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RANK **05** Mayur Hazarika



RANK
08
Aniruddh Yadav



RANK **O9** Kanika Goyal

Our Top Performers



RANK 12 Abhinav Siwach



RANK 23 Vaishali



RANK 25 Sankhe Kashmira Kishor



RANK 27 Yadav Suryabhan Achchhelal



RANK 41 Shubham



RANK 42 Pranita Dash



RANK 44 Tushar Kumar



RANK 45 Narayani Bhatia



RANK 46 Manan Agarwal



RANK 49 Sanskriti Somani



RANK 51 Sparsh Yadav



RANK 52 Pratiksha Singh

267 Total Ranks out of 933 vacancies

Ranks in Top 10

06 Ranks in Top 25

30 Ranks in Top 100

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Ranks in Top 10

12 Ranks in **Top 25**

25

Ranks in **Top 50**











RANK 13
Priyamvada
Mhaddalkar



Abhinav Jain



Challapalle Yaswanthkumarreddy





























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Congratulations to our toppers

Ranks in **Top 10**

Ranks in Top 50

Ranks in **Top 100**



Jagrati Awasthi



Kartik Jivani





Gaurav Budania



Karishma Nair



Sarthak Agarwal



Vaibhav Rawat



Pulkit Singh



Divya Mishra



RANK 30

Divyanshu



Megha Swaroop



Rallapalli Jagat Sai



Aparna Ramesh



Narwade Vinayak





Aswathy Jiji



RANK 42

Pooja Gupta



Jubin Mohapatra



Abhishek Shukla

Incredible Results

CSE 2019

4 Ranks in top 10

13 Ranks in top 50

22 Ranks in top 100



Pratibha Verma



Vishakha Yadav



Abhishek Saraf



Sanjita Mohapatra

CSE 2018



28 Ranks in top 100

183 Ranks in the final list





Dhodmise Trupti Ankush





Anuraj Jain



CSE 2017

5 Ranks in top 50

34 Ranks in top 100

236 Ranks in the final list



Sachin Gupta



Koya Sree Harsha



Anubhay Singh





CSE 2016



18 Ranks in top 100

215 Ranks in the final list







CSE 2015

5 Ranks in top 50

14 Ranks in top 100

162 Ranks in the final list



Vipin Garg





Chandra Mohan Garg Khumanthem Diana Devi

CSE 2014

6 Ranks in top 50

12 Ranks in top 100

83 Ranks overall selections



Suharsha Bhagat

Ananya Das



Anil Dhameliya





Kushaal Yadav Vivekanand T.S

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Monday to Friday - 6:00 AM to 9:30 AM

Monday to Friday - 6:00 AW to 9:30 AW							
Slots	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5	Batch 6	Batch 7
1st Feb to 6th March, 2023	Polity						
7th March to 10th April, 2023	Economics	Economics					
11th April to 15th May, 2023	Modern History + Post Independent India	Modem History + Post Independent India	Modern History + Post Independent India				
16th May to 16th June, 2023	Geography	Geography	Geography	Geography			
19th June to 21st July, 2023	Ethics + Governance	Polity	Polity	Polity	Polity		
24th July to 25th August, 2023	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Economics	Economics	Economics	Economics	
28th August to 3rd October, 2023	Environment & Ecology + Science & Technology + Compulsory Language Paper	Environment & Ecology + Science & Technology + Compulsory Language Paper	Environment & Ecology + Science & Technology + Compulsory Language Paper	Modern History + Post Independent India			
4th October to 7th November, 2023	International Relations + World History	Polity	Polity				
8th November to 12th December, 2023	Ancient India + Medieval India + Art & Culture	Geography	Geography	Geography			
13th December to 17th January, 2024	Internal Security + CSAT	Economics					
18th January to 21st February, 2024	Focus Prelims	Ethics + Governance	Ethics + Governance	Environment & Ecology + Science & Technology + Compulsory Language Paper			
22nd February to 27th March, 2024	Focus Prelims	Focus Prelims	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture
28th March to 2nd May, 2024	Focus Prelims	International Relations + World History	International Relations + World History				
3rd May to 22nd May, 2024	Focus Prelims	CSAT					
23rd May to 2nd June, 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024
3rd June to 5th July, 2024				Ethics + Governance	Ethics + Governance	Ethics + Governance	Ethics + Governance
8th July to 9th August, 2024					Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management
12th August to 27th August, 2024							Internal Security
1st September to 30th September, 2024	MAIN 2024						









YEAR LONG TIMETABLE

(Evening Batch)
Monday to Friday - 5:00 PM to 8:30 PM

Slots	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5	Batch 6	Batch 7
1st Feb to 6th March, 2023	Modern History + Post Independent India				N		
7th March to 10th April, 2023	Geography	Geography					
11th April to 15th May, 2023	Polity	Polity	Polity				
16th May to 16th June, 2023	Economics	Economics	Economics	Economics			
19th June to 21st July, 2023	Ethics + Governance	Modern History + Post Independent India					
24th July to 25th August, 2023	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Geography	Geography	Geography	Geography	
28th August to 3rd October, 2023	International Relations + World History	International Relations + World History	International Relations + World History	Polity	Polity	Polity	Polity
4th October to 7th November, 2023	Internal Security + CSAT	Internal Security + CSAT	Internal Security + CSAT	Internal Security + CSAT	Economics	Economics	Economics
8th November to 12th December, 2023	Environment & Ecology + Science & Technology + Compulsory Language Paper	Modern History + Post Independent India	Modern History + Post Independent India				
13th December to 17th January, 2024	Ancient India + Medieval India + Art & Culture	Geography					
18th January to 21st February, 2024	Focus Prelims	Ethics + Governance	Ethics + Governance	Ethics + Governance	Internal Security + CSAT	Internal Security + CSAT	Internal Security + CSAT
22nd February to 27th March, 2024	Focus Prelims	Focus Prelims	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Environment & Ecology + Science & Technology + Compulsory Language Paper	Environment & Ecology + Science & Technology + Compulsory Language Paper
28th March to 2nd May, 2024	Focus Prelims	Ancient India + Medieval India + Art & Culture					
3rd May to 22nd May, 2024	Focus Prelims	Focus Prelims	Focus Prelims	International Relations	International Relations	International Relations	International Relations
23rd May to 2nd June, 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024	PRELIMS 2024
3rd June to 14th June, 2024				World History	World History	World History	World History
18th June to 22nd July, 2024					Ethics + Governance	Ethics + Governance	Ethics + Governance
23rd July to 27th August, 2024				·		Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management
1st September to 30th September, 2024	MAIN 2024						







YEAR LONG TIMETABLE

(Weekend Batch)

Saturday - 12:00 PM to 8:00 PM | Sunday - 10 AM to 8 PM)

Slots	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5
February (04, 05, 11, 12, 18, 19, 25 & 26) + March (04, 05 & 11)	Economics				
March (12, 18, 19, 25 & 26) + April (01, 02, 08, 09, 15 &16)	Polity	Polity			
April (23, 29 & 30) + May (06, 07, 13, 14, 20, 21, 27 & 28)	Geography	Geography	Geography		
June (03, 04, 10, 11, 17, 18, 24 & 25) + July (01, 02 & 08)	Modern History + Post Independent				
July (09, 15, 16, 22, 23 & 30) + August (05, 06, 12, 13 & 19)	Environment & Ecology + Science & Technology + Compulsory Language Paper	Economics	Economics	Economics	Economics
August (20, 26 & 27) + September (02, 03, 09, 10, 16, 17, 23 & 24)	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture	Polity	Polity	Polity
September (30) + October (01, 07, 08, 14, 15, 21, 22, 28 & 29) + November (04)	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management	Geography	Geography
November (05, 11, 18, 19, 25 & 26) + December (02, 03, 09, 10 & 16)	Ethics + Governance	Ethics + Governance	Ethics + Governance	Ethics + Governance	Modern History + Post Independent
December (17, 23, 24, 30 & 31) + January '24 (06, 07, 13, 14, 20 & 21)	Internal Security + CSAT				
January '24 (27 & 28) + February '24 (03, 04, 10, 11, 17, 18, 24 & 25) + March '24 (02)	Focus Prelims	Environment & Ecology + Science & Technology + Compulsory Language Paper	Environment & Ecology + Science & Technology + Compulsory Language Paper	Environment & Ecology + Science & Technology + Compulsory Language Paper	Environment & Ecology + Science & Technology + Compulsory Language Paper
March '24 (03, 09, 10, 16, 17, 23, 24, 30 & 31) + April '24 (06 & 07)	Focus Prelims	Focus Prelims	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture
April '24 (13, 14, 20, 21, 27 & 28) + May '24 (04, 05, 11, 12 & 18)	International Relations + World History				
31st May to 11th June, 2024	PRELIMS 2024				
June '24 (01, 02, 08, 09, 15, 16, 22, 23, 29 & 30) + July (06)				Social Issues & Social Justice + Essay + Disaster Management	Social Issues & Social Justice + Essay + Disaster Management
July '24 (07, 13, 14, 20, 21, 27 & 28) + Aug '24 (03, 04, 10 & 11)					Ethics + Governance
1st September to 30th September, 2024	MAIN 2024	MAIN 2024	MAIN 2024	MAIN 2024	MAIN 2024



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POLITY

Rule 267 in Rajya Sabha

Syllabus: Parliament and rules

Prelims: Rule 267 in Rajya Sabha

Context

• The Government and the Opposition differed on the format of the discussion on the Manipur situation.

• While the government agreed for a short-duration discussion, the Opposition insisted that the Prime Minister make a suo motu statement followed by a discussion, suspending all business under Rule 267 of the Rajya Sabha.

What are the rules for raising a matter in Rajya Sabha?

