary adjustments.
- **Carbon Taxation:** It can facilitate the implementation of a progressive carbon tax system. This means that individuals and businesses with higher carbon emissions would pay more in taxes, incentivizing carbon reduction measures and promoting sustainability.
- **Integration with Economic Goals:** NCA can help integrate carbon reduction goals with economic development objectives. This ensures that economic growth is sustainable and doesn't come at the expense of exacerbating climate change.

Conclusion

- National Carbon Accounting is a holistic approach that addresses the complex and interconnected nature of the climate polycrisis.
- If adopted globally, NCA can facilitate international cooperation on climate action. Standardized carbon accounting methodologies would allow nations to compare their emissions and collaborate on global climate agreements more effectively.
- It aligns with the overarching goal of reducing carbon emissions and achieving net-zero targets, which is critical in addressing the climate polycrisis.

MCQ

Question: The increasing amount of carbon dioxide in the air is slowly raising the temperature of the atmosphere, because it absorbs: (UPSC 2012)

- the water vapor of the air and retains its heat
- the ultraviolet part of the solar radiation
- all the solar radiations
- the infrared part of the solar radiation

Answer: (d)

Adaptation Gap Report 2023 - Funding to Developing Nations Declines 15% Despite International Pledges, Rising Costs

Priority: Medium



Primary Source: Down To Earth

Syllabus Relevance & Important Keywords:

Conservation, environmental pollution and degradation, environmental impact assessment, Adaptation Gap Report, Adaptation Financing, Efforts Towards Adaptation Financing and Associated Challenges

Context

- The **2023 Adaptation Gap Report** highlights a **15% decline** in climate adaptation finance to developing nations, contrary to pledges made at **COP26**.
- Public multilateral and bilateral sources have reduced funding **to around \$21 billion in 2021** despite their commitment to double adaptation finance support **to \$40 billion annually by 2025**.

What is Adaptation Financing?

- Adaptation financing** refers to the **flow of funds to developing countries** to help them adapt to the adverse effects of climate change.
- It is a key element of the broader **climate finance landscape**, which includes investments in both **mitigation** (to reduce greenhouse gas emissions and halt global warming) and **adaptation** (to deal with the impacts of climate change that are already happening or are expected to occur).

Key Findings of the Report

1) Decline in Funding

- Current Financing State:** The report by UNEP shows a significant drop in funding from developed countries.
- Domestic Budgets:** Developing nations primarily rely on their own government budgets for climate adaptation, ranging from 0.2% to over 5%.

2) Inadequate Support

- Gap in Financing:** Domestic and private funding sources are insufficient to cover the adaptation finance gaps, particularly in the poorest nations.
- Adaptation Efforts:** Despite the funding challenges, 85% of countries have national-level adaptation plans in place.

3) Finance Gap and Needs

- Global Adaptation Finance Gap:** The current annual gap is between \$194–366 billion.

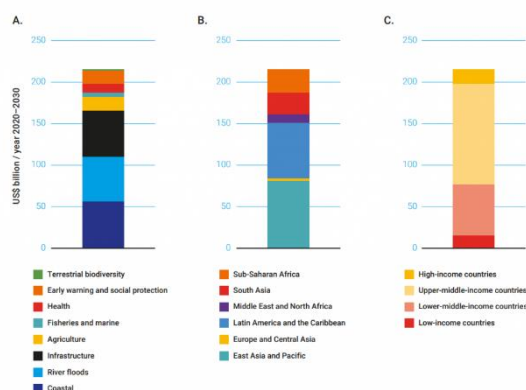
- Developing Countries' Needs:** These countries require 10–18 times more than what they receive in international public finance.
- Cost of Adaptation:** Annually, developing nations need \$215 billion for adaptation measures.

4) Regional Analysis

- Regional Costs:** East Asia, the Pacific, Latin America, and the Caribbean face the highest adaptation costs.
- Income and Adaptation Costs:** Low-income countries have a higher adaptation cost burden relative to their GDP compared to middle-income countries.

5) Costs for Vulnerable Nations

- Least Developed and Small Island Nations:** These countries have an estimated cost of \$25 billion and \$4.7 billion annually, respectively.



(Estimated Cost of Adaptation for Developing Countries by Sector (A), Region (B) and Income Group (C) for 2030)

What are the Global Efforts Towards Climate Adaptation Financing?

International Agreements and Commitments

- The **Paris Agreement**, adopted in 2015, requires all parties to plan and implement adaptation efforts and has called for a balance between adaptation and mitigation financing.
- The **Green Climate Fund (GCF)**, established within the framework of the **UNFCCC**, is one of the primary mechanisms for transferring money from developed countries to developing nations to assist in adaptation and mitigation practices.

Climate Conferences and Pledges

- Annual **UN Climate Change Conferences (COPs)** serve as a platform where countries discuss and negotiate commitments, including financing for climate adaptation.
- The pledge made at **COP26 in Glasgow** to double adaptation finance by 2025 from 2019 levels is an example of the commitments made in these international forums.

Multilateral Development Banks (MDBs)

- Institutions such as the **World Bank**, **African Development Bank**, and **Asian Development Bank** provide funding for climate change adaptation projects through loans, grants, and other financial instruments.

Bilateral Aid

- Developed countries often provide adaptation financing to developing countries through bilateral agreements, either directly or through agencies such as the **United States Agency for International Development (USAID)** or the **UK's Foreign, Commonwealth & Development Office (FCDO)**.

Private Sector Involvement

- Increasingly, there is an acknowledgment of the need for private sector investment in adaptation projects. Efforts to engage private investors include green bonds, insurance schemes, and public-private partnerships.

National Adaptation Plans and Strategies

- Developing countries are encouraged to formulate and implement **National Adaptation Plans (NAPs)** that articulate their priority adaptation needs.

Technology Transfer

- Technology Mechanism under the **UNFCCC** aims to facilitate the transfer of technology and know-how to developing countries to help them adapt to climate change.

Capacity-Building and Knowledge Sharing

- Various international organizations and networks focus on building the capacities of developing nations to plan for and respond to climate impacts.
- Initiatives include knowledge exchange programs, workshops, and training sessions.

Innovative Financing Mechanisms

- Efforts are being made to develop new financial instruments and mechanisms that can help leverage additional funds for adaptation, such as **climate risk insurance, catastrophe bonds, and resilience bonds**.

Civil Society and NGO Engagement

- NGOs and civil society organizations play a critical role in advocacy, project implementation, and monitoring the effective use of adaptation finance.

Benefits of Adaptation Financing

- Reducing Vulnerability:** Adaptation financing helps communities, sectors, and countries become more resilient to the impacts of climate change by reducing their vulnerability to extreme weather events, sea-level rise, and other climate-related risks.
- Cost-Effectiveness:** Investing in adaptation measures can be significantly more cost-effective in the long term than bearing the full costs of climate impacts. For instance, building flood defenses is far less expensive than the economic losses that would result from unmitigated flood damage.
- Sustainable Development:** Effective adaptation contributes to sustainable development by ensuring that climate risks are accounted for in the planning and execution of development projects.
- Food Security:** Adaptation financing in agriculture can help ensure food security by developing more resilient

agricultural practices and crop varieties that can withstand changing climate conditions.

- Protecting Biodiversity:** Financing adaptation actions can help protect ecosystems and biodiversity that are threatened by climate change, maintaining the services they provide to humanity.
- Health Benefits:** Climate adaptation measures in public health can reduce the burden of climate-sensitive diseases and health conditions, and protect communities from the health impacts of extreme weather events.
- Economic Stability:** By reducing the impacts of climate change, adaptation finance can contribute to economic stability in vulnerable regions, helping to prevent loss of livelihoods and displacement.
- Infrastructure Resilience:** Building resilient infrastructure with adaptation finance can ensure that roads, buildings, and other critical infrastructure can withstand the impacts of climate change.
- Global Collaboration:** Adaptation finance fosters international cooperation, as it often involves partnerships between developed and developing nations, international organizations, and the global community.

Challenges in Adaptation Financing

- Insufficient Funds:** The amount that is currently being allocated for climate adaptation is far below what is needed, especially in the most vulnerable countries.
- Unfulfilled Pledges:** Developed countries have frequently failed to meet their funding pledges, which leads to unpredictability and insufficient financial flows for adaptation initiatives.
- Green Climate Fund (GCF),** where developed countries committed to contributing \$100 billion annually to support climate change mitigation and adaptation efforts in developing nations. Despite repeated promises, many developed countries have fallen short of meeting these financial commitments.
- Imbalance Between Adaptation and Mitigation Financing:** There is a significant imbalance in favor of mitigation over adaptation in the allocation of climate finance, despite the increasing importance of adaptation for many vulnerable regions.
- Complex Access Procedures:** Accessing adaptation funds can be complicated and bureaucratic, making it difficult, especially for the poorest and most vulnerable nations, to obtain the necessary finance.
- Lack of Private Sector Engagement:** There is a challenge in attracting private investment in adaptation projects, which are often seen as less profitable than mitigation projects like renewable energy.
- Limited Capacity to Plan and Implement:** Developing countries may lack the institutional and technical capacities required to effectively plan, apply for, and implement adaptation projects.

- **Transparency and Accountability:** There are concerns about the transparency and accountability of how adaptation finance is used, which can lead to inefficiencies and corruption.
- **Climate and Economic Shocks:** Global economic downturns, pandemics, or large-scale climate disasters can suddenly redirect attention and resources away from long-term adaptation needs.
- **Measuring Adaptation Outcomes:** It is challenging to measure the effectiveness of adaptation interventions, which makes it difficult to assess and justify the allocation of funds.
- **Integrating Adaptation into Development:** There is a need for better integration of adaptation into broader development strategies and financial planning, which has been difficult to achieve.

Conclusion

- The widening adaptation finance gap indicates years of neglect, with affluent nations compounding the issue with continued fossil fuel investments.
- Urgent need for policymakers to consider the Adaptation Gap Report seriously and increase finance to protect low-income countries from the detrimental effects of climate change.

UPSC Previous Year Practice Question

Q. Discuss global warming and mention its effects on the global climate. Explain the control measures to bring down the level of greenhouse gases which cause global warming, in the light of the Kyoto Protocol, 1997. **(2022)**

Q. Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by India in this conference? **(2021)**

Q. Should the pursuit of carbon credit and the clean development mechanism set up under UNFCCC be maintained even though there has been a massive slide in the value of carbon credit? Discuss with respect to India's energy needs for economic growth. **(2014)**

MCQs

Q. Consider the following statements: (UPSC 2023)

Statement-I: Carbon markets are likely to be one of the most widespread tools in the fight against climate change.

Statement-II: Carbon markets transfer resources from the private sector to the State.

Which one of the following is correct in respect of the above statements?

- Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- Statement-I is correct but Statement-II is incorrect
- Statement-I is incorrect but Statement-II is correct

Answer: (c)

Q. "Climate Action Tracker" which monitors the emission reduction pledges of different countries is a: (UPSC 2022)

- Database created by coalition of research organisations
- Wing of "International Panel of Climate Change"
- Committee under "United Nations Framework Convention on Climate Change"
- Agency promoted and financed by United Nations Environment Programme and World Bank

Answer: (a)

Q. The 'Common Carbon Metric', supported by UNEP, has been developed for: (UPSC 2021)

- assessing the carbon footprint of building operations around the world
- enabling commercial farming entities around the world to enter carbon emission trading
- enabling governments to assess the overall carbon footprint caused by their countries
- assessing the overall carbon foot-print caused by the use of fossil fuels by the world in a unit time

Answer: (a)

Q. "Momentum for Change: Climate Neutral Now" is an initiative launched by: (UPSC 2018)

- The Intergovernmental Panel on Climate Change
- The UNEP Secretariat
- The UNFCCC Secretariat
- The World Meteorological Organisation

Answer: (c)

Q. The term 'Intended Nationally Determined Contributions' is sometimes seen in the news in the context of: (UPSC 2016)

- pledges made by the European countries to rehabilitate refugees from the war-affected Middle East
- plan of action outlined by the countries of the world to combat climate change
- capital contributed by the member countries in the establishment of Asian Infrastructure Investment Bank
- plan of action outlined by the countries of the world regarding Sustainable Development Goals

Answer: (b)

Indian Society (GS Paper Prelims) & GS Paper I(Main)

Nagaland Nod for 33% Quota for Women in Urban Local Bodies

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Social Justice, Mechanisms, laws, institutions and Bodies constituted for the protection and betterment of vulnerable sections,

Women's Reservation, Urban Local Bodies, 74th Constitutional Amendment Act

Context

- Recently, Nagaland's Legislative Assembly passed a bill to **reserve 33% of seats in urban local bodies (ULBs) for women**.

About the Bill

- The bill addresses a longstanding contentious issue, facilitating municipal elections in Nagaland after a 20-year hiatus.
- The bill was introduced in response to opposition and calls for a boycott from civil society organizations and tribal bodies.
- The **Nagaland Municipal Bill, 2023**, excludes provisions related to taxes on land and buildings.
- The earlier provision for reserving **one-third** of the **ULB chairperson** positions for women is not included in the new bill.

Background

- 2004:** For the first time civic body election was held in the state in 2004, in accordance with the **Nagaland Municipal Act of 2001**.
- 2006:** In 2006, the **Nagaland Municipal Act of 2001** was amended to include a **33 per cent reservation for women** in line with the 1992 Constitutional Amendment Act.
- Many Naga groups contend that the reservations are in contravention with Naga customary laws as enshrined in **Article 371(A)** of the Constitution.
- 2011:** In 2011 High Court directed the government to hold the elections giving **33 percent reservation** for women.
- However, the **Nagaland Assembly, in 2012**, adopted a resolution rejecting women's reservation in ULBs.
- In 2017, as the Nagaland government tried holding the elections as per a Supreme Court and High Court directive (to hold elections with 33 per cent reservation for women), the state was convulsed by violent protests that led to two deaths, and ouster of the then chief minister **T R Zeliang**.

What was the hindrance?

- Apex tribal bodies in Nagaland opposed this reservation, claiming it infringed on Nagaland's special rights under **Article 371(A)** of the Indian Constitution.
- This article grants special status to Nagaland, acknowledging the unique customs and social practices of the Naga people.
- However, these bodies eventually accepted the reservation, marking a significant shift in local political and social attitudes.

What are Urban Local Bodies (ULBs)?

- Urban Local Bodies (ULBs)** refer to specific governmental entities that operate at the urban level, primarily tasked with the administration and governance of towns, cities, or any other urban area.

- These bodies are instrumental in managing the daily municipal affairs and providing civic amenities to the urban population.
- ULBs come in various forms, such as **municipal corporations, municipalities, and town councils**, depending on the size and population of the urban area they govern.
- They play a crucial role in urban planning, development, and maintaining public health and hygiene standards.
- Their operation is guided by **specific laws and regulations**, and they have the authority to collect taxes and raise funds for carrying out their responsibilities.

What is Article 371(A)?

- Article 371(A)** of the Indian Constitution is a special provision that grants certain special rights and privileges to the state of **Nagaland**.
- This article is particularly significant because it acknowledges and protects the unique cultural heritage and social practices of the Naga people.
- One of the key aspects of Article 371(A) is that it gives the Nagaland Legislative Assembly the power to decide on matters related to **Naga customary law and procedure**, including those related to land and its resources.

What is the 74th Constitutional Amendment Act?

- The 74th Constitutional Amendment Act, passed in **1992**, was a significant reform in Indian governance, focusing on the **decentralization of power to urban local bodies (ULBs)**.
- This amendment aimed to strengthen democracy at the **grassroots level** in urban areas and bring about efficient urban governance.
- It provides for the constitution of three types of municipalities:
 - Nagar Panchayats** for areas in transition from a rural area to an urban area.
 - Municipal Councils** for smaller urban areas.
 - Municipal Corporations** for larger urban areas.
- The Act mandates the reservation of seats for **Scheduled Castes (SCs) and Scheduled Tribes (STs)** in proportion to their population.
- It also requires the reservation of not less than **one-third of the total seats for women**, including the seats reserved for women belonging to SCs and STs.
- The Act specifies a **five-year term** for municipalities. However, a State Government can dissolve a municipality before the completion of its term, subject to certain conditions.

Conclusion

- The bill marks a significant step towards gender equality in Nagaland's urban governance.

- With the bill's passage, Nagaland is poised to conduct municipal elections, addressing a critical gap in local governance since 2004.

UPSC Previous Year Practice Question

Q. Discuss the contributions of civil society groups for women's effective and meaningful participation and representation in State Legislatures in India. **(2023)**

Q. Explain the constitutional perspective of Gender Justice with the help of relevant Constitutional Provisions and case laws. **(2023)**

Q. Discuss the desirability of greater representation to women in the higher judiciary to ensure diversity, equity and inclusiveness. **(2021)**

Q. "The reservation of seats for women in the institutions of local self- government has had a limited impact on the patriarchal character of the Indian Political Process." Comment. **(2019)**

Q. What are the continued challenges for Women in India against time and space? **(2019)**

MCQs

Q. Given below are two statements, one labeled as Assertion(A) and the other labeled as Reason (R) **(UPSC 1997)**

Assertion (A): Reservation of thirty-three percent of seats for women in Parliament and State Legislature does not require any Constitutional amendment.

Reason (R): Political parties contesting elections can allocate thirty-three percent of seats they contest to women candidates without any Constitutional amendment.

In the context of the above two statements, which one of the following is correct?

- Both A and R are true and R is the correct explanation of A
- Both A and R are true but R is not the correct explanation of A
- A is true but R is false
- A is false but R is true

Answer: (d)

Economy (GS Paper Prelims) & GS Paper III (Main)

Improving India's Logistics Performance Index (LPI) Ranking

Priority: High



Primary Source: PIB

Syllabus Relevance & Important Keywords:

Infrastructure: Energy, Ports, Roads, Airports, Railways etc., Important International institutions, agencies and fora-their structure, mandate, India's Performance on the Logistics Performance Index and Measures to Improve it

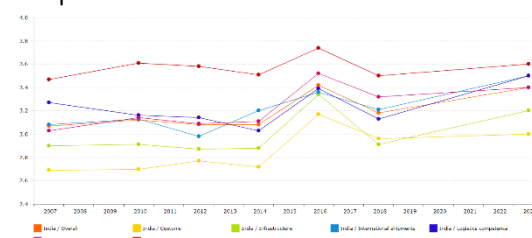
Context

- Recently, India's remarkable ascent in the **2023 Logistics Performance Index (LPI)** published by the

World Bank reflects a strategic blend of modernization, digitalization, and robust governmental initiatives.

How did India perform on the 2023 Logistics Performance Index?

- Current Rank:** In the 2023 edition of the LPI, India was ranked **38th out of the 139 countries which were assessed.**
- India's performance had improved from previous editions in which it was ranked **44th in 2018 and 54th in 2014.**
- According to the report:
 - Infrastructure:** India's rank rose five places from 52nd in 2018 to 47th in 2023.
 - International shipments:** India's rank improved from 44th in 2018 to 22nd in 2023.
 - Logistics competence and equality:** India's position improved by 4 places from 48th to 44th.
 - Shipping timelines:** India's ranking rose by 17 places to the 35th position.
 - Tracking and tracing:** India's rank fell from 38th rank to 41st in 2023.
 - Customs:** India's performance dropped from the 40th position in 2018 to 47th in 2023.



What is the Logistics Performance Index?

- The **Logistics Performance Index (LPI)** was an interactive benchmarking tool that has been developed by the **World Bank** to assess opportunities and challenges faced in trade and logistics.
- It also measures the ease of establishing supply chains and the structural factors related to it like border control, quality of logistics, and trade and transit infrastructure.
- It also makes suggestions to improve the performance of various countries in logistics.
- The index measures Logistics performance across six parameters:
 - Customs performance**
 - Infrastructure quality**
 - Ease of arranging shipments**
 - Logistics services quality**
 - Tracking and tracing of shipments**
 - Shipment timelines**
- The index was introduced by the **World Bank in 2010** and was published **every two years**. However, it was delayed in 2020 on account of the pandemic and was published in 2023 following changes in the procedure of the Index.

- **LPI 2023 has measured 139 countries** and has used shipment tracking datasets to measure the speed of trade.

What are the reasons behind India's improvements?

- According to the report, **modernization and digitalization** are the major reasons for developing countries like India performing better than some developed nations.
- The government has also invested in **technological reform** to improve the country's performance in terms of timelines and handling of international shipments.
- Between March and October 2022, the average **dwell time** for containers between India and Singapore was three days.
- In comparison, advanced nations such as the U.S.A. and Germany took around seven and ten days respectively.
- Emerging economies like India have used technological reform to improve tracking of consignments and dwell times.
- For example, the introduction of cargo tracking technology at Vishakapatnam Port led to a drop in dwell times from 32.4 days (in 2015) to 5.3 days (in 2019).
- **Government initiatives:**
 - Since 2015 India has invested in the development and improvement of trade-related hard and soft infrastructure connecting port gateways on both coasts to economic hubs in the country's hinterland.
 - A **supply chain visibility platform has been developed through a public-private partnership in order to reduce delays.**
 - For example, the **NICDC Logistics Data Services** applied **RFID tags to containers and offered consignees end-to-end tracking of the supply chain** to improve performance on the tracking and tracing parameter.
 - The **PM Gati Shakti initiative** was launched in October 2021 as a National Master Plan for multimodal connectivity. It has aimed at reducing the costs involved with the logistics sector and thus boosting the economy by 2024-25. Projections suggested that around ₹10 lakh crore per annum could be saved by improving logistics efficiency.
 - The **National Logistics Policy** was introduced in 2022 and was aimed at solving transport-related challenges, ensuring speedier last-mile delivery, efficient transport and saving time and costs of logistics borne by the manufacturing sector.

What measures have been taken to improve India's LPI ranking?

- **Dedicated cell:** The LPI dedicated cell formed in the eleven Stakeholder Ministries/Departments meets on a fortnightly basis to assess measures taken and outcomes achieved across the LPI's parameters.

Stakeholder departments/Ministries

- Land Ports Authority of India (LPAI)
- Union Ministry of Civil Aviation
- Union Ministry of Railways
- Union Ministry of Port Shipping and Waterways (MoPSW),
- Union Ministry of Coal
- Union Ministry of Civil Aviation (MOCA),
- Central Board of Indirect Taxes and Customs (CBIC),
- Union Ministry of Steel
- Department of Commerce
- Directorate General of Foreign Trade (DGFT)
- National Industrial Corridor Development Corporation Limited (NICDC).

- **Land Port Management System:** The **Land Ports Authority of India (LPAI)** has implemented a **Land Port Management System (LPMS)** to digitize operations.
 - It will also facilitate a **secure electronic flow of information** between all stakeholders at Integrated check posts (ICPs).
 - **Advantages:**
 - The dwell time of cross-border movements, both trade and passenger, has reduced from 57 days to less than 24 hours.
 - Shipment delivery has become timely
 - Customs and border management clearance has become more efficient.
- **Railways:** Indian Railways has implemented numerous measures to improve India's performance across the six parameters of the LPI.
 - **100% electrification of railway tracks**
 - Enhancement of speed and volume of freight transport by increasing CAPEX to ₹2.6 lakh crore in FY24.
 - Implementation of **Eastern and Western dedicated freight corridors**
 - Transit time and inventory costs to customers have been reduced by increasing the average speed of freight trains
 - **Rail containerization** at ports and freight terminals is expected to lead to rail container loading increasing by three times from 80MMT in FY22-23 by FY31.
 - In order to promote **multi-modal connectivity**, the Ministry of Railways has attempted to examine the feasibility of railway siding at land ports.
- **Airports:**
 - Airport capacity building including construction of upgraded facilities such as at Kolkata.
 - An investment of ₹1200 crores is being planned for an air cargo village of 37 acres to be commissioned by Dec 2024.
- **Ports:** Various initiatives have been undertaken by the Department of Ports to improve India's logistics efficiency.
 - Automation of weighbridges
 - Improved scanning facilities at ports
 - Increased DPD/ DPE share to 80% by rail

- Creation of Standard Operating Procedures (SoPS) to simplify processes across all ports in the country.
- **Scientific analysis:** The CBIC has established a **Custom Revenue Control Laboratory** at Guwahati to assist in field formations in chemical analysis of samples of various trade commodities.

Way forward

- India's logistics efficiency can be improved through targeted intervention alongside the above-mentioned initiatives.
- The implementation of good practices will help convey India's commitment to objective-based assessment of LPI.
- Therefore, all stakeholders should share initiatives, best practices, and interventions to improve their logistics efficiency.
- A timeline-based action plan must be prepared by stakeholder departments in coordination
- In order to improve the perception of the logistics sector in India, a systematic approach must be adopted to raise awareness about initiatives to improve logistics efficiency.

UPSC Mains Practice Questions

Q.1) The basis of providing urban amenities in rural areas (PURA) is rooted in establishing connectivity. Comment. (UPSC GS2 2013)

Q.2) "Investment in infrastructure is essential for more rapid and inclusive economic growth. "Discuss in the light of India's experience. (UPSC GS3 2021)

Q.3) e-governance, as a critical tool of governance, has ushered in effectiveness, transparency, and accountability in governments. What inadequacies hamper the enhancement of these features? (UPSC GS2 2023)

Q.4) Bring out the socio-economic effects of the introduction of railways in different countries of the world. (UPSC GS1 2023)

MCQs

Question: In which one of the following groups are all four countries members of G20? (UPSC CSE 2020)

- (a) Argentina, Mexico, South Africa and Turkey
- (b) Australia, Canada, Malaysia and New Zealand
- (c) Brazil, Saudi Arabia and Vietnam
- (d) Indonesia, Japan, Singapore and South Korea

Answer: (a)

Question: Consider the following pairs:

Regions often mentioned in the news	Country
1. Anatolia	Turkey
2. Amhara	Ethiopia
3. Cabo Delgado	Spain
4. Catalonia	Italy

How many pairs given above are correctly matched? (UPSC CSE 2022)

- (a) Only one pair

- (b) Only two pairs
- (c) Only three pairs
- (d) All four pairs

Answer: (b)

Question: A present group of nations known as G-8 started first as G-7. Which one among the following was not one of them? (UPSC CSE 2009)

- (a) Canada
- (b) Italy
- (c) Japan
- (d) Russia

Answer: (d)

Concerns Related to Edible Oil Imports

Priority: High

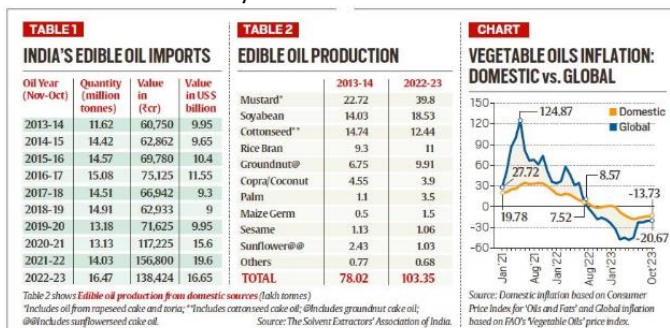


Primary Source: Indian Express

Syllabus Relevance & Important Keywords: Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment, Food processing and related industries in India- scope' and significance, location, upstream and downstream requirements, supply chain management, Concerns Related to the Production and Export of Edible Oils in India

Context

- The **production and import trends of edible oils** in India have become a focal point of economic discussions, given the significant impact they wield on the nation's economy.
- In the face of substantial price volatility over the past few years, a comprehensive analysis reveals a growing reliance on imports, with implications for domestic production and economic stability.
- This article delves into the intricate dynamics of **edible oil imports and production in India**, shedding light on the associated challenges and proposing strategies for a resilient way forward.



Trends in edible oil imports and production in India

Imports

- Over the last ten years, **India's edible oil imports have increased by 1.5 times while the value of the imports has doubled in rupee terms in the same period.**
- According to the Solvent Extractors Association of India, the **imports of vegetable oils grew to 16.5 million**

tonnes (mt) by October 2023 from 14 mt in the 2021-22 oil year.

- However, the value of imports fell in both dollar (from \$19.6 billion to \$16.7 billion) and rupee (Rs 156,800 crore to Rs 138,424 crore) terms due to the fall in global prices.
- **Between 2012-14 and 2022-23, Indian edible oil imports have risen from 11.6 mt to 16.5 mt.**
- Edible oil imports in 2022-23 consisted of:
 - **Palm:** 9.8 mt from **Indonesia, Malaysia, and Thailand**
 - **Soyabean:** 3.7 mt from **Argentina, and Brazil**
 - **Sunflower:** 3 mt from **Russia, Ukraine, and Argentina**
- The majority of imports are crude oils which are shipped in tankers and processed in giant refineries. Refining consists of
 - **De-gumming** i.e. removing gums, waxes, and other impurities
 - **Neutralization** i.e. removing free fatty acids
 - **Bleaching** i.e. removing color
 - **De-odourisation** i.e. removing volatile compounds
- Import of edible oils is under **Open General License (OGL)**. In order to harmonize the interests of farmers, processors, and consumers, the Government reviews the duty structure of edible oils from time to time.

Production

- **In 2022-23, domestic production accounted for just 38.6% of the total availability of edible oils in India (26.8 mt).**
- Edible oil produced from domestically grown oilseeds and other alternatives such as **cottonseed, rice bran, and maize** were around 10.3 mt.
- In 2004-05, domestic output (7 mt) exceeded imports (5 mt).
- This meant that **India had a self-sufficiency ratio of around 60% in edible oils.**
- In the previous year, the availability of edible oils exceeded actual consumption requirements of 24-25 mt.
- **According to estimates, availability is estimated to reach 30-32 mt by 2029-30.**
- However, this could mean imports rising beyond 20mt if efforts are not undertaken to boost domestic production.
- In such a situation, India's self-sufficiency ratio could drop to lower than 33%.

India's edible oil profile

- **Mustard and soybean** are the two largest contributors to India's edible oil production followed by cottonseed and rice bran.
- **Cotton:**
 - The **kapas or raw un-ginned cotton** harvested by farmers contains 36% lint, 62% seed, and 2% waste.
 - Cottonseed contains around 13% oil.
 - **As a result of Bt technology (GM), yields have increased leading to higher production of**

cottonseed oil from 0.5 mt to 1.5 mt between 2002-03 and 2013-14.