- Both Houses of Parliament function by rules that regulate the procedure and conduct of its business and provide for
 instruments that can be used by elected representatives to highlight issues of public interest.
- In Rajya Sabha, these are known as the Rules of Procedure and Conduct of Business in the Council of States, in effect since 1964.
- If an MP wants to ask questions, initiate or participate in a debate, or raise an issue of public interest, the Rajya Sabha rulebook requires the legislator to first inform the presiding officer— the Chairman of the Rajya Sabha.
- This prior information, called notice, must be submitted in writing to the Secretary-General for the consideration of the Chairman.
- For example, an MP should give a 15-day prior notice to ask starred or unstarred questions and a three-day advance notice for half-an-hour discussions.
- However, there are instances when an issue of public importance needs urgent attention.
- In such instances, the MPs invoke Rule 267 in the Upper House.
- Rule 267 allows for the suspension of rules in the pre-decided business of the day with the approval of the Chairman to debate an issue of urgent public importance.

Rule 267

- → Any member, may, with the consent of the Chairman, move that any rule may be suspended in its application to a motion related to the business listed before the Council of that day and if the motion is carried, the rule in question shall be suspended for the time being:
- → Provided further that this rule shall not apply where specific provision already exists for suspension of a rule under a particular chapter of the Rules.
- An MP must give a notice to the Secretary-General of the House before 10 a.m. on the day they seek suspension of business to raise an urgent matter.
- It is up to the Chairman to admit the motion for suspension of rules.
- In case the Chair allows, the Motion is put to vote.
- The rule, however, does not apply in cases where specific provisions already exist for the suspension of a rule.

What is the precedence on Rule 267?

Rule 267 has been invoked a total of 11 times since 1990 to debate issues like the Gulf War and corruption. While Shankar Dayal Sharma accepted four notices under Rule 267 between 1990 and 1992, Bhai ton Singh Shekhawat admitted three such notices.

Interestingly, the last instance when the Chairman allowed a discussion under Rule 267 was more than seven years ago in 2016. when then Vice-President llamid Ansari admitted a motion for a debate on demonetisation. The Rule was invoked three other times under Mr. Ansari's chairmanship. Ills successor, Venkaiah Naidu, did not admit a single motion under the Rule when he served as the ex•officio Chairman of the Rajya Sabha from 2017 to 2022.

How is Rule 267 different from Rule 176?

The ongoing face-off between members of the Opposition and the Treasury benches in the Upper House is majorly due to differences over the duration of discussion on the ethnic violence in Manipur. The Opposition insists that a discussion on the serious situation in the northeastern State must be held after the suspension of all business of the day. Members have submitted over 70 notices under Rule 267 in this regard since July 20, but the Chairman has rejected all so far, despite the Opposition citing precedents.



The Government, meanwhile, maintains that it is ready for a short-duration discussion under Rule 176. As the name suggests, debates under Rule 176 are short discussions that do not last for more than two-and-a-half hours. Similar to Rule 267, the Chairman decides if the notice under Rule 176 is admissible. If it is admitted, the Chairman in consultation with the Leader of the Council (or Leader of the House) fixes the date on which the matter may be taken up for discussion.

There is, however, no requirement for a formal motion or voting. 'The member who has given notice may make a short statement and the Minister shall reply shortly. Any member who has previously intimated to the Chairman may be permitted to take part in the discussion," the rulebook says. As per the rules, the Chairman can also prescribe a time limit for speeches 'if he thinks fit."

2. Jan Vishwas Bill

Syllabus: GS-2, Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Critical analysis of Jan Vishwas (Amendment of Provisions) Bill

Context: The Jan Vishwas (Amendment of Provisions) Bill, 2023 was passed in Lok Sabha.

Background

- The Jan Vishwas (Amendment of Provisions) Bill, 2023, was initially introduced in the Lok Sabha in 2022. It was then
 referred to the Joint Committee of the Parliament.
- Along with the Legislative Department and Department of Legal Affairs, the Joint Committee on the Jan Vishwas (Amendment of Provisions) Bill, 2022 undertook thorough discussions with each of the 19 Ministries and Departments.

About Jan Vishwas (Amendment of Provisions) Bill, 2023

- The Jan Vishwas (Amendment of Provisions) Bill, 2023 seeks to improve both the quality of life and commercial accessibility.
- The Bill aims to turn many fines and penalties into 42 laws while decriminalising a number of acts.
- According to the seriousness of the offence, the law calls for the rationalisation of monetary penalties to support trustbased governance.

Benefits of the Amendment Bill

- The Amendment Bill will aid in the rationalisation of criminal laws and make sure that people, companies, and government agencies can do their affairs without being concerned about being imprisoned for inconsequential, technical, or procedural errors.
- The type of punishment for an offence should be appropriate given how serious the offence was.
- The Bill introduces suitable administrative adjudication mechanisms which will reduce undue pressure on the justice system, reduce the pendency of cases and help in a more efficient and effective justice dispensation.
- Decriminalising laws that pertain to citizens and specific groups of government workers will allow them to live free
 from the worry of being imprisoned for very minor offences.
- The passage of this legislation would signal a significant step in the process of rationalising regulations, removing obstacles, and supporting commercial growth.
- With the aim of saving time and money for both the government and businesses, this legislation would act as a model for future revisions to other laws.

Concerns Associated with the Amendments

- The Bill exempts manufacturers of Not of Standard Quality Drugs (NSQ) from harsh penalties even though these medications may have negative effects on patients.
- The Bill also lessens the consequences for pharmacy operators who disregard their license's restrictions.
- The Drugs and Cosmetics Act, 1940 amendments have generated the most debate. The Act controls the nation's medication and cosmetic manufacturing, distribution, and sales.

Conclusion

The Indian pharmaceutical sector, including manufacturing and pharmacies, is already subject to extremely loose supervision, as proven by the recent eruption of scandals worldwide linked to 'Made in India' drugs. Government should not give the business a literal "get out of jail free" card; instead, it should be tightening the regulatory screws. The laws should instil in businesses a deeper sense of social responsibility and sensibility rather than making them a cost of operating.

Nut Graf: India is the world's pharmacy, thus we must fight to make sure that the greatest medications are delivered while fair advantages are granted to businesses. It is crucial to rationalise legislation, remove obstacles, and support corporate expansion.



3. Digital time vouchers

Syllabus: GS-2, Elections

Mains: Media time for political parties

Context: Recently, the Election Commission of India has decided to issue digital time vouchers to National & State political parties for campaigning on Doordarshan & All India Radio during elections.

Background:

- The scheme regarding political parties' access to government-owned electronic media such as Doordarshan and All India Radio for campaigning during elections was initially notified in 1998.
- This scheme holds a statutory basis under Section 39A of the Representation of People's Act, 1951.
- Under this Scheme, an equitable base time is allotted to each National Party and Recognized State Party of the state concerned uniformly on DD & AIR.
- An additional time is allotted based on the poll performance of the parties in the last assembly elections from the respective States/UT or in the last general Elections to Lok Sabha, as the case may be.

About Digital Time Vouchers:

- The Election Commission of India has amended the existing scheme for the use of Government-owned electronic media by political parties.
- This has been done by introducing a provision to issue digital time vouchers through an Information Technology (IT) platform.
- Each party shall be given time Vouchers of different denominations of, 5 minutes and 10 minutes, equal to the total time allotted to it for telecasts on Doordarshan and broadcasts on AIR.
- That party shall have the discretion to choose any representatives and allow them to use those time vouchers provided that no such individual representative shall be allowed to use more than 20 minutes of the total time allotted to that party, either on Doordarshan or on AIR.

Background

- The scheme was initially notified on 16th January 1998, holds a statutory basis under Section 39A of the Representation of People Act, 1951.
- It aimed at ensuring equitable access to government-owned electronic media during elections for campaigning.
- Under this Scheme, an equitable base time is allotted to each National Party and Recognized State Party of the state concerned uniformly on DD & AIR.
- The additional time to be allotted to the parties is decided on the basis of the poll performance of the parties in the last assembly elections from the respective States/UT or in the last general Elections to Lok Sabha, as the case may be.
- The actual date and time during which the above telecasts/broadcasts will be made by the authorised representatives
 of any party is predetermined, by a lot, by the Prasar Bharati Corporation in consultation with ECI and in the presence
 of political party representatives.

4. Privilege Motions

Syllabus: GS-2, Parliamentary provisions

Prelims: Privilege Motions

Context: Rajya Sabha Chairman referred complaints related to the privilege of the House against two MPs (TMC's Derek O'Brien and AAP's Raghav Chadha) to the privileges committee. This comes amid differences between the ruling party and some opposition parties that have plagued the ongoing Monsoon Session of its sittings.

About Parliamentary privileges:

- Parliament, as an institution, and its members, in their individual capacities, have various Rights and immunities that allow them to carry out their parliamentary duties "efficiently and effectively" without impediment.
- These powers, privileges, and immunities are addressed under Articles 105 and 194 of the Constitution.

Basics

- Parliament's Authority: Parliament holds the exclusive authority to determine breaches of privilege or contempt of the House; no court has this power.
- Member's Right: A House member can raise a breach of privilege concern with the presiding officer's consent.



Understanding Privilege Motion

- Privilege Motion Definition: A privilege motion is raised when a member believes there's a breach of privilege. It requires admission by the Chairman and can be referred to the Privileges Committee.
- Conditions for Raising: Concern pertains to a recent specific matter.
- Role of Chairman/Speaker: In both Rajya Sabha and Lok Sabha, the Chairman/Speaker reviews the motion. They
 decide or refer it to Parliament's Privileges Committee.
- Privileges Committee Formation: Committee of Privileges: If the presiding officer consents, the matter is decided by a 10-member panel in Rajya Sabha and a 15-member panel in Lok Sabha.
- Suo-Motu Power: The presiding officer can independently refer questions of privilege to the Committee for examination, investigation, and reporting.

5. Reducing the Age to Contest Elections

Syllabus: GS-2, Elections

Mains: Reducing the Age to Contest Elections

Context: A Parliamentary panel has suggested lowering the minimum age for contesting in Assembly elections from 25 years to 18 years.

Current Minimum Age to Contest Elections

Article	Legislative Body	Minimum Age Requirement
Article 80	Rajya Sabha	30 years
Article 84	Lok Sabha	25 years
Article 173	State Legislative Assembly	25 years

Arguments in Favor of Reducing the Age

- Young people are already eligible to vote at 18 years old.
- Global practices show that 18-year-olds can be reliable and responsible political participants.
- Youth representation in government can help address issues that matter to young people.

Arguments Against Reducing the Age

- 18-year-olds may not have the necessary experience and maturity to be elected officials.
- Reducing the age could lead to a decrease in the quality of representation.
- It could also be difficult for 18-year-olds to raise the funds necessary to run for office.

Next Steps

• The government will need to decide whether to accept the Parliamentary Standing Committee's recommendation. If the government does decide to reduce the age, it will need to amend the Constitution.

6. Government introduces Delhi Services Bill in Lok Sabha

Syllabus: GS-2, Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Critical analysis of National Capital Territory of Delhi (Amendment) Bill, 2023

Context: The Government has introduced the Government of National Capital Territory of Delhi (Amendment) Bill, 2023 in Lok Sabha.

What is the Government of National Capital Territory of Delhi (Amendment) Bill, 2023?

- The Bill establishes the National Capital Civil Services Authority(NCCSA) which consists of the Chief Minister, Chief Secretary of Delhi, Principal Home Secretary of Delhi.
- The Authority will make recommendations to the Lieutenant Governor(LG) regarding transfers and postings of officials and disciplinary matters.
- The Bill empowers the LG to exercise his sole discretion on several matters including those recommended by the National Capital Civil Services Authority and the summoning, prorogation and dissolution of the Delhi Legislative Assembly.
- It authorizes department secretaries to bring to the notice of the LG, the Chief Minister and the Chief Secretary any matter that may bring Delhi Government into controversy with the Central Government.



What are the issues with the National Capital Territory of Delhi (Amendment) Bill, 2023?

- Conferring powers over the transfer and posting of officers to the Authority may break the triple chain of accountability that links the civil services, ministers, the legislature and citizens. This may violate the principle of parliamentary democracy, which is a part of the basic structure doctrine.
- The LG has been granted sole discretion in several matters including when the Legislative Assembly will convene. This implies that the Chief Minister may be unable to convene a session needed for essential government business.
- Department secretaries will bring certain matters directly to the LG, Chief Minister and the Chief Secretary, without consulting the concerned minister. This may go against the collective responsibility of the Cabinet, as the concerned ministers cannot provide his inputs.

Conclusion

It remains to be seen how the bill will be implemented and what its impact will be on the governance of Delhi.

7. Bill to amend appointment of CEC & ECs

Syllabus: GS-2, Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Appointment of CEC & ECs

Context: Recently, the Government has introduced a bill in the Rajya Sabha aiming to alter the process of appointing the Chief Election Commissioner (CEC) and Election Commissioners (ECs). The Bill seeks to remove the Chief Justice of India (CJI) from a panel to select the CEC and ECs.

Background

- The Supreme Court (SC) in March 2023 ruled that CEC and ECs will be appointed by the President of India on the advice of a Committee consisting of the Prime Minister, and Leader of Opposition in the Lok Sabha, and the Chief Justice of India until a law is enacted by Parliament on their appointments.
- Article 324(2) Reads: The Election Commission shall consist of the Chief Election Commissioner and such number
 of other Election Commissioners, if any, as the President may from time-to-time fix and the appointment of the Chief
 Election Commissioner and other Election Commissioners shall, subject to the provisions of any law made in that
 behalf by Parliament, be made by the President.
- Since no parliamentary law was enacted as prescribed by Article 324 of the Constitution, the Court stepped in to address the "constitutional vacuum."

Key features of the Bill

- Composition of the Selection Committee:
 - The Prime Minister as Chairperson,
 - The Leader of the Opposition in Lok Sabha as member
 - If the Leader of Opposition in Lok Sabha has not been recognised, the leader of the single largest opposition party in Lok Sabha will assume the role.
 - A Union Cabinet Minister nominated by the Prime Minister as member.
- Search Committee: The Bill proposes the establishment of a Search Committee to prepare a panel of five persons
 for consideration for the positions of CEC and ECs. The Search Committee will be headed by the Cabinet Secretary
 and will also include two members not below the rank of Secretary who have knowledge and experience in matters
 related to elections.
- Can not be Invalidated due to Vacancy: The appointment of the CEC and other ECs will not be invalidated due to any vacancy or defect in the constitution of the Selection Committee.
- Repealing of Previous Act: The proposed Bill repeals the Election Commission (Conditions of Service of Election Commissioners and Transaction of Business) Act, 1991. The business of the Election Commission will be governed by the new Act once it is passed. The 1991 Act provides that the salary of the ECs will be equal to that of a SC judge. The Bill provides that salary, allowance, and service conditions of the CEC and other ECs will be the same as that of the Cabinet Secretary.
- Unanimity and Majority Decision: The Bill maintains the provision that the business of the Election Commission should be transacted unanimously whenever possible. In case of a difference of opinion, the majority's view will prevail.

Concerns with the Bill

- Balance of Power
- Impact on Electoral Governance
- Alignment with Framers' Intentions



8. Replacement of IPC, CrPC, Indian Evidence Act

Syllabus: Indian Constitution, Amendments, Significant provisions

Prelims: Criminal Laws in India

Mains: Amendments to Criminal Laws in India

Three bills introduced in Lok Sabha



Details:

- Union Home Minister's introduction of three crucial bills in the Lok Sabha has set the stage for a transformative shift in India's criminal justice system.
- The 3 bills introduced are- Bharatiya Nyaya Sanhita Bill, 2023; Bharatiya Nagarik Suraksha Sanhita Bill, 2023, and Bharatiya Sakshya Bill, 2023.
- The bills seek to repeal the archaic Indian Penal Code, the Indian Evidence Act, and the Code of Criminal Procedure, introducing a modern framework aligned with contemporary legal needs.
- Indian Penal Code (IPC) is the official criminal code of India drafted in 1860 in the wake of the first law commission established in 1834 under the Charter Act of 1833.
- Code of Criminal Procedure (CrPC) provides procedures for administering criminal law in India. It was enacted in 1973 and became effective on 1 April 1974.
- The Indian Evidence Act, originally passed in India by the Imperial Legislative Council in 1872, during the British Raj, contains a set of rules and allied issues governing admissibility of evidence in the Indian courts of law.

Main Features of the Bharatiya Nyay Sanhita Bill, 2023?

- The bill defines terrorism and offenses such as separatism, armed rebellion against the government, challenging the sovereignty of the country, which were earlier mentioned under different provisions of law.
- It repeals the offense of sedition, which was widely criticized as a colonial relic that curbed free speech and dissent.
- It prescribes capital punishment as the maximum sentence for mob lynching, which has been a menace in recent years.
- It proposes 10 years imprisonment for sexual intercourse with women on false promise of marriage, which is a common form of deception and exploitation.
- The bill introduces community service as a form of punishment for specific crimes, which can help in reforming offenders and reducing overcrowding in prisons.
- The bill fixes a maximum limit of 180 days to file a charge sheet, which can speed up the trial process and prevent indefinite delays.

Main Features of the Bhartiya Nagrik Suraksha Sanhita Bill, 2023?

- It promotes the use of technology for trials, appeals, and recording depositions, allowing video-conferencing for proceedings.
- The bill makes video-recording of statement of survivors of sexual violence compulsory, which can help in preserving evidence and preventing coercion or manipulation.
- The bill mandates that police must inform about the status of a complaint in 90 days, which can enhance accountability and transparency.
- Section 41A of the CrPC will be renumbered as Section 35. This change includes an added safeguard, stipulating that
 no arrest can be made without prior approval from an officer at least at the rank of Deputy Superintendent of Police
 (DSP), especially for offenses punishable by less than 3 years or for individuals above 60 years.



- The bill requires that police consult the victim before withdrawing a case punishable by seven years or more, which can ensure that justice is not compromised or denied.
- It allows absconding criminals to be tried in-absentia by court and sentenced too, which can deter fugitives from escaping justice.
- It empowers magistrates to take cognizance of offenses based on electronic records such as emails, SMSs, WhatsApp messages etc., which can facilitate evidence collection and verification.
- Mercy petitions in death sentence cases to be filed within 30 days to the Governor and within 60 days to the President.
 No appeal shall lie against the President's decision in any court.

Main Features of Bharatiya Sakshya Bill, 2023?

- The bill defines electronic evidence as any information generated or transmitted by any device or system that is capable of being stored or retrieved by any means.
- It lays down specific criteria for admissibility of electronic evidence such as authenticity, integrity, reliability etc., which can prevent misuse or tampering of digital data.
- It provides for special provisions for admissibility of DNA evidence such as consent, chain of custody etc., which can enhance accuracy and reliability of biological evidence.
- It recognises expert opinion as a form of evidence such as medical opinion, handwriting analysis etc., which can assist in establishing facts or circumstances relevant to a case.
- It introduces the presumption of innocence as a fundamental principle of criminal justice system, which means that every person accused of an offence is presumed to be innocent until proven guilty beyond reasonable doubt.

Outdated Criminal Justice System

- Colonial Era Laws: The criminal justice system is a replica of the British colonial jurisprudence, which was designed with the purpose of ruling the nation and not serving the citizens.
- **Ineffectiveness:** The purpose of the criminal justice system was to protect the rights of the innocents and punish the guilty, but nowadays the system has become a tool for the harassment of the common people.
- Pendency of Cases: According to the Economic Survey, there are more than 3.5 crore cases pending in the judicial system, especially in district and subordinate courts, which leads to the actualization of the maxim "Justice delayed is justice denied."
- **Huge Undertrials:** India has one of the world's largest numbers of undertrial prisoners. According to NCRB Prison Statistics India, 67.2% of our total prison population comprises undertrial prisoners.
- **Poor Investigation:** Corruption, huge workload and accountability of police is a major hurdle in the speedy and transparent delivery of justice.

Committees for Reforming Criminal Laws

- Malimath Committee Report: It was headed by Justice V.S. Malimath, former Chief Justice of the Karnataka and Kerala High Courts. This Committee began its work in 2000 and submitted its report in 2003. It suggested 158 changes in the CJSI but the recommendations weren't implemented. The Committee had opined that the existing system "weighed in favour of the accused and did not adequately focus on justice to the victims of crime."
- Madhav Menon Committee: It submitted its report in 2007. The four-member panel was set up to draft a national policy paper on the criminal justice system.
- Ranbir Singh Committee: Committee for Reforms in Criminal Laws was set up by MHA in 2020.