- However, with the recent drop in cotton output and yield due to the diminishing effectiveness of Bt technology and the arrival of new pests, oil production has dropped to 1.25 mt in 2022-23.
- **Rice bran:** There has been an increase in the production of bran and germ from rice and maize due to the increased output of the two crops over the last ten years.
- **Oilseeds:**
 - **Mustard:** Mustard accounts for 39% of the total oil production in the country with production expected to grow by 4.3% (CAGR) between 2023 and 2028.
 - **Groundnut:** Although groundnut oil production has grown, the majority of it is used for exports or direct consumption leaving less for oil extraction.
 - **Other oilseeds:** There has been a decline in the domestic output of coconut, sesame, sunflower, and safflower with cheaper imported oils available.

Why are the rising imports of edible oils a concern?

- **Dependence on Foreign Sources:** India heavily relies on imports to meet its edible oil demand. Depending too much on foreign sources makes the country vulnerable to fluctuations in global prices, currency exchange rates, and geopolitical events
- The **vegetable oils price index of the UN Food and Agriculture Organization** grew from 98.7 points (August 2020) to 251.8 points (March 2022).
- However, in the aftermath of the Russian invasion of Ukraine in March 2022, the index fell to 120 points by October 2023.
- **Impact on Farmers:** A surge in edible oil imports may negatively affect **domestic farmers** involved in oilseed cultivation.
- If imported oils are cheaper than domestically produced ones, it can create a price mismatch, affecting the income and livelihoods of local farmers.

Way forward

- **Increased domestic production of edible oils will help protect Indian farmers from global price volatility.**
- **Introduction of technology:** Farmers must be encouraged to adopt new forms of technology in the production of edible oils.
- This can include the **introduction of GM hybrids and other varieties of crops that are amenable to herbicide application.**
- **Tariffs:** The government can support farmers by providing price support in terms of **procurement or tariff policy.**
- **Diversify Agriculture:** Encourage crop diversification to reduce dependence on a few specific oilseed crops, thereby mitigating risks associated with price volatility and production uncertainties.

National Mission on Edible Oils

- **The National Mission on Edible Oils – Oil Palm** was launched by the Union government in 2021 as a **Centrally Sponsored Scheme**.
 - It aims to have an additional 6.5 lakh hectares of palm oil by 2025–26.
 - It involves raising the area under oil palm cultivation to 10 lakh hectares by 2025–26 and 16.7 lakh hectares by 2029–30.
- **Objective:**
 - Become self-reliant in edible oil and raise domestic production of palm oil by three times to 11 lakh MT by 2025–26.
- **Features:**
 - Oil palm farmers will be provided financial assistance and remuneration under a price and viability formula. VP is calculated as the annual average CPO price of the last five years, adjusted with the wholesale price index, multiplied by 14.3%.
 - The deficiency price payment will be made directly into the farmers' bank accounts.
 - Increase the support of inputs/interventions provided to farmers.
 - Special assistance will be given to replant old gardens for their rejuvenation.
- **Special Focus:**
 - The scheme will focus on Northeast India and the Andaman and Nicobar Islands due to the favorable weather conditions.
 - The scheme has provisions of ₹5 crores to attract industry to the NE and Andaman regions with pro-rata increase for higher capacity.
- **Significance:**
 - **Raise farmers income:** Incentivize production of palm oil to reduce dependence on imports and help farmers cash in on the huge market.
 - **Reduced imports:** India is the largest consumer of vegetable oil in the world with palm oil imports constituting a major portion of these imports.
- **Concerns:**
 - **Impact on tribals:** In southeast Asia, the plantation of palm oil trees has replaced massive tracts of rainforests which could delink tribespeople from their identity linked with the community ownership of land.
 - **Threat to wildlife:** Oil palm cultivation can lead to a loss of forest cover and the destruction of the habitat of endangered wildlife.
 - **Invasive nature:** The oil palm is a water-guzzling, monoculture crop with a long gestation period making it unsuitable for small farmers. It is an invasive species. It is an invasive species that can spread and interfere in a new ecosystem by posing a serious threat to the native biodiversity.
 - **Health Concerns:** Oil palms require 300 liters of water per tree per day, as well as high pesticide use

in areas where it is not a native crop, leading to consumer health concerns as well.

- **Farmers not Getting Fair Price:** The most critical issue in the cultivation of oil palm has been the inability of farmers to realize a remunerative price of fresh fruit bunches (FFBs). Moreover, they are highly perishable and need to be processed within twenty-four hours of harvest.

Conclusion

- India's escalating reliance on edible oil imports, coupled with global price volatility, poses a substantial economic risk.
- To mitigate this vulnerability, concerted efforts are imperative, encompassing technological advancements in oilseed cultivation, incentivizing farmers through supportive policies, and fortifying domestic production.
- Proactive measures are indispensable to safeguard against international market fluctuations and bolster India's self-sufficiency in edible oils.

UPSC Mains Practice Questions

- Q.1)** Explain the changes in cropping patterns in India in the context of changes in consumption patterns and marketing conditions. **(UPSC GS3 2023)**
- Q.2)** What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification? **(UPSC GS3 2021)**
- Q.3)** How can biotechnology help to improve the living standards of farmers? **(UPSC GS3 2019)**

MCQs

Question: Consider the following statements: (UPSC CSE 2018)

1. The quantity of imported edible oils is more than the domestic production of edible oils in the last five years.
2. The Government does not impose any customs duty on all imported edible oils as a special case.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (a)

Question: Other than resistance to pests, what are the prospects for which genetically engineered plants have been created?

1. To enable them to withstand drought.
2. To increase the nutritive value of the produce.
3. To enable them to grow and do photosynthesis in spaceships and space stations.
4. To increase their shelf life

Select the correct answer using the codes given below: **(UPSC CSE 2012)**

- a. 1 and 2 only

- b. 3 and 4 only
- c. 1, 2 and 4 only
- d. 1, 2, 3 and 4

Answer: (c)

Question: With reference to the cultivation of Kharif crops in India in the last five years, consider the following statements:

1. Area under rice cultivation is the highest.
2. Area under the cultivation of jowar is more than that of oilseeds.
3. Area of cotton cultivation is more than that of sugarcane.
4. Area under sugarcane cultivation has steadily decreased.

Which of the statements given above are correct? (UPSC CSE 2019)

- a. 1 and 3 only
- b. 2, 3 and 4 only
- c. 2 and 4 only
- d. 1, 2, 3 and 4

Answer: (a)

CBAM Will Kill Manufacturing In EU; India To Levy Carbon Tax

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Effect of policies and politics of developed and developing countries on India's interests; Environmental pollution and degradation, Carbon Border Adjustment Mechanism, Carbon Tax

Context

- Recently, India's Commerce and Industry Minister has asserted that the **European Union's Carbon Border Adjustment Mechanism (CBAM)** is inequitable due to the dissimilarity in carbon pricing between India and Europe.

What is Carbon Tax?

- **Carbon Tax** is a form of pollution tax which imposes a fee on the production, distribution, and use of fossil fuels based on the amount of carbon released during combustion.
- It is based on **Kyoto protocol's 'cap and trade'** method.
- The goal of this tax is **to reduce** the use of fossil fuels while also providing an incentive to use alternative energy sources.

What is the EU's Carbon Border Adjustment Mechanism (CBAM)?

- The EU's Carbon Border Tax, formally known as the **Carbon Border Adjustment Mechanism (CBAM)**, is a policy initiative aimed at addressing carbon emissions associated with the production of certain goods imported into the European Union (EU).
- It is a significant component of the **"Fit for 55 in 2030"** package, which outlines the EU's strategy to reduce

greenhouse gas emissions by a minimum of **55% by 2030** compared to 1990 levels, in alignment with the **European Climate Law**.

Key Features of CBAM

- **Coverage:** It is primarily focused on **imports of specific goods**, including cement, iron and steel, aluminum, fertilizers, electricity, and hydrogen.
- **Carbon Pricing:** Importers of these goods will be required to purchase carbon certificates that reflect the carbon emissions associated with the production of the imported products. The price of these certificates will be equivalent to the price of carbon allowances in the EU Emissions Trading System (ETS).
 - It is a market-based system that sets limits on carbon emissions for industries within the EU and allows for the trading of emissions allowance
- **Emission Transparency:** It promotes transparency by calculating and certifying the embedded carbon emissions in the imported products.
 - This measure helps ensure that imported goods are subject to a similar carbon pricing mechanism as those produced within the EU.

India's Concerns regarding CBAM

- **Reduce competition:** It could increase costs and **reduce competitiveness** for Indian exports to the EU, impacting sectors like steel and aluminum, valued at USD 8 billion annually.
 - In 2022, India's 27 per cent exports of iron, steel, and aluminium products of value USD 8.2 billion went to the EU.
- **Compliance Burden:** It imposes a significant **compliance burden** on Indian producers and importers.
 - It could also create administrative and technical challenges for Indian producers and importers, who will have to monitor, calculate, report and verify their emissions according to the EU standards.
- **FTA Violations:** It acts as a **non-tariff trade barrier** that contradicts zero-duty Free Trade Agreements (FTAs).
 - India is subject to the levy while providing duty-free access for ostensibly "green" products, creating a perceived inconsistency in trade practices.
- **Contradicts Green Commitment:** It appears contrary to the EU's and developed nations' commitment to support the green transition in other countries, potentially hindering green initiatives in India and other emerging economies.

What is India's Response and Carbon Tax Strategy?

- **Carbon Tax Implementation:** India plans to counterbalance the effects of the EU's carbon tax by introducing its own **carbon tax system**.
- **Green Energy Investment:** The revenue generated from India's carbon tax will be directed towards bolstering the nation's green energy initiatives.

- This strategic allocation of funds can indirectly assist exporters in transitioning to cleaner energy sources, consequently reducing their carbon emissions.
- **Negotiations with EU:** The Indian government is actively involved in ongoing discussions and negotiations with European Union counterparts, focusing on aspects such as the fairness and pricing disparities of the carbon tax, to seek equitable solutions.

Conclusion

- India, contesting the EU's Carbon Border Adjustment Mechanism, plans a counterbalancing carbon tax.
- This strategic move aims to mitigate economic impacts, promote green energy, and engage in fair negotiations with the EU for equitable solutions.

MCQ

Question: 'Broad-based Trade and Investment Agreement (BTIA)' is sometimes seen in the news in the context of negotiations held between India and (UPSC 2017)

- (a) European Union
- (b) Gulf Cooperation Council
- (c) Organization for Economic Cooperation and Development
- (d) Shanghai Cooperation Organization

Answer: (a)

Can Dollarization Save The Economy of Argentina?

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Effects of liberalization on the economy, Dollarization, Issues Related to Dollarization

Context

- Recently, **Javier Milei**, the winner of the Presidential elections in Argentina had promised to **de-dollarize the Argentine economy** by replacing the peso with the **dollar**, cutting government spending, and eliminating the Central Bank.
- The Argentine economy has been suffering inflation of more than **100%** which has resulted in a drop in purchasing capacities and an increase in poverty.



What is dollarization?

- **Dollarization is loosely used to refer to the replacement of a local currency by a foreign currency** like the **dollar** in any of its functions.
- **Significance:** Dollarization helps eliminate the risk of a sudden, sharp devaluation of the country's exchange rate, thereby reducing the risk premium attached to its international borrowing.
- **Types:**
 - **Asset Dollarization:** It refers to the use of foreign currency in any of its three functions - as a **unit of account, means of exchange, and store of value**.
 - **Currency Substitution:** It refers to the **use of foreign money as a means of exchange**. The domestic currency may still be used for transactions.
 - **Liability Dollarization:** It refers to the **relatively large foreign currency debt obligations of countries**. Here, the country could be scarcely dollarized in terms of assets while loans are mostly in foreign currency.
 - **Full Dollarization:** Full Dollarization is a situation in which a **country abandons its currency and adopts another country's currency as a means of payment and unit of account**.
- **Origin:** Dollarization was conceived as a solution to advancing global economic stability and prosperity through exchange rate regimes.
- Dollarisation has been economically successful in **Ecuador, Panama, and El Salvador**.

Why have countries advocated dollarization?

- **Solution to hyperinflation:** Dollarization breaks the **feedback link between rising prices and rising money supply**, which helps tackle hyperinflation.
- The replacement of the domestic currency ensures that the money supply cannot be controlled by those with vested political interests.
- **Price rise would slow down as consumption demand drops due to the difficulty in accessing currency.**
- **Effect on growth:** Dollarization would incentivize the economy to **focus on exports and ease conditions for foreign capital** since small economies can only access the dollar through foreign trade or capital inflows.
- This would **attract foreign capital who prefer to invest in economies with a stable currency**.
- The stability of the dollar's value will ensure that both foreign and domestic economic agents can make long-term plans regarding economic activity.

What are some of the concerns associated with dollarization?

- **Loss of policy leverage:** When a country adopts the dollar as its currency, the **money supply can no longer be controlled by the monetary policy of the domestic country**.
- In terms of foreign trade, **countries would not be able to use depreciation to boost exports**.
- Some experts have claimed that this is a positive aspect since the government would then have to

employ productivity-boosting methods to counter recessions instead of modifying exchange rates.

- **Risks of over-dependence on a single currency:** Over-dependence on a single currency could **expose the nation to risks associated with fluctuations in the value of the dollar, changes in US monetary policy, and potential sanctions or restrictions imposed by the US.**
- There have been increased concerns about the value of the dollar and inflation due to the consistent budget deficits of the US government.
- **US's geopolitical conflicts:** The US has been involved in several geopolitical conflicts in recent years, including the wars in Iraq and Afghanistan, which have affected the dollar.
- **China factor:** China has been promoting the use of its currency, the **renminbi**, as an alternative to the dollar.
- **Loss of power of central banks:** Following the implementation of dollarization, **Central banks become bodies with no power.**

Case study: Ecuador and Greece

Ecuador

- In the late 1990s, the Ecuadorian economy was afflicted by a series of debilitating crises that led to
 - Contraction of economic output by around 7%,
 - Inflation at 67%,
 - Depreciation of the local currency (**Sucre**) by 200% in 1999.
- **In January 2000, Ecuador adopted the dollar** and persisted with the policy of dollarisation despite widespread protests that led to the resignation of President Jamil Mahuad.
- **Outcome of dollarisation:**
 - The Ecuadorian economy progressed on economic growth and social welfare parameters.
 - **Economic growth:** According to the World Bank, the economy grew by 4.5% in real GDP terms between 2001 and 2014.
 - **Poverty:** The poverty rate dropped from 36.7% in 2007 to 22.5% in 2014.
 - **Inequality:** Inequality measured using the Gini index dropped by 9% in the same period.
 - **Impact in recession:** Even during the recession of 2008, the economy only lost 1.3% of GDP and later achieved its 20-year growth target by 2010.
 - **Inflation:** Inflation averaged around 4% between 2003 and 2006, dropping from 108% prior to dollarization. The inflation rate in Ecuador hit a high of 108% in September 2000.
 - **Foreign debt to GDP:** The ratio of foreign debt to GDP also reduced from 55% in 2000 to 21.5% in 2006.

Reasons for the success of dollarization in Ecuador

- Although dollarisation helped tackle inflation, active fiscal policy played a significant role in ensuring sustainable growth.

- **Oil and gas reserves:** Ecuador has significant reserves of oil and gas which boosted the country's economic growth during the commodity price boom of the 2000s and enabled a greater inflow of dollars.
 - However, reductions in oil prices post-2014 have led to slowing economic growth, and rising debt and deficits.
 - Rising oil prices led to windfall gains in the Ecuadorian economy, which were translated into social spending by the government.
- **Expansion of state's role:** Between 2007 and 2017, Ecuador expanded the role of the state in the dollarized economy.
 - As a result, government expenditures and deficits rose significantly.
 - **The government renegotiated contracts with oil exploration companies using the threat of nationalization of oil fields to give the state greater revenue.**
 - Ecuador's foreign debt was restructured and certain bonds deemed illegitimate or unfairly beneficial to private parties were defaulted on.
 - **Social spending increased from 5% of GDP in 2006 to 10.3% in 2011 as a result of the freed-up fiscal space.**
 - In contrast to mainstream monetary policy approaches, the Central Bank was not independent of the executive in this period.
 - Economists have criticized the return to austerity economics in Ecuador as the IMF has set the independence of the Central Bank as a pre-condition for receiving financial assistance.

Greece

- Greece is an example of the dangers associated with adopting an external currency that curtails the state's ability to implement an independent policy.
- Greece joined the **European Union** in 1981 and adopted the **Euro** as its currency in 2001.
- **The adoption of the euro, a stable currency, fuelled growth, and rise in capital inflows and boosted tourism in Greece.**
- **However, Greece was left without fiscal and monetary policy options in the aftermath of the Eurozone crisis** as
 - The European Central Bank (ECB) retained control over the monetary policy
 - Fiscal policy was restrained as a pre-condition for adopting the Euro.
- As a result, **Greece was forced to adopt severe austerity measures in exchange for financial assistance from the IMF and the ECB.**

Conclusion

- Therefore, dollarisation can be effective if used in combination with effective domestic policy and should not be treated as a silver bullet.
- However, the election of the new President of Argentina who has expressed a desire to slash government

spending and abolish the Central Bank has raised concerns.

UPSC Mains Practice Questions

Q.1) How would the recent phenomena of protectionism and currency manipulations in world trade affect the macroeconomic stability of India? (UPSC GS3 2018)

MCQs

Question: With reference to Central Bank digital currencies, consider the following statements:

1. It is possible to make payments in a digital currency without using the US dollar or the SWIFT system.
2. A digital currency can be distributed with a condition programmed into it such as a time frame for spending it.

Which of the statements given above is/are correct? (UPSC CSE 2023)

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer: (c)

Question: In the context of India, which of the following factors is/are contributor/contributors to reducing the risk of a currency crisis?

1. The foreign currency earnings of India's IT sector.
2. Increasing government expenditure.
3. Remittances from Indians abroad.

Select the correct answer using the code given below. (UPSC CSE 2019)

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

Answer: (b)

NHAI Accepts First Insurance Surety Bond as Bid Security for NHAI TOT Bid for Monetization

Priority: Medium



Primary Source: Indian Express

Syllabus Relevance & Important Keywords: Investment Model, Infrastructure, Insurance Surety Bond, Issues Related to the use of Insurance Surety Bond

Context

- Recently, **National Highways Authority of India (NHAI)** has accepted **Insurance Surety Bond** for the monetization program of the upcoming bid of Toll Operate Transfer (TOT) bundle.
- Insurance Surety Bond is being utilized as a Bank Guarantee (BG) in the road infrastructure sector for monetization of bids. This initiative involves collaboration between the National Highways Authority of India (NHAI), the Highway Operators

Association of India (HOAI), SBI General Insurance, and AON India Insurance.

What is an Insurance Surety Bond?

- Surety Bonds** are a type of insurance policy protecting parties involved in a transaction or contract from potential financial losses due to a breach of contract or other types of non-performance.
- It's described as a written agreement guaranteeing compliance, payment, or performance of an act.

Three-Party Agreement:

- Involves three parties - Principal (purchaser of the bond), **Surety (insurance company providing financial guarantee)**, and Obligee (party requiring the benefit of the surety).
 - Principal:** The party that purchases the bond and undertakes an obligation to perform an act as promised.
 - Surety:** The insurance company or surety company that guarantees the obligation will be performed. If the principal fails to perform the act as promised, the surety is contractually liable for losses sustained.
 - Obligee:** The party who requires, and often receives the benefit of the surety bond. For most surety bonds, the obligee is a local, state or federal government organization.

Collaboration

- NHAI has worked closely with HOAI, SBI General Insurance, and AON India Insurance to implement this initiative.

Utilization of Insurance Surety Bond as a Bank Guarantee:

- This marks the first instance of using the Insurance Surety Bond in the road infrastructure sector as a Bank Guarantee for bid monetization.

Security Arrangement for Infrastructure Projects:

- The Surety Bond serves as a security arrangement for infrastructure projects, protecting both the contractor and the principal.

Contractual Guarantee:

- Provides the principal with a contractual guarantee that terms and business deals will be concluded as mutually agreed.

Claim Process:

- If the contractor fails to fulfill contractual terms, the principal can raise a claim on the surety bond to recover incurred losses.

Reduced Financial Burden on Contractors:

- Unlike a bank guarantee, the Surety Bond Insurance doesn't require large collateral from the contractor, freeing up significant funds for business growth.

Debt Reduction for Contractors:

- The product is expected to help reduce contractors' debts, addressing their financial concerns.

Issues

- Surety bonds as a new concept is risky and insurance companies in India are yet to achieve expertise in risk assessment in such business.

- Surety Bonds need extensive reinsurance support and no primary insurers can issue any policy without proper reinsurance backup.

Significance

- **Enhanced Security:** The Surety Bond acts as a robust security arrangement for infrastructure projects, providing assurance to both the contractor and the principal.
- **Easier Project Execution:** The product offers the principal a contractual guarantee, ensuring that contractual terms and other business deals will be concluded as mutually agreed. This certainty can contribute to smoother project execution.
- **Risk Mitigation:** In the event that the contractor fails to fulfill the contractual terms, the principal has the ability to raise a claim on the surety bond. This mechanism helps in mitigating the financial risks associated with non-compliance.
- **Financial Flexibility for Contractors:** Unlike traditional bank guarantees that often require large collateral from contractors, the Surety Bond Insurance offers a more flexible approach. This flexibility allows contractors to free up significant funds that can be utilized for the growth and development of their business.
- **Debt Reduction:** The introduction of the Surety Bond is expected to contribute to reducing contractors' debts. This reduction can be particularly significant in addressing financial concerns and improving the overall financial health of contractors involved in infrastructure projects.

Conclusion

- This initiative is significant for the infrastructure sector as it introduces an innovative approach to financial guarantees, potentially easing financial burdens on contractors and providing a more flexible security arrangement for infrastructure projects.

UPSC Mains Practice Questions

- Q.1)** Adaptation of PPP model for infrastructure development of the country has not been free from criticism. Critically discuss the pros and cons of the model. (UPSC GS3 2013)
- Q.2)** "Investment in infrastructure is essential for more rapid and inclusive economic growth." Discuss in the light of India's experience. (UPSC GS3 2021)

MCQs

Question: With reference to 'IFC Masala Bonds', sometimes seen in the news, which of the statements given below is/ are correct? (UPSC CSE 2016)

1. The International Finance Corporation, which offers these bonds, is an arm of the World Bank.
2. They are the rupee-denominated bonds and are a source of debt financing for the public and private sector.

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (c)

Question: Consider the following statements:

Statement-I: Interest income from the deposits in Infrastructure Investment Trusts (InvITs) distributed to their investors is exempted from tax, but the dividend is taxable.

Statement-II: InvITs are recognized as borrowers under the 'Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest-Act, 2002'.

Which one of the following is correct in respect of the above statements? (UPSC CSE 2023)

- a. Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- b. Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- c. Statement-I is correct but Statement-II is incorrect
- d. Statement-I is incorrect but Statement-II is correct

Answer: (d)

Windfall Profit Tax On Crude Oil, Diesel Exports Cut

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Changes in industrial policy and their effects on industrial growth. Government policies and interventions for development in various sectors and issues arising out of their design and implementation, Windfall tax, SAED, Windfall Taxes on Diesel Exports and Crude and Associated Concerns

Context

- Recently, the government of India cut the windfall profit tax on crude oil produced in the country and on exports of diesel.



What are windfall taxes?

- A **windfall tax**, or **one-time tax**, is a **higher tax rate levied by governments against certain industries when economic conditions allow those industries to experience above-average profit.**

- According to the United States Congressional Research Service, **a windfall is an undeserved or unforeseen increase in revenue that results from neither additional labor nor expense.**
- These gains cannot be directly linked to something the company actively did, like an investment plan or a corporate development.
- They are **imposed retroactively** along with the regular rates of tax on such earnings.

India's new windfall tax rates

- **Crude oil:** India has cut its windfall tax on domestically produced crude oil, which is levied in the form of the **Special Additional Excise Duty (SAED).**
- The **SAED on crude oil has been reduced to ₹6,300 per tonne from ₹9,800 per tonne.**
- **Diesel:** The **SAED on the export of diesel was reduced from ₹2 per liter to ₹1 per liter.**
- **ATF and petrol:** The **levy on the export of aviation turbine fuel (ATF) and petrol has been maintained at zero.**
- The new tax rates came into effect on 16th November 2023.

Previous rate revisions

- India first imposed windfall profit taxes on July 1, 2022, by levying export duties of ₹6 per liter each on petrol and ATF and ₹13 a liter on diesel.
- A windfall profit tax of ₹23,250 per tonne was also imposed on crude oil produced by companies such as ONGC.
- The levy on domestic crude oil dropped to nil in the first half of April but was brought back in the second half in accordance with the changes in international fuel prices.
- The levy on ATF was brought back in the second half of August from nil in March while the export tax on petrol was scrapped in the very first review.
- In the previous revision of the windfall taxes (November 1st, 2023), the tax on crude oil was hiked from ₹9,050 per tonne to ₹9,800 per tonne.
- The levy on the export of diesel was halved from ₹4 to ₹2 while the levy on ATF was reduced from ₹1 to 0.

Why have windfall taxes been changed?

- **A windfall tax is levied on domestic crude oil if rates of the global benchmark rise above \$75 per barrel.**
- The **tax rates are reviewed every fortnight** based on average oil prices in the previous two weeks.
- A levy is imposed on the export of diesel, ATF, and petrol if **product cracks (or margins) rise above \$20 per barrel.**
- **Product cracks or margins:** It refers to the difference between crude oil (raw material) and finished petroleum products.
- **Present scenario:** The easing of international oil prices since the last revision has led to the government implementing a reduction in windfall taxes.

- The average price of the basket of crude oil imported by India dropped to \$84.78 per barrel in comparison to \$90.8 per barrel (October) and \$93.54 per barrel (September).

Other reasons for revising windfall taxes:

- Redistribution of unforeseen profits
- Provide support for social welfare programmes,
- Mechanism to reduce the nation's expanding trade deficit.
- Additional source of revenue for the government.

Challenges associated with windfall taxes

- **Market uncertainty:** According to experts, the **imposition of windfall taxes can cause market confusion about future taxes.**
- This is mainly because windfall taxes are applied retroactively and are influenced by unanticipated events.
- Therefore, the industry may not be able to predict and account for the levy which in turn can affect investments in linked sectors.
- **Populist nature:** Such windfall taxes have been criticized as **populist and having a short-term political advantage.**
- The IMF has also criticized the imposition of taxes in reaction to price increases can have design issues due to their political nature.
- **Reward vs Risk:** Businesses have claimed that the **unforeseen profits were a reward for their appetite for risks** in supplying petroleum at a cheap rate.
- Therefore, they claim that it is unfair to tax them their rewards.
- **Applicability of taxation:** Critics have also questioned whether the tax should be levied on small corporations as well as the large corporations that account for the majority of sales.
- Some observers have suggested that those **corporations making less than a specified amount of revenue or profit should be exempted from the levy.**

Conclusion

- India's recent revision of windfall taxes on crude oil, diesel, and other petroleum products reflects a responsive and balanced approach to global market conditions and the need for effective fiscal policies to ensure sustained economic growth.

UPSC Mains Practice Questions

Q.1) What is the meaning of the term tax-expenditure? Taking the housing sector as an example, discuss how it influences the budgetary policies of the government. (UPSC GS3 2013)

MCQs

Question: Consider the following statements : [2019-1]

1. The Petroleum and Natural Gas Regulatory Board (PNGRB) is the first regulatory body set up by the Government of India.

2. One of the tasks of PNGRB is to ensure competitive markets for gas.

3. Appeals against the decisions of PNGRB go before the Appellate Tribunals of Electricity.

Which of the statements given above is/are correct?

- 1 and 2 only
- 2 and 3 only
- 1 and 3 only
- 1, 2 and 3

Answer: (b)

Question: Which among the following steps is most likely to be taken at the time of an economic recession? (UPSC CSE 2021)

- Cut in tax rates accompanied by an increase in interest rate
- Increase in expenditure on public projects
- Increase in tax rates accompanied by reduction of interest rate
- Reduction of expenditure on public projects

Answer: (b)

Agriculture (GS Paper Prelims) & GS Paper III (Main)

Tropical Crops At Risk From Pollinator Loss Due To Climate Change, Shift In Land Use, Finds Study

Priority: High



Primary Source: Down To Earth

Syllabus Relevance & Important Keywords:

Conservation, environmental pollution and degradation, environmental impact assessment. Food security, Concerns Related to Climate Change and Decline of Pollinator Populations

Context

- Recently, a study by the **University College London and the Natural History Museum** revealed that climate change and land-use change have led to a loss of pollinator insects which is likely to affect crops like coffee, cocoa, watermelon, and mango.

What is the crisis faced by tropical crops?

- Climate change and changes in land use have led to a decline in the insect pollinator population of tropical crops.
- Population decline:** The **number of insects that pollinate tropical plants like coffee, cocoa, mango, etc declined by 61%.**
- According to an **FAO Report from 2021, more than 40% of invertebrate pollinators are at risk of extinction.**

Factors in population decline:

- Climate change:** Insects are highly sensitive to climatic conditions such as precipitation and temperature and plant-pollinator interactions are highly sensitive to thermal changes.
- Destruction of habitat:** Traditional habitats of insects have been destroyed due to natural reasons as well

as **anthropogenic activities like deforestation, pollution, etc.**

- Improper land use:** Areas where vegetation has been modified for human land use have led to alterations in microclimatic conditions which leads to a decline in tropical insects.
- Agricultural practices: Crop monoculture and the unscientific use of chemical pesticides and fertilizers** has impacted the insect populations.

At-risk areas:

- The crisis of decline in pollinator pollutants was the **most severe in the tropics, especially sub-Saharan Africa, South America, and Southeast Asia** as the **majority of animal pollination-dependent crops are grown in the tropics**
- China, India, Indonesia, Brazil, and the Philippines are the most at risk in terms of production potential.**

Crops threatened:

- Cocoa faced the highest risk especially in Africa, followed by mango in India, and watermelon in China.