Conclusion: The Bills will be sent to the Parliamentary Standing Committee on Home Affairs for a detailed review and discussion.

Nut Graf: An overhaul of the criminal laws was long overdue in the country owing to the colonial origins of the system. However, the pros and cons of the changes must be weighed and consulted with all stakeholders before making this huge transition.

9. Digital Personal Data Protection Bill

Syllabus: Indian Constitution—Historical Underpinnings, Evolution, Features, Amendments, Significant Provisions and Basic Structure.

Prelims: Data Protection Board of India

Mains: Fundamental Rights, Right to Privacy, The Data Protection Bill 2023

Provisions

- Scope: The Data Protection Bill applies to the processing of personal data in India or for offering goods or services in India.
- **Personal data:** Personal data may be processed only with consent, except for legitimate uses such as getting services from the government, medical emergencies, etc.
- Data principal (DP): The Bill introduces duties and rights on a data principal (DP).
 - o **Data principals**: Individuals whose personal data is being processed by a company or organization.
 - **Rights:** Data principals have the right to obtain information about their data, seek correction or erasure, nominate a representative, and file a grievance.



- Duties: Data principals must not file false complaints, provide false or misleading information, or impersonate
 another person when interacting with companies or organizations that are processing their data. Violation of
 these can result in a fine of up to Rs. 10,000.
- Right to grievance redressal: Data principals also have the right to file a grievance with the Data Protection Board of India (DPB) if they believe that their data has been mishandled.
- Data Fiduciaries (DF): Data fiduciaries (DFs) are entities determining the purpose and means of data processing. DFs must ensure the accuracy and completeness of data, build security safeguards, inform of data breaches, and erase data when necessary. Government entities are exempt from storage limitation and the right to erasure.
- **Data Protection Board of India (DPB):** The DPB will be established by the central government to monitor compliance with data protection laws, impose penalties, and hear grievances.
- **Penalties:** The bill specifies penalties of up to Rs. 250 crore for data breaches and non-compliance with child protection provisions.

Issues

- Data breaches: Data breaches are becoming increasingly common in India. For example, in June 2023, personal
 details of vaccinated users were leaked from the CoWIN portal, and in July 2023, confidential records of SBI employees
 were leaked. Critics have questioned the lack of grievance redressal when leaks happen from government sources.
- **Right to Information Act:** The bill widens the scope of information that can be withheld under the Right to Information act under the garb of "information related to personal information". This has implications on ensuring transparency and accountability of the government actions.
- Compensation: The provisions of compensating a user for breach of their data is not available.
- Third-party usage: DFs are also not mandated to share information on third party usage, duration of storage, etc. to the DPs.
- Personal data and sensitive personal data: The Bill fails to differentiate between "personal data" and "sensitive personal data". In case of sensitive data such as biological and genetic data, enhanced protection might be needed to prevent identity theft, etc.
- Independence of DPB: The independence of DPB has been questioned by critics since all members of the DPB are appointed by the Union Government.

Way Forward

- Alignment with GDPR: Some of the provisions can be aligned according to the General Data Protection Regulations (GDPR) as seen in the EU.
- **Independence of DPB:** To ensure the independence of the Data Protection Board of India, their salary, allowances and terms of service should not be varied to their disadvantage post appointment.

Nut Graf: The Data Protection Bill of India proposes to protect personal data by requiring consent for processing, giving data principals certain rights, and establishing the Data Protection Board of India to oversee compliance. However, the bill has been criticized for lack of adequate protection of privacy, its failure to provide adequate compensation for data breaches, and its lack of independence for the Data Protection Board of India.

10. Why are Rohini panel's findings important?

Syllabus: Indian Constitution—Historical Underpinnings, Evolution, Features, Amendments, Significant Provisions and Basic Structure; Government Policies and Interventions for Development in various sectors and Issues arising out of their Design and Implementation.

Prelims: Fundamental Rights, Grounds for Reservation

Mains: Fundamental Rights, Sub-Categorisation of OBCs, Rohini Commission recommendations

Context

The Justice G.Rohini led Commission on the sub-categorisation of Other Backward Classes groups has submitted its report to the Government. It was constituted in October 2017.

Terms of Reference:

- The Justice Rohini Commission was asked to examine how evenly the benefits of reservation have been distributed among the different castes and communities included in the Central list of Other Backward Classes (OBCs).
- To develop a scientific approach for sub-categorizing OBCs into smaller groups, based on factors such as their social and economic status.
- To rationalize the Central OBC list by suggesting corrections and replacements in spellings of the different castes, communities, sub-castes, and synonyms in the Central List of OBCs and classify them into their respective subcategories.

Need for Sub Categorisation?

- o Concerns that benefits of reservation are being utilised by a small number of caste groups.
- For example, according to some preliminary findings, 97% of all jobs and educational seats have gone to just 25% of all sub-castes classified as OBCs. 37% of the groups under the Central OBC list have zero representation in jobs and educational institutions.



The complete details of the report is yet to be released for the general public.

Impact of findings?

- The Commission's findings will show the data on OBC communities that have availed benefits since reservation for them began in 1992.
- The data set will also show the changes, if any, in the socio-economic status of OBC communities that have historically been able to avail benefits.
- The data will have an impact on political parties who bank on votes from different communities. The issues of development or lack of it in different communities will now have data to justify.

Reasons for delay?

- The Commission was initially given 12 weeks to submit its report, but the government kept giving it extensions.
- The government said that the Commission was taking time because of the COVID-19 pandemic, but it later said that the panel was still working on rationalising the Central OBC list.

Nut Graf: The Justice G. Rohini Commission has submitted its report on sub-categorization of OBCs. The report is yet to be released to the public, but it is expected to have a significant impact on the distribution of reservation benefits.

11. SC to appoint all-women panel to oversee relief in Manipur

Syllabus: GS-2, Judiciary

Mains: All-women panel of Manipur

- Appointment of All-Women Committee
 - The Chief Justice of India announced the formation of an all-women committee composed of three former High Court judges, headed by Justice Gita Mittal.
 - Committee's mandate: Supervise, intervene, and monitor relief, rehabilitation, and restoration efforts, including homesteads and places of worship.
- Monitoring Investigation
 - Retired Maharashtra Cadre IPS officer Dattatray Padsalgikar to oversee an investigation into registered cases during Manipur violence.
- Special Investigation Teams (SITs) and External Oversight
 - The Supreme Court emphasised on the need for external oversight of State Police investigation.
 - DGPs from six States to appoint six officers of DIG rank for each of the six SITs.
 - o Multiple layers of monitoring introduced to ensure transparent and efficient investigation.
- External Involvement in CBI Investigation
 - The Supreme Court directs the inclusion of officers from other States in the CBI investigation.
 - These officers are nominated by their respective State DGPs and supervised by a CBI Joint Director.
- The Supreme Court's proactive measures aim to address the challenges posed by the violence in Manipur by facilitating comprehensive relief efforts, effective rehabilitation, and transparent investigation processes.

12. SC plans expansion of infra; eCourts to offer national link

Syllabus: GS-2, Judiciary

Mains: eCourts

Introduction

- Chief Justice of India, D.Y. Chandrachud announced a project to modernise the court infrastructure for improved accessibility and inclusivity.
- The new project aims to build a new structure to house extra courts, judges' chambers, registrar courtrooms, registrar chambers, and other necessary spaces for lawyers and litigants.

Role of Judiciary and Access to Justice

- The Chief Justice emphasised the crucial role of the judiciary in ensuring that government institutions operate within constitutional boundaries.
- Courts provide a safe space for individuals to seek the protection of their rights and liberties.
- The Supreme Court has played a key role in promoting access to justice and upholding constitutional values.

Technology and Modernization

- Technology is a powerful tool to enhance court efficiency, transparency, and accessibility.
- Phase 3 of the e-Courts project aims to revolutionise the court system by connecting courts nationwide, establishing paperless processes, digitising records, and creating advanced e-sewa kendras in court complexes.
- The Supreme Court uses technology to make its premises and services friendly for people with disabilities.
- Measures like screen-readable websites and case files are implemented to aid the blind community in accessing court services.



13. How is the SC tackling gender stereotyping?

Syllabus: Structure, Organization and Functioning of the Executive and the Judiciary

Mains: Addressing Gender stereotypes in the Judicial system

Prelims: The Handbook on Combating Gender Stereotypes

Context:

• The Supreme Court's "The Handbook on Combating Gender Stereotypes" is a significant step towards recognizing and addressing the biases of the legal system.

Importance

- By acknowledging and challenging stereotypes associated with women, and providing alternate words and phrases, the Court has taken a crucial step towards discarding the patriarchal notions of language in the legal system.
- Lawyers and judges have also been asked to move away from these gender-unjust terms.
- Some of the important changes are:
 - The word "adulteress" should be replaced with "woman who has engaged in sexual relations outside of marriage."
 - o Words like "obedient" and "chaste" should not be used as prefixes for women.
 - A person who has experienced sexual violence can choose to identify as either a "survivor" or a "victim."
 - It should be made clear that a person's clothing choices do not imply consent for sexual activity, and it is never okay to touch someone without their permission.
 - The handbook recognizes that it takes courage to report a sexual offense and acknowledges that women may delay filing a complaint until they are able to do so. This challenges the stereotype that delayed reporting implies dishonesty on the part of the woman.

Impact of negative stereotypes:

- Stereotypes are harmful because they create unequal opportunities based on preconceived notions about gender, race, caste, religion, and other factors. This has direct implications in areas such as education, employment, and access to justice.
- For example, the stereotype that people from marginalized castes are not meritorious can create additional mental pressure for individuals from these groups, affecting their performance.
- Over 25,000 reserved category students have dropped out of central universities and IITs in the past five years, citing reasons such as poor performance and personal issues.
- In the context of gender, phrases like "women are nurturing" might perpetuate the idea that childcare responsibilities fall exclusively on women.
- The Supreme Court's handbook addresses these issues by providing guidelines for judges and lawyers to recognize
 and avoid gender stereotypes in their decision-making process. By emphasizing that gender does not determine a
 person's capacity for rational thought, the Court has set a precedent for future cases involving gender bias.

Judgements where the patriarchal notions were challenged?

- In Joseph Shine vs Union of India, the Court struck down the offense of adultery under Section 497 of the Indian Penal Code, calling it a "codified rule of patriarchy" that restricts women's behavior and attributes impossible virtues to them.
- In State of Jharkhand vs Shailendra Kumar Rai, the Court prohibited the use of the "two-finger test" in determining rape, stating that it violates the dignity of rape survivors or victims and is not relevant to the investigation.
- In State of Punjab vs Gurmit Singh, the Court ruled that a rape survivor or victim's testimony is inherently credible.

Way forward:

As suggested by IAS officer Uma Mahadevan-Dasgupta, the handbook will bring about a gradual shift in perspective, ultimately leading to a significant change in mentality and awareness on these issues.

Nut Graf: The Supreme Court's handbook on combating gender stereotypes is a significant step towards recognizing and addressing the biases of the legal system. The handbook provides guidelines for judges and lawyers to recognize and avoid gender stereotypes in their decision-making process. It also challenges the patriarchal notions of language in the legal system and provides alternate words and phrases.



14. Decoding the President's speech

Syllabus: GS-2, Constitution of India —historical underpinnings, evolution, features, amendments, significant provisions and basic structure.

Mains: Ideological Contestation and Constitution as a Guiding Document

Background

- The President of India stated that "our Constitution is our guiding document" in her message to the nation on the eve
 of this year's Independence Day.
- It is comforting to hear the head of state speak candidly in this era of intense political and ideological conflict.
- This is because they imply that the Constitution's limitations should not be violated by the ideas or politics of various political parties and organizations.
- Additionally, this important phrase in the speech made the resolute vow that India would continue to be a constitutional democracy.
- In her speech, the President made numerous points that reflected both India's current needs and its ambitions for a better world.

Ideological Contestation

- Government officials have brought up India's history of slavery in both domestic and international settings. This is consistent with how the ruling regime interprets the period of Indian history known as the "Medieval Period."
- Government officials previously refrained from stigmatizing the medieval era as one of foreign dominance and enslavement.
- This classification was only applicable to the colonial era. Liberation from foreign rule, therefore, meant liberation from British rule.
- The President appears to have preferred this conventional view, suggesting that for her, foreign dominance refers to the time under British authority.
- India is the birthplace of democracy, and democratic institutions have been here at the grassroots level ever since the dawn of civilization.
- With the beginning of the era of foreign rulers leaving numerous colonies, colonization came very close to coming to an end.

Constitution as a Guiding Document

- All Indians were correctly reminded by the country's President that their identification as "citizens of India" came before all other identities.
- Given India's size and its enormous population, our Indian identity encompasses a variety of identities.
- The President highlighted caste, creed, language, area, family, and profession among other identities.
- A creed may be a component of a religion, but the two are not the same thing. This was also made obvious by the President's use of the word "panth" rather than "dharma" in her speech in Hindi.

Conclusion

The Constitution serves as the nation's guiding document, hence it should be used exclusively. Religion and faith, not creed, are mentioned in the Constitution. The Preamble to the Constitution makes reference to dharma, the Hindi term for faith. Moreover, when the nation's highest constitutional authority speaks, it matters. In the midst of the blazing political and ideological struggles, the nation needs her calmness, consideration, and constitutional accuracy.

15. Causing floods is a terrorist offence in law proposed to replace the Indian Penal Code

Syllabus: Legal framework and anti-terror laws.

Mains: Internal security challenges, anti-terrorism legislation, constitutional provisions related to law enforcement.

Context:

The proposed Bharatiya Nyaya Sanhita Bill (BNS) introduces causing "floods" as a terrorist offence, seeking to replace the Indian Penal Code. This move raises concerns about procedural safeguards.

Bharatiya Nyaya Sanhita Bill (BNS) Proposal

- BNS Bill classifies causing "floods" as a terrorist offence, aiming to replace British-era Indian Penal Code.
- Terrorism is defined as a separate offence for the first time within general law in contrast with the Unlawful Activities (Prevention) Act, 1967, which focused on terrorist activities.

Definition and Scope of Terrorism

- Section 111 (6) (a) of the Bill defines "terrorist" as a person involved in various activities, including causing floods.
- The Bill, introduced on August 11 during the Monsoon Session of Parliament, has been referred to the Parliamentary Committee on Home Affairs for examination.



Lack of Procedural Safeguards

- The proposed law lacks procedural safeguards against false implications in terrorism and organised crime, just as is the case with UAPA and the Maharashtra Control of Organised Crime Act (MCOCA).
- UAPA is known for its draconian provisions and has led to 4,690 arrests (2018-2020) with only 3% convictions.

Missing Safeguards and Implications

- The proposed law bypasses safeguards and any police officer can register FIR labelling an individual as a terrorist.
- MCOCA and UAPA require senior police officer approval for FIRs, specific investigative ranks, and government sanctions for court cognizance. Similar safeguards are missing in the proposed law.

Real-World Case and Controversy

- The 2022 flood incident in Silchar, Assam led to criminal case registration; floods claimed over 120 lives.
- The Assam CM attributed floods to human action; accusations against one particular community led to social media uproar ("flood jihad").

Proposed Punishment and Safeguard Comparison

• Section 111 proposes minimum five-year imprisonment and the death penalty for terrorist offences.

Nut Graf: The BNS Bill's inclusion of flood-related offences as terrorism triggers debates on safeguards. Experts highlight contrasts with existing laws, while a real-world incident in Silchar adds controversy.

16. Rethink the dynamics of India's fiscal federalism

Syllabus: 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.

Prelims: Per Capita Income, Human Development Index, 73rd and 74th Constitutional Amendments

Mains: Fiscal Federalism, Sixteenth Finance Commission, Reform of Panchayati Raj Institutions

Introduction:

- India's fiscal federalism has evolved significantly due to a number of factors such as the shift from a planned economy to a market-mediated economy, the 73rd and 74th Constitutional Amendments, the passage of the Fiscal Responsibility and Budget Management Act, the Goods and Services Tax (GST) Act, and the use of cess and surcharges.
- As seen in the works of Chancel and Piketty, top 1% earners in India corner 22% of the income. Various incentives offered for corporations and individuals such as tax exemptions and concessions have favoured the rich disproportionately and reduced the divisible pool of the government.

Major issues to be addressed for improving the fiscal governance are:

1. Equity in intergovernmental transfers:

- The **per capita income (PCI)** of 16 major Indian states (from 1970-71 to 2020-21), has been diverging over time meaning that the gap between the rich and poor states is getting wider.
- Human Development Index (HDI) data on the other hand indicated that there is a narrowing of the gap between rich and poor states (from 1991 to 2018). However, since 2005, the rate of convergence has been slowing down.
- This has major implications on the ability of poorer states to cater to the needs of education, healthcare and ensure a decent standard of living.
- For the 16th Finance Commission, HDI can be considered as one of the criteria for horizontal distribution of tax devolution.

2. Division of powers between Union and states:

- Due to the changing polity, society, technology, demographic structure and the development paradigms in different states, one size fits all approach will be difficult and not sustainable.
- Legislations like Mahatma Gandhi National Rural Employment Guarantee Act 2005, the Right of Children to Free and Compulsory Education Act 2009, and the National Food Security Act 2013 also impose extra burden on state finances.
- A new scheme of division of power that aids decentralisation and autonomy to states will help address the local needs better.
- Article 246 and the Seventh Schedule that deals with the division of powers, functions and responsibilities between Centre and the states should be revisited accordingly.

3. Role of local governments:

- The third tier of government in India has not been given its due place in the fiscal federal map of the country.
- The 73rd and 74th Constitutional Amendments have added to the confusion with the introduction of Schedule XI and Schedule XII.
- These schedules deal with the subject matters already mentioned in the state list.
- Without functional mapping and delineation of the responsibilities of the panchayats for the various sub activities
 on these subject matters, quality of service delivery of public goods is affected. Principle of subsidiarity i.e right
 delivery of services at the appropriate level of government is also lacking.



- There is no uniform financial reporting system (uniform budgeting rules, accrual based accounting etc).
- A new local list that will map out the functional and financial responsibilities of the panchayat raj institutions and municipalities is the need of the hour.
- Terms of reference for the 16th Finance Commission should include provision of services of standard quality in local bodies as one of the criteria.

4. Off-budget borrowing:

- Off-budget borrowings are borrowings not accounted for in the Budget but whose repayment liabilities eventually fall on the Budget. These are usually not part of public scrutiny.
- For example, if public sector units have any debt obligations, it will eventually fall on the government but is not transparently accounted for in the Budget.
- Loans from the National Small Savings Fund (NSSF) to central government ministries and public sector undertakings are not counted in the Union's fiscal deficit.
- Transparency and public accountability demand that the Union, States and local governments bring all extrabudgetary transactions to the public domain.

Conclusion:

• The 16th Finance Commission provides an opportunity to rethink the dynamics of fiscal federalism in India and help achieve the development goals of the constitution.

Nut Graf: India's fiscal federalism has evolved significantly in recent years, but there are still major issues to be addressed, such as equity in intergovernmental transfers, division of powers between Union and states, role of local governments, and off-budget borrowing.

17. The Election Commission — Autonomy in the crosshairs

Syllabus: Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional Bodies.

Mains: Appointment issue of Election Commission

Context:

The Election Commission of India (ECI) has recently become a flashpoint for disagreements between the government and the judiciary. This time, the disagreement is about its appointment.

Background:

- The Supreme Court of India directed that the President of India select the Chief Election Commissioner (CEC) and the Election Commissioners (EC).
- The President will make this decision based on the recommendations of a committee composed of the Prime Minister, the Leader of the Opposition in the Lok Sabha or the leader of the single largest Opposition party, and the Chief Justice of India (CJI).
- This Constitution Bench decision was a significant step towards broadening and strengthening the ECI's constitutional position.