Tropical Crops

- Tropical crops refer to plants that are grown in the regions between the Tropic of Cancer and the Tropic of Capricorn, i.e the tropics.
- Growing conditions:** Hot and humid climate with little to no frost.
 - Average temperatures above 18°C throughout the year.
 - Examples:** Bananas, pineapples, mango, coconuts, cocoa, coffee, rubber

Impact of the pollinator decline

- Production risk:** The decline of insect pollinators could lead to a **loss of productivity of tropical crops.**
 - This could have a side effect of **increasing income insecurity among vulnerable agricultural populations** in tropical regions.
- Loss of biodiversity:** According to the US Department of Agriculture, **3/4th of the world's flowering plants and around 35% of the world's food crops depend on animal pollinators.**
 - The loss of insect pollinators could affect the survival and reproduction of many plant species.
- Human health:** A study in the Environmental Health Perspectives journal revealed that around **half a million premature human deaths occur each year linked to the global insect pollinator decline.**
 - The lowered consumption of fruits could lead to a higher incidence of strokes among humans.
- Food commodity prices:** The decline in pollinator populations has impacted the availability and as a result, the **price of foods such as nuts, legumes, fruits, and vegetables have risen.**
 - This is **most severe in middle-income countries like India, Russia, and China** while wealthy nations are more immune.

What measures can be taken to prevent pollinator loss?

- **Climate action:** Global action to mitigate climate change through cooperative initiatives and knowledge sharing is the need of the hour in order to reduce the impact of climate change on insect populations across the world.
- **Land use policies:** Land use changes must be slowed down and natural habitats must be protected to protect insect pollinators.
 - The creation of hedgerows has also been recommended as it helps increase the connectivity between plant and pollinator populations.
- **Agricultural practices:** Farmers should be encouraged to reduce the use of pesticides and other harmful chemicals in agriculture or adopt selective use of fertilizers and pesticides.
 - Intercropping helps promote and sustain diverse and abundant pollinator populations, especially during the crucial flowering season.
 - Planting crops such as cassava has been found to be effective in maintaining pollinator populations in Ghana.
- **Creation of alternate habitats:** Governments, civil society organizations, and individuals must create new, pollinator habitats at the farm and national level and plant crops depending on their affinity to local pollinators.
- **Alternative methods:** Alternative pest management methods such as biological control or integrated pest management which rely on natural predators, parasites, or pathogens instead of chemicals to control pests should be promoted.

Measures implemented by India

- **National Beekeeping and Honey Mission (NBHM):** It aims to promote beekeeping and honey production in India by providing financial assistance to beekeepers for the purchase of bee colonies and beekeeping equipment.
- **Integrated Pest Management (IPM):** It aims to reduce the dependence on pesticides in agriculture and promotes the use of natural predators and other non-toxic methods for pest control.
- **National Mission for Sustainable Agriculture (NMSA):** It promotes sustainable agriculture practices that are beneficial for pollinators such as the reduction of the use of chemicals in agriculture and the promotion of organic farming techniques.
- **National Action Plan for Pollinators (NAPP):** It is a comprehensive plan to protect and conserve pollinators in India including measures to reduce pesticide use and ensure the conservation of pollinators and their habitats.

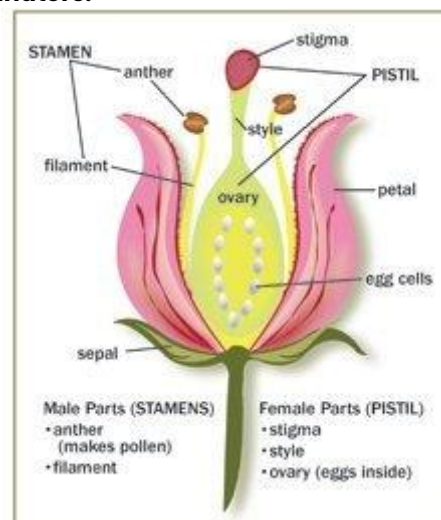
Conclusion

- The rapid decline in pollinator populations is a significant threat to tropical crops, biodiversity, and human well-being.

- Therefore, it is necessary for countries to implement globally coordinated efforts such as climate action, sustainable land use, and eco-friendly agricultural practices.

What is pollination?

- Pollination is the **process of movement of a pollen grain from the anther (male part) of a flower to the stigma (female part)**.
- It is the first step in the reproductive process of plants which produces seeds, fruits, and the next generation of plants.
- **Forms:** Pollination can take place through **self-pollination, wind, and water pollination** or through **pollinators**.



What are pollinators?

- Pollinators are vectors that move pollen within the flower and from flower to flower.
- **Types:**
 - **Invertebrate pollinators:** Bees, moths, flies, wasps, beetles and butterflies.
 - **Vertebrate pollinators:** Monkeys, rodents, lemurs, tree squirrels, and birds.

How does pollination take place?

- When pollinators visit flowers in search of food i.e. nectar and pollen, they may accidentally come into contact with the flower's reproductive parts.
- During this process, the pollinator unknowingly deposits pollen from flower to flower.
- This pollen is then used by the plant to produce a fruit or seed.

UPSC Mains Practice Questions

- Q.1) Discuss the consequences of climate change on the food security in tropical countries. (UPSC GS1 2023)
- Q.2) What are the major reasons for declining rice and wheat yield in the cropping system? How crop diversification is helpful to stabilize the yield of the crop in the system? (UPSC GS3 2017)

MCQs

Question: Due to some reasons, if there is a huge fall in the population of species of butterflies, what could be its likely consequence/consequences? (UPSC CSE 2017)

1. Pollination of some plants could be adversely affected.
2. There could be a drastic increase in the fungal infections of some cultivated plants.
3. It could lead to a fall in the population of some species of wasps, spiders, and birds.

Select the correct answer using the code given below:

- a. 1 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Answer: (c)

Question: Biodiversity forms the basis for human existence in the following ways

1. Soil formation
2. Prevention of soil erosion
3. Recycling of waste
4. Pollination of crops

Select the correct answer using the codes given below (UPSC CSE 2011)

- a. 1,2 and 3 only
- b. 2, 3, and 4 only
- c. 1 and 4 only
- d. 1, 2, 3 and 4 only

Answer: (d)

Indian Farmers Taxed \$169 Bn via Export Bans or Restrictions in 2022: OECD Report

Priority: High



Primary Source: Down To Earth

Syllabus Relevance & Important Keywords: Issues Related to Direct & Indirect Farm Subsidies & Minimum Support Prices, OECD, Market Price Support, Concerns Related to Market Price Support in Indian Agriculture

Context

- As per the **OECD Report**, Indian farmers experienced an **implicit tax of \$169 billion in 2022 due to export bans, duties, or permits** imposed by the government on agricultural commodities such as wheat and rice.
- The purpose of these measures was to stabilize domestic consumer prices, particularly in the **context of the Ukraine war and a domestic heatwave**.
- However, these policies resulted in domestic market prices being lower than international prices, which is referred to as a **negative Market Price Support (MPS)**.

What is OECD?

- The Organisation for Economic Co-operation and Development (OECD) is an international organization founded in 1961 that works to build better policies for better lives.

- The OECD provides a platform where governments can work together to share experiences and seek solutions to common problems.
- It works with governments to understand what drives economic, social, and environmental change.
- It provides a forum to compare policy experiences, seek answers to common problems, identify good practices, and coordinate domestic and international policies of its members.
- The OECD is known for its economic surveys, research, and analysis, and it publishes a wide range of reports and statistics that are used by governments, policymakers, and researchers around the world to understand and address economic challenges.

In most of the countries studied by the OECD, market price support (MPS) is positive or zero. A positive MPS reflects that the support measures make domestic prices higher than international reference prices. MPS close to zero indicates that domestic prices are aligned with world prices. Negative MPS reflects interventions on prices that lead to domestic prices below international reference prices.

Key Findings of the Report

1) Implicit Taxation on Indian Farmers: Indian farmers experienced an implicit tax amounting to \$169 billion in 2022 due to government policies such as export bans, duties, or permits on commodities like wheat and rice. This was implemented to stabilize domestic consumer prices.

2) Negative Market Price Support (MPS): The report highlights that these policies resulted in a negative MPS for Indian farmers, meaning that domestic prices were kept lower than international prices, adversely affecting farmers' incomes.

3) Global Context: India's negative MPS accounted for over 80% of the global total, with a global implicit taxation on farmers reaching around \$200 billion among 54 countries studied.

4) Comparison with Other Emerging Economies: While other emerging economies also faced negative MPS, they managed to counterbalance it with other forms of budgetary support, leading to net positive figures.

- In contrast, India's support through subsidies for inputs and PM-KISAN did not compensate for the loss from domestic marketing regulations and trade policies.

5) Budgetary Transfers vs. Negative MPS: In India, budgetary transfers to farmers accounted for 11% of gross farm receipts, whereas the negative MPS was 27.5% of gross farm receipts for various commodities, leading to a net negative support of 15% of gross farm receipts.

6) Policies Affecting Commodities: India's export bans and other restrictions affected a range of commodities, including rice, wheat, sugar, and onions.

7) Impact on India's Agriculture: The OECD report points out that such producer transfer policies have been

predominantly in forms that are production- and trade-distorting, consistent since the early 2000s. Indian farmers have faced negative net support over the last two decades, with significant fluctuations.

8) Producer Support Estimate (PSE): The OECD uses the PSE as an international measure of government support to farmers. The report notes that these recent policies significantly impacted the MPS of Indian wheat, increasing the implicit taxation by about \$10 billion.

9) Impact on India's Global Trade Reliability: The export restrictions cast doubt on India's reliability as a supplier in the international market and further contribute to the ongoing issue of low farm incomes in the country.

10) Global Support to Agriculture Sector: Across the 54 countries, the total support to the agricultural sector averaged \$851 billion per year over 2020-2022, rising from \$696 billion in the preceding three years. This increase is attributed to responses to the COVID-19 pandemic, inflationary pressures, and the impact of the war in Ukraine.

11) Decline in Producer Support: Globally, there has been a decline in producer support since the early 2010s, although the pace has slowed.

12) Distorting Forms of Support: The report indicates that \$411 billion, or two-thirds of the positive support to producers, was in forms considered most distorting to production and trade. These forms are seen as inefficient and poorly targeted for aiding needy households and are more prevalent in emerging economies than in OECD countries.

What is Market Price Support (MPS)?

- Market Price Support (MPS) is an economic policy tool used to measure the amount of monetary transfer from consumers and taxpayers to agricultural producers, which is attributable to policy measures that maintain agricultural prices at above-market levels.
- Essentially, it's a measure of the difference between the prices that farmers receive for their products due to government action (like tariffs, price controls, or subsidies) and the prices they would otherwise receive in a free market.
- MPS is a key component of the **Total Support Estimate (TSE)**, which is used by organizations like the Organisation for Economic Co-operation and Development (OECD) to evaluate the level and nature of support provided to agriculture within an economy.
- While MPS can provide stability for farmers, it can also distort trade by encouraging overproduction of certain crops and potentially undermining international market prices.
- It may also lead to inefficiencies and increased costs for consumers and taxpayers.

Why did India introduce Export bans, Duties and Permits?

Stabilization of Domestic Prices

- Following the outbreak of war in Ukraine, global commodity prices, especially for agricultural products, saw significant volatility.
- To prevent these international price fluctuations from affecting domestic prices, India implemented export bans and duties.
- This was intended to ensure that the domestic market remained insulated from global price spikes, thereby keeping essential goods affordable for Indian consumers.

Response to Domestic Challenges

- The year 2022 brought a severe heatwave in India, which likely affected crop yields and agricultural output.
- The risk of reduced production due to heat damage would have naturally led to higher domestic prices due to lower supply.
- By restricting exports, the Indian government aimed to maintain an adequate supply within the country and prevent price escalation, which would have affected food security and affordability for the population.
- However, the measures to stabilize prices for consumers had the side effect of causing "**implicit taxation**" on farmers. This effect is quantified as a **negative Market Price Support (MPS)**, indicating that farmers received less for their products than they would have in the absence of these policies.

What is Negative Market Price Support (MPS)?

- Negative Market Price Support (MPS) refers to a situation where the policies enacted by a government result in domestic market prices for agricultural products being lower than international market prices.
- This effectively means that farmers receive less for their products than what they would have if they were selling at world market prices.
- This discrepancy arises due to policy measures such as export bans, duties, or permits that are usually intended to stabilize or reduce prices for consumers within the domestic market.
- Negative MPS, therefore, is not a direct tax, but the result of policies that effectively reduce farmers' incomes by keeping domestic prices below potential market levels.
- While such policies may aim to protect consumers from price spikes and provide food security, they can also adversely affect the income of producers and their ability to invest in and improve agricultural productivity.

Impact of Negative Market Price Support on Farmers

- Impact on Farmers' Income:** Negative MPS means that the prices farmers receive for their produce are lower than what they would have received if domestic prices were aligned with international prices.
- Disincentive to Produce:** When farmers are not getting fair value for their products due to price

controls and export restrictions, it can serve as a disincentive to produce more or invest in productivity improvements, potentially leading to lower agricultural output in the long term.

- **Farmers' Welfare:** Despite various subsidies provided by the government, such as for fertilizers, electricity, and irrigation, along with direct income support through schemes like PM-KISAN, the overall financial position of farmers was adversely affected due to the suppressed market prices driven by trade and marketing policies.
- **Global Market Impact:** The export bans and duties not only affect domestic markets but also India's reliability as a global supplier.
- **Economic Inefficiencies:** Support that distorts market prices can lead to inefficient allocation of resources within the agricultural sector, promoting overuse of subsidized inputs like fertilizers and water, which can have negative environmental consequences as well.
- **Effect on Consumer Prices:** While these policies might be aimed at keeping domestic food prices stable (especially in times of external shocks like the war in Ukraine), there is a complex balance between consumer interests (lower food prices) and producer interests (fair market value for their products).
- **Comparison with Other Economies:** Unlike other emerging economies, India's negative MPS was not offset by other budgetary support to result in a positive net support.
- **Long-term Trends:** Net support to producers in India has been negative for two decades, indicating a persistent policy trend that has not been favorable to Indian farmers in terms of market price support.

Global Agricultural Support Trends and Distortions

- The OECD uses the **Producer Support Estimate (PSE)** to track global agricultural subsidies, which reflect the additional earnings a farmer gets at the farm-gate due to government support.
- In India, policy changes have led to an implicit taxation increase for wheat producers, totalling nearly \$10 billion, while also affecting India's reliability as a food supplier and further straining low farm incomes.
- Globally, agricultural support across 54 countries surged to an annual average of \$851 billion during 2020–2022 due to policy reactions to COVID-19, inflation, and the Ukraine conflict, up from \$696 billion in 2017–2019.
- Distorting forms of support are more **prevalent in emerging economies** than in OECD countries.

What is the Producer Support Estimate (PSE)?

- The Producer Support Estimate (PSE) is an indicator developed by the Organisation for Economic Co-operation and Development (OECD) to measure the annual monetary value of agricultural policy transfers to farmers from consumers and taxpayers.

- It represents the cost to the economy of agricultural policies that support farmers.
- The PSE provides a comprehensive overview of the total support provided to agricultural producers and can be used to compare the level of support across different countries and over time.
- It is expressed as a percentage of total farm receipts, including support and market income, or in absolute terms.
- The purpose of the PSE is to quantify the amount of support farmers receive due to government policies.
- It is used to analyze and compare the extent and nature of agricultural support, which can have implications for production decisions, resource allocation within agriculture, and trade competitiveness.

Conclusion

While the Indian government's policies were designed to protect consumers from price volatility, they resulted in significant economic disadvantages for Indian farmers, making India the largest contributor to negative MPS globally. This situation has wider implications for India's agricultural sector's efficiency, equity, and international trade reliability.

Mains

Q.1) What are the direct and indirect subsidies provided to farm sector in India? Discuss the issues raised by the World Trade Organization (WTO) in relation to agricultural subsidies. **(UPSC GS3 2023)**

Q. What do you mean by Minimum Support Price (MSP)? How will MSP rescue the farmers from the low-income trap? **(UPSC GS3 2018)**

Q. How do subsidies affect the cropping pattern, crop diversity and economy of farmers? What is the significance of crop insurance, minimum support price and food processing for small and marginal farmers? **(UPSC GS3 2017)**

MCQs

Which of the following factors/policies were affecting the price of rice in India in the recent past?

1. Minimum Support Price
2. Government's trading
3. Government's stockpiling
4. Consumer subsidies

Select the correct answer using the code given below: **(UPSC 2020)**

- (a) 1, 2 and 4 only
- (b) 1, 3 and 4 only
- (c) 2 and 3 only
- (d) 1, 2, 3 and 4

The economic cost of food grains to the Food Corporation of India is the Minimum Support Price and bonus (if any) paid to the farmers plus (UPSC 2019)

- (a) transportation cost only
- (b) interest cost only
- (c) procurement incidentals and distribution cost
- (d) procurement incidentals and charges for godowns

Answer: (c)

India Becomes Chair of International Sugar Organisation (ISO) for 2024 to Lead Global Sugar Sector

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Important International institutions, agencies and fora– their structure, mandate, Storage, transport and marketing of agricultural produce and issues and related constraints, Indian Sugar Industry, Government Initiatives and Challenges faced by the sector

Context

- India has been chosen as the **Chair of the International Sugar Organisation (ISO) for 2024**. This appointment reflects India's growing stature in the global sugar sector.
- The announcement was made during the **63rd council meeting of the ISO**, headquartered in London.

What is the International Sugar Organisation (ISO)?

- **International Sugar Organisation (ISO):** The International Sugar Organisation (ISO) is an international organization that was **established in 1968** as a part of the **United Nations International Sugar Agreement**.
- **Member:** The ISO consists of member countries that are involved in sugar production, consumption, and trade.
- **Objectives:** The primary objectives of the ISO are to ensure the stabilization of the global sugar market, facilitate trade among member countries, and promote sustainable and efficient sugar production and consumption practices.
- It aims to improve the global sugar economy through various means, including policy recommendations, market analysis, and research.
- In recent years, the ISO has increasingly focused on promoting sustainable practices in the sugar industry, including environmentally friendly cultivation techniques, energy efficiency, and the use of sugar by-products.

India's Position in the Global Sugar Sector

- **Leadership in Global Sugar Consumption and Production:** India is the largest consumer and the **second-largest producer of sugar globally**. With approximately 15% of global sugar consumption and

about 20% production, India's sugar trends have a profound impact on the global market.

- **Influence in the Eastern Hemisphere:** India, along with Brazil in the Western Hemisphere, is a market leader in the sugar sector in the Eastern Hemisphere.
- **Commitment to Green Energy and Ethanol Production:** India is the **third-largest country in ethanol production after the USA and Brazil**. The significant increase in ethanol blending and production in recent years demonstrates India's commitment to green energy and its ability to utilize surplus sugar for sustainable purposes.
- **Modernization and Diversification of the Sugar Industry:** The Indian sugar industry has undergone modernization and expansion, focusing on sustainable and profitable business models. The industry has also capitalized on the potential of by-products, creating additional revenue streams.
- **Response during the COVID-19 Pandemic:** The resilience of the Indian sugar industry was evident during the COVID-19 pandemic. Despite lockdowns, the mills continued operations and contributed significantly by producing hand sanitizers to meet domestic demand.
- **Fair Practices in Cane Pricing:** India is unique in paying the highest cane price to farmers while maintaining profitability and operating self-sufficiently without government financial assistance.
- **Managing Domestic Sugar Prices:** Despite global sugar price hikes, India has managed to maintain stable and consistent domestic sugar retail prices, with only a minimal increase, thereby protecting consumers without burdening the industry.
- **International Collaborations and Knowledge Sharing:** Through institutions like the National Sugar Institute in Kanpur, India is extending its expertise globally. It collaborates with countries such as Indonesia, Nigeria, Egypt, and Fiji to share the latest technologies and best practices in the sugar sector.

Sugar Industry in India

- India ranks as the world's largest consumer (holding a 15% share) and the second-largest producer of sugar (with a 20% share).
- The sugar industry in India is mainly spread across two key regions:
- In the north, it is prevalent in **Uttar Pradesh, Bihar, Haryana, and Punjab**, while in the south, it is concentrated in **Maharashtra, Karnataka, Tamil Nadu, and Andhra Pradesh**.
- The tropical climate of South India is conducive to higher sucrose content, leading to **greater yields per unit area** compared to the northern region.

Contribution of Sugar Industry in India's Economy (Current Trends)

- **Production:** India has surpassed Brazil to become the world's largest producer of sugar.
- During the marketing year 2021–2022, India produced 35.8 million tonnes of sugar, and it was anticipated to reach 36.5 million tonnes in the marketing year 2022–2023.
- **Maharashtra** is the leading state in sugar production in India, surpassing Uttar Pradesh in 2022.
- **Consumption:** India is also the world's largest consumer of sugar.
- **Employment:** The sugar industry involves around 50 million farmers in sugarcane farming and employs approximately 5 lakh workers in sugar mills.
- **Sugarcane Cultivation:** The production of sugarcane increased from 110 million tonnes in 1961 to 405 million tonnes in 2019
- The area under sugarcane cultivation also grew from 2413 thousand hectares in 1961 to 5061 thousand hectares in 2019.
- The productivity of sugarcane improved from 45 tonnes per hectare to 80 tonnes per hectare.

Challenges in the Indian Sugar Sector

- **Reliance on Monsoon:** In central and southern India, where sugarcane cultivation largely depends on rainfall, a good monsoon season is crucial, unlike the northern states where irrigation is more prevalent.
- **Low Crop Yields:** Despite having the world's largest sugarcane cultivation area, India's yield per hectare is notably low, especially in the northern regions compared to the south.
- **Low Sugar Extraction:** The average sugar extraction rate from sugarcane in India is below 10%, whereas in other sugar-producing regions like Java, Hawaii, and Australia, it reaches around 14%.
- **Pricing Policies by the Government:** The dual price system set by the government hinders investment in the industry's growth and improvement.
- **Limited Crushing Season:** The sugar industry operates seasonally, with a crushing season that typically ranges from 4 to 7 months annually.

Government Initiatives

- **Fair and Remunerative Price (FRP) for Sugarcane:** This pricing system ensures profit margins and risk coverage for farmers regardless of individual sugar mills' profitability.
- The FRP is set following the **Commission for Agricultural Costs and Prices (CACP) recommendations**, in consultation with State Governments and other relevant parties.
- To mitigate excess sugarcane production, the government incentivizes sugar companies to produce ethanol for fuel blending with petrol.

- Consequently, India has ascended to become the third-largest ethanol producer globally, following the USA and Brazil.
- **Farmers' Welfare:** India pays the highest cane price to farmers and maintains profitability without government financial assistance.
- **Cane Dues:** Significant reduction in pending cane dues, with over 98% of the last season's dues cleared.
- **Price Stability:** Domestic sugar retail prices in India are stable, with only a 5% increase compared to the global hike of 40%.

Conclusion

India's chairmanship of ISO is not just a recognition of its market position but also its efforts in sustainable practices, farmer welfare, and consumer price stability. India's leadership in ISO is expected to bring positive changes in global sugar sector practices and collaborations.

MCQs

Q. The Fair and Remunerative Price (FRP) of sugarcane is approved by the (UPSC 2015)

- Cabinet Committee on Economic Affairs
- Commission for Agricultural Costs and Prices
- Directorate of Marketing and Inspection, Ministry of Agriculture
- Agricultural Produce Market Committee

Answer: (a)

Q. With reference to the usefulness of the by-products of sugar industry which of the following statements is/are correct? (UPSC 2013)

1. Bagasse can be used as biomass fuel for the generation of energy.
2. Molasses can be used as one of the feedstocks for the production of synthetic chemical fertilizers.
3. Molasses can be used for the production of ethanol.

Select the correct answer using the codes given below:

- 1 only
- 2 and 3 only
- 1 and 3 only
- 1, 2 and 3

Answer: (c)

The Need to Transform Agri-Food System

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Major crops-cropping patterns in various parts of the country, - different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints, Akkadi saalu, FAO, Intensive Agriculture and Transformation of the Agri-Food System

Context

- The **United Nations Food and Agriculture Organization (FAO)** report highlights the **high hidden costs of global agrifood systems**.

- In India, these costs amount to nearly **11% of GDP**, leading to poverty, environmental damage, and health issues.
- The report emphasizes the urgency to transform agrifood systems, suggesting **multi-cropping as a viable solution**.

What is the issue?

- The United Nations Food and Agriculture Organization (FAO) report reveals the enormous hidden costs of current global agrifood systems, exceeding \$10 trillion.
- In countries like India, these costs account for nearly **11% of GDP**, manifesting in higher poverty, environmental damage, and health impacts like undernourishment and unhealthy diets.
- India's agricultural productivity gains over the past 50 years, largely through **monocropping and chemical-intensive practices**, have led to negative consequences.
- These include loss of seed sovereignty, erosion of Indigenous knowledge, nutritional deficiencies in diets, ecological damage (like excessive groundwater extraction), and increased farmer indebtedness.
- The Indian government's procurement policy heavily favors rice and wheat, leading to a decrease in the cultivation of coarse grains and a rise in water-intensive cash crops like sugarcane and areca nut.
- This trend impacts food security and the production of nutritional crops, exacerbating biodiversity loss and environmental issues.

What is Intensive Agriculture?

- **Intensive agriculture, also known as intensive farming**, is a type of agriculture characterized by a high level of input and output per unit of agricultural land area.
- It typically involves the use of large amounts of fertilizers, pesticides, and other chemical inputs, as well as extensive use of irrigation and mechanization, to significantly increase crop yields.
- The primary goal is to maximize crop yield or livestock production. This is achieved through the use of high-yield crop varieties, heavy use of chemical fertilizers, and advanced technological inputs.
- Often involves the cultivation of a single crop over a large area for consecutive seasons, known as **monoculture**.
- This approach can lead to greater efficiencies in planting and harvesting but reduces biodiversity and can make crops more susceptible to pests and diseases.
- **Relies heavily on synthetic fertilizers and pesticides** to boost crop growth and control pests and diseases. While this increases crop yields, it can also lead to environmental pollution and can degrade soil quality over time.
- **Intensive use of water for irrigation** is common to ensure optimal crop growth, especially in areas with

insufficient rainfall. This can lead to water scarcity and affect the natural water balance in the region.

- While it can lead to increased production and profits, it often requires significant investment and can lead to economic challenges for small-scale farmers who cannot afford such technologies.

Impacts of Intensive Agriculture

- **Negative Environmental Consequences:** Intensive agriculture, particularly the **monocropping systems and chemical-intensive farming practices** adopted during the Green Revolution, have led to adverse ecological consequences. This includes **excessive extraction of groundwater** and a decrease in biodiversity due to the focus on monocultures of paddy and wheat.
- **Impact on Nutritional Diversity:** The shift from diverse crop varieties to monoculture plantations has compromised the nutritional needs of households. There's been a decline in the cultivation of nutritionally rich crops like pulses and millets.
- **Economic Viability and Farmer Indebtedness:** The reliance on seeds and fertilizers from multinational corporations has increased the indebtedness among agrarian households. The average monthly household income of a farming household is low, making agriculture increasingly unviable.
- **Procurement Policies and Crop Favoritism:** The Indian government's procurement policies **favor rice and wheat**, leading to a **neglect of coarse grains like jowar, bajra, ragi, maize, and barley**. This has resulted in a significant reduction in the cultivation of these grains.
- **Water-Intensive Cash Crops:** Policies favoring certain cash crops like **sugarcane and areca nut** have exacerbated pressure on water resources and contributed to air and water pollution.
- **Impact of Global Trade Relations:** International market fluctuations and trade policies have historically influenced local agricultural practices, often to the detriment of local farmers.

Impact of the Green Revolution in India

- The Green Revolution, initiated in the 1960s, significantly enhanced India's agricultural productivity.
- It introduced high-yielding varieties of crops like paddy and wheat, along with chemical-intensive farming practices.
- While this led to a dramatic increase in food production, it also had several unintended consequences:
- **Reduction in Crop Diversity:** There was a shift from diverse crops to monocultures, primarily focusing on rice and wheat. This reduced the cultivation of nutritionally rich staples like pulses and millets.
- **Environmental Impact:** The intensive farming practices led to excessive extraction of

groundwater, soil degradation, and a decline in biodiversity.

- **Economic Challenges for Farmers:** The reliance on purchased seeds and fertilizers increased farmers' indebtedness and made agriculture less economically viable for many.
- **Nutritional Concerns:** The focus on rice and wheat compromised the nutritional needs of households, as these crops are less nutritionally diverse compared to traditional staples.

Favoured Crops in India and Their Impact

- **Rice and Wheat:** These two crops constitute more than 70% of India's agricultural production.
- The focus on high-yielding varieties of rice and wheat was a significant aspect of the Green Revolution in India.
- This focus has led to monocropping systems and chemical-intensive farming practices.
- Farmers are incentivized to grow these crops over others like coarse grains (jowar, bajra, ragi, maize, barley).
- This has resulted in a decrease in the cultivation of coarse grains by 20% between 1966-1967 and 2017-2018, while the cultivation area for rice and wheat increased by about 20% and 56%, respectively.
- **Sugarcane and Areca Nut:** These water-intensive cash crops have also flourished due to favorable policies, such as investments in dams and canal irrigation (beneficial for sugarcane) and free electricity for borewells (favorable for areca nut).
- It has had adverse effects on biodiversity.
- It has also increased pressure on groundwater resources and contributed to air and water pollution.
- **Food and Nutritional Security:** Despite the production of vast quantities of rice and wheat, small and marginal farmers in India remain among the most food and nutrition insecure. This is ironic, given that they are major contributors to the agricultural sector.
- **Global Market Influences:** The influence of global market fluctuations, as seen with soy prices and supply gluts, has directly impacted local farmers and agro-companies.
- In the Malwa region, for example, fluctuations in soy prices have eroded incomes for local soy farmers.

Steps Needed to Transform Agri-Food System

- **Shifting to Multi-Cropping Systems:** Moving away from monoculture and chemical-intensive farming practices towards multi-cropping systems. These systems can protect farmers' well-being, improve nutritional outcomes, and benefit ecological health.
- **Rebalancing Crop Favoritism:** Policies that currently favor the cultivation of rice and wheat, often neglecting other nutritious and ecologically sustainable crops like pulses, millets, and coarse grains, need to be revised. This would involve

adjusting procurement policies and subsidies to support a broader range of crops.

- **Promoting Crop Diversification:** Introducing diversified multi-cropping systems, rooted in agroecology principles, can revitalise degraded land and soil. These systems include a mix of legumes, pulses, oilseeds, trees, and livestock, improving soil health and supporting biodiversity.
- **Economic and Environmental Considerations:** The transition should factor in the "hidden costs" of current systems and emphasize the long-term benefits of diversified farming both for the environment and farmer income.
- **Gradual Transition for Farmers:** A systematic and gradual shift from mono-cultivation to more diverse farming practices. This could start with moving from chemical-intensive practices to non-pesticide management and natural farming, reducing input costs and improving environmental outcomes.
- **Value Addition and Income Diversification:** Farmers can diversify their income sources by incorporating practices like value addition, livestock, and poultry rearing.
- **Implementing Transition Pathways:** A proposed pathway includes allocating land for commercial crops, food and fodder production, and environmental services. Over time, the focus can shift more towards food and fodder and integrating tree species and livestock rearing.

What is Crop Diversification?

Crop diversification is an agricultural strategy that involves growing a variety of different crops in the same area or on the same farm. This practice contrasts with monoculture, where only one type of crop is cultivated over a large area.

- **Temporal Diversification:** This involves planting different crops in the same field, but at different times or seasons. This method, known as crop rotation, helps in breaking pest and disease cycles and managing soil fertility.
- **Spatial Diversification:** This is achieved by growing different crops in the same field at the same time. It can be done through intercropping (growing two or more crops in proximity) or mixed cropping (growing several crops in the same area without a distinct pattern).
- **Diversification through Varieties:** This involves planting different varieties of the same crop. This approach can reduce the risk of total crop failure due to disease, pests, or adverse weather conditions, as different varieties may have different levels of resistance and tolerance.
- **Structural Diversification:** This involves integrating other forms of agricultural activities such as agroforestry (combining agriculture and forestry

practices) or integrating crop farming with livestock rearing.

What is 'akkadi saalu'?

- "Akkadi Saalu" is a traditional agricultural practice in parts of Karnataka, India. The term roughly translates to "patterned row" in Kannada.
- It is a method of farming that involves intercropping – growing two or more crops in proximity.
- This practice is part of a broader set of sustainable agricultural techniques that emphasize diversity and synergy between different plant species.
- It involves planting a combination of crops such as legumes, pulses, oilseeds, trees, shrubs, and sometimes integrating livestock. This diversity is beneficial for soil health and helps in pest control.
- This method provides various ecosystem services like nitrogen fixation (by leguminous plants), and pest management (certain plants act as pest traps).
- By having a variety of plants, the soil remains fertile and less prone to erosion. The diverse root systems and organic matter from different plants enhance soil structure and nutrient content.
- The diversity of crops in "Akkadi Saalu" makes the system more resilient to pests and diseases, reducing the reliance on chemical pesticides.

Benefits of Crop Diversification

- **Environmental Benefits:** Diversified cropping systems contribute to ecological health.
- They can improve soil health by enhancing soil structure and fertility, facilitating water retention, and reducing erosion.
- Intercropping with various plants, including legumes, trees, and shrubs, can support biodiversity, provide pest traps, and contribute to nitrogen fixation in the soil.
- **Nutritional Outcomes:** Diversifying crops leads to a more varied food basket, which can improve the nutritional quality of diets.
- Crops like millets, legumes, and pulses are nutritionally rich and can be cultivated as alternatives to the dominant rice and wheat crops.
- This helps in addressing issues like undernourishment and unhealthy dietary patterns.
- **Economic Sustainability for Farmers:** Diversification can potentially reduce the heavy reliance on chemical inputs, thus lowering farming costs.
- It can also provide multiple sources of income for farmers through the sale of different types of crops and products.
- By shifting subsidies to support diversified farming, farmers can be incentivized to preserve natural capital.

- **Reduction of Hidden Costs:** The current monoculture-based, chemical-intensive farming practices have hidden environmental and health costs.
- Diversifying crops can help mitigate these costs by promoting more sustainable agricultural practices.
- **Improved Resilience:** Diversified farming systems are generally more resilient to climate change, pests, and diseases.
- This is because the diversity of crops can reduce the risk of total crop failure and provide a buffer against market and environmental fluctuations.
- **Socioeconomic Benefits:** Crop diversification can also play a role in reducing poverty and indebtedness among farming households by providing more stable and diverse income sources.
- It can also help in revitalizing rural economies through local food production and associated industries.
- **Transition Strategies:** The transition to diversified farming needs to be systematic and supportive. This includes moving away from chemical-intensive practices to more natural farming methods, integrating livestock and poultry for additional income, and providing farmers with the necessary support and incentives for this transition.

Limitations of Crop Diversification

- **Loss of Productivity:** Diversification might lead to a reduction in productivity when measured in terms of kilograms per hectare. This is because monocultures are often optimized for maximum yield of a single crop, while diversified systems spread their productivity across multiple crop types.
- **Transition Challenges:** Shifting from monoculture, especially those reliant on chemical-intensive practices, to diversified cropping systems can be complex and gradual. Farmers need time and support to adjust to new farming practices, such as non-pesticide management and natural farming.
- **Economic Concerns:** There is a perceived risk of a decline in farmer income with the shift to alternative farming systems, even though the long-term benefits might outweigh these short-term losses.
- **Need for Support in Value Addition and Livestock Integration:** For successful diversification, farmers may need to incorporate livestock and poultry, and engage in value addition activities. This requires additional skills, resources, and possibly investment.
- **Institutional and Market Challenges:** There is a need for addressing issues related to local seeds, institutional arrangements for market access, and the labor required in diversified farming.
- **Scaling Up and Collaboration Requirements:** Effective implementation of diversified cropping at a larger scale requires collaboration among various stakeholders, including institutions, policymakers, and social groups. This is necessary to articulate economic incentives and create supportive policies.

- **Environmental Considerations:** While beneficial for the environment, the transition to diversified cropping systems might initially face resistance due to established practices favoring monocultures and high-input agriculture.

Transition Strategies for Farmers

- **Gradual Shift from Monoculture:** Farmers should gradually move away from the mono-cultivation of crops like rice and wheat. This transition needs to be systematic to allow farmers to adjust.
- **Reduced Reliance on Chemical Inputs:** They should start by moving from chemical-intensive practices to non-pesticide management. Then, gradually adopt natural farming practices to reduce input costs.
- **Diversification of Income Sources:** Farmers can diversify their income by incorporating livestock and poultry, along with the cultivation of crops. This can include partial experimentation on specific land portions.
- **Adopting Multi-Cropping Systems:** Implement diversified multi-cropping systems that include a mix of legumes, pulses, oilseeds, trees, shrubs, and livestock. This approach is beneficial for soil health, biodiversity, and ecological balance.
- **Allocation Strategy:** A visual representation of an ideal diversified farm could include 70% allocated for commercial crops, 20% for food and fodder, and 10% for environmental services. Over time, the fraction for commercial crops could be reduced to 50%.
- **Integration of Tree Species and Livestock:** Incorporating locally suitable tree species for fruits and fodder, along with livestock rearing, can further improve farm incomes.
- **Economic Modelling:** Preliminary economic modelling suggests that such pathways can sustain farm incomes and improve ecological outcomes both in the short term (up to three years) and long term (up to 25 years).
- **Addressing Challenges:** Challenges related to local seeds, market access, labor, and drudgery need to be addressed. This involves institutional arrangements and policy support.
- **Collaboration and Support:** Scaling up these practices requires collaboration among institutions, policymakers, and social groups. Articulating economic incentives for farmers to shift from high-input monoculture to diversified cropping is essential.
- **Policy and Subsidy Redirection:** Redirecting subsidies currently accruing to corporations towards paying farmers for sustaining natural capital is suggested. This would incentivize preserving natural resources rather than depleting them.

Conclusion

The transition strategy involves a multi-faceted approach focusing on gradual change, diversification, ecological sustainability, and economic viability. It calls for

collaborative efforts and supportive policies to facilitate this transition while ensuring the financial and ecological well-being of farming communities.

UPSC Previous Year Practice Question

- Q.** Explain the changes in cropping pattern in India in the context of changes in consumption pattern and marketing conditions. **(2023)**
- Q.** What is Integrated Farming System? How is it helpful to small and marginal farmers in India? **(2022)**
- Q.** What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification? **(2021)**
- Q.** What are the major factors responsible for making rice-wheat system a success? In spite of this success how has this system become bane in India? **(2020)**
- Q.** How far is the Integrated Farming System (IFS) helpful in sustaining agricultural production? **(2019)**
- Q.** How has the emphasis on certain crops brought about changes in cropping patterns in recent past? Elaborate the emphasis on millets production and consumption. **(2018)**
- Q.** What are the major reasons for declining rice and wheat yield in the cropping system? How crop diversification is helpful to stabilize the yield of the crop in the system? **(2017)**
- Q.** Explain various types of revolutions, took place in Agriculture after Independence in India. How these revolutions have helped in poverty alleviation and food security in India? **(2017)**
- Q.** In view of the declining average size of land holdings in India which has made agriculture non-viable for a majority of farmers, should contract farming and land leasing be promoted in agriculture? Critically evaluate the pros and cons. **(2015)**

MCQs

Q. Among the following, which one is the least water-efficient crop? **(UPSC 2021)**

- Sugarcane
- Sunflower
- Pearl millet
- Red gram

Answer: (a)

Q. In the context of India, which of the following is/are considered to be of practice(s) of eco-friendly agriculture? **(UPSC 2020)**

- Crop diversification
- Legume intensification
- Tensiometer use
- Vertical farming

Select the correct answer using the code given below:

- 1, 2 and 3 only
- 3 only
- 4 only
- 1, 2, 3 and 4

Answer: (d)

Q. With reference to the circumstances in Indian agriculture, the concept of "Conservation Agriculture" assume significance. Which of the following fall under the Conservation Agriculture? (UPSC 2018)

1. Avoiding monoculture practices
2. Adopting minimum tillage
3. Avoiding the cultivation of plantation crops
4. Using crop residues to cover soil surface
5. Adopting spatial and temporal crop sequencing/crop rotations

Select the correct answer using the code given below:

- (a) 1, 3 and 4
- (b) 2, 3, 4 and 5
- (c) 2, 4 and 5
- (d) 1, 2, 3 and 5

Answer: (c)

Q. What are the significances of a practical approach to sugarcane production known as the 'Sustainable Sugarcane Initiative'? (UPSC 2014)

1. Seed cost is very low in this compared to the conventional method of cultivation.
2. Drip irrigation can be practiced very effectively in this.
3. There is no application of chemical inorganic fertilizers at all in this.
4. The scope for intercropping is more in this compared to the conventional method of cultivation.

Select the correct answer using the code given below.

- (a) 1 and 3 only
- (b) 1, 2 and 4 only
- (c) 2, 3 and 4 only
- (d) 1, 2, 3 and 4

Answer: (b)

Q. In the context of food and nutritional security of India, enhancing the 'Seed Replacement Rates' of various crops helps in achieving the food production targets of the future. But what is/are the constraint/constraints in its wider/greater implementation? (UPSC 2014)

1. There is no National Seeds Policy in place.
2. There is no participation of private sector seed companies in the supply of quality seeds of vegetables and planting materials of horticultural crops.
3. There is a demand-supply gap regarding quality seeds in case of low value and high volume crops.

Select the correct answer using the code given below.

- (a) 1 and 2
- (b) 3 only
- (c) 2 and 3
- (d) None

Answer: (b)

Science & Technology (GS Paper Prelims) & GS Paper III
(Main)

'White Hydrogen' Reserves

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords:

Infrastructure: Energy, White Hydrogen, Green Hydrogen Mission, Significance, Advantages and Challenges

Context

- Recently, a large deposit of natural hydrogen (white hydrogen) was accidentally discovered in the Lorraine region of France when testing methane in soil.
- Hydrogen is classified into different categories based on their GHG emission profile or process of extraction, with each category identified by a color.
- The discovery could help develop a safe, clean, and renewable source of energy which would allow countries to transition away from the fossil fuel-based economy.
- These transition efforts could be impacted by the oligopolistic control over mining and processing of rare earth elements which are a critical element in scaling up of green technologies according to India's Chief Economic Advisor V. Anantha Nageswaran.

What is white hydrogen?

- **White hydrogen refers to a naturally occurring form of hydrogen which is found within subsurface deposits.**
- Hydrogen is considered to be the most abundant element on earth but significant quantities of hydrogen gas in its pure form were not thought to be available on the earth.
- It is not clear how the deposits were formed but scientists have suggested numerous theories such as **water-mineral reactions, degassing from the Earth's crust and mantle, reactions with rocks, and biological activities.**
- It is **highly soluble in freshwater, with solubility increasing corresponding to increased pressure.**

Evidence of white hydrogen

- In 2012, a borehole drilled for a well decades earlier in Mali was found to be emitting almost pure natural hydrogen.
- In 2023, deposits of white hydrogen were found in France by researchers testing the presence of methane in the soil.
 - According to estimates, this white hydrogen deposit ranging from 6 to 250 million MT, is considered to be the largest ever deposit found.
- Deposits have also been discovered in **Australia, eastern Europe, Oman, Spain, the US, and West Africa.**
- Private companies such as **Helios Aragón in Spain, Gold Hydrogen in Australia and Koloma in the US** are

actively involved in extracting and utilizing white hydrogen for various energy applications.

What is Hydrogen Energy?

- Hydrogen is an important source of energy since it **has zero carbon content** and is a non-polluting source of energy in contrast to hydrocarbons that have net carbon content in the range of 75–85 per cent.
- Hydrogen energy is expected to reduce carbon emissions that are set to jump by 1.5 billion tons in 2021.
- It has the **highest energy content by weight and lowest energy content by volume**.
- As per International Renewable Energy Agency (IRENA), Hydrogen shall make up **6 per cent of total energy consumption by 2050**.
- Hydrogen energy is currently at a nascent stage of development, but has considerable potential for aiding the process of energy transition from hydrocarbons to renewable.

Why is the discovery important?

- Eco-friendly source of energy:** Scientists and experts have identified hydrogen as a potential **source of clean energy** for the aviation, shipping, and steel industries.
- The combustion of hydrogen produces only water as a by-product, making it **eco-friendlier than solar or wind energy**.
- Naturally occurring:** It was originally believed that large-scale hydrogen production was possible only through lab-based processes.
- The discovery has indicated that **large-scale sources of hydrogen may be present beneath the surface**.
- Renewable:** White hydrogen is constantly **replenished** unlike fossil fuels which take millions of years to develop.
- Cost-effective:** Since white hydrogen is naturally occurring, it **does not require energy-intensive production methods**, which makes it less expensive than other energy sources.
- According to estimates, the **production costs of white hydrogen is around \$1 per Kg as opposed to \$6 per Kg for green hydrogen**.
- Potential for use:** Hydrogen is an **ideal fuel for heavy-duty vehicles** like ships and planes in which batteries cannot be used easily.
- It is also suitable for use in the steel industry and in chemical processes like fertilizer production.

What are the challenges associated with hydrogen energy?

- Lack of information:** Scientists have pointed out the lacunae in data on hydrogen leaks and the potential harm they could cause.
- This is a major challenge for the industry as it could affect adoption rates.

- Environmental damage:** Leakage of hydrogen into the atmosphere can lead to a reduction in the concentration of atmospheric molecules that destroy the greenhouse gases.
 - This counteracts the potential environmental benefits of white hydrogen.
 - However, the **indirect global warming impact of fugitive hydrogen emissions is much lesser than the impact of other life cycle greenhouse gas impacts**.
- Safety:** Technology needs to be developed to help monitor hydrogen leaks which could otherwise lead to significant health and environmental damage.
 - Hydrogen molecules are much smaller and lighter than methane, making them harder to contain, and more explosive than natural gas.**
 - This was one of the major reasons for the popularity of heat pumps and battery powered EVs over hydrogen-based alternatives.
 - Therefore, white hydrogen must be used with caution in order to tackle safety risks.
- Transportation and storage:** The transportation and storage of hydrogen makes it more expensive than other energy sources.
 - It occupies a lot of space in its gaseous state.
 - Temperatures of -253°C are required to liquify hydrogen.
 - There is a lack of adequate infrastructure for the transport of hydrogen such as pipelines and distribution systems.
 - Hydrogen can corrode metal pipes which can lead to cracking.

Types of hydrogen

Category	Source	Production
Green Hydrogen	Water and renewable sources of energy	Electrolysis using renewable electricity
Blue Hydrogen	Natural gas	Steam Methane Reforming with Carbon Capture and Storage
Gray Hydrogen	Natural gas	Steam Methane Reforming without CCS
Black and Brown Hydrogen	Black coal or lignite	Gasification
Pink/Purple/Crimson Hydrogen	Water	Nuclear powered electrolysis

Turquoise Hydrogen	Methane	Methane pyrolysis
Gold Hydrogen	Oil and gas	Fermentation of bacteria in oil wells
Yellow Hydrogen	Solar energy	Electrolysis
White Hydrogen	Subsoil deposits	Naturally occurring

To know more about the categories, click the [link](#).

Could the green transition be weaponized?

- The **Chief Economic Advisor of India, V. Anantha Nageswaran** stated that **external funding to help developing countries transition could be weaponized**.
- He recommended that investors in the green transition strategies of developing countries should **focus on the creation of public goods instead of prioritizing returns**.
- He cited the **post-World War II reconstruction, space exploration and the development of the prototype of the Internet to highlight the role played by public investment in green transitions**.
- **Public investment in carbon sequestration, carbon sinks, battery storage technologies and green hydrogen** will help avoid challenges associated with **intellectual property rights**.
- Market-based solutions to mitigate carbon emissions had limitations as it could **promote and push capital market liberalization** which posed the **risk of over-financializing the economy and other macroeconomic consequences**.
- **Countries must be allowed to own their climate agenda while focusing on economic growth** instead of becoming reliant on external sources.
- In case, **countries lacked resources, it could lead to external dependencies and vulnerabilities** which would enable **funding to be weaponized and impact the availability of these nations to deliver on climate security without growth**.
- This highlighted the need to support countries prioritizing economic growth instead of penalizing them.
- Investors have sought risk mitigation interventions, so the CEA has recommended lowering their return expectations accordingly.
- If investors focus on raising their returns it would lead to a counterproductive situation for both investors and the host country.
- **Access to rare earth elements and critical minerals is critical to scale up production and implementation of technologies** as part of the green transition.

- However, the **oligopolistic control over the mining and processing of these minerals** poses a significant risk to accessing these minerals and implementing the green transition.

Green Hydrogen Mission

- The Union Ministry of New and Renewable Energy launched the National Green Hydrogen Mission with the aim of incentivizing the production of green hydrogen in India to make the country a net exporter of the fuel.
- **Target:** Develop production capacity of at least 5MMT (Million Metric Tonnes) per annum.
- It also sets an additional target of 125 GW of renewable energy to help decarbonize the Indian industrial, mobility, and energy sectors.
- According to the Union government, create \$8 trillion of investment and 6 lakh jobs by 2030.
- It also sets cost of reducing the cost of green hydrogen to \$1 per kg by 2030.
- India's ambitious goal of 175 GW by 2022 got an impetus in the 2021-22 budget which allocated Rs. 1500 crore for renewable energy development and NHM.
- **Umbrella missions:** There are two umbrella missions under the programme:
 - **Strategic Interventions for Green Hydrogen Transition Programme (SIGHTS):** It will fund the domestic manufacture of electrolyzers and the development of green hydrogen.
 - Support pilot projects in emerging end-use and production pathways.
- **Other components:**
 - **Strategic Hydrogen Innovation Partnership (SHIP):** It will facilitate a public-private partnership framework for Research and Development under the Mission.
 - A robust Standards and Regulations framework will also be developed.
 - A coordinated skill development programme will also be undertaken.
- **Implementation:** Identification of states and regions capable of producing or utilizing hydrogen on a large scale will be done by the **Union Ministry of New and Renewable Energy**.
 - These identified sites will be developed as **Hydrogen hubs** by the Ministry.
 - The Ministry has budgeted ₹17,490 Crore for the SIGHTS programme, ₹1466 Crore for pilot projects and hydrogen hubs, ₹400 Crore for research and development, and ₹388 Crore for other parts of the mission.

To know more, click the [link](#).

Conclusion

White hydrogen has significant potential for a sustainable and cost-effective energy transition due to its easy availability and cost-effectiveness. However,

considerations related to implementation, effect on the environment, safety and external funding could affect the green transitions in developing countries highlighting the need for a balanced and inclusive approach to environmental sustainability.

What is tantalum, the rare metal found in Sutlej?

Priority: High



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: GS3, Science and Technology, Industries, Discovery of Tantalum in India and its Significance

Context

- A team of researchers from the Indian Institute of Technology (IIT), Ropar has found the presence of tantalum, a rare metal, in the Sutlej river sand in Punjab.
- The team was headed by Dr Resmi Sebastian, assistant professor at the institute's Civil Engineering Department.

What is tantalum?

- Tantalum is a rare metal with the atomic number 73 and atomic mass is 180.948.
- Its chemical symbol is "Ta".
- It was first discovered in 1802 by Anders Gustaf Ekenberg, a Swedish chemist, in minerals obtained from Ytterby, Sweden. It was recorded as a distinct element in 1866.
- The name is derived from the legendary Greek figure King **Tantalus**. Its name reflects its insolubility in acids. Just like the Tantalus failed to take up fruit and water, despite being surrounded by it, Tantalum placed in the midst of acids, is incapable of taking any of the acid.

- **Atomic number:** It is defined as the number of protons found in an atom.
- **Atomic Mass:** The atomic mass of an element is the average mass of the atoms of an element measured in atomic mass unit (amu, also known as daltons, D).

Satluj River:

- The Satluj River is a major tributary of the Indus River.
- It is the longest among all the tributaries of the Indus.
- **Source:** Rakas Lake, also known as Lake Rakshastal, near Kailash Mansarovar, Tibet.
- Enters into India through the Shipki La pass.
- The river traverses through the states of Himachal Pradesh and Punjab within Indian territory.
- Upon entering Pakistan, it joins the Chenab River.
- The total length of the Satluj River is 1450 km, with 1050 km flowing within Indian territory.

Properties of Tantalum:

- **Physical Properties:**
 - Shiny, Silvery Grey, heavy, and very hard.
- **Corrosion Resistance:**

- It forms an oxide layer when exposed to air leading to high corrosion resistance.
- Even in strong and hot acid environments, the oxide layer is extremely difficult to remove,
- **Ductility:**
 - In pure form Tantalum can be stretched, pulled, or drawn into a thin wire or thread without breaking.
- **Chemical Immunity:**
 - Almost completely immune to chemical attack at temperatures below 150°C.
 - Attacked only by hydrofluoric acid, acidic solutions containing the fluoride ion, and free sulphur trioxide.
- **High Melting Point:**
 - Tantalum has an extremely high melting point, exceeded only by tungsten and rhenium.

Uses of Tantalum:

- **Electronic Sector:**
 - Dielectric property of the oxide layer formed on the surface of Tantalum makes it suitable to be used for Capacitors.
 - It exhibits superior capabilities for storing more electricity in smaller sizes with minimal leakage.
 - Ideal for use in portable electronic devices like smartphones, laptops, and digital cameras.
- **Substitute for Platinum:**
 - Tantalum, with its high melting point, serves as a substitute for platinum.
 - Particularly useful given platinum's higher cost.
- **Industrial Applications:**
 - Used in the manufacturing of high refractive index glass, vacuum furnaces and other components for chemical plants, nuclear power plants, airplanes, and missiles.
- **Biocompatibility:**
 - Tantalum does not react with bodily fluids.
 - Makes it ideal to be used in surgical equipment and implants, including artificial joints.
- **Cutting-Edge Material:**
 - Composite of tantalum carbide (TaC) and graphite forms one of the hardest materials known.
 - Therefore, it is used on the cutting edges of high-speed machine tools.
- Its properties are very similar to Niobium, a similar rare element.

Global scenario of Tantalum production and consumption:

- **Democratic Republic of the Congo** is the largest producer.
- Global Tantalum Technology:
 - Tantalum technology is dominated by a few Chinese companies.
- World Consumption:
 - Total world consumption of tantalum in various forms is approximately 5.0 million pounds.
 - 60% of this consumption is attributed to capacitor-grade powder.

Indian scenario:

- Tantalum Consumption in India:
 - India's approximate tantalum consumption is around 20 tons.
 - Notably, capacitor-grade powder and wire account for around 500 kg of this consumption.
- Tantalum Ore Availability in India:**
 - Tantalum ore, in the form of tantalite-columbite ore, is present in mines across Bihar, Rajasthan, Karnataka, etc.
- Controlling Agency in India:
 - The Atomic Mineral Directorate for Exploration and Research (AMDER) holds sole control over tantalum ore in India.
 - This ore is classified and must be stockpiled for applications in nuclear contexts.
- **Significance of discovery for India:**
 - As per the annual report of the Union Ministry of Mines for 2020-21 it is one of the 12 critical and strategic minerals.
 - India Imports from China of Tantalum were US\$785.19 thousand in 2022, which can be substituted with domestic supplies if found industry grade.
 - Emphasis on Electric vehicles, solar energy, and energy storage hybrid systems generates a need for Tantalum.

MCQs

Q. With reference to the management of minor minerals in India, consider the following statements: (UPSC 2019)

1. Sand is a 'minor mineral' according to the prevailing law in the country.
2. State Governments have the power to grant mining leases of minor minerals, but the powers regarding the formation of rules related to the grant of minor minerals lie with the Centre Government.
3. State Governments have the power to frame rules to prevent illegal mining of minor minerals.

Which of the statements given above is/are correct?

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

Answer: (a)

Q. Recently, there has been a concern over the short supply of a group of elements called 'rare earth metals'. Why? (UPSC 2012)

1. China, which is the largest producer of these elements, has imposed some restrictions on their export.
2. Other than China, Australia, Canada and Chile, these elements are not found in any country.

3. Rare earth metals are essential for the manufacture of various kinds of electronic items and there is a growing demand for these elements.

Which of the statements given above is/are correct?

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

Answer: (c)

OneWeb 1st pvt Satcom Firm To Get Regulatory Nod

Priority: Medium



Primary Source: PTI

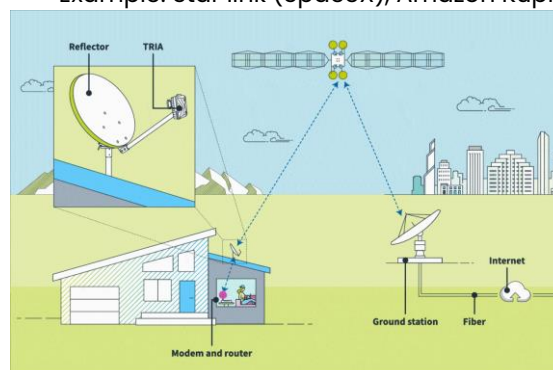
Syllabus Relevance & Important Keywords: Science and Technology, Awareness in the fields of Space, OneWeb, IN-SPACe, Satellite Broadband

Context

- Bharti Group-backed OneWeb India has received the necessary authorisations from the Indian space regulator IN-SPACe.
- It also obtained in-principle approval to establish and operate two gateways in Gujarat and Tamil Nadu to deliver the services.
- OneWeb India is the first organization to be granted this authorisation.

What is Satellite broadband:

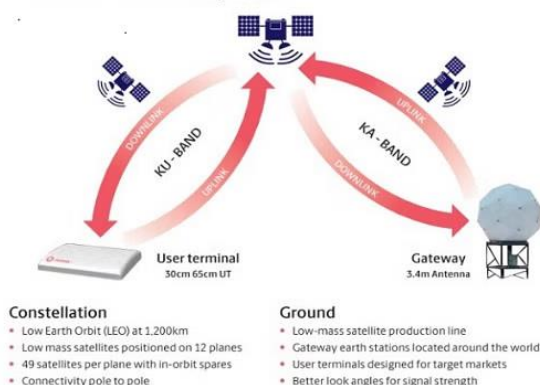
- Satellite internet provides an online connection powered by satellites in space.
- These satellites send and receive signals that route to the internet service provider and then to the receiver's internet modem.
- Internet service providers (ISPs) launch multiple satellites into space that orbit around the Earth (low-earth orbit or high-earth orbit) to ensure this communication.
- Example: Star link (SpaceX), Amazon Kupier, LeoSat.

**OneWeb Satellite broadband :**

- It is a satellite-based network to provide high-speed, low-latency internet connectivity worldwide.
- Indian Space Research Organisation (**ISRO**) and NewSpace India Ltd (**NSIL**) in partnership with UK-based **OneWeb Group** launched this.

OneWeb Satellites Connectivity

How our connectivity works



- Operates using OneWeb Constellations which was launched On 23-10-22.

OneWeb Constellation:

- The OneWeb Constellation comprises 588 operational satellites arranged in 12 rings, each containing 49 satellites.
- Positioned in low Earth orbit (LEO), these satellites complete a full orbit around the Earth in just 109 minutes.

India's most powerful rocket, Launch Vehicle Mark-3 (LVM3), launched satellites for OneWeb's initial internet constellation from SDSC.

- In the first launch, 36 OneWeb broadband satellites were transported to low Earth orbit (LEO) in a circular path around 280 miles (450 kilometers) above Earth.
- For deeper insights, [click here](#).

Potential benefits of Satellite broadband:

- Low Latency:** Low earth orbit satellites 1,000km from earth - compared to 35,000km for GEO satellites - significantly increase bandwidth and reduce latency in space to around **50-70ms**.
- High Speeds:** It expects to provide an upload speed of 30-70 Mbps and a download speed of up to 150 Mbps, which is suitable for most applications.
- Redundancy:** In areas without traditional broadband, space-based systems offer a redundant connection, critical for emergency situations.
- IoT and Machine-to-Machine Communication:** Supporting the growth of IoT devices and enabling machine-to-machine communication, particularly in agriculture, transportation, and logistics.
- Low Cost:** LEO antennas require less power and a smaller antenna size for a reliable link, and are substantially easier and less expensive to deploy, bridging the digital divide with affordable internet.
- Disaster Response:** Swift deployment of space-based systems facilitates emergency communication during natural disasters, enhancing life-saving efforts and relief coordination.
- Scalability:** These systems can quickly scale to meet rising demand, crucial in areas experiencing rapid

population growth or sudden surges due to emergencies.