Significance of Supreme Court Judgement:

- Article 324 of the Constitution requires Parliament to pass such legislation.
- The fact that this was a unanimous decision by a five-judge Bench adds to its weight.
- So far, the President of India has appointed the ECI's senior executives on the suggestion of the federal government.

Government Response

- The current administration submitted a Bill in the Rajya Sabha that, if enacted, will overturn this ruling.
- The Bill proposes that the high-powered selection committee replace the Chief Justice of India.
- The Prime Minister (Chairperson), the Leader of the Opposition in the Lok Sabha (Member), and a Union Cabinet Minister selected by the Prime Minister (Member) shall make up the committee.
- The government has confronted the Supreme Court, stating unequivocally that it wants greater weightage in the nominations of key election officials and hence a stronger grip on the institution.
- Experience and studies reveal that incumbent governments, particularly those with authoritarian tendencies, strive tirelessly to make them pliant.

Concerns over the Appointment

- Since the deliberations in the Constituent Assembly, the selection process for the CEC and the ECs has been the subject of extensive discussion in political and policy circles, and much has been written about it.
- During the Constituent Assembly debates, it was suggested that the CEC's nomination be subject to confirmation by a two-thirds majority in a joint session of both Houses of Parliament.
- However, Parliament was charged with enacting suitable legislation on the subject.
- The committee shall comprise the Lok Sabha Speaker, the Leaders of the Opposition in the Lok Sabha and the Rajya Sabha, the Law Minister, the Rajya Sabha Deputy Chairperson and a Supreme Court judge recommended by the CJI.



Conclusion

The government is aiming to drive the ECI towards further state control through the present Bill, creating the notion that democracy is deteriorating. The Indian public views the ECI as a dependable, accountable, and trustworthy institution. It is uncertain whether this has to do with election schedules, electoral speeches, electoral rolls, or other types of malpractices. But it is weakening not only its own autonomy but also the confidence of the public. However, the fact still stands that the current administration continues to view the ECI as an independent organization.

Nut Graf: The Election Commission of India is in risk of being weakened as the focal point of disagreements between the government and the court over its selection procedure.



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ECONOMY

1. Medium-Term Expenditure Framework

Syllabus: GS 3- Economy

Prelims: FRBM Act and Medium-Term Expenditure Framework

Introduction

- India's Finance Ministry emphasised the importance of maintaining "fiscal firepower" to effectively handle external shocks.
- Global economic conditions have not improved since the Union Budget presentation in February 2023.

Medium Term Expenditure Framework (MTEF)

- The MTEF, mandated by the Fiscal Responsibility and Budget Management (FRBM) Act, cannot be released due to current circumstances.
- Assumptions about economic growth rates and revenue receipts are required for meaningful expenditure projections and rolling targets for the next two years.
- The Finance Ministry conveys its inability to release the MTEF in the present situation.

Continued Global Headwinds and Risks

- No favourable changes observed in global economic conditions and associated risks since February.
- The Finance Ministry initially cited "unprecedented global uncertainties" as a reason for not presenting fiscal projections for 2024-25 and 2025-26 in the Parliament.

Need for Flexibility in Expenditure Management

- Effective management of external shocks and global uncertainties calls for additional flexibility in expenditure management and fiscal consolidation.
- Flexibility in fiscal policies is necessary to respond to unforeseen economic challenges.

2. China tips into deflation

Syllabus: GS 3- Economy

Prelims: deflation, Consumer Price Index and Producer Price Index

Introduction

- China's consumer sector experienced deflation, while factory gate prices continued to decline in July.
- Economic struggles in the world's second-largest economy are pressuring Beijing for more policy stimulus.

Anxiety of Slower Economic Growth

- Concerns are growing that China might be entering a phase of significantly slower economic growth.
- Parallels drawn to Japan's "lost decades" characterised by stagnant consumer prices and wages for a generation.

Consumer Price Index (CPI) Decline

- Consumer Price Index (CPI) dropped by 0.3% year-on-year in July according to the National Bureau of Statistics (NBS).
- This decline contrasts with a median estimate of a 0.4% decrease from a Reuters poll.
- This is the first CPI decline since February 2021.

Producer Price Index (PPI) Decline

• Producer Price Index (PPI) experienced a 10th consecutive month of decline, down by 4.4%.

Two-Speed Growth in the Economy

- There is a noticeable divergence between the manufacturing and services sectors.
- The economy is predicted to grow at two different speeds for the rest of 2023.
- The real estate issue is re-emerging and contributing to this divergence.

Impact on Economic Rebound

- The data reveals that China's economic rebound is slower than expected.
- Insufficient to counterbalance weaker global demand and boost commodity prices.

Trade Figures and Economic Performance

• Trade figures for July showed declines in both exports and imports, indicating economic challenges.



Inflation Target and Deflation Concerns

- Beijing had set a consumer inflation target of around 3% for the year.
- Authorities downplay concerns about deflation.

Month-on-Month CPI Variation

• Despite the year-on-year decline, the Consumer Price Index (CPI) actually rose by 0.2% on a month-on-month basis.

3. GST Council sticks to its plan to collect 28% tax on online gaming

Syllabus: Indian Economy and issues relating to planning, mobilisation of resources, growth, development and employment.

Mains: Government revenue generation through taxation, impact of tax rates on various sectors, and the challenges of taxation in the digital economy.

Prelims: Recent changes in tax policies related to online gaming.

Context:

The GST Council has decided to impose a 28% levy on bets in online gaming, casinos, and horse racing, aiming for implementation from October 1. Some states expressed concerns, but the decision remains unchanged.

Introduction

- The GST Council has opted to levy a 28% tax on wagers made in online gaming, casinos, and horse racing.
- The decision was made under the chairmanship of Finance Minister Nirmala Sitharaman.
- The implementation of the levy is scheduled to begin on October 1.

Amendment of GST Law

- The Centre plans to amend the Goods and Services Tax (GST) law during the current session of Parliament to enable the implementation of the 28% levy.
- Sikkim and Goa expressed dissent over the modalities of the tax for casino users but the Council decided to proceed with the implementation.

Exemption for Banned Online Gaming

- Tamil Nadu raised concerns about the impact of the levy on the statewide ban on online gaming.
- Ms. Sitharaman assured that the new norms would explicitly state that the tax cannot be levied in regions where a ban on online gaming is in place.

Mixed Reactions from States

- Delhi sought a fresh review for the online gaming sector.
- However, most other states supported sticking to the Council's previous decision, which was taken after three years of deliberations.

Critical Clarification on Valuation Rules

- The online gaming industry expressed concerns about the impact on investments and jobs.
- The GST Council clarified that the tax will be levied only on the entry amount, not on any winnings.
- For instance, if a person buys chips worth ₹1,000, plays a round, and wins ₹300, the tax will be imposed only on the ₹1,000 entry amount, not on ₹1,300.

Appreciation from Online Gaming Associations

- The E Gaming Federation and Federation of Indian Fantasy Sports welcomed this clarification as it addresses concerns about "repeat taxation" and provides clarity on tax calculations.
- However, the industry remains anxious about the overall impact of the levy.

Nut Graf: The GST Council, chaired by Finance Minister Nirmala Sitharaman, is set to levy a 28% tax on online gaming, casinos, and horse racing from October 1. Despite concerns from certain states, the decision stands, and the industry has received clarification on tax calculations.



4. Index of Industrial Production

Syllabus: GS-3; Growth

Prelims: Index of Industrial Production

Context: India's industrial production growth declined to a three-month low of 3.7 per cent in June mainly due to poor showing by the manufacturing sector.

The factory output growth measured in terms of the Index of Industrial Production (IIP) stood at 12.6 per cent in June 2022 on account of a lower base effect.

About IIP:

- IIP is an indicator that measures the changes in the volume of production of industrial products during a given period.
- It is compiled and published monthly by the National Statistical Office (NSO), Ministry of Statistics and Programme Implementation.
- It is a composite indicator that measures the growth rate of industry groups classified under: Broad sectors, namely, Mining, Manufacturing, and Electricity.
- Use-based sectors, namely Basic Goods, Capital Goods, and Intermediate Goods.
- Base Year for IIP is 2011-2012.
- The eight core industries of India represent about 40% of the weight of items that are included in the IIP. The eight core sector industries in decreasing order of their weightage: Refinery Products> Electricity> Steel> Coal> Crude Oil> Natural Gas> Cement> Fertilizers.

Significance of IIP

- It is used by government agencies including the Ministry of Finance, the Reserve Bank of India, etc., for policy-making purposes.
- IIP remains extremely relevant for the calculation of the quarterly and advance GDP (Gross Domestic Product) estimates.

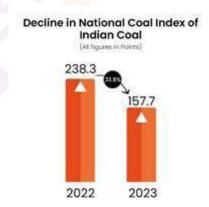
5. National Coal Index

Syllabus: GS-3; Energy

Prelims: National Coal Index

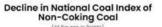
Context

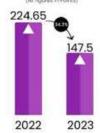
- The National Coal Index (NCI) fell a significant 33.8% year-on-year to 157.7 points in 2023.
- It indicates a strong supply of coal in the market, with sufficient availability to meet the growing demands.



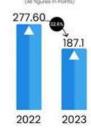
- Similarly, the NCI for non-coking coal stands at 147.5 points in May 2023, reflecting a decline of 34.3% compared to May 2022, while coking coal index stands at 187.1 points in May 2023, with a decline of 32.6%.
- The peak of NCI was observed in June 2022 when the index reached 238.8 points.
- However, subsequent months have experienced a decline, indicative of abundant coal availability in the Indian market.







Decline in National Coal Index of Coking Coal



National Coal Index (NCI):

- It is a price index that combines coal prices from all sales channels, including notified prices, auction prices and import prices.
- It is a price index which reflects the change in the price level of coal on a particular month relative to the fixed base year.
- Established with the base year as FY 2017-18.
- It has been rolled out in June 2020 and the aim is to have an index that will truly reflect the market price.
- The concept and design of the Index as well as the Representative Prices have been developed by the Indian Statistical Institute, Kolkata.
- It serves as a reliable indicator of market dynamics, providing valuable insights into coal price fluctuations.