- Global Coverage:** Space-based broadband ensures coverage even in the most remote areas, a challenge for traditional ground-based systems.
- Improved Connectivity for Travel:** The low latency and high-speed capabilities enhance connectivity for air and sea travel, improving safety and ensuring passengers stay connected during their journey.

Indian National Space Promotion and Authorization Centre(IN-SPACe):

- It is headquartered in Ahmedabad (Gujrat)
- IN-SPACe was established as an autonomous agency within the Department of Space, following Space sector reforms.
- It facilitates private sector participation in various space activities.
- IN-SPACe authorizes and supervises non-governmental entities in building launch vehicles, and satellites, and providing space-based services.
- IN-SPACe addresses the needs of private players, including educational and research institutions, aiming to enhance India's overall capabilities in the space sector.

MCQs

Question: With reference to India's satellite launch vehicles, consider the following statements: (UPSC 2018)

- PSLVs launch the satellites useful for Earth resources monitoring whereas GSLVs are designed mainly to launch communication satellites.
- Satellites launched by PSLV appear to remain permanently fixed in the same position in the sky, as viewed from a particular location on Earth.
- GSLV Mk III is a four-staged launch vehicle with the first and third stages using solid rocket motors; and the second and fourth stages using liquid rocket engines.

Which of the statements given above is/are correct?

- 1 only
- 2 and 3
- 1 and 2
- 3 only

Answer: (a)

Cryogenic Upper Stage of LVM3 Makes a Re-entry

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords:

Indigenization of Technology & Developing New Technology, Space Technology, Chandrayaan-3, Chandrayaan-3 Mission and Issues Related to Space Debris

Context

- Recently, the cryogenic upper stage of the LVM3 M4 launch vehicle, used in India's Chandrayaan-3 moon mission, made an uncontrolled re-entry into the Earth's atmosphere.
- The probable impact point predicted is over the North Pacific Ocean.

Chandrayaan-3 Mission – An Overview

- Chandrayaan-3 was launched on July 14, 2023, using the **LVM3 M4 launch vehicle**.
- The spacecraft was successfully injected into an orbit of 133 km x 35823 km with a 21.3° inclination.
- The key objectives of Chandrayaan-3 are:
 - **Technological Demonstration:** To demonstrate the capability to perform a soft landing on the lunar surface and operate a robotic rover.
 - **Scientific Exploration:** To conduct scientific experiments using instruments onboard the lander and rover, focusing on lunar surface studies.
- Chandrayaan-3 aims to contribute significantly to our understanding of the moon's topography, mineralogy, and lunar regolith (moon soil).
- It also showcases India's growing capabilities in space technology and exploration.
- The mission serves as an inspiration for future deep space missions and stimulates advancements in space technologies.
- On August 23, India achieved a milestone by becoming the fourth country to successfully land on the moon and the first to land in the moon's polar region.

LVM3 M4 Launch Vehicle

- The LVM3 M4 launch vehicle refers to a specific configuration of the Indian Space Research Organisation's (ISRO) Launch Vehicle Mark-3, also known as the **GSLV Mk III (Geosynchronous Satellite Launch Vehicle Mark III)**.
- The GSLV Mk III is designed as a heavy-lift launch vehicle, capable of carrying large payloads into space, including geosynchronous orbits, which are essential for communication satellites, and lunar and interplanetary missions.
- It is a **three-stage vehicle**, typically comprising two solid rocket boosters, a liquid-fueled core stage, and a **cryogenic upper stage**.
- The cryogenic stage is a crucial part of the GSLV Mk III, enabling it to place heavier payloads into higher orbits. This stage uses a highly efficient engine that burns liquid hydrogen and liquid oxygen.
- The vehicle is suited for launching satellites into **geostationary transfer orbits (GTO) and low Earth orbits (LEO)**.
- The GSLV Mk III has been used in several key missions, including the Chandrayaan-2 mission to the Moon and the planned Gaganyaan mission, which aims to send Indian astronauts into space.

Cryogenic Upper Stage Re-entry

- Cryogenic upper stage re-entry refers to the process where the cryogenic upper stage of a rocket re-enters the Earth's atmosphere after completing its mission in space.
- The cryogenic upper stage re-entered Earth's atmosphere in an uncontrolled manner.
- The re-entry happened 124 days after the launch.
- The stage's post-mission orbital lifetime was in line with the **"25-year rule"** for **Low Earth Orbit (LEO) objects**, as recommended by the **Inter-Agency Space Debris Coordination Committee (IADC)**.

What is the 25-year Rule?

- The 25-year rule is a guideline in space debris mitigation that suggests that space objects, particularly those in Low Earth Orbit (LEO), should be deorbited or moved to a less congested orbit within 25 years of the end of their mission.
- This rule is widely accepted in the international space community and forms a part of the space debris mitigation guidelines proposed by the Inter-Agency Space Debris Coordination Committee (IADC) and endorsed by the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS).

What is the Inter-Agency Space Debris Coordination Committee (IADC)?

- The Inter-Agency Space Debris Coordination Committee (IADC) is an international governmental forum for the coordination of activities related to the issues of man-made and natural debris in space.
- Established in 1993, the IADC is composed of member space agencies from various countries around the world.
- The primary purpose of the IADC is to exchange information on space debris research activities between member space agencies to facilitate cooperation in space debris research and mitigation.
- The IADC aims to improve the understanding of the space debris environment, enhance operational safety, and preserve the outer space environment for future generations.
- One of the key contributions of the IADC is the development of space debris mitigation guidelines.

Significance of Cryogenic Upper Stage Re-entry Process

- **End of Mission:** Typically, a cryogenic upper stage re-entry occurs at the end of a space mission, after the stage has successfully delivered its payload (like a satellite or spacecraft) into orbit.
- **Orbital Decay:** Re-entry can happen due to orbital decay. After fulfilling its role, the upper stage remains in orbit for a period, gradually losing altitude due to the faint atmospheric drag in low Earth orbit (LEO) or due to gravitational perturbations and other forces acting upon it.

- **Controlled vs. Uncontrolled Re-entry:**
- **Controlled Re-entry:** Ideally, the re-entry of a rocket stage is controlled, where the stage is deliberately guided back to Earth to land in a predetermined area. This minimizes the risk of debris causing damage or harm.
- **Uncontrolled Re-entry:** In some cases, the re-entry is uncontrolled, meaning the stage returns to Earth's atmosphere without guidance. This can happen if the stage lacks the capability to perform a controlled descent or if there's a malfunction.
- **Atmospheric Disintegration:** During re-entry, the cryogenic upper stage typically disintegrates due to the intense heat and friction generated as it moves through the atmosphere at high speeds.
- **Space Debris Concern:** The re-entry of such stages is a concern in the context of space debris management. Controlled re-entries are preferred to minimize the risk of debris falling in populated areas.
- **Compliance with Space Debris Mitigation Guidelines:** Many space agencies adhere to international guidelines (like the 25-year rule for de-orbiting inactive satellites and rocket stages in LEO) to minimize space debris. Part of this involves ensuring that end-of-life stages re-enter the atmosphere and pose minimal risk.
- **Safety Measures:** Measures like passivation (removing or neutralizing leftover fuel and disabling batteries to prevent explosions) are often taken to minimize risks associated with re-entry.

What is Space Debris?

- Space debris, also known as space junk, refers to defunct human-made objects in space that no longer serve any useful purpose.
- This includes non-functional spacecraft, abandoned launch vehicle stages, mission-related debris, and fragments from the disintegration, erosion, and collision of space objects.
- These objects typically orbit the Earth, just like operational satellites. Their orbits can vary from Low Earth Orbit (LEO), where most of the debris is concentrated, to Geostationary Earth Orbit (GEO) and even beyond.
- Space debris poses a significant risk to space operations, as collisions with even small debris at high velocities can cause considerable damage to satellites, spacecraft, and the ISS.

Measures Taken by ISRO for Space Debris Mitigation

- **Compliance with the "25-year rule":** The cryogenic upper stage of the LVM3 M4 launch vehicle re-entered the Earth's atmosphere within 124 days of its launch.
- This is in full compliance with the "25-year rule" for Low Earth Orbit (LEO) objects recommended by the Inter-Agency Space Debris Coordination Committee (IADC).

- This rule is a guideline suggesting that space objects in LEO should deorbit within 25 years of the end of their mission to reduce long-term space debris.
- **Passivation of the Upper Stage:** After the successful injection of Chandrayaan-3 into its intended orbit, ISRO undertook the passivation of the upper stage of the launch vehicle.
- Passivation involves the removal of all residual propellants and energy sources from the spent stage of the rocket.
- This process is crucial to minimize the risks of accidental explosions, which can create additional space debris.
- **Adherence to International Guidelines:** ISRO's actions in the disposal of the rocket body and passivation process were in adherence to the space debris mitigation guidelines prescribed by the United Nations and the IADC.
- These guidelines are designed to preserve the long-term sustainability of outer space activities by minimizing the creation of space debris.
- **Controlled Re-entry and Impact Prediction:** Although the re-entry of the rocket body was uncontrolled, ISRO predicted the probable impact point over the North Pacific Ocean.
- The agency also ensured that the final ground track of the re-entry did not pass over India, indicating measures taken to predict and track the re-entry path for safety and debris impact assessment.

Space Debris Mitigation Guidelines

- **Limiting Debris Released During Normal Operations:** This involves designing and operating space systems to minimize the intentional release of debris during normal operations.
- **Minimizing the Potential for Break-ups During Operational Phases:** Ensuring that spacecraft and launch vehicle orbital stages are designed to minimize the possibilities of accidental break-ups, such as explosions or collisions.
- **Limiting the Probability of Accidental Collision in Orbit:** Implementing measures to avoid in-orbit collisions. This includes the use of collision avoidance maneuvers and ensuring proper coordination and communication with other space operators.
- **Avoiding Intentional Destruction and Other Harmful Activities:** Refraining from deliberate actions that would generate long-lived debris. This is particularly relevant to the avoidance of anti-satellite weapon tests that create debris.
- **Minimizing Potential for Post-Mission Break-ups Resulting from Stored Energy:** Ensuring that spacecraft and launch vehicle stages that have reached the end of their mission are left in a state that minimizes the chance of break-ups due to

leftover energy sources, such as residual propellants or batteries.

- **Post-Mission Disposal:** Practicing post-mission disposal of space structures, such as deorbiting or moving them to a so-called 'graveyard orbit,' especially for satellites in geosynchronous orbit.
- For low-Earth orbit missions, the guideline is to ensure that spacecraft re-enter the Earth's atmosphere within 25 years after the end of their mission.
- **Preventing On-Orbit Collisions:** Efforts are made to prevent collisions with known pieces of debris. This includes keeping track of and maneuvering to avoid existing large debris.
- **Designing for a Long-Term Disposal:** This involves planning and implementing safe disposal methods for spacecraft and orbital stages at the end of their operational life.

Conclusion

The safe and compliant conclusion of the Chandrayaan-3 mission's launch phase marks a significant achievement for ISRO and India's space program. It underscores India's ongoing commitment to responsible space exploration and adherence to global standards in space missions.

UPSC Previous Year Practice Question

Q. What is the main task of India's third moon mission which could not be achieved in its earlier mission? List the countries that have achieved this task. Introduce the subsystems in the spacecraft launched and explain the role of the Virtual Launch Control Centre' at the Vikram Sarabhai Space Centre which contributed to the successful launch from Sriharikota. **(2023)**

Q. What is India's plan to have its own space station and how will it benefit our space programme? **(2019)**

Q. India has achieved remarkable successes in unmanned space missions including the Chandrayaan and Mars Orbiter Mission, but has not ventured into manned space mission, both in terms of technology and logistics? Explain critically. **(2017)**

Q. Discuss India's achievements in the field of Space Science and Technology. How the application of this technology has helped India in its socio-economic development? **(2016)**

MCQs

Q. With reference to India's satellite launch vehicles, consider the following statements: **(UPSC 2018)**

1. PSLVs launch the satellites useful for Earth resources monitoring whereas GSLVs are designed mainly to launch communication satellites.
2. Satellites launched by PSLV appear to remain permanently fixed in the same position in the sky, as viewed from a particular location on Earth.

3. GSLV Mk III is a four-staged launch vehicle with the first and third stages using solid rocket motors; and the second and fourth stages using liquid rocket engines. Which of the statements given above is/are correct?

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

Answer: (a)

Q. With reference to the Indian Regional Navigation Satellite System (IRNSS), consider the following statements: **(UPSC 2018)**

1. IRNSS has three satellites in geostationary and four satellites in geosynchronous orbits.
2. IRNSS covers the entire India and about 5500 sq. km beyond its borders.
3. India will have its own satellite navigation system with full global coverage by the middle of 2019.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) None

Answer: (a)

Q. Consider the following statements: **(UPSC 2016)**

The Mangalyaan launched by ISRO

- 1) is also called the Mars Orbiter Mission
- 2) made India the second country to have a spacecraft orbit the Mars after USA
- 3) made India the only country to be successful in making its spacecraft orbit the Mars in its very first attempt

Which of the statements given above is/are correct?

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

Answer: (c)

How Was The First Vaccine For Chikungunya Approved?

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Science and Technology, Chikungunya and the Significance of the Ixchiq Vaccine

Context

- Recently, the **world's first vaccine for chikungunya, named Ixchiq**, was approved by the U.S. FDA on November 9.
- The vaccine was developed by the **European vaccine manufacturer Valneva**.

About Chikungunya

Chikungunya is a viral disease caused by the chikungunya virus (CHIKV).

- **Transmission:** The virus is primarily transmitted to humans through the bites of infected mosquitoes, particularly the **Aedes aegypti** and **Aedes albopictus** species.
- **Symptoms:** The most common symptoms of chikungunya include high fever and severe joint pain, often debilitating. Other symptoms can include muscle pain, headache, nausea, fatigue, and rash.
- **Duration and Severity:** The joint pain can be very severe and typically lasts for a few days. However, in some cases, it can be prolonged for weeks or even months.
- **Global Distribution:** Chikungunya has been identified in **Africa, Asia, Europe, and the Americas**.
- Since 2004, outbreaks have become more frequent and widespread, in part due to viral mutations that have made transmission easier.
- **Treatment:** Currently, there is **no specific antiviral treatment** for chikungunya. Management of the disease primarily focuses on relieving the symptoms, such as administering analgesics for pain and antipyretics for fever.
- **Prevention:** Preventive measures largely revolve around controlling mosquito populations and avoiding mosquito bites.
- This includes using insect repellent, wearing long-sleeved shirts and trousers, and ensuring there's no stagnant water where mosquitoes can breed.

Current Status of Chikungunya in India

- As of September 2023, the latest data on the prevalence of Chikungunya in India, as reported by the **National Center for Vector Borne Diseases Control (NCVBDC)**, reveals a significant number of cases across various states and union territories.
- In 2023, there were a total of 93,455 suspected cases of Chikungunya, with 3,711 confirmed cases.
- This data reflects an ongoing challenge in managing the disease, particularly in states like **Karnataka, Gujarat, and Maharashtra**, which reported high numbers of both suspected and confirmed cases.

Vaccine Against Chikungunya

Vaccine Overview

- **Brand Name:** Ixchiq
- **Manufacturer:** Valneva, a European vaccine manufacturer
- **Approval Date:** November 9
- **Approving Authority:** U.S. Food and Drug Administration (FDA)

Eligibility for Vaccination

- **Target Age Group:** People 18 years or older
- **Target Population:** Individuals at increased risk of exposure to the chikungunya virus

Approval Process

- **Approval Pathway:** Accelerated Approval pathway

- This pathway is utilized by the FDA for products that address serious or life-threatening conditions, based on promising evidence of effectiveness.

Vaccine Composition and Testing

- The Ixchiq vaccine contains a **live, weakened version** of the chikungunya virus.
- This formulation is designed to stimulate an **immune response** in the vaccine recipient that is similar to the response experienced by people who contract the disease naturally.
- The vaccine is administered as a **single dose** by injection into the muscle.
- The safety and effectiveness of Ixchiq were evaluated in clinical studies.
- These studies reported common side effects in vaccine recipients, including **headache, fatigue, muscle pain, joint pain, fever, nausea, and tenderness at the injection site**.
- The vaccine's effectiveness was determined based on **immune response data**, comparing the response in vaccinated individuals to those who received a placebo.
- The level of antibody evaluated in study participants was based on a level shown to be protective in nonhuman primates that had received blood from people who had been vaccinated.

Significance of the Vaccine

- **Filling an Unmet Medical Need:** Prior to the vaccine, there was no cure for chikungunya; treatment was limited to symptomatic relief. The vaccine addresses this gap by providing a preventive measure against the virus.
- **Reducing the Disease Burden:** Chikungunya can cause debilitating joint pain that can last for months.
- By preventing the infection, the vaccine can significantly reduce the physical and societal burden of the disease.
- **Facilitating Global Health Efforts:** With outbreaks becoming more frequent and widespread, the vaccine is a crucial tool in global health efforts to control the spread of the virus, especially in endemic regions.
- **Impact on Public Health:** The vaccine offers a proactive approach to disease control, complementing other preventive measures like mosquito control and public health outreach.
- **Advancement in Vaccine Development:** The vaccine's approval, especially through the FDA's Accelerated Approval pathway, represents a significant advancement in vaccine research and development, potentially paving the way for more rapid responses to other emerging diseases.
- **Global Relevance:** The vaccine is particularly significant for countries with high chikungunya prevalence like Brazil, Paraguay, India, and parts of western Africa.

Conclusion

- The development of this new vaccine marks a significant step in combating chikungunya, a disease with no current cure and limited treatment options.
- The vaccine's approval is expected to have a major impact on global health, particularly in regions heavily affected by the virus.

Trouble With India's Guidelines on Genetically Modified Insects

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: Science and Technology, Biotechnology, Genetically Engineered Insects, its Significance and Associated Concerns

Context

- The article highlights the shortcomings of India's new guidelines on **genetically engineered (GE) insects**.
- The guidelines are unclear about the purposes for which GE insects may be approved in India, the criteria that will be used to consider proposals for deployment of GE insects, and the definition of "beneficial" insects.
- This uncertainty is likely to impede investment in research and development of GE insects in India, which could hamper India's efforts to achieve its ambitious bioeconomy goals.

Contextual Background

- India's bioeconomy contributes **2.6% to the GDP**. The Government of India's **Department of Biotechnology (DBT)** aims to **increase this contribution to 5% by 2030**.
- However, funding for biotechnology research and development (R&D) in India has been stagnating.
- The growth of the biotech sector in India has been hampered by inconsistent funding, especially post the COVID-19 pandemic.
- The DBT recently released **guidelines for genetically engineered (GE) insects**. However, these guidelines have several problems.
- GE insects are seen as a promising tool for addressing challenges in public health, agriculture, and environmental conservation.
- The ambitious goals set by the **Bioeconomy Report 2022** highlight the disconnect between India's economic aspirations in biotechnology and the current regulatory frameworks and policies.

Bioeconomy Report 2022 – Key Highlights

- India's bioeconomy is anticipated to reach \$150 billion by 2025 and more than \$300 billion by 2030.
- The bioeconomy was valued at \$80 billion in 2021, up 14.1% from \$70.2 billion in 2020.
- The sector generated \$219 million daily in 2021.
- An average of three biotech startups were established each day in 2021, totaling 1,128 for the year.
- More than \$1 billion was spent on R&D by the bioeconomy industry.
- India administered about 4 million COVID-19 vaccine doses and conducted 3 million COVID-19 tests daily in 2021.

UPSC Previous Year Practice Question

Q. What is the basic principle behind vaccine development? How do vaccines work? What approaches were adopted by the Indian vaccine manufacturers to produce COVID-19 vaccines? **(2022)**

MCQs

Q. In the context of vaccines manufactured to prevent COVID-19 pandemic, consider the following statements: **(UPSC 2022)**

1. The Serum Institute of India produced COVID-19 vaccine named Covishield using mRNA platform.
 2. Sputnik V vaccine is manufactured using a vector based platform.
 3. COVAXIN is an inactivated pathogen based vaccine.
- Which of the statements given above are correct?

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

Answer: (b)

Q. With reference to recent developments regarding 'Recombinant vector Vaccines', consider the following statements: **(UPSC 2021)**

1. Genetic engineering is applied in the development of these vaccines.
 2. Bacteria and viruses are used as vectors.
- Which of the statements given above is/are correct?
- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2

Answer: (c)

Q. What is the importance of using **Pneumococcal Conjugate Vaccines** in India? **(UPSC 2020)**

1. These vaccines are effective against pneumonia as well as meningitis and sepsis.
2. Dependence on antibiotics that are not effective against drug-resistant bacteria can be reduced.
3. These vaccines have no side effects and cause no allergic reactions.

Select the correct answer using the code given below:

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

Answer: (b)

- The number of biotech startups has grown from 50 to over 5,300 in the past decade, expected to double by 2025.
- BIRAC has established 74 bio-incubation centers across 21 states/UTs to support the bio-entrepreneurial ecosystem.
- India has the second-highest number of USFDA-approved manufacturing plants outside the US.

What are Genetically Engineered (GE) Insects?

- Genetically Engineered (GE) or Genetically Modified (GM) insects are insects that have had their genetic material altered using biotechnology.
- Scientists use various techniques to modify the DNA of these insects to exhibit certain desired traits that do not occur naturally or to suppress unwanted characteristics.
- One common method used is called **gene editing**, particularly **CRISPR-Cas9**, which allows precise changes to be made to the organism's DNA.
- Other methods include the use of **transposons** ("jumping genes") or the insertion of foreign DNA through techniques like microinjection.

Concerns Regarding the Guidelines for Genetically Engineered (GE) Insects

1) Uncertainty of Purpose

- The guidelines do not specify the purposes for which GE insects may be approved, nor how their use aligns with the broader economic goals, such as contributing to the bioeconomy.
- They focus on regulatory procedures rather than on a clear policy direction or economic vision, which can limit understanding of how GE insects fit into India's bioeconomic future.
- Economic opportunities provided by GE insects, such as engineering bees for better honey production or silkworms for finer silk, are not addressed, leading to uncertainty about how these innovations will be integrated into the market.

2) Uncertainty for Researchers

- The guidelines apply to research but not to field trials or actual deployment, which creates a gap in the regulatory process.
- There is a lack of clarity on how the Environment Ministry will handle the approval for the deployment of GE insects and the criteria for such approvals.
- The nature of GE products makes them difficult to regulate once released into the environment, as they cannot be recalled and do not allow for consumer choice, unlike GM foods.
- Guidelines categorize GE insects by risk group rather than end product, which could impose unnecessary regulatory burdens on certain applications, such as those not meant for consumption.

3) Uncertainty of Ambit

- The definition of what is considered 'beneficial' in the context of GE insects is vague, making it hard for funders and scientists to decide on investing in this line of research.
- Ambiguity in the guidelines can hinder the identification and promotion of research priorities, which is critical in a setting where both public and private funding are limited.
- There's a concern that the guidelines do not adequately address the potential for misuse of genetic engineering, such as the development of bioweapons.

Significance of Genetically Engineered (GE) Insects

1) Public Health

- **Disease Vector Control:** GM insects, like mosquitoes, can be engineered to combat the spread of infectious diseases.
- For example, modifying mosquitoes to either resist carrying diseases like malaria, dengue, or Zika virus, or to have reduced lifespans, can significantly lower disease transmission rates.
- **Pharmaceutical Production:** Certain GM insects can be used to produce substances for pharmaceutical use, such as the silk from GM silkworms that could be used in medical applications.

2) Agriculture

- **Pest Management:** GM insects can be designed to control pest populations that damage crops, thus reducing the reliance on chemical pesticides. This can be achieved through sterile insect techniques or by creating insects that can outcompete harmful pests.
- **Pollination:** Enhancements in bees and other pollinators through genetic modifications could address the challenges posed by declining bee populations, ensuring crop pollination and food security.

3) Environmental Conservation

- **Biodiversity Protection:** By controlling invasive insect species through GM counterparts, the natural balance of ecosystems can be preserved, protecting indigenous plant and animal species.
- **Sustainable Practices:** GM insects can contribute to more sustainable agricultural practices by reducing the need for chemical inputs and lowering the carbon footprint of farming operations.

4) Ethical and Scientific Research

- **Advancements in Genetics:** Research into GM insects advances our overall understanding of genetics, gene function, and the potential for future applications in various fields.
- **Bioethics:** The development and deployment of GM insects raise important ethical questions and can help frame regulations and discussions around the responsible use of biotechnology.

5) Regulatory and Economic Implications

- **Biotech Industry Growth:** The field of GM insects can stimulate growth in the biotech industry, with implications for job creation, economic development, and international trade.
- **Regulatory Frameworks:** The rise of GM insects necessitates comprehensive regulatory frameworks to ensure safety, address public concerns, and manage ecological risks.

Challenges Related to Genetically Engineered (GE) Insects

Ecological Risks

- Once released into the environment, GM insects could potentially spread or interbreed with wild populations in unforeseen ways, leading to ecological disruptions.
- Altering insect populations may have cascading effects on food webs and ecosystems, as insects play critical roles as pollinators, decomposers, and food sources for other animals.
- There is a risk that targeted pests may evolve resistance to the modifications in GM insects, potentially leading to even more resilient pest populations.

Health and Safety Concerns

- If the GM insects interact with humans directly or indirectly, there may be unforeseen health implications.
- There is a theoretical risk that GM insects could produce new allergens or toxins to which humans and other animals have not been previously exposed.

Ethical and Social Issues

- There might be ethical objections to the release of GM organisms into the wild, and public mistrust can be a significant barrier to the deployment of GM insects.
- In regions where GM insects are released, the consent of local communities is crucial.
- Issues of governance—deciding who has the right to release GM organisms into environments shared by many—can be complex.

Regulatory and Control Challenges

- The lack of adequate regulatory frameworks and international guidelines can lead to uncontrolled releases or insufficient monitoring of the effects of GM insects.
- Once GM insects are released, it may be very difficult or impossible to remove them from the environment if problems arise.
- There is a potential for misuse of the technology for malicious purposes, such as developing insects that could harm crops or carry diseases.

Economic and Market Dynamics

- The development and deployment of GM insects can be costly, and there might be issues related to the accessibility of the technology for poorer regions that might need it the most.

- GM insects could disrupt existing markets, like organic farming, or impact small-scale farmers if not managed inclusively.

Scientific and Technical Challenges

- Gene editing is a complex process, and off-target effects or unintended genetic mutations could arise.
- The long-term ecological and evolutionary effects of releasing GM insects are still not fully understood.

Way Forward

- **Clarifying Purposes and Economic Goals:** The Department of Biotechnology (DBT) needs to articulate clear purposes for the use of GE insects, aligning them with economic goals.
- **Integrating Policies with Funding:** Policies should be designed to encourage both public and private investment in research and development, especially in areas that could lead to significant economic and societal benefits.
- **Engaging Stakeholders:** Establish a dialogue with scientists, industry representatives, investors, and the public to shape a policy framework that encourages innovation while addressing ethical, environmental, and safety concerns.
- **Risk Assessment and Management:** Develop a clear risk assessment framework for GE insects that considers both the potential benefits and risks.
- **Streamlined Regulatory Pathways:** Simplify and clarify regulatory pathways for the research, trial, and deployment of GE insects.
- **Monitoring and Evaluation:** Establish robust monitoring and post-release evaluation mechanisms to track the impact of GE insects on health, biodiversity, and the ecosystem.
- **International Collaboration:** Align national guidelines with international standards and collaborate with global health and agricultural bodies to ensure best practices in the development and use of GE insects.
- **Ethical and Social Considerations:** Consider the ethical, cultural, and social implications of GE insects, particularly in terms of consumer choice and the rights of communities to consent to the use of these technologies in their localities.

Conclusion

The DBT's guidelines for GE insects are not in sync with the ambitions outlined in the Bioeconomy 2022 report. The government needs to address the problems with the guidelines in order to support the growth of India's bioeconomy.

UPSC Previous Year Practice Question

- Q.** What are the research in developmental achievements in applied biotechnology? How will these achievements help to uplift the poor sections of the society? **(2021)**
- Q.** How can biotechnology improve the living standards of farmers? **(2019)**

Q. Why is there so much activity in the field of biotechnology in our country? How has this activity benefitted the field of biopharma? **(2018)**

MCQs

Q. Bollgard I and Bollgard II technologies are mentioned in the context of (UPSC 2021)

- Clonal propagation of crop plants
- Developing genetically modified crop plants
- Production of plant growth substances
- Production of biofertilizers

Answer: (b)

Q. With reference to the Genetically Modified mustard (GM mustard) developed in India, consider the following statements: (UPSC 2018)

- GM mustard has the genes of a soil bacterium that give the plant the property of pest-resistance to a wide variety of pests.
- GM mustard has the genes that allow the plant cross-pollination and hybridization.
- GM mustard has been developed jointly by the IARI and Punjab Agricultural University.

Which of the statements given above is/are correct?

- 1 and 3 only
- 2 only
- 2 and 3 only
- 1, 2 and 3

Answer: (b)

Q. The Genetic Engineering Appraisal Committee is constituted under the (UPSC 2015)

- Food Safety and Standards Act, 2006
- Geographical Indications of Goods (Registration and Protection) Act, 1999
- Environment (Protection) Act, 1986
- Wildlife (Protection) Act, 1972

Answer: (c)

Q. Recombinant DNA technology (Genetic Engineering) allows genes to be transferred: (UPSC 2013)

- Across different species of plants
 - From animals to plants
 - From microorganisms to higher organisms
- Select the correct answer using the codes given below:

- 1 only
- 2 and 3 only
- 1 and 3 only
- 1, 2 and 3

Answer: (d)

Q. Other than resistance to pests, what are the prospects for which genetically engineered plants have been created? (UPSC 2012)

- To enable them to withstand drought
- To increase the nutritive value of the produce

- To enable them to grow and do photosynthesis in spaceships and space stations
- To increase their shelf life

Select the correct answer using the codes given below:

- 1 and 2 only
- 3 and 4 only
- 1, 2 and 4 only
- 1, 2, 3 and 4

Answer: (c)

Scientists Fabricate 2D Protein Monolayer That Can Help to Study Diseases like Amyloidosis

Priority: Low

Primary Source: PIB

Syllabus Relevance & Important Keywords: Science and Technology, Indigenization of technology and developing new technology, Langmuir-Blodgett (LB) Technique, Lysozymes, Indigenization of Research to Study Amyloidosis

Context

- Scientists have created a 2D protein monolayer focusing on lysozyme molecules. This development is significant for studying diseases like Amyloidosis.

About the Research

- The research was conducted by the Institute of Advanced Study in Science and Technology, Guwahati.
- The team was led by Dr. Sarathi Kundu and junior Research Fellow Himadri Nath.
- The methodology involved assembling lysozyme molecules into a 2D monolayer using **Langmuir-Blodgett (LB) technique**.

What is Langmuir-Blodgett (LB) Technique?

- It is a method used in material science and surface chemistry to create ultra-thin films, often of a single molecule thickness.
- This technique involves the transfer of a monolayer of molecules from the surface of a liquid (usually water) onto a solid substrate.
- It is named after Irving Langmuir and Katharine Blodgett, who pioneered this technique.
- These films have applications in various fields, including electronics, optics, materials science, and biophysics.
- They are particularly useful for studying the properties of membranes, fabricating components for molecular electronics, and creating biosensors.

Key Findings

- Fabrication of a 2D Protein Monolayer:** The scientists successfully assembled lysozyme molecules into a two-dimensional (2D) monolayer.
- Lysozyme, found in mucosal secretions and airway fluid, serves as a model protein for studying diseases like Amyloidosis.

- **Relevance to Amyloidosis:** The misfolding and agglomeration of proteins like lysozyme are central to the disease's development. This research aids in understanding these processes.
- **Investigation of Physical Properties:** The research explored how lysozyme molecules behave under different conditions, such as varying surface pressure and subphase pH.
- They discovered that the lysozyme monolayers exhibit compressible behavior and form stripe-like domains with increased surface pressure.
- **Model System for Amyloidosis:** The structural or conformational changes of lysozyme molecules in various pH conditions at the air-water interface provide a model system for studying Amyloidosis.
- **Applications of the 2D Monolayers:** The densely packed lysozyme monolayers formed using the LB method offer a new way to study chemical and physical properties in two dimensions within a protein environment.
- Additionally, the LB films of lysozyme could serve as nanotemplates for crystallizing other proteins of interest.

What are Lysozymes?

- Lysozymes are enzymes that play an important role in the body's immune system. They are found in various body fluids, such as saliva, mucus, and tears, and are also present in egg white.
- The primary function of lysozymes is to break down the cell walls of certain bacteria. They do this by cleaving the glycosidic bonds in peptidoglycan, a major component of bacterial cell walls, leading to the destruction of the bacteria.
- This antibacterial property makes lysozymes an important part of the innate immune system, providing a first line of defense against bacterial infections.

What is Amyloidosis?

- Amyloidosis is a rare and complex disease characterized by the abnormal **deposition of amyloid, a protein substance**, in various tissues and organs throughout the body.
- Amyloid is an abnormal protein usually produced in the bone marrow. It can be deposited in any tissue or organ in the body.

Types of Amyloidosis	• Primary Amyloidosis (AL): The most common form, not associated with other diseases. It occurs when the bone marrow produces abnormal antibodies that can't be broken down. This type can affect nerves, skin, heart, kidneys, and liver. • Secondary Amyloidosis (AA): Associated with chronic infectious or inflammatory diseases, such as
-----------------------------	--

	rheumatoid arthritis, Crohn's disease, or tuberculosis. • Hereditary Amyloidosis (ATTR): Caused by a genetic mutation and often affects the liver, nerves, heart, and kidneys. • Dialysis-Related Amyloidosis (ABeta2M): Occurs in people who have been on dialysis for a long time. Amyloid fibrils consist of beta-2-microglobulin.
Symptoms	• Common symptoms include fatigue, weight loss, swelling of extremities, numbness or tingling in the hands and feet, and an irregular heartbeat.
Diagnosis	• It typically involves a combination of blood tests, urine tests, organ function tests, and biopsy to identify amyloid deposits.
Treatment	• Focuses on limiting the production of amyloid protein and managing symptoms. • Treatment options can include chemotherapy, targeted therapy, stem cell transplantation, and supportive care for organ function.
Impact on Organs	• Amyloid deposits can lead to organ dysfunction and failure, with severity depending on the type of amyloidosis and organs involved.

Conclusion

The 2D lysozyme monolayers, created using the LB technique, provide a platform for studying protein behaviors in two dimensions. The research marks a significant step in understanding the behavior of proteins in diseases and could pave the way for further scientific breakthroughs in disease study and treatment.

MCQs

Q. 'Aerial metagenomics' best refers to which one of the following situations? (UPSC 2023)

- Collecting DNA samples from air in a habitat at one go
- Understanding the genetic makeup of avian species of a habitat
- Using air-borne devices to collect samples from moving blood animals
- Sending drones to inaccessible areas to collect plant and animal samples from land surfaces and water bodies

Answer: (a)

Q. In the context of recent advances in human reproductive technology, 'Pronuclear Transfer' is used for (UPSC 2020)

- (a) Fertilisation of egg in vitro by the donor sperm
- (b) Genetic modification of sperm producing cells
- (c) Development of stem cells into functional embryos
- (d) Prevention of mitochondrial diseases in offspring

Answer: (d)

Q. With reference to the recent developments in science, which one of the following statements is not correct? (UPSC 2019)

- (a) Functional chromosomes can be created by joining segments of DNA taken from cells of different species.
- (b) Pieces of artificial functional DNA can be created in laboratories.
- (c) A piece of DNA taken out from an animal cell can be made to replicate outside a living cell in a laboratory.
- (d) Cells taken out from plasma and animals can be made to undergo cell division in laboratory petri dishes.

Answer: (a)

Q. RNA interference (RNAi)' technology has gained popularity in the last few years. Why? (UPSC 2019)

- 1. It is used in developing gene silencing therapies.
- 2. It can be used in developing therapies for the treatment of cancer.
- 3. It can be used to develop hormone replacement therapies.
- 4. It can be used to produce crop plants that are resistant to viral pathogens.

Select the correct answer using the code given below:

- (a) 1, 2 and 4
- (b) 2 and 3
- (c) 1 and 3
- (d) 1 and 4 only

Answer: (a)

Q. In the context of the developments in Bioinformatics, the term 'transcriptome', sometimes seen in the news, refers to (UPSC 2016)

- (a) a range of enzymes used in genome editing
- (b) the full range of mRNA molecules expressed by an organism
- (c) the description of the mechanism of gene expression
- (d) a mechanism of genetic mutation taking place in cells

Answer: (b)

Geography (GS Paper Prelims) & GS Paper I & III (Main)

Cyclone Midhili

Priority: High



Primary Source: Down To Earth

Syllabus Relevance & Important Keywords: Important Geophysical Phenomena, Disaster Management Cyclone Midhili, Formation and Types of Cyclones, Mitigation Initiatives

Context

- The Indian Meteorological Department (IMD) declared about the development of **Cyclone Midhili** in the northwest Bay of Bengal.
- Under the influence of **Cyclone Midhili**, heavy rainfall is forecasted in the coastal regions of **Odisha, West Bengal, Tripura, and Mizoram** with wind speed blowing in the range between 40 kmph and 70 kmph.

About Cyclone Midhili

- Cyclonic Storm Midhili was a minor cyclone that made landfall in **Bangladesh**.
- Midhili originated from a low-pressure area over the **Bay of Bengal**, according to the Bangladesh Meteorological Department (BMD).
- The name '**Midhili**' for the cyclonic storm was given by the Maldives.
- Midhili means '**huge tree**' in the Maldivian language.

What are Cyclones?

- Cyclones are large-scale **air masses** that rotate around a strong center of low atmospheric pressure.
- They are characterized by inward spiraling winds that rotate **counterclockwise** in the Northern Hemisphere and **clockwise** in the Southern Hemisphere.

Favorable Conditions for Formation of Cyclones

- **Warm Ocean Water:** Sea surface temperatures must be around **26°C or higher**. This warmth provides the necessary energy for the cyclone to form.
- **Atmospheric Instability:** Warm, moist air rising from the ocean surface leads to the formation of cumulus clouds, which can grow into a cyclone under the right conditions.
- **Moisture in the Atmosphere:** High humidity, especially in the lower and middle levels of the troposphere, aids in the development of clouds and thunderstorms within the cyclone.
- **Low Wind Shear:** Low levels of wind shear (changes in wind speed and direction with height) are essential. High wind shear can disrupt the cyclone's structure.
- **A Pre-existing Weather Disturbance:** A cyclone often forms from a pre-existing disturbance in the atmosphere, like a tropical wave, which provides an initial structure for storm development.
- **Coriolis Effect:** This is necessary to create the spin in the cyclone. It becomes effective at least 5° away from the equator.
- **Distance from the Equator:** Cyclones typically form at least 5° away from the Equator since the Coriolis effect is too weak near the Equator to create the cyclonic rotation.

Types of Cyclones

1) Tropical Cyclones

- These form over warm ocean waters near the **equator**.
- They are **fuelled** by the heat from the sea and evaporated water.
- Tropical cyclones are characterized by a low-pressure center, high winds, and heavy rain.

- Depending on their location and intensity, they are known as **hurricanes** (Atlantic and eastern Pacific Oceans), **typhoons** (northwestern Pacific Ocean), and simply **cyclones** in the South Pacific and Indian Ocean.

Formation of Tropical Cyclones

Formation and Early Stages

- The initial formation and development of a cyclonic storm are driven by the transfer of heat and water vapor from the warm ocean to the air above, mainly through evaporation at the sea surface.
- This process promotes the creation of large vertical cumulus clouds as a result of convection and the condensation of rising air over the ocean.

Mature Stage

- As the storm strengthens, air ascends in powerful thunderstorms and spreads horizontally at the level of the tropopause.
- This spreading of air creates a positive pressure at higher altitudes, which in turn enhances the downward movement of air due to convection.
- This process leads to the warming of the air by compression, forming a warm '**Eye**' (a low-pressure center) of the storm.
- The primary characteristic of a mature tropical cyclone in the Indian Ocean is the presence of concentric bands of turbulent, large cumulus thunderclouds.

Weakening and Dissipation

- A tropical cyclone starts to lose its strength, evident in the reduction of central low pressure, internal warmth, and extreme wind speeds, when its supply of warm, moist air diminishes or is suddenly cut off.
- This typically occurs after the cyclone makes landfall or moves over cooler waters.

2) Extratropical Cyclones

- These develop in **higher latitudes, generally between 30° and 60°** latitude in both hemispheres.
- Unlike tropical cyclones, they form over land or water and are driven by temperature contrasts between air masses.
- Extratropical cyclones often bring widespread rain, wind, and sometimes snow.
- Frontal depressions, wave cyclones, temperate cyclones, and mid-latitude depressions are some names for extratropical cyclones.

Formation of Extratropical Cyclones

- The Polar Front theory provides the most comprehensive explanation for the formation and development of temperate cyclones.
- This theory posits that when warm and humid air from the tropics converges with the dry and cold air from the poles, a **polar front** is established.
- The denser and heavier cold air causes the **warm air to rise**.
- This interaction between the cold and warm air masses leads to instability and the creation of low

pressure at their meeting point, particularly at the **center of this interaction**.

- This results in a pressure void, which is filled by the surrounding air.
- This incoming air, influenced by the rotation of the Earth, gives rise to a cyclone.
- In comparison, extratropical cyclones are **less severe** than the tropical cyclones or hurricanes, which develop in areas of more uniform temperature.

Mitigation and Preparedness Measures

- Mapping Hazards:** Assessing cyclone risks and displaying them on maps.
- Regulating Land Use:** Implementing policies for land use and enforcing building codes.
- Engineered Structures:** Constructing buildings on stilts or earthen mounds, ensuring they are wind and water-resistant.
- Cyclone Shelters:** Establishing shelters in cyclone-prone areas.
- Flood Management:** Building barriers and creating water storage facilities to manage flooding.
- Plantation of Mangroves:** Protecting coastal areas from storm surges.
- Public Awareness Generation:** Educating the public on cyclone risks and safety measures.
- Early Warning System:** Enhancing systems for rapid and efficient response.
- Community Participation:** Involving local communities in developing mitigation measures

Government Initiatives

- National Cyclone Risk Mitigation Project:** A National Cyclone Risk Mitigation Project (NCRMP) was launched in **2011** covering cyclone prone coastal States of the country with the objective to reduce vulnerability of the States to cyclone and other hydro-meteorological hazards of coastal communities, and increase the capacity of the State entities to effectively plan for and respond to disasters.
- Hazard, Vulnerability and Risk Assessment (HVRA):** HVRA study was also conducted as part of NCRMP Phase I leading to development of a **Web based Composite Risk Atlas (Web-CRA)** using deterministic hazard and vulnerability analysis modelling based on historical cyclone events.
- Integrated Coastal Zone Management (ICZM) Project:** It aims to improve the livelihood of coastal communities and conserve the coastal ecosystem, including mangrove conservation.
- Coastal Regulation Zones (CRZ):** Declares certain coastal areas as CRZs to regulate development activities in these regions.
- Color Coding of Cyclones:** A weather warning system issued by the India Meteorological Department (IMD) using different colors to alert people about impending natural hazards

UPSC Previous Year Practice Question

Q. Discuss the meaning of colour-coded weather warnings for cyclone prone areas given by India Meteorological Department. **(2022)**

Q. The recent cyclone on the east coast of India was called "Phailin". How are the tropical cyclones named across the world? **(2013)**

MCQs

Q. Consider the following statements: (UPSC 2020)

1. Jet streams occur in the Northern Hemisphere only.
2. Only some cyclones develop an eye.
3. The temperature inside the eye of a cyclone is nearly 10°C lesser than that of the surroundings.

Which of the statements given above is/are correct?

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

Answer: (c)

Q. In the South Atlantic and South-Eastern Pacific regions in tropical latitudes, cyclone does not originate. What is the reason? (UPSC 2015)

- (a) Sea surface temperatures are low
- (b) Inter-Tropical Convergence Zone seldom occurs
- (c) Coriolis force is too weak
- (d) Absence of land in those regions

Answer: (b)

Ken-Betwa River Linking

Priority: High

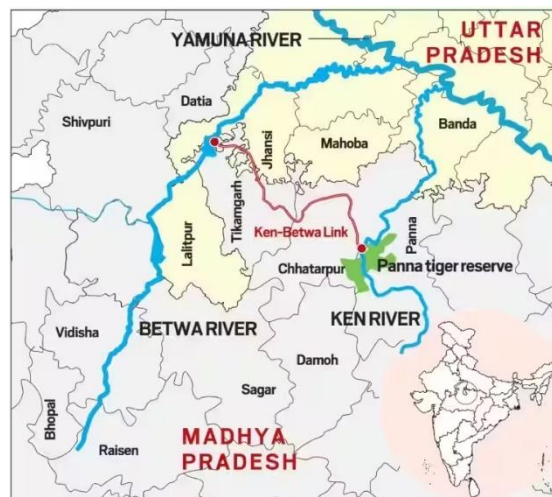


Primary Source: The Indian Express

Syllabus Relevance & Important Keywords: Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, Ken-Betwa River Interlinking, Issues Related To River Interlinking

Context

- Recently, the Ken-Betwa Link Project (KBLP) secured the final forest clearance necessary nearly six years after it got provisional approval.

**What is the Ken-Betwa River linking project?**

- The [Ken-Betwa River linking project](#) is the first project for river interlinking under the National Perspective Plan.
- It will link the **Ken and Betwa Rivers in Madhya Pradesh and Uttar Pradesh** respectively.
- The project will enable the transfer of surplus water from the Ken River to the Betwa to irrigate the **drought-prone Bundelkhand region**.
- As part of the project, a 77-metre tall and 2-km wide **Dhaudhan dam** will be built within the **Panna Tiger Reserve** along with a 230-km canal.

History

- In August 2005, the Union government and the governments of Uttar Pradesh and Madhya Pradesh signed a tripartite memorandum of understanding for the preparation of the Detailed Project Report (DPR).
- It was marked as a **National Project in 2008** and was later included in the Prime Minister's package for the development of the drought-prone Bundelkhand region.
- In 2011, the KBLP had been rejected by the Union government due to its high environmental cost but it was revived and granted wildlife, environmental, and in-principle forest clearances in 2016-2017.
- In 2021, the Union Ministry of Jal Shakti and the two states signed a memorandum of agreement to implement this project, with an eight-year deadline.
- In October 2023, the final clearance was granted to the project by the Union Ministry of Environment, Forests, and Climate Change.

KBLP commitments to get clearance

- The Forest clearance had conditions such as
 - The closure of dam gates and the impounding of water is barred until all the revenue villages are relocated.
 - The KBLP has undertaken that the state government and the user agency would ensure that the canal would be realigned to minimize the use of forest land for construction.
 - The KBLP has committed that the powerhouses shall not be constructed in the forest area to be diverted, which will help avoid constant disturbance in PTR.

What is the significance of the project?

- The completion of the project will accelerate water conservation and produce **103 MW of hydropower and 27 MW of solar electricity**.
- It would encourage **more river-interlinking projects** which help reduce water scarcity in the country.
- It will provide **annual irrigation of 10.62 lakh hectares** and **supply drinking water to around 62 lakh people in Bundelkhand**.

What are the concerns associated with the project?

- **Scientific basis:** Hydrological and ecological experts have expressed concern that the government's '**surplus and deficit**' model has little basis in science.
- This may also endanger the water security of the protected Panna region.
- **Threat to protected areas:** The total loss of 105 sq km of wildlife habitat as a result of submergence and fragmentation will impact endangered species such as vultures, gharials, and tigers.
- Panna is an exceptional tiger habitat with deep gorges, that are at risk of being drowned when the new dam is constructed.
- Similarly, the **Ken Gharial Sanctuary**, which is home to the critically endangered Gangetic gharial, is located downstream of the national park and could also be affected by the dam.
- It should be evident right away how devastating the planned dam would be for the water flow into and out of this sanctuary, as well as how it would be in violation of the Act's requirements for a sanctuary.
- It is forbidden to divert, stop, or enhance the flow of water into or outside of a sanctuary or a national park except if it is deemed necessary to enhance and better manage the species within.
- **Insufficiency of Ken:** Some experts have claimed that the **Ken, which is a non-perennial river, may not have sufficient water reserves to satisfy the projected needs of the Betwa**, let alone that of the drought-hit Bundelkhand region.
- **Economic cost:** The large estimated economic costs attached to the implementation and maintenance of the project have risen due to the delays in project implementation.
- **Clearances:** The KBLP requires a total of 60.17 sq km of forest land, including 41.41 sq km of PTR.
- The KBLP has regularly reiterated a request for partial exemption from compensating for the diversion of 60.17 sq km of forest land, by adding an equal extent of revenue or private land to the Panna Tiger Reserve (PTR).
- In 2018, Madhya Pradesh could identify only 42.06 sq km of revenue land and claimed that it would consider 36.22 sq km, of degraded forest land to meet the 60.17 sq km commitment.
- **Other challenges:** Experts have also claimed that the proposed changes have altered the nature of the

project which means that new environmental clearances must be obtained

- The Supreme Court has not yet ruled on the Central Empowered Committee's 2019 report that sought studies on the impact of KBLP.
- The Madhya Pradesh government has also not completed its recount of the trees to be felled for the KBLP.

To know more, click the [link](#).

What are the benefits of river interlinking?

- **Water redistribution:** It helps redistribute water resources from regions experiencing excessive rainfall to those facing chronic drought conditions.
- This will help in mitigating floods and alleviating droughts.
- **Hydropower:** As part of river interlinking initiatives, numerous dams and reservoirs will be established.
- This will increase hydropower generation, by around 34,000 MW if fully realized.
- **Water flow:** It will also contribute to dry weather flow augmentation with surplus water in reservoirs released during the dry season to maintain consistent minimum flow in rivers
- This will benefit areas such as pollution control, navigation, forest preservation, fisheries, and wildlife protection.
- **Agriculture and irrigation:** India's agriculture is heavily monsoon-reliant which leads to agricultural vulnerabilities due to the erratic nature of the monsoon.
- River interlinking will improve irrigation facilities and provide relief to water-deficient regions, thereby enhancing agricultural productivity and stability.
- **Transportation:** River interlinking will help improve the inland waterways transport network in the country.
- This will help generate revenue in the form of transportation, tourism, and other activities like pisciculture.
- **Security:** It will also help strengthen the country's national defense and security by expanding the country's waterline defense capabilities.

UPSC Mains Practice Questions

Q.1) The interlinking of rivers can provide viable solutions to the multi-dimensional inter-related problems of droughts, floods, and interrupted navigation. Critically examine. (UPSC GS1 2020)

MCQs

Question: Recently Uttar Pradesh and Madhya Pradesh governments signed a Memorandum of Understanding for the linking of two rivers as a link project. Which are these two rivers? (UPSC CSE 2006)

- Betwa and Chambal
- Betwa and Ken
- Chambal and Son
- Ken and Narmada

Answer: (b)

Question: Recently, linking of which of the following rivers was undertaken? (UPSC CSE 2016)

- Cauvery and Tungabhadra
- Godavari and Krishna
- Mahanadi and Sone
- Narmada and Tapi

Answer: (b)

International Relations (GS Paper Prelims) & GS Paper II (Main)

Indo-Pacific Regional Dialogue

Priority: High



Primary Source: PIB

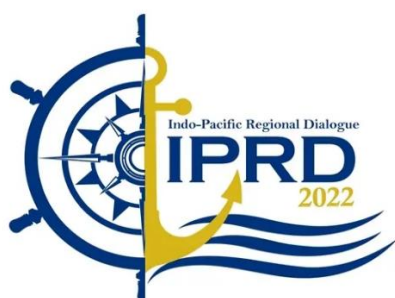
Syllabus Relevance & Important Keywords: India and its neighborhood- relations, Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests, Indo-Pacific Regional Dialogue (IPRD), UNCLOS, Significance for India

Context

- Recently, the Indo-Pacific Regional Dialogue was hosted in New Delhi between 15th and 17th November 2023.

What is the Indo-Pacific Regional Dialogue?

- The IPRD is an annual apex-level international conference conducted by the Indian Navy.
- It serves as a platform to discuss and address holistic maritime security issues across the Indo-Pacific region.
- Aim:** Review the existing geopolitical situation in the Indo-Pacific region
- Identify opportunities and challenges arising from the actions and responses of regional and global players in the Indo-Pacific region.
- The Conference is an essential component of India's foreign policy particularly in relation to its Indo-Pacific strategy.
- The IPRD was first hosted in 2018.



Theme of IPRD-2023

- "Geopolitical Impacts upon Indo-Pacific Maritime Trade and Connectivity".**
- This year's edition of the IPRD is built upon the previous one, which focussed upon **'Operationalising the Indo-Pacific Oceans Initiative (IPOI)'**, by

specifically addressing the **'Trade, Connectivity and Maritime Transport'** pillar of the IPOI.

- Both 'Trade' and 'Maritime Transport' are segments of maritime connectivity.
- Speakers from 16 countries, students, military practitioners, scholars, eminent citizens, diplomats, and think tanks from India and abroad attended the event.

Areas of discussion:

- Nodes of Maritime Connectivity**
- China's Impact vis-à-vis Maritime Connectivity across the Indo-Pacific**
- Maritime Connectivity through Shipping and Trade**
- Private Industry in the Safety and Security of Indo-Pacific Maritime Trade and Shipping**
- Maintaining a Rules-based, Safe, and Secure Indo-Pacific**

Discussion areas?

- Operationalising a Regional MDA (Maritime Domain Awareness) Network in the Indo-Pacific;**
- Cooperative Regional Solutions to Address Disruptions of the Maritime Rules-based Order**
- Staunching the Proliferation of Maritime Lawfare in the Indo-Pacific;**
- Enhancing Underwater Domain Awareness across the Indo-Pacific;**
- Building a Consensual Rules-based Maritime Order in Indo-Pacific through Multilateral Engagement of Minilateral Constructs.**
- In his address to the UNSC in 2021, Indian Prime Minister Narendra Modi emphasized three key aspects of marine infrastructure creation.
 - Physical sustainability
 - Absorption capacity of the country
 - Global norms and standards of marine infrastructure creation
- Although **India shared historical and deep-rooted ties with the seas** on account of it being an ancient civilization with a rich maritime heritage, its maritime competence has waned over the years.
- India had advocated for the Global South and aimed to promote North-South cooperation** which could be seen in how championed the issues of the Global South and hosted the Global South Summit during its G-20 Presidency.

What is Indo-Pacific?

- The Indo-Pacific is a vast biogeographic region of Earth which in terms of geo-spatiality, encompasses the interconnected space between the Indian Ocean and the Pacific Ocean.
- The debate surrounding its expanse ranges from the eastern shores of Africa to the western coast of the United States, with definitions varying based on the perspectives of different actors and their geographic positions in this vast region.

Significance of the Indo-Pacific:

- The Indo-Pacific, spanning the Indian and Pacific Oceans, holds strategic importance due to its critical sea routes, high-energy demands of populous nations, and global commons.
- Its centrality is underscored by the straits of Malacca, a key trading channel connecting the two oceans.
- Three of the most important allies of the United States namely Japan, South Korea and Australia are located here.
- More than one-third of the foreign trade of the world takes place in this region.
- The world's largest economies are located in the Indo-Pacific region namely, China, India, Japan, Indonesia, South Korea, Thailand, Australia, Taiwan, Malaysia and Philippines.

What are the Recent Geo-Political Developments in the Indo-Pacific Region?

- **US' Indo-Pacific Strategy:** Recently, US administration has announced its long-awaited Indo-Pacific strategy which focusses on building collective capacity to deal with challenges in the region.
- **Indo-Pacific Economic Framework (IPEF):** To deal with China, the US at the recently launched the Indo-Pacific Economic Framework (IPEF) to offer the region better alternatives to fulfil its developmental goals.
- The IPEF will work on fine-tuning four major pillars: standards and rules for digital trade; resilient supply chains; green energy commitments; and fair trade.
- **EU's Indo-Pacific Strategy:** The European Union (EU) has recently come up with an Indo-Pacific strategy that aims to enhance its engagement across a wide spectrum.
- The EU already sees itself and the Indo-Pacific as "natural partner regions".
- It is a significant player in the Indian Ocean littoral states, the ASEAN area and the Pacific Island states.
- **AUKUS Grouping:** In September 2021, the US has announced a new trilateral security partnership for the Indo-Pacific, between Australia, the UK and the US (AUKUS).
- The security grouping AUKUS will focus on advancing strategic interests in the Indo-Pacific region.
- The major highlight of this arrangement is the sharing of US nuclear submarine technology to Australia.

India's Evolving Strategy:

India's Indo-Pacific vision extends from the Look East to Act East Policy. While echoing U.S. concerns, India grapples with inclusivity, emphasizing a "free and open Indo-Pacific" and the SAGAR of **SAGAR (Security and Growth for All in the Region)**.

Challenges

Dilemma between national security & economic gains

- countries in the Indo-Pacific region are confronted with the dilemma of prioritizing resilience and national security over economic gains.

- Preemptive extreme measures, such as disconnecting from global supply chains or adopting exclusive trade policies, may inadvertently fuel conflicts rather than prevent them.

Rivalry among some East Asian Countries:

- The Indo-Pacific region has been under pressure East Asia, in particular. South Korea and Japan face regular nuclear and missile threats from North Korea.
- China, too, not only challenges international maritime laws in the, but also confronts Japan over the Senkaku Islands dispute.

Chinese aggression:

- Six nations, including China and Taiwan, are involved in the dispute over the Spratly Islands, which are supposedly sitting on vast reserves of oil and natural gas.
- China has vigorously militarised some portions of the disputed isles, islets and coral reefs; and countries like Vietnam and the Philippines are anxious not to be left behind.

Unwillingness to Act Against China:

- There is a limit to which countries in the region will want to get on the anti-China bandwagon, economic or strategic.
- Whether it is in East, Southeast or South Asia, every country has its own unique relationship with China.

U.S. Decline and Indo-Pacific Dynamics:

- The relative decline of the U.S. presence is evident, despite being a net-security provider and possessing a potent navy.
- The U.S. withdrawal from the Trans-Pacific Partnership and challenges in the Quad alliance (with Australia, Japan, and India) have left its alliance system in uncertainty.
- **Issues with IPEF:** The first indications are that while the IPEF may be a good idea, there is discontent that the framework does not address issues of trade and tariffs.

Possible Measures

Balance between security concerns and economic cooperation

- Striking a careful balance between security concerns and economic cooperation is imperative to avoid deepening divisions and fostering regional growth.
- As the Indo-Pacific region braces for potential major events, India must formulate robust policies to safeguard its interests in the Indian Ocean.
- Striking a balance between regional cooperation and national security, India needs to foster an environment that encourages growth while remaining resilient to external pressures.

Establishing Common Standards

- To facilitate deeper integration, stakeholders in the region must prioritize the establishment of common standards.

- Covering crucial aspects such as labor rights, environmental standards, intellectual property rights, and rules governing the digital economy, these standards will serve as a foundation for cohesive regional cooperation in the future.
- Countries in the region should uphold the principles of international law, granting equal access to common spaces at sea and in the air.
- Emphasizing freedom of navigation, unimpeded commerce, and peaceful dispute resolution, these initiatives promote connectivity based on respect for sovereignty, territorial integrity, good governance, transparency, viability, and sustainability.

Combined Indo Pacific Strategy

- To counter challenges posed by China, a combined Indo-Pacific strategy must involve strengthening relations among key stakeholders. Priorities include bolstering defence cooperation, promoting economic assistance, and addressing environmental issues.
- Key players in this collaborative effort include the US, India, Japan, Australia, South Korea, Indonesia, and Taiwan. By collectively addressing military capabilities, economic assistance, and environmental threats, these nations can enhance regional cooperation and resilience in the Indo-Pacific.

National Maritime Foundation

- The National Maritime Foundation is India's first maritime think tank which was established in 2005.
- It is based in New Delhi and conducts independent research on the maritime domain.
- It also provides inputs for policy formulation in the maritime domain.
- Despite being an autonomous think tank, it is supported by the Indian Navy and the Union Ministry of Defence in its organizational development.