National Coal Index (NCI) Trend:

- India's coal industry affirms a substantial stockpile, with coal companies holding impressive stock.
- This availability ensures a stable supply for various sectors dependent on coal, significantly contributing to the overall energy security of the nation.
- The downward trend in the NCI signifies a more balanced market, aligning supply and demand.
- With sufficient coal availability, the nation can not only meet the growing demand but also support its long-term energy requirements, thus building a more resilient and sustainable coal industry.

6. Battery Electric Vehicle in India

Syllabus: GS-3; Energy

Mains: Challenges in Battery Electric Vehicle in India

Context: The EV push has been termed as "not capitalism, but a collusion" among the state, manufacturers, and the mining companies sitting behind the "EV dream".

FOUR TYPES OF EVS

HEVs: Conventional hybrid electric vehicles (such as variants of the Toyota Hyryder Hybrid or Honda City e:HEV in India) combine a conventional ICE system with an electric propulsion system, resulting in a hybrid drivetrain that substantially lowers fuel usage. The onboard battery in a conventional hybrid is charged when the IC engine is powering the drivetrain.

PHEVs: Plug-in hybrid vehicles (such as the Chevrolet Volt) also have a hybrid drivetrain that uses both an ICE and electric power for motive power, backed by rechargeable batteries that can be, in this case, plugged into a power source.

BEVs: Vehicles like the Tata Nexon in India, or the Nissan Leaf and Tesla Model S, have no ICE or fuel tank, and run on a fully electric drivetrain powered by rechargeable batteries.

FCVs: Fuel cell vehicles (such as Toyota's Mirai and Honda's Clarity) use hydrogen to power an onboard electric motor. FCVs combine hydrogen and oxygen to produce electricity, which runs the motor, and the only residue of the chemical process is water. Since they're powered entirely by electricity, FCVs are considered EVs — but unlike BEVs, their range and refuelling processes are comparable to conventional cars and trucks.



Issues

- Upfront subsidy
- Lack of Infrastructure China, the leader in the number of publicly available chargers, accounts for 85% of global fast chargers and 55% slow chargers.
- Source of electricity
- Supply chain: Lithium
- Slow adoption
- High initial cost

Alternate options

- Hybrids
- Ethanol and flex fuel A flex fuel, or flexible fuel, vehicle has an internal combustion engine, but unlike a regular petrol or diesel vehicle, it can run on more than one type of fuel, or even a mixture of fuels such as petrol and ethanol.
- Synthetic fuels
- Hydrogen vehicles

7. Agriculture technology

Syllabus: GS-3; Technology in aid of agriculture

Mains: Agriculture technology

Context: Agriculture and allied sectors are central to the Indian economy. Keeping this and a sustainable future in mind, the Indian government, quite rightly, is promoting technology-enabled sustainable farming, including natural, regenerative, and organic systems, during its G20 presidency.

Central idea

Despite achieving food security through the production of 330 MT of food grains, challenges persist in meeting
the demand for coarse cereals, pulses, oil seeds, and vegetables. These shortcomings contribute to a large
undernourished population, including a substantial child wasting rate of 19.3%.

The Rise of the Indian Seed Industry

- Strong Foundation (1960s): The National Seeds Corporation was established, setting the groundwork for the industry's growth.
- Policy Impetus (Late 1980s): Proactive policies and regulatory support boosted the industry's development.
- Legislative Landmark (2001): The Protection of Plant Varieties and Farmers Rights Act was enacted, bolstering intellectual property rights and innovation.
- **Technological Transition (2002):** The introduction of BT cotton hybrids marked a shift toward technology-driven approaches for better productivity and sustainability.
- Current Market Size: The Indian seed market is estimated at \$4.0 to \$6.0 billion, with untapped potential for global prominence.
- Millet Leadership: India's global leadership in millet production positions it to capture the international seed market.
- **Public-Private Collaboration:** Collaboration between ICAR research institutions and private companies enhances the development of hybrid varieties.
- Major determinants of profitability in agriculture
- Seed Quality and Varieties: High-quality seeds and improved crop varieties significantly impact profitability. Improved seeds can contribute to a yield advantage of up to 15-20% beyond the genetic potential under different cultivation conditions.
- Input Costs: The costs of inputs like seeds, fertilizers, pesticides, and irrigation influence profitability. The cost of seed typically constitutes around 3 to 6% of the total cost of production, but it can provide up to a 15-20% yield advantage.
- Land and Soil Management: Effective land preparation, soil health management, and crop rotation practices are critical for sustained profitability. Sustainable land practices help maintain productivity over the long term.
- Water Management: Proper irrigation methods and access to reliable water sources impact profitability. Effective water management can reduce waste and increase yields.
- Labor Efficiency: Efficient labor utilization, including timely planting, weeding, and harvesting, optimizes production processes and reduces labor costs.
- Technology Adoption: Modern agricultural technologies like precision farming and mechanization enhance efficiency and reduce resource waste. Applied seed technologies can ensure good performance even under unfavorable conditions
- Market Access and Pricing: Access to markets and fair prices for agricultural products directly affect profitability.
 Public-private partnerships have improved Variety Replacement Rates (VRR) and Seed Replacement Rates (SRR) in field crops and vegetables.



Challenges Ahead for the Indian Seed Industry

- Climate Variability: Unpredictable weather patterns and shifting climate conditions challenge consistent seed
 production, impacting crop yields and resilience.
- **Resource Scarcity:** Diminishing natural resources like water and arable land strain the industry's capacity to meet the escalating demand for quality seeds.
- Regulatory Framework: Navigating evolving and intricate regulations can hinder the timely release of new seed varieties, obstructing innovation.
- Market Access: Equitable access to quality seeds, particularly in remote or economically disadvantaged regions, remains a significant challenge.
- Global Competition: The fiercely competitive international seed market demands continuous improvement in quality and variety offerings.
- Intellectual Property Protection: Safeguarding intellectual property rights while encouraging open innovation poses a delicate balancing act.
- Consumer Preferences: Adapting seed varieties to evolving consumer preferences concerning nutrition, taste, and environmental impact is a dynamic challenge.

Emerging Seed Technologies

- Priming and Enhancement Protocols: These protocols prepare seeds to excel under various growing conditions.
 Particularly valuable in regions experiencing stressors, they boost seed performance independently or in conjunction with the seed's genetic attributes.
- **Film Coating and Pelleting:** Film coating involves a protective layer applied to seeds, aiding precise planting and acting as a vehicle for pesticides, nutrients, and growth promoters. Pelleting shares similar benefits, enhancing seed protection and handling.
- Seed Treatments: Seed treatments encompass the application of biological or chemical pesticides to seeds, with contact or systemic action against pests and diseases during germination and early growth stages.
- Bio-stimulants and Nutrients: Integration of bio-stimulants and nutrients into seeds fosters improved germination
 rates and rapid seedling establishment, contributing to overall plant vitality and productivity.
- Al-Responsive Sensors/Substances: Seeds infused with Al-responsive sensors or substances can adjust plant responses to external stimuli, bolstering adaptability and performance across varying conditions.
- Clean and Green Planting Materials: This technology revolves around generating environmentally friendly and highperforming planting materials for horticultural crops, aligning with sustainable cultivation practices.
- Genetic Advancements in Variety Development: Genetic enhancements play a pivotal role in creating seed varieties
 with amplified traits such as disease resistance, augmented yield, and enhanced adaptability to shifting environments.
- Metabolic Cues and Molecules: Seed enrichment with molecules or metabolites that act as cues in biological pathways can augment metabolic processes and overall plant well-being.

Way Forward: Embracing Seed Technology for Sustainable Growth

- Research and Innovation: Invest in innovative research for climate-resilient, high-yielding seed varieties.
- Quality Assurance: Guarantee reliable access to quality-assured seeds to bolster the seed market's stature.
- Tech Transfer: Facilitate technology dissemination to fields via farmer training and extension services
- Empower Smallholders: Ensure affordable, quality seeds and provide capacity-building programs

Conclusion

As India forges ahead with sustainable agriculture, embracing seed technologies emerges as a linchpin for progress.
 With robust regulatory mechanisms, India's journey towards a Clean Green Mission can set the stage for a greener, more resilient agricultural future.

8. Centre to release food grain stock

Syllabus: GS 3- Economy

Prelims: deflation, Consumer Price Index and Producer Price Index

Introduction

The Centre has taken significant steps to counter the escalating prices of food grains, including wheat and rice, with
the aim of ensuring sufficient domestic availability and curbing price inflation. The move encompasses additional
sales through the Open Market Sales Scheme (OMSS) and adjustments to reserve prices.

Increased Sales through OMSS

- The Centre plans to sell an additional 50 lakh tonnes of wheat and 25 lakh tonnes of rice through the OMSS for Food Corporation of India stocks.
- Objective: To maintain ample supplies of rice, wheat, and atta (flour) and stabilise their prices.
- Expected Outcome: Ensuring the welfare of the population and alleviating food price concerns.



Adjustment of Reserve Prices

- The reserve price of rice is set to be reduced by ₹200 per quintal, resulting in an effective price of ₹2,900 per quintal.
- Source of Reduction: The price stabilisation fund of the Department of Consumer Affairs.
- Rationale: Counter the surge in prices and maintain affordability.

Price Hikes in Wheat and Rice

- Over the past year, the retail price of wheat has risen by 6.77%, and its wholesale price has increased by 7.37%.
- In the case of rice, the price escalation stands at 10.63% in retail and 11.12% in wholesale markets.
- Necessity for Action: Mitigate the adverse impact of these price increases on the general populace.

Enhancing Availability and Curbing Inflation

- The Centre emphasises that these measures aim not only to improve market availability but also to temper price increases and control food inflation.
- Ultimate Goal: Maintain stable food inflation levels.

Wheat Import Duty

- The Centre is considering a reduction in wheat import duty based on actual requirements.
- Addressing Rising Trends: The Centre acknowledges the ongoing discussions about the upward trend in prices.