UNCLOS 1982

Conclusion

The Indo-Pacific initiative is to create a "virtuous cycle" of strong, sustainable, balanced and inclusive growth throughout the Indo-Pacific region by sharing best practices, investment promotion and buyer-seller matching events for supply chain diversification.

ASEAN India Grassroots Innovation Forum (AIGIF)

Priority: High



Primary Source: Department of Science and Technology

Syllabus Relevance & Important Keywords: India and its neighborhood- relations, Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests, ASEAN India Grassroots Innovation Forum, National Innovation Foundation (AIGIF), ASEAN

Context

- Recently, India participated in the **4th edition** of the **ASEAN India Grassroots Innovation Forum (AIGIF)** held in Langkawi, Malaysia on 28th November 2023.



What is the ASEAN India Grassroots Innovation Forum?

- The **ASEAN India Grassroots Investment Forum** is an annual forum to strengthen the cooperation between **India** and the **ASEAN** in the fields of **Science, Technology, and Innovation**.
- **Objective:** Provide **exposure to social innovation**
 - **Strengthen governance in the grassroots innovation ecosystem.**
- **Organizers:**
 - The ASEAN Committee on Science, Technology, and Innovation (COSTI)
 - Department of Science & Technology (DST), GoI
 - India's National Innovation Foundation (NIF)
 - Host nation's Science and Technology Ministry of the host nation - Ministry of Science, Technology and Innovation, Malaysia (MOSTI) (2023)
- The **Yayasan Inovasi Malaysia (YIM)**, an agency under MOSTI, was responsible for executing the 2023 edition of the AIGIF.
- **Previous editions:**
 - **1st edition:** Jakarta, Indonesia (2018)
 - **2nd edition:** Davao, Philippines (2019)
 - **3rd edition:** Phnom Penh, Cambodia (2022)
- **Participants from India:**
 - Representatives from the Department of Science and Technology, Government of India; staff members of the NIF, and 17 student innovators and grassroots innovators.

Highlights of the 2023 edition

- According to the Malaysian Minister of Science, Technology, and Innovation, YB Chang Lih Kang, annual flagship programmes like the AIGIF were a **dynamic platform to showcase and promote innovations with the potential to impact the lives of citizens at the grassroots level**.
- Countries were urged to continue their commitment to social innovation and ensure a better tomorrow for the global population.
- Steps to help improve innovation and technological capability, resilience of entrepreneurs, and sustainability include
 - **Support cross-border mechanisms**

- **Share information about best practices**
- **Networking of ASEAN linkages to global and regional networks.**
- The Secretary of the Department of Science and Technology, Government of India, highlighted the importance of innovators for the world's future.
- Therefore, steps must be taken to support them to make the world a better place.
- He underlined the need to define cooperation involving emerging possibilities in the broader Asian region such as
- **Joint Technology and Product Development**
- **Cross Border Technology Licensing opportunities**
- **Sharing infrastructure with countries that do not have access to it**
- **Dissemination and social diffusion of emerging technologies.**
- The High Commissioner of India to Malaysia emphasized India's key contributions to the startup ecosystem in different parts of the world, including unicorns rooted in India and operating in Malaysia.
- He claimed that the AIGIF could help students and the grassroots population in the participating countries and ensure greater cooperation between India and the ASEAN member states.
- He also urged the industry to connect with grassroots innovation to ensure sustainable solutions.
- Participants at the **AIGIF 2023** reiterated their commitment to tackling societal challenges through improved participation and collaboration.

What is the National Innovation Foundation?

- The **National Innovation Foundation is an autonomous body of the Department of Science and Technology (DST), Government of India.**
- **Established:** It was established in **2000** in **Ahmedabad** with the aim of providing institutional support to sustain and scale up the grassroots innovations ecosystem in the country.
- **Objective:** It aims to **strengthen grassroots technological innovations and traditional knowledge by making India a creative and knowledge-based society.**
- It will work towards expanding policy and institutional space for grassroots technological innovators in the country.

Initiatives of the NIF

- The NIF has a pooled database of 3,25,000 technological ideas, innovations, and traditional knowledge practices.
- It has collaborated with various research & development (R&D) and academic institutions and universities.
- NIF has filed over **1274 patent applications**, including eight filed in the USA and 28 Patent Cooperation Treaty (PCT) applications, on behalf of the innovators and outstanding traditional knowledge holders.

- It has also been successful in commercializing products in numerous countries.
- **Awards:** It has recognized 1093 grassroots innovators and school students at the national level through the **National Biennial Grassroots Innovation Award and Dr A P J Abdul Kalam Ignite Children Awards.**
- **Grassroots Innovations Design Studio (GRIDS):** It has been set up to facilitate formal design inputs to grassroots innovations at premier institutes.
- **Students' Club for Augmenting Innovations (SCAI):** It is a nationwide student movement providing product development, mentoring, and monitoring support to innovators and traditional knowledge holders at the grassroots level.
- **Fab Lab:** It has established an augmented Fabrication Laboratory (Fab Lab) for product development and strengthening in-house research.
- **Micro Venture Innovation Fund (MVIF):** It has provided risk capital support to numerous innovation-based enterprises with support from the **Small Industries Development Bank of India (SIDBI).**

ASEAN

- **ASEAN or the Association of South East Asian Nations** is a **regional association of countries that was established to promote social and political stability in the Asia-Pacific region.**
- **Formation:** It was established in **1967** under the **Bangkok Declaration** which was signed by Malaysia, Indonesia, the Philippines, Thailand, and Singapore.
- **Members:** Brunei Darussalam, Burma, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam
- **Secretariat:** Jakarta, Indonesia
- **Fundamental principles:**
 - **Mutual respect for the independence, sovereignty, equality, territorial integrity, and national identity of all nations.**
 - **The right of a state to be free from external interference, subversion, or coercion.**
 - **Non-interference** in the internal affairs of other members.
 - **Peaceful settlement of disputes**
 - **Renounce the threat or use of force.**
 - **Cooperation among members.**

Objectives:

- Develop a **peaceful and prosperous community of Southeast Asian nations** through economic growth, social progress, and cultural development.
- Abide by the **rule of law, justice, and principles of the UN charter** to ensure regional peace and stability
- Collaborate and assist in **shared interests in economic, social, cultural, technical, scientific, and administrative fields.**

- Collaborate in agriculture, industries, trade expansion, transportation and communications, and improving living standards of people.
- Promote **Southeast Asian studies**.
- Cooperation with existing international and regional organizations.

ASEAN Forums

- **ASEAN Regional Forum (ARF)**: It was launched in 1993 to facilitate cooperation on political and security issues to contribute to regional confidence-building and preventive diplomacy.
- **ASEAN Plus Three**: It is a consultative group of the ten ASEAN states, China, Japan, and South Korea that was launched in 1997.
- **East Asia Summit (EAS)**: It is a summit for heads of state from ASEAN, Australia, China, India, Japan, New Zealand, Russia, South Korea, and the United States that discusses security and prosperity in the region with ASEAN playing a central role.
- **ASEAN Defence Ministers Meeting (ADMM)-Plus Meeting**: The ADMM-Plus is a platform for ASEAN and its eight Dialogue Partners to strengthen security and defense cooperation for peace, stability, and development in the region.
 - **Dialogue partners**: Australia, China, India, Japan, New Zealand, ROK, Russian Federation, and the United States.

To know more, click the [link](#)

Conclusion

- The ASEAN India Grassroots Innovation Forum fosters collaboration in science, technology, and innovation, promoting social impact. India's National Innovation Foundation plays a pivotal role in this transformative initiative.

UPSC Mains Practice Questions

Q.1) Innovation is the key determinant of economic growth and social welfare. (UPSC Paper-I 2016)

Q.2) Skill development programmes have succeeded in increasing human resources supply to various sectors. In the context of the statement analyse the linkages between education, skill and employment. (UPSC GS2 2023)

Q.3) The Indian Diaspora has an important role to play in South-East Asian countries' economies and society. Appraise the role of the Indian Diaspora in South-East Asia in this context (UPSC GS2 2017)

Q.4) China is using its economic relations and positive trade surplus as tools to develop potential military power status in Asia', In light of this statement, discuss its impact on India as her neighbor. (UPSC GS2 2017)

MCQs

Question: Which of the following statements is/are correct regarding National Innovation Foundation-India (NIF)? (UPSC CSE 2015)

1. NIF is an autonomous body of the Department of Science and Technology under the Central Government.
2. NIF is an initiative to strengthen the highly advanced scientific research in India's premier scientific institutions in collaboration with highly advanced foreign scientific institutions.

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (a)

Question: Consider the following infrastructure sectors:

1. Affordable housing
2. Mass rapid transport
3. Health care
4. Renewable energy

How many of the above does the UNOPS Sustainable Investments in Infrastructure and Innovation (S3i) initiative focus on its investments? (UPSC CSE 2023)

- a. Only one
- b. Only two
- c. Only three
- d. All four

Answer: (c)

Question: India is a member of which among the following?

1. Asia-Pacific Economic Cooperation (APEC)
2. Association of South-East Asian Nations
3. East Asia Summit

Which of the above is/are correct? (UPSC CSE 2015)

- a. 1 and 2 only
- b. 3 only
- c. 1, 2 and 3
- d. India is a member of none of them

Answer: (b)

Proposed India-UK FTA, Its Politics, And Why The UK May Benefit More

Priority: Medium



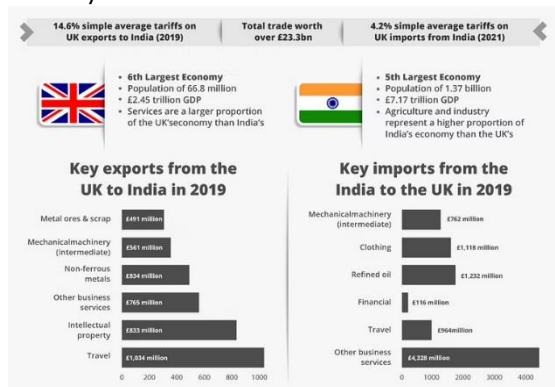
Primary Source: The Indian Express

Syllabus Relevance & Important Keywords: Bilateral, regional, and global groupings and agreements involving India and/or affecting India's interests, Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora, India-U. K Free Trade Agreement Benefits and Concerns Associated with the Free Trade Agreement between India and the U.K.

Context

- Recently, **External Affairs Minister S Jaishankar** discussed the **India-UK Free Trade Agreement (FTA)**

with Britain's Prime Minister Rishi Sunak and Foreign Secretary David Cameron.



About the India-UK free trade agreement

- India and the U.K. launched talks for a **free-trade agreement (FTA)** in 2022 with the aim of concluding talks by Deepavali (October 24, 2022).
- There are 26 chapters in the agreement, which include goods, services, investments, and intellectual property rights.
- It will serve as a template for future trade agreements with EU and **European Free Trade Countries (EFTA)**.

Free Trade Agreement

- A **Free Trade Agreement (FTA)** is an agreement between two or more nations to reduce barriers to imports and exports among them.
- Under an FTA scheme, 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.
- FTAs can be further classified as **Preferential Trade Agreements**, **Comprehensive Economic Cooperation Agreements**, and **Comprehensive Economic Partnership Agreements (CEPA)**.

Benefits of India -UK Free Trade Agreement for India:

- Doubling trade:** It will help to facilitate the target of doubling bilateral trade between India and the United Kingdom by 2030.
- It will help to increase our exports in Leather, Textile, Jewellery and processed Agri products. India is also expected to register a quantum jump in the export of Marine Products through the recognition of 56 marine units in India.
- Services:** The FTA with the UK is expected to provide certainty, predictability, and transparency and will create a more liberal, facilitative, and competitive services regime.
- Great potential for increasing exports in service sectors like IT/ITES, Nursing, education, and healthcare, including AYUSH and audio-visual services.
- Mutual Recognition Agreements (MRAs)** on Pharma could provide additional market access.
- Boost employment:** Market access and relaxation of trade restrictions would help to generate direct and indirect employment in both nations.

- India's labor-intensive sectors such as apparel, gems, and jewellery will benefit due to tariff relaxations.
- Supply-chain resilience:** Will also contribute to integrating value chains and help augment our mutual efforts to strengthen the resilience of supply chains.
- India, after exiting the **China-dominated Regional Comprehensive Economic Partnership (RCEP)**, has been looking at trade deals with the **UK, Australia, EU, and Canada**, to hold off China in the region.
- Moreover, the increase in exports to India will help compensate for the UK's loss of access to the **European Single Market** following Brexit.
- Strategic importance:** India believes that stronger bonds between India and the U.K., which is also a permanent member of the **UNSC**, can be developed through trade. This will help the country seek the U.K.'s support on global issues such as reform of multilateral institutions, dispute settlement, etc.

Issues that need resolution

- Entry barrier for India's skilled professionals:** The reluctance of the UK for greater access for India's skilled professionals from sectors like IT, and healthcare in the UK market.
- In December 2023, the UK announced plans to raise the minimum salary a skilled worker must earn to get a visa.
- Rules of origin:** It prescribes **minimum processing standards in the FTA country**, so that the final manufactured product may be called originating goods in that country.
- India wants strict rules of Origin so that any third country can not take unfair advantage of the FTA.
- Intellectual property rights (IPRs):** India is reluctant to compromise on its generic drug production which can be impacted by FTA.
- The UK has also sought a higher level of protection than the general protection India normally provides for violation of **Geographical Indication rules**.
- Duty concessions for UK products:** India is opposing duty concessions on electric vehicles, scotch whiskey, lamb meat, chocolates, and certain confectionary items.
- Although the FTA could boost India's agricultural export share from just 1.1% of the UK's import basket for goods like rice, marine products, spices, and meat, it has expressed concerns about the potential losses that could be faced by Indian farmers due to British imports.**
- Data localization norms:** The UK's insistence on exemption from data localization regulations has an impact on industries like the financial services industry and better access to India's government contracts.
- India has expressed its inability to relax the data localization rules due to domestic laws.

- **Non tariffs barriers:** NTBs are in the form of **regulations, standards, testing, certification, or pre-shipment inspection that are aimed at protecting human, animal, or plant health and the environment.**
- Vegetable and fruit exporters face strict limits, and rejections on the charge of pesticides and other contaminants residues. In manufacturing too, Indian products face high rejection based on conformity assessments and technical requirements.
- **Issue of a carbon tax:** The UK has shortlisted products such as cement, chemicals, glass, iron and steel, non-ferrous metals, non-metallic minerals, paper and pulp, refining, fertilizers, and power generation.
- So even if India wins significant removal of tariffs, India would be at a great loss due to the imposition of a carbon tax on Indian products.
- **Impact on Less Developed Countries:** According to some experts, the FTA would affect **Least Developed Countries (LDCs)** such as Bangladesh that currently enjoy preferential access to the UK market.
- **Dispute Resolution:** Both countries have yet to resolve their differences over the mechanism for dispute settlement. **India has proposed to first utilize all local judicial remedies for the settlement of disputes before initiating an international arbitration.**

Conclusion

The potential benefits of the India-UK Free Trade Agreement are vast, spanning trade in goods and services, technology, and various strategic sectors. This agreement not only holds the promise of boosting economic growth and creating employment opportunities but also symbolizes a deeper diplomatic and strategic engagement between India and the UK.

Why Peace In West Asia Matters To India

Priority: Medium



Primary Source: The Indian Express

Syllabus Relevance & Important Keywords: India and its extended neighborhood, Bilateral, regional, and global groupings and agreements involving India and/or affecting India's interests, India-West Asia Ties and India's Foreign Policy Approach to the Region

Context

- As the **Israel-Hamas conflict** extends into its seventh week, there is an increasing worry about the possibility of its escalation, leading to destabilization across the entire West Asia region.
- On November 11, 2023, the annual **India-US 2+2 dialogue** Joint statement stressed support for Israel against Hamas terror, emphasized adherence to international humanitarian law, and outlined shared objectives of preventing conflict escalation, preserving Middle East stability, and pursuing a political solution for durable peace.

About West Asia

- West Asia, or the **Middle East**, includes countries located in **Western Asia and parts of North Africa.**
- The West Asia region comprises Armenia, Azerbaijan, Bahrain, Cyprus, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Iran, Oman, Palestine, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, and Yemen.



Background of India-West Asia relations:

- **Historical Ties**
 - Post-independence, Gamal Abdel Nasser, the President of Egypt, played a significant role and was part of the Non-Aligned Movement.
 - Nehru-Nasser bond, both shared a good bonhomie with each other.
- **Goa Liberation Support**
 - Nasser's friendship was instrumental in blocking the Portuguese navy from entering the Suez Canal during India's operation to liberate Goa in 1961.
- **Terrorism and fundamentalism:**
 - Suspicions that some countries are supporting Islamic fundamentalism and terrorism in India, have continued to irk.
- **Trade relations:**
 - Since the 1990s, India has established trade alliances with West Asia, particularly in the fields of energy and oil.

Current foreign policy of India towards West Asia

- **Look West Policy:**
 - India with continued foreign policy goals placed an active focus on three main axes: the **Arab Gulf countries, Israel, and Iran.**
- **De-hyphenation strategy:**
 - **Israel and Palestine:** India's relationship with Israel would stand on its own merits, independent and separate from India's relationship with the Palestinians. Standalone visits to each were done by the Indian Prime Minister.
 - **Russia and U.S.:** Balancing act of increased cooperation with the U.S. while continuing decade-long friendship with Russia.
- **Countering China's influence:** Through infrastructure projects and agreements, for example,
 - Infrastructure projects such as the extension of the **International North-South Transport Corridor (INSTC).**

- **Ashgabat Agreement:** Designed to streamline the transit and transportation of goods connecting Central Asia with the Persian Gulf.

Significance of West Asia for India:

- **Energy Security:**
 - **Gulf- West Asia- North Africa region** meets a major share of India's energy needs, contributing over **60 percent of India's total imports of crude oil** and over **85 percent of India's LNG requirements**.
- **Indian Diaspora and remittances:**
 - India boasts a substantial diaspora in West Asia, particularly in Gulf countries.
- **Economic Significance:**
 - **Remittances:** Inwards remittances with approximately 38 billion U.S. dollars from the Gulf into India in 2022.
 - **Trade:** West Asia is today the largest trade partner with India with the volume of the two-way trade touching \$150 billion.
 - **Investment:** The UAE-India Infrastructure Investment Fund targets \$75 billion for supporting Indian infrastructure projects. Saudi Aramco's strategic investment includes a 20% share in Reliance Industries' oil business, amounting to \$15 billion.
- **Entry gate to Central Asia:**
 - Landlocked Central Asia, can be accessed through West Asia. This necessitated India's development of the **Chabahar port** in Iran.
- **Counter-terrorism and deradicalization:**
 - The UAE and Saudi Arabia, emerged as strong partners in strategic and counter-terrorism cooperation with India.
 - The UAE handed over Dawood's aide, and a wanted terrorist, Farooq Takla, to India in 2018 and warned Pakistan not to allow its terrorists to use its territory.

Roadblocks in India- West Asia relations:

- **Global Wars:**
 - Russia-Ukraine war has forced India to walk on a tightrope.
 - Israel-Hamas conflict: With all West Asian countries grouped into two blocks, it has raised concerns.
- **Organisation of Islamic Cooperation (OIC):**
 - Interference in the domestic issue of Kashmir through its communications and statements has irked India.
 - Issues such as hijab issue, communal violence are being raised by OIC in international forums including the UN Human Rights Council.
- **China factor:**
 - Economic and strategic competition with China is seen in the region.
- **Shia-Sunni conflict:**
 - Saudi Arabia and Iran often find themselves at loggerheads on the sectarian issue of the Shia-Sunni conflict. India finds itself in a difficult situation to balance.
- **Stagnation in Economic ties:**

- Due to physical distance and geopolitical issues, bilateral trade is stagnated.
- Major bias is towards Petroleum trade, leading to non-diversification of the trade basket.

India's Recent diplomatic endeavors:

- **I2U2 initiative:** Israel, India, the United Arab Emirates, and the United States formed the bloc in **2021** to deepen technological and private sector collaboration in the region and tackle transnational challenges in six focus areas: water, energy, transportation, space, health and food security.
- **OIC:** At the **46th summit of the OIC (Organisation for Islamic Cooperation earlier)** in 2019 in UAE, the Indian foreign minister was invited as the Guest of Honour at the inaugural plenary.
- **Abu Dhabi Document:** Underscoring India's importance, the **Abu Dhabi Document** did not mention the Kashmir issue for the first time in the history of the OIC (Organisation for Islamic Cooperation earlier).
- India has secured access to the key **Port of Duqm** in Oman for military use and logistical support.
- Reiteration of the two-state solution for the Israel-Palestine conflict to ensure global peace during the India-U.S. 2+2 summit.

Two-State Solution Progress Through Oslo Accords:

- **1993 Oslo Accords:**
 - It was initiated by US President Bill Clinton, and signed by Israel and the Palestine Liberation Organisation (PLO).
 - The objective of it was to bring the two countries closer to agreeing on the two-state solution.
- **Post-Rabin Era:**
 - Despite the assassination of Yitzhak Rabin in 1995, Prime Minister Netanyahu, in power since 1996, continued the peace process.
 - Signing of the Hebron Protocol in 1997, transferring most of Hebron to Palestinian control.
- **Wye River Plantation (1998):**
 - Negotiations involving Clinton, Netanyahu, and Arafat (Chairman of PLO).
 - Agreement for further Israeli withdrawals from the West Bank.
- **Clinton's Presidency End (2000):**
 - Substantial progress toward an independent Palestine.
 - Proposal included 98% of the West Bank and the entire Gaza Strip, nearing the envisioned two-state solution.
- **Collapse of the initiative:**
 - The accord's collapse is attributed largely to the deceptive actions of Arafat and the terrorist activities of Hamas in Gaza and Israel.
 - Distrust between Israel and Palestine has led to the resumption of talks challenging.

Conclusion:

- While the ongoing Israeli military actions against Hamas in Gaza may make discussions about the two-state solution seem untimely and unrealistic, New Delhi remains steadfast in its commitment to the two-state solution as a foundational principle for lasting peace in West Asia. This commitment aligns with India's unwavering stance on zero tolerance for terrorism.

MCQs

Question: The term "two-state solution" is sometimes mentioned in the news in the context of the affairs of (UPSC CSE 2018):

- China
- Israel
- Iraq
- Yemen

Answer: (b)

India, Bhutan To Discuss New Routes Of Regional Connectivity

Priority: Medium



Primary Source: The Hindu

Syllabus Relevance & Important Keywords: India and its neighborhood- relations. Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests, India-Bhutan ties, Issues and Challenges Associated with India-Bhutan Ties

Context

- Recently, the **King of Bhutan, Jigme Khesar Namgyel Wangchuck**, and Indian PM Narendra Modi held discussions on bilateral cooperation and regional and global issues of mutual interest.
- The two countries agreed to discuss **new routes of regional connectivity** and upgrade border and immigration posts between the two countries.



What was discussed in the meeting between the leaders of India and Bhutan?

- Rail Connectivity:** The two countries agreed to proceed with the final survey for the 58 km cross-border rail link between **Gelephu in Bhutan** and **Kokrajhar in Assam** to be built by India.
- India and Bhutan also committed to exploring a second rail link of around 18 km length between **Samtse in Bhutan** and **Banarhat in West Bengal**.
- Air Connectivity:** The proposed rail connectivity projects could aid in the implementation of air connectivity in the northeast region as well.

- Bhutan has planned to build an **international airport at Gelephu** as part of the larger **Sarpang district Special Economic Zone**.
- Trade:** India also agreed to allow Bhutanese trade items to be carried further on from **Haldibari in West Bengal to Chilahati in Bangladesh**.
- Both countries also agreed on the need to strengthen trade infrastructure and upgrade the existing land customs station at **Dadgiri (Assam) to a modernized "Integrated Check Post" (ICP)**.
- India will also support the Bhutanese SEZ project and aid in the development of facilities at **Gelephu**.
- Immigration and Border Control:** The **Darranga-Samdrup Jongkhar border crossing between Assam and Bhutan's SouthEastern district** will be designated as an immigration checkpost.
- This will enhance connectivity and tourism while also permitting third-country nationals to enter and exit efficiently and safely.
- Tourism:** Ease of travel between the two countries and further exchanges to Bangladesh will generate opportunities for trade and travel in Bhutan.
- This will provide a significant boost for the pandemic-hit Bhutanese economy in the form of tourism revenues.
- Socio Economic Development:** Bhutan informed India of the ongoing reforms within the country while India reiterated its commitment to supporting socio-economic development in Bhutan.
- Bhutan expressed its gratitude for India's development assistance for **Bhutan's 12th Five-Year Plan** and India's continued support of the new **13th Five-Year Plan**.
- Bilateral Relations:** India has committed to maintaining its close friendship and cooperation with Bhutan.



What are the problems faced by the Bhutanese economy?

- Bhutan's economy was significantly affected by the **COVID pandemic** and the **after-effects of a stringent lockdown**.
- The country's economy is expected to grow 4.3%, which is lower than the sub-regional average.
- Bhutan is expected to face long-term impacts due to a **net-out migration by its youth in pursuit of education and employment**.
- Other concerns faced by Bhutan include:
 - **Low forex reserves**
- Major **public debt** with an estimated 125% Government Debt to GDP ratio in 2022,
 - The majority of this public debt consists of debt to India.
- The proposed SEZ in Bhutan is aimed at tackling these challenges by generating employment in the country and improving forex reserves.

India-Bhutan relations

- **Historical ties:** India-Bhutan ties can be traced back to 747 AD when the **Buddhist monk Padmasambhava** travelled to Bhutan from India.
 - During the colonial era, Bhutan became a part of British Empire.
 - Post independence, Bhutan was given an option to remain independent or join the Indian Union but Bhutan chose to remain independent.
- **Diplomatic relations:**
 - In 1949, India and Bhutan signed the **Indo-Bhutan Treaty** also known as the **Treaty of Peace and Friendship**, which formed the bedrock of ties between the two countries.
 - It called for peace between the two nations and non-interference in each other's internal affairs.
 - **It was revised in 2007 to replace the provisions requiring Bhutan to take India's guidance on foreign policy matters and permission for arms imports.**
 - Bilateral diplomatic relations were established in 1968 through the establishment of a special office in Thimphu.
- **Borders:** There is a 699 km long border between India and Bhutan spanning the states of **Assam, Arunachal Pradesh, West Bengal and Sikkim**.
 - The Indo-Bhutan border also acts as a buffer between India and China.
- **Economic:** India is Bhutan's largest trading partner with **imports from India accounting for more than 77.1% of Bhutan's total imports** and **exports from Bhutan constituting 90.2 % of its total exports**.
 - The trade between the two countries is governed by the **India-Bhutan Trade and Transit Agreement 1972** which established a free trade regime.
 - Increased trade and commerce ties with Bhutan will assist with trade and development in landlocked Arunachal Pradesh and Assam.
 - India has been a key development partner for Bhutan and has contributed to Bhutan's Five Year Plans.

- India has contributed to the development of transport and communication networks in Bhutan.
- The **Bilateral Agreement on Trade, Commerce and Transit between India and Bhutan came into effect in 2017**, and will be valid for ten years.
- **Energy and hydrology:** The core of bilateral economic cooperation between India and Bhutan is hydro-power cooperation.
 - Bhutan is the source of the **Brahmaputra, the Sankosh, and the Manas** which are crucial for irrigation, hydroelectric power generation, and other purposes for India.
 - Projects totalling 2136 MW are already operational in Bhutan and are supplying electricity to India.
- **Security:** Bhutan serves as a vital buffer between India and China.
 - India and Bhutan have established the **Border District Coordination Meeting (BDCM) Mechanism** for border management and security cooperation.
 - India provides security assistance to Bhutan and has helped Bhutan build its border infrastructure, and develop the Bhutanese army.
- **Educational and cultural exchange:** Bhutanese students pursue their education in India, supported by Indian scholarships.
 - The two countries have also promoted people-people connections among them.
 - The Indian diaspora of around 60,000 Indians residing in Bhutan.
 - Bhutan is a Buddhist theocracy, and monarchy, which also shares a historical and cultural link with India.
- **Multilateral partnerships:** India and Bhutan are founding members of the **South Asian Association for Regional Cooperation (SAARC)** and also participate in other regional multilateral bodies like the **BBIN, BIMSTEC**, etc.

Challenges in ties

- India has been criticized for its **meddling in Bhutan's internal affairs** which has led to a negative perception of Indians among the Bhutanese.
 - This has developed resentment against what is seen as a big brother attitude by India.
- There is a growing feeling in Bhutan that **India's support for the development of Bhutan's hydropower production is driven by self-interest** as it is getting Bhutan's surplus power at relatively cheap rates.
 - Both India and Bhutan face a common threat in the form of **militancy in the border regions** which could affect its internal security.
- **China's claims to strategic border regions like the Chumbi valley and Doklam** are a concern for both India and Bhutan.
 - The recent boundary talks between China and Bhutan is a matter of concern for India due to its potential

impact on India's interests in the Chicken's neck corridor.

Conclusion

- Strong India-Bhutan ties signify the continued strength of bilateral relations and cooperation in various sectors such as connectivity, trade, and socio-economic development. Although challenges exist, the partnership holds strategic importance and is pivotal in maintaining regional stability and economic progress.

FAQs

UPSC Mains Practice Questions

Q.1) Indian Diaspora has an important role to play in South-East Asian countries' economy and society. Appraise the role of Indian Diaspora in South-East Asia in this context. (UPSC GS2 2017)

Q.2) How far are India's internal security challenges linked with border management, particularly in view of the long porous borders with most countries of South Asia and Myanmar? (UPSC GS3 2013)

MCQs

Question: With reference to India's projects on connectivity, consider the following statements:

- East-West Corridor under Golden Quadrilateral Project connects Dibrugarh and Surat.
- Trilateral Highway connects Moreh in Manipur and Chiang Mai in Thailand via Myanmar.
- Bangladesh – China –India – Myanmar Economic Corridor connects Varanasi in Uttar Pradesh with Kunming in China.

How many of the above statements are correct? (UPSC CSE 2023)

- Only one
- Only two
- All three
- None

Answer: (d)

What Is The BDS Movement, Led By Palestinian Groups Against Israel?

Priority: Medium



Primary Source: Indian Express

Syllabus Relevance & Important Keywords: Important International institutions, agencies and fora- their structure, mandate, Boycott, Divestment, Sanctions Movement (BDS), Anti-Semitism

Context

- This article discusses the Boycott, Divestment, Sanctions (BDS) Movement which was launched in 2005 by more than 170 Palestinian groups to encourage international support for Palestinian people's rights.

What is the BDS Movement?

- The **Boycott, Divestment, Sanctions (BDS) Movement** is an inclusive, anti-racist human rights movement that was launched in 2005 in opposition to all forms of discrimination including Islamophobia and anti-semitism.
- It was launched by more than 170 Palestinian groups with the aim of building international support for the rights of the Palestinian people.
- It was inspired by the **South African anti-apartheid movement** and placed nonviolent pressure on Israel to comply with international law in order to meet its demands.



What are the demands of the BDS?

- End the occupation and colonization of all Arab lands and the dismantling of the wall.**
 - The Wall is the term used to refer to the **structure that separates the Israeli and Palestinian settlements in the West Bank.**
 - According to Israel, the wall has been built for security purposes while Palestine alleges that it has been built for the annexation of Palestinian territory.
 - Earlier, the **International Court of Justice** had ruled that Israel must halt its violation of international obligations and cease its work on the construction of the wall.
- Recognize the fundamental rights of the Arab-Palestinian citizens of Israel including full equality.**
- Respect, protect, and promote the rights of Palestinian refugees to return to their homes and properties as provided for under UN Resolution 194.**
 - UN Resolution 194** was adopted by the **UN General Assembly** in 1948 amid the Israeli-Arab war following the creation of Israel.
 - The war and displacement (also known as **Naqba**) led to around 7,00,000 Palestinians becoming refugees.
 - The Resolution had recommended that refugees who desired to return to their homes should be permitted to do so at the earliest and that those who chose not to return should be compensated adequately.

How does the BDS achieve its goals?

- Boycotts:** The BDS movement proposes the **withdrawal of support from the Israeli government and the sporting, cultural, and academic institutions associated with it.**

- It also recommends the **boycott of all Israeli and international enterprises that are involved in the violation of the human rights of the Palestinians.**
- The Movement has recommended the boycott of international sportswear and equipment brand Puma which is a sponsor of the Israel Football Association which also includes teams in the illegal settlements in Israel.
- Divestment:** It has suggested that banks, local councils, churches, pension funds, and universities withdraw investments from Israel.
- Sanctions:** It aims to pressure governments to fulfill their legal obligations to end the Israeli apartheid.
- It has also campaigned to put an end to Israel's membership in international forums such as UN bodies and FIFA.
- It has adopted a strategy to focus on a small number of carefully selected companies and products in order to achieve the maximum impact as longer lists could make the entire campaign ineffective.



What was the economic impact of the BDS Movement?

- The BDS movement has been successful in encouraging brands like Ben and Jerry's and celebrities like Roger Waters of the band, Pink Floyd, to work in Israel.
- The BDS movement has proved that it can serve as a powerful tool to end Western support for Israeli apartheid and settler colonialism.
- Such boycotts are similar to the longstanding policy of Arab states to boycott Israel although it has been difficult to measure the impact of the scattered movement on the economy of the state.

Criticism of the BDS

- Israel's Prime Minister Benjamin Netanyahu has claimed that the BDS movement is anti-semitic in nature.
- According to him, such antisemites have progressed to boycotting the Jewish state and aiming to end the Jewish state.
- Officials of Israel-allied countries like the USA, including former U.S. Vice President Mike Pompeo, have also criticized the work of the BDS movement.

BDS response

- BDS has responded to these criticisms by claiming that its valid criticism of Israeli activities violating international law was not anti-semitic.
- It has claimed that Israel was a state and was thus open to criticism for its unjust actions.
- Therefore, its activities were perfectly legal and could not be silenced by describing it as anti-semitic.

Anti-semitism

- Anti-Semitism refers to any form of prejudice against the Jewish people although the term "Semitic" designates a language group instead of a race.**
- It can therefore be used to refer to a prejudice against speakers of the Semitic languages (including Arabs and Ethiopians,).
- However, in practical terms, it is commonly used specifically to pertain to Jews.

Types of Anti-Semitism

- Racial anti-Semitism:** It is associated with the Nazis and is based on a belief in the distinctness and inferiority in terms of the genetic behavior of the Jews.
- It manifests in the belief that Jews need to be exterminated altogether.
- Religious anti-Semitism:** It is based on the notion that Jews should be converted to other faiths and can be traced back to the era of early Christianity.
- Social anti-Semitism:** It is a form of exclusion of Jews from social situations including golf and sports clubs.
- Economic anti-Semitism:** It states that Jews have a disproportionate degree of control over global and national financial institutions.
- Therefore, the influence of the Jews on these institutions should be reduced.
- Political anti-Semitism:** It is an attempt to keep Jews out of political positions of power.
- Some critics associate political anti-semitism with anti-zionism which denies Jews the right to a national homeland.

UPSC Mains Practice Questions

Q.1) Too little cash, too much politics, leaves UNESCO fighting for life.' Discuss the statement in the light of the US' withdrawal and its accusation of the cultural body as being 'anti-Israel bias'. **(UPSC GS2 2019)**

Ethics GS Paper IV (Main)

Case Study: Upholding Ethical Governance in the Face of Bureaucratic Politicization

Priority: Medium

Primary Source:

Syllabus Relevance & Important Keywords: Public/Civil service values and Ethics in Public administration, Probity

in Governance, Issues Related to Politicization of the Bureaucracy

Problem Statement:

- India is gearing up for its upcoming Lok Sabha elections, expected in April–May 2024. The ruling Party (BJP) has planned a roadshow called "Viksit Bharat Sankalp Yatra" to showcase its achievements over the last nine years, which coincide with the two terms in office since 2014. The roadshow is expected to be a massive public campaign, highlighting the government's accomplishments, featuring 822 'selfie points' where citizens can take photos with a picture of the Prime Minister.
 - The involvement of Joint Secretaries, Directors, and Deputy Secretaries in the "Viksit Bharat Sankalp Yatra" roadshow, aimed at showcasing the achievements of the ruling government, presents an ethical dilemma. This case raises concerns about the potential politicization of the bureaucracy and the blurring of lines between the roles of government officials as impartial public servants and political actors.
- What ethical dimensions are involved for the public servants?
 - What should be a course of action by public servants?

Solution:

Stakeholders:

1. Bureaucratic Officials (Joint Secretaries, Directors, and Deputy Secretaries):

- These officials may be concerned about ethical issues related to their involvement in a political roadshow. Their primary responsibility is to serve the public interest impartially, and participation in a partisan event can compromise their perceived impartiality and neutrality.

2. Ruling Party:

- The BJP is the organizing party behind the roadshow, and their concern lies in showcasing their achievements and garnering public support. They may see the participation of bureaucratic officials as a means to enhance the credibility of their government's accomplishments.

3. Opposition Parties:

- Opposition parties may raise concerns about the ethical conduct of the ruling party in using government officials for partisan purposes. They may see this as an attempt to gain an unfair electoral advantage and seek to hold the government accountable.

4. Election Commission of India:

- The Election Commission's primary role is to ensure free and fair elections. They may have concerns about the roadshow potentially violating electoral ethics or providing undue advantages to a particular political party, which could compromise the integrity of the electoral process.

5. Civil Society Organizations:

- Civil society organizations are often advocates for ethical governance and transparency. They may express concerns about the involvement of bureaucratic officials in a political event, as it may raise ethical questions about the separation of powers and the impartiality of the bureaucracy.

6. Media:

- The media plays a critical role in reporting on political events and ensuring transparency. They may have concerns about the ethical implications of the roadshow and its potential impact on the public perception of government officials' impartiality.

- The key ethical dimensions in this case are the perceived politicization of the bureaucracy, including the involvement of Joint Secretaries, Directors, and Deputy Secretaries as Rath Prabharis (chariots in-charge) for the roadshow. The decision to use bureaucratic officials in roles promoting the achievements of the ruling party raises concerns about the impartiality and independence of the civil services.
- Impartiality and Neutrality:** Government officials, particularly those in the bureaucracy, are expected to uphold the principles of impartiality and neutrality. Their roles should be guided by the public interest rather than partisan considerations. Involving Joint Secretaries, Directors, and Deputy Secretaries in a political roadshow raises questions about their ability to maintain these ethical principles. It risks blurring the lines between their roles as impartial public servants and political actors promoting a particular party's achievements.
 - Ethical Conduct:** Ethical conduct in governance is fundamental to maintaining public trust and ensuring that government institutions serve the common good. When government officials participate in activities that may be perceived as promoting a specific political party, it raises ethical concerns. The ethical dimension here revolves around whether these officials are acting in the best interests of the public or advancing political interests.
 - Separation of Powers:** The principle of the separation of powers is vital to prevent the abuse of power and maintain the integrity of institutions. It ensures that each branch of government—executive, legislature, and judiciary—performs its designated functions independently and without undue influence from the others. In this case, the involvement of the bureaucracy in a political roadshow questions the separation of powers, as it blurs the lines between the bureaucracy and the political executive, potentially compromising institutional integrity.
 - Accountability:** Government officials, including bureaucrats, must be held accountable for their

actions and decisions. If their participation in a political roadshow compromises their ethical obligations as civil servants, it raises questions about their accountability. Maintaining accountability is essential for transparency and the prevention of abuses of power.

5. **Electoral Ethics:** The run-up to elections is a critical period for upholding ethical conduct. Ensuring that government resources and officials are not used to provide undue advantages to any political party or candidate is an essential ethical consideration. Any actions that may create an unfair electoral advantage need to be addressed to preserve the integrity of the democratic process.

Recommended Actions:

1. The Election Commission of India should closely monitor the roadshow to ensure that it does not violate electoral ethics or create an unfair advantage for any political party. The Commission plays a crucial role in ensuring that elections are conducted fairly and ethically.
2. Government officials involved in the roadshow should consider the ethical implications of their participation. They should reflect on whether their involvement aligns with their roles as civil servants, which require impartiality and the prioritization of the public interest over political interests.
3. The Opposition parties and civil society organizations should raise awareness about the potential ethical issues associated with the roadshow. By highlighting these concerns, they can hold the government accountable and ensure that ethical standards are maintained.
4. The media should report on the roadshow objectively, highlighting any ethical concerns. Their role is crucial in promoting transparency in government actions and informing the public about potential ethical breaches.
5. Government officials should consider the long-term impact of their involvement in partisan activities. They should assess how their participation may affect the credibility and integrity of the civil services and the principles of ethical governance.

Conclusion

Upholding ethical governance and maintaining the separation of powers are essential for the functioning of a vibrant democracy. In the face of challenges like the "Viksit Bharat Sankalp Yatra," government officials, institutions, and citizens have a shared responsibility to ensure that democratic principles and ethical conduct are preserved. The ethical dimensions of impartiality, ethical conduct, separation of powers, accountability, and electoral ethics must be considered and upheld to maintain the integrity of the democratic process.

Places In News

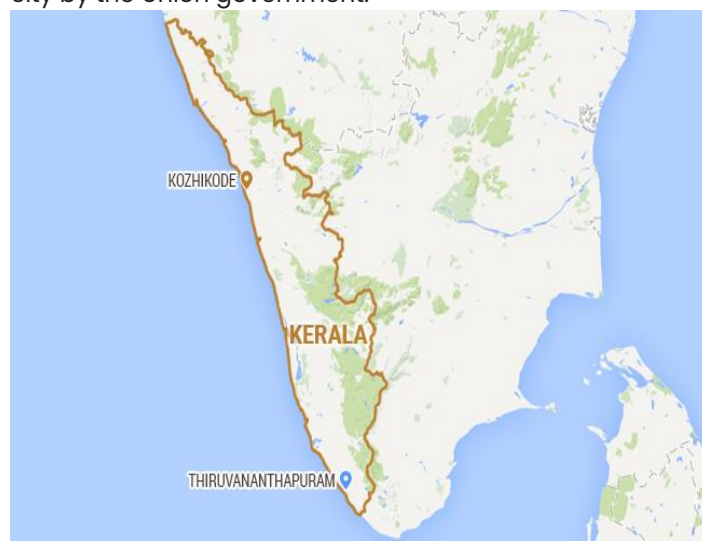
India

Kozhikode

Reason to be in news: Recently, Kozhikode was added to the UNESCO Creative Cities List as the City of Literature.

Historical & Cultural Significance: It was the capital of the Zamorin kings and was known as Calicut during the colonial era in recognition of the "calico" – a fine variety of hand-woven cotton cloth– that was exported from the city's port. The city is also famous for its music, football, and food.

Geographical Location: Kozhikode is a city along the Malabar coast of northern Kerala. It is the second largest metropolis in Kerala and has been designated as a tier II city by the Union government.



Gwalior

Reason to be in news: Recently, Gwalior was added to the UNESCO Creative Cities List as the City of Music.

Cultural Significance: It is home to the Gwalior Gharana and is associated with famous Indian musicians such as Tansen and Baiju Bawra.

Geographical Location: Gwalior is situated in northern Madhya Pradesh, and was the winter capital of the state of Madhya Bharat, and a princely state ruled by the Scindias



Sutlej River

Reason to be in news: Recently, a team of researchers from IIT, Ropar found the presence of tantalum, a rare metal, in the Sutlej river sand in Punjab.

Tantalum: Tantalum is a corrosion-resistant metal used in electronics.

Geographical Location: The Sutlej river or Satadree is the longest of the five major rivers in Punjab and the easternmost tributary of the Indus. It originates in Tibet and enters India through the Shipki La pass and flows into the Thar desert. As per the Indus River Water Treaty, the waters of the Sutlej are allotted to India.



Malerkotla

Reason to be in news: Recently, the Mubarak Manzil in Malerkotla was in the news for being in ruins despite its cultural heritage and awaits for restoration.

Historical Background: Malerkotla in Punjab is significant in Sikh history as being blessed by the tenth Sikh Guru Guru Gobind Singh. The palace was the home of the Nawab of Malerkotla who had opposed the execution of the sons of Gur Gobind Singh by Wazir Khan. It was the seat of the eponymous princely state during the British Raj. The palace was in ruins due to financial constraints and family disputes.

Grographical Location: Malerkotla became the 23rd and newest district of Punjab in 2021. Malerkotla is a small city located in central part of Punjab state in northwestern India, about 27 miles south of the city of Ludhiana and about 25 miles north of the city of Snahrur.



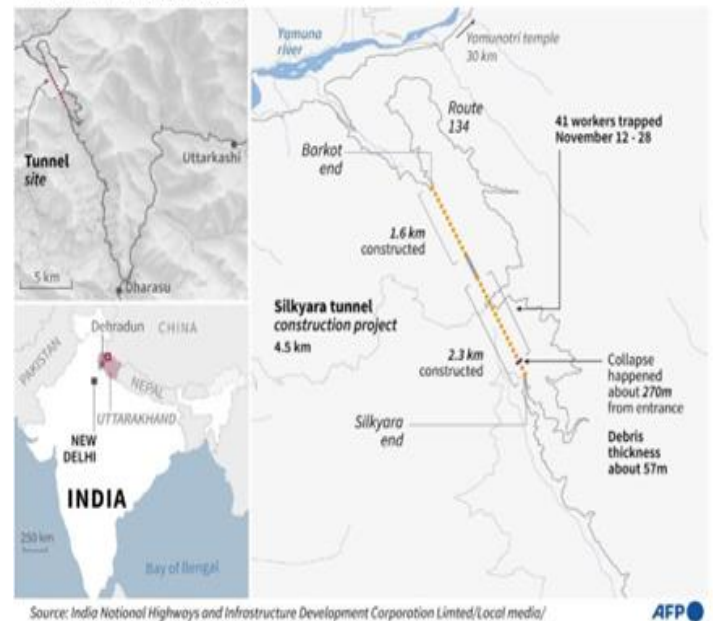
Silkyara–Barkot Tunnel

Reason to be in news: Recently, a section of the under-construction Silkyara–Barkot tunnel in Uttarkashi district, Uttarakhand collapsed trapping numerous workers.

Geographical Location: The Silkyara–Barkot tunnel was conceived as part of the Union government's Char Dham all-weather road initiative and stretches 4.5 km in length. The tunnel extends from the Silkyara Bend to Barkot along NH-134. The Char Dham highway expansion project aims to widen 889 km of hill roads.

Cultural Significance: To provide all-weather connectivity in the Char Dham circuit and covers Uttarakhand's four major shrines — Badrinath, Kedarnath, Gangotri and Yamunotri.

India tunnel rescue



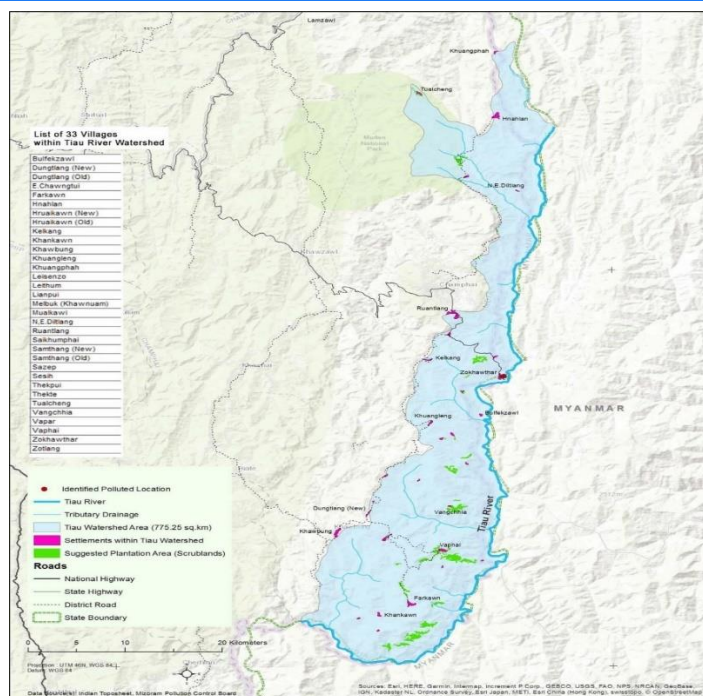
Source: India National Highways and Infrastructure Development Corporation Limited/Local media/

AFP

Tiau River

Reason to be in news: Recently, smugglers have begun to use the Tiau River to enter India while avoiding the conflict in Manipur.

Geographical Location: The Tiau River forms the border between India and Manipur. It originates in the Mizo Hills in northern Mizoram, merges with the Tuichang, and flows on as the Chhimtui.

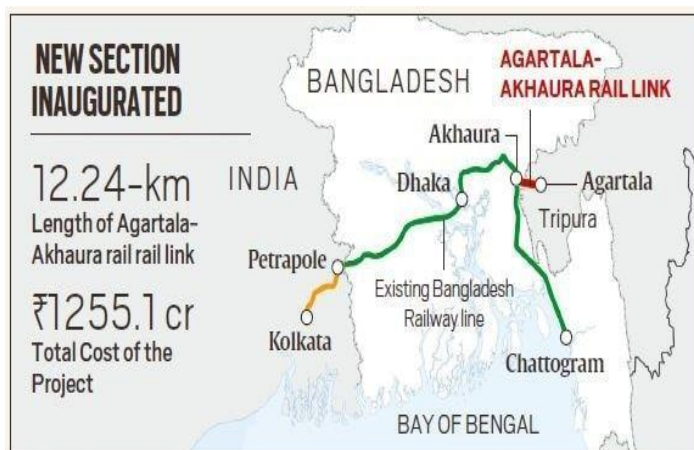


Agartala-Akhaura Rail Link

Reason to be in news: Recently, Prime Minister Narendra Modi and his Bangladesh counterpart Sheikh Hasina virtually inaugurated the Agartala-Akhaura rail link between northeast India and Bangladesh.

Geo-Economic Significance: The railway link connects Agartala in Tripura with Akhaura in Bangladesh and aims to foster connectivity and commerce in India's northeast and Bangladesh. The funding for this initiative is entirely provided by India, with financial support coming from both the Ministry for Development of North East Region and the Ministry of External Affairs.

Geographical Location: Spanning a distance of 12.24 kilometers, the Agartala-Akhaura railway line includes 5.46 kilometers within the Indian territory of Tripura and 6.78 kilometers in the Akhaura upa-zilla, located in Bangladesh's Brahmanbaria district. The journey will commence in Agartala, proceeding to Nischintapur at the India-Bangladesh border, where immigration formalities will take place. Gangasagar will be the first station encountered in Bangladesh.



World

Seattle

Reason to be in news: India recently announced plans to open a new consulate in Seattle, USA making it the sixth consulate in the USA. It was significant as Seattle houses the offices of major technological corporations like Microsoft, Apple, Meta, etc. This is expected to boost people-people ties between the two countries and build linkages between the IT industries of the two countries.

Geographical Location:

Seattle, chief city of the state of Washington, U.S., seat (1853) of King county, the largest metropolis of the Pacific Northwest, and one of the largest and most affluent urban centres in the United States. A major port of entry and an air and sea gateway to Asia and Alaska, Seattle lies alongside Puget Sound, a deep inland arm of the northern Pacific Ocean, and is at the centre of a conurbation that is defined roughly by Everett to the north, Bellevue to the east, and Tacoma to the south.



Shan State

Reason to be in news: Shan state witnessed fighting between the Myanmar junta and various ethnic minority groups.

Geographical Location: Shan State lies in northern Myanmar along the border with China. The fighting has caused the displacement of more than 23,000 people in the region. It is the largest province of Myanmar by area and accounts for over 80% of the opium production in Myanmar (a part of the Golden Triangle), the second largest producer of opium in the world.



Nepal

Reason to be in news: Recently, a powerful earthquake of 6.4 magnitude took place in Nepal. It was the worst earthquake faced by the country since 2015 and its effects were felt as far as Delhi.

India provided US\$ 1 billion to Nepal as for post-earthquake reconstruction under its long-term assistance for post-earthquake reconstruction in housing, education, health, and cultural heritage sectors.

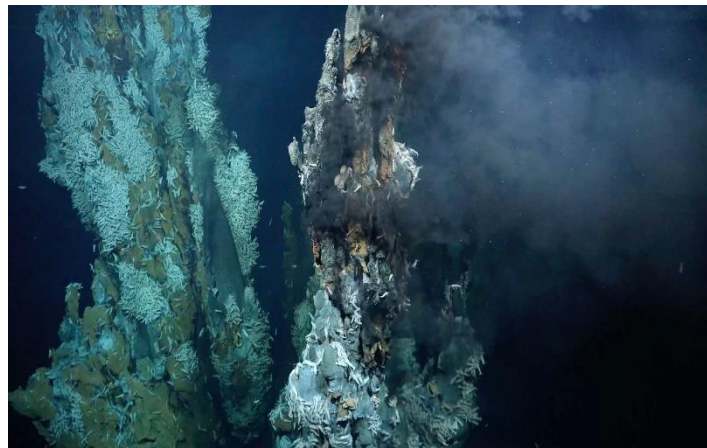
Geographical Location: Nepal borders 5 Indian states- Uttarakhand, Uttar Pradesh, West Bengal, Sikkim, and Bihar- and shares strong geographic, historical, cultural, and economic ties with India.



Lost City Hydrothermal Field

Reason to be in news: Recently, scientists raised concerns that the Lost City Hydrothermal Field was at threat from mining.

Geographical Location: It is an underwater mountain near the Mid-Atlantic Ridge, over 700 metres beneath the ocean surface. It was discovered in 2000. It consists of vents that release hydrogen, methane, and other gases that help sustain microbial communities in the absence of oxygen. This has helped scientists understand extra-terrestrial habitats on other celestial bodies.



Reykjanes peninsula

Reason to be in news: Recently, around 1,400 earthquakes were detected in a day in the Reykjanes peninsula in southwest Iceland.

Geographical Location: The peninsula has experienced over 24,000 seismic events since late October leading the

Rwanda

Reason to be in news: Recently, the Supreme Court of the United Kingdom ruled that the UK's proposed policy to deport asylum seekers to Rwanda was unlawful.

Geographical Location: Rwanda is a landlocked country located in the Great Rift Valley of Central Africa, where the African Great Lakes region and Southeast Africa converge. It is bordered by Uganda, Tanzania, Burundi, and the Democratic Republic of the Congo.



Gulf of Guinea

Reason to be in news: Recently, the Indian Navy completed its second anti-piracy patrol in the Gulf of Guinea.

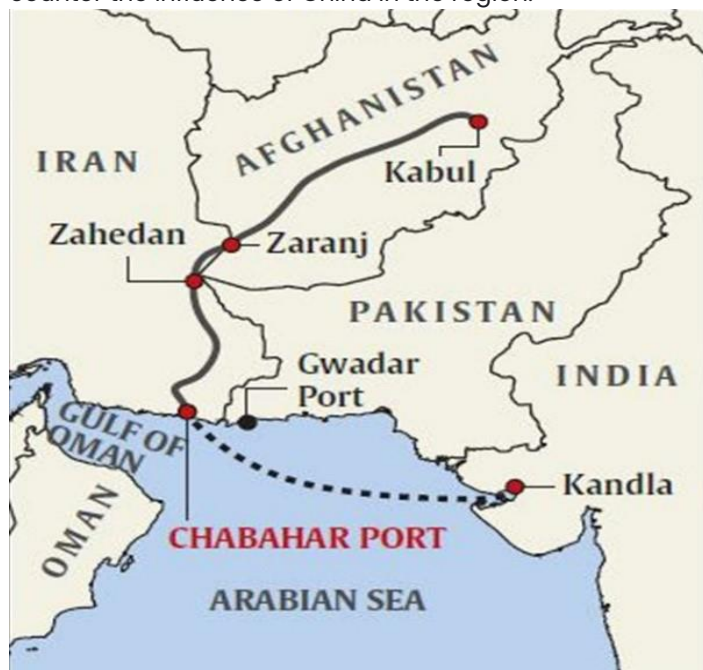
Geographical Location: It is the northeastern part of the tropical Atlantic Ocean, along the western coast of Africa. It is located at 0°0'N and 0°0'E, at the intersection of the Prime Meridian and the Equator. Warm tropical waters with relatively low salinity due to the rivers that flow into it and the heavy rainfall in the region. Angola, Benin, Cameroon, Cote d'Ivoire, Democratic Republic of Congo, Republic of Congo, Guinea, Equatorial Guinea, Guinea-Bissau, Gabon, Nigeria, Ghana, So Tomé and Principe, Togo, and Sierra Leone lie along the coast of the Gulf of Guinea.



Chabahar

Reason to be in news: Recently, India and Iran discussed the delayed Chabahar Port, which is located in southeastern Iran in the Gulf of Oman and has direct access to the Indian Ocean.

Geographical Location: It consists of two separate ports named Shahid Kalantari and Shahid Beheshti which lie along the Makran coast of Sistan and Baluchistan Province at the mouth of the Strait of Hormuz. Chabahar Port offers India an alternative route to trading with Central Asia bypassing Pakistan. It will also help India counter the influence of China in the region.



Avdiivka

Reason to be in news: Recently, Ukraine accused Russia of launching major attacks on Avdiivka.

Geographical Location & Significance: Avdiivka is an industrial hub in the Donetsk region and a former coal hub. It is a fortress for Ukrainian forces and lies close to the separatist Donetsk People's Republic. It is a crucial territory for establishing control of eastern Ukraine.



Source: Institute for the Study of War (21:00 GMT, 20 November)



Democratic Republic of Congo

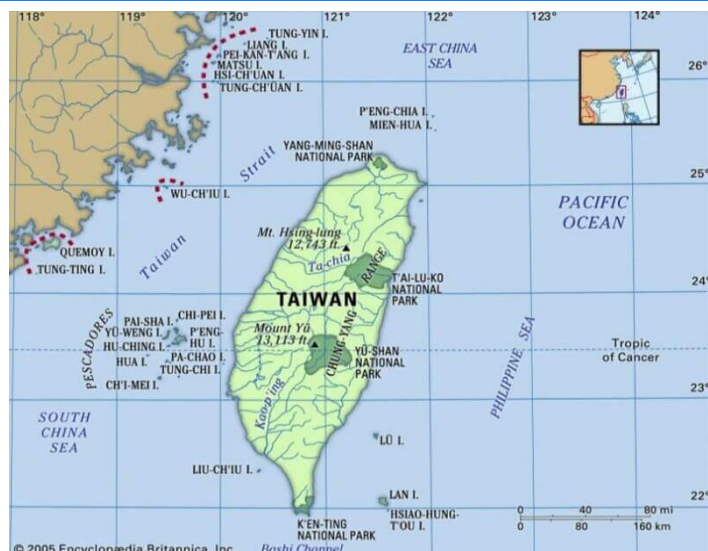
Reason to be in news: Recently, The UN International Organization for Migration has reported around 6.9 million internally displaced people in the Democratic Republic of Congo (DRC) due to conflicts with the M23 rebel group. The Mouvement du 23 Mars (M23) is a primarily Tutsi rebel group that has been active in the eastern DRC and is one of the primary sources of the current conflict.

Geographical Location: The Democratic Republic of the Congo (DRC) in Central Africa is the second-largest country in Africa by area. It is also known as Congo-Kinshasa and formerly known as Zaire. It is bordered by the Central African Republic, South Sudan, Uganda, Rwanda, Burundi, Tanzania (across Lake Tanganyika), Zambia, Angola, the Atlantic Ocean and the Republic of the Congo. The Congo River, the second-longest river in Africa, passes through the DRC and more than half the country is covered by dense tropical rainforests.



Taiwan

Reason to be in news: Recently, China reiterated its claim to the territory of Taiwan. Taiwan is an East Asian nation located at the confluence of the East and South China Seas in the northwestern Pacific Ocean. It is bordered by the People's Republic of China, Japan, and the Philippines. It is officially known as the Republic of China (ROC) and is separated from China by the Taiwan Strait.



Dubai

Reason to be in news: Recently, the 28th Conference of the Parties was convened at Dubai from November 20th to December 12th. Dubai is the second largest emirate within the United Arab Emirates (UAE) and is located on the eastern coast of the Arabian peninsula along the Persian Gulf. It is bordered by Abu Dhabi, Sharjah, and Oman.