Scope of OMSS

- In addition to the current 15 lakh tonnes of wheat and 5 lakh tonnes of rice being sold through OMSS, the new allotment further increases availability.
- Progress of Sales: About 7-8 lakh tonnes of wheat and minimal rice quantities have been auctioned through OMSS.

FCI's Involvement

- FCI Chairman and Managing Director, Ashok K. Meena, highlights the success of the initiative.
- Impact on Wheat Sales: Initial offerings of 4 lakh tonnes have been scaled down to 1 lakh tonne in the most recent
- Notable Sales: Around 8 lakh tonnes of wheat have been sold so far.
- Market Demand: The weighted average selling price of wheat shows an increase due to growing market demand.

Buffer Stocks

• FCI reveals the presence of excess buffer stocks: an additional 87 lakh tonnes of wheat and 217 lakh tonnes of rice beyond buffer norms.

9. Is India's sugar surplus leading to a crisis?

Syllabus: Major crops-cropping patterns in various parts of the country

Mains: Critical analysis of Excess Sugar Production in India

Background:

- In 2021-2022, India surpassed Brazil as the world's leading sugar producer, with a record of 359 lakh tonnes.
- Sugar exports have increased as a result of the excess, with a record of 110 lakh tonnes sold in 2021-2022.
- In fact, Brazil, Australia, and Guatemala filed a complaint with the World Trade Organisation (WTO) against India for providing excessive export subsidies and domestic support to farmers in order to outcompete other countries in the global sugar market.

Reasons Behind Excess Sugar Production

- India is the world's largest consumer of sugar, thus it must produce enough to meet its massive domestic demand.
- The excess sugar production is the result of policies and procedures that encourage farmers to cultivate sugarcane.
- The Central Government provides a fair and remunerative pricing (FRP) scheme, which requires sugar mills to pay a minimum price to sugarcane growers.
- State governments also provide substantial subsidies to encourage sugarcane growth.

Concerns

- India's main sugarcane-growing states rely largely on groundwater for irrigation, raising concerns about groundwater depletion.
- Sugarcane's water-intensive farming has depleted groundwater. In states that are already prone to drought and groundwater stress, 100 kg of sugar requires two lakh liters of irrigation groundwater, which raises worries.
- The enormous use of resources in sugar production is fast decreasing, threatening a future disaster.
- Sugarcane over-cultivation has resulted in a sugar surplus and excessive exports, which has a negative impact on groundwater.
- The sugar industry's excessive usage of groundwater must be addressed if agricultural collapse is to be avoided.



Sugar Surplus and Ethanol Production

- The Indian government explored diverting the sugar excess to the manufacturing of ethanol, an organic chemical produced by fermenting sugarcane molasses or sugar.
- The government began the EBP project in 2003 in order to cut crude oil imports and minimize greenhouse gas emissions from gasoline-powered vehicles; it has been somewhat successful.
- It began with a modest goal of obtaining a 5% blending rate, but the ambition for 2025 is 20%.
- In addition, in 2021, the government will lower the Goods and Services Tax on ethanol from 18% to 5%.
 - Ethanol is a key element in alcoholic beverages, as well as in the chemical and cosmetics industries.
 - In the transportation industry, using ethanol-blended petrol (EBP) greatly reduces harmful emissions from automobiles, such as carbon monoxide and other hydrocarbons.

Measures to be Taken

Even though the negative effects of excessive sugar production on the environment should be obvious, exporting extra sugar has significant economic benefits, bringing in millions or crores of dollars annually.

- To evaluate and then rectify incentives that favor sugarcane over other crops, resulting in a persistent surplus.
- The implementation of fair and comprehensive crop subsidy programmes for a variety of crops can assist farmers in diversifying agriculture equally and ensuring an equitable income.
- To ensure the availability of a broader range of profitable and less resource-intensive crops can help to reduce the burden on essential natural resources.
- To focus on needs to invest in overall water-saving and management systems.
- To map different aspects of groundwater availability and distribution throughout India.

Conclusion

Cleaner practices such as rainwater gathering, wastewater treatment, and canal irrigation networks can assist reduce demand on groundwater reservoirs as additional water sources become accessible for irrigation. Investment in groundwater research must therefore be taken seriously. As India continues to rise to prominence in the agriculture sector, it must prioritize sustainability.

Nut Graf: India surpassed Brazil as the world's greatest sugar producer, however the enormous use of resources in sugar production is depleting rapidly, threatening a future disaster.

10. Centre imposes 40% duty on onion exports

Syllabus: Storage, Transport and Marketing of Agricultural Produce and Issues and Related Constraints

Prelims: Custom Duty, Central Board of Indirect Taxes and Customs, Minimum Export Price

Mains: Agricultural Export Policy, Doubling Farm Incomes, Food Inflation

Context:

- The Central Board of Indirect Taxes and Customs (CBIC) on Saturday imposed a 40% customs duty on the export of onions. It will be in force till 31st December 2023.
- India imposed an export ban on non-basmati white rice in July 2023
- The government will also offload stocks of onions in various wholesale markets to reduce the retail prices.

Why is it needed?

- The national average price of onions has increased by at least ₹5 from last year's.
- The decision was taken to increase the availability of onions in the domestic market, especially in view of the coming festival season.
- According to the Monetary policy framework, RBI is expected to keep the inflation between 4-6%. Higher vegetable
 prices have already led to CPI inflation reaching 7.4% in July 2023.
- The move will also lead to private traders who were holding on to their stocks to offload fearing a crash in prices.
- Experts such as Ashok Gulati have highlighted that export duties will help offset the input subsidies given to farming
 by the government. For example, free electricity and water for agriculture, subsidised fertilisers are provided by the
 government to aid agriculture.

Trade tools to control inflation?

- India uses a variety of trade policy tools to control inflation by restricting exports: Minimum Export Price, Export duty,
 Export bans, Export quota, Export capping, Export permit
- **Minimum Export Price(MEP):** It is the price below which an exporter is not allowed to export the commodity from India. Notifications on MEP issued by the Department of Commerce.

Issues with restriction of exports?

- Farmers should have the ability to export and get remunerative prices. But ad hoc restrictions and duties will lead to an unstable trade policy regime affecting export supply chains.
- India's image as a reliable supplier of agricultural commodities will be affected. This will make it difficult for India to achieve the goals of its Agriculture Export Policy.



- It reduces the appetite of traders to invest in infrastructure such as warehouses. Legal methods of agricultural storage by traders should be encouraged for year round supply of agricultural commodities.
- Export bans on food items hurt vulnerable nations. India is the leading exporter of rice and vegetables, and export bans have direct consequences on food security around the world.

Way Forward:

- There has to be a balance between the interests of farmers and consumers. Farmers should get remunerative prices.
 Consumers should get onions at a reasonable price. It is the duty of the government to ensure a win-win situation.
- The government should focus on other measures to control inflation, such as increasing production and reducing food waste.
- Efficient value value chains for perishable commodities are needed. For example, processing facilities to turn
 perishable commodities into products with a longer shelf life, such as tomato puree and dehydrated onion flakes,
 needs support from the government.

Nut Graf: India imposed a 40% export duty on onion exports to control rising prices and ensure adequate supply in the domestic market. The way forward is to find a balance between the interests of farmers and consumers. The government should focus on other measures to control inflation, such as increasing production and reducing food waste. Efficient value chains for perishable commodities are also needed.

11. Amrit Bharat Station Scheme

Syllabus: GS-3; Infrastructure

Prelims: Amrit Bharat Station Scheme

Context: Recently, the Indian Prime Minister has laid the foundation stone for the Redevelopment of 508 railway stations across India as a part of Amrit Bharat Stations Scheme, spreading across 27 states and union territories.

• The extensive redevelopment project, estimated to cost more than RS 24,470 crores, aims to transform railway stations into modern, well-equipped hubs.

What is the Amrit Bharat Stations Scheme?

- The Amrit Bharat Station Scheme aims to redevelop 1309 stations nationwide.
- The redevelopment will provide modern passenger amenities along with ensuring well-designed traffic circulation, inter-modal integration, and signage for the guidance of passengers.
- The Scheme was launched in February 2023 by the Ministry of Railways.

What is the Amrit Bharat Stations Scheme?

- Station-wise Plans: The station buildings' designs will be inspired by local culture, heritage, and architecture. For instance, the Jaipur Railway Station will feature elements resembling the Hawa Mahal and Amer Fort from Rajasthan.
- Integrated Approach to Urban Development: The redevelopment is planned with a holistic approach to urban development, treating the stations as "City Centres." This approach aims to integrate both sides of the city and create well-designed traffic circulation, inter-modal connectivity, and clear signage for passengers' guidance.

Benefits of Amrit Bharat Stations Scheme?

- Passenger Amenities: The redeveloped stations will feature modern passenger amenities, including upgraded waiting rooms, improved seating on platforms, and free Wi-Fi connectivity.
- Local Involvement: The redevelopment plans also incorporate the local community's input, aiming to represent the essence of the region in the station's design and amenities.
- Green Energy and Emission Reduction: LED lights will be installed in around 70,000 coaches and the substantial increase in the number of bio-toilets in trains, contributing to environmental sustainability.
- Net Zero Emissions Goal: There is an ambitious goal for India's railway network, aiming for Net-Zero Emissions by 2030. The emphasis on green building standards and energy-efficient practices aligns with the broader vision of environmental sustainability.

Indian Railways Facts

- Mascot: The Indian Railways boasts its own mascot, a 'Shubhankar named 'Bholu,' created by the National Institute of Design in 2002. Bholu is an elephant dressed as a railway guard, introduced on the railways' 150th anniversary.
- World's 4th Largest Rail Network
- UNESCO World Heritage Sites: The Indian Railways has four UNESCO-recognized world heritage sites Darjeeling Himalayan Railway, Chhatrapati Shivaji Terminus in Mumbai, Nilgiri Mountain Railway, and Kalka Shimla Railway.
- World's Highest Rail Bridge: India is home to the Chenab Rail Bridge, the world's highest railway bridge, located in Dharot, Jammu, and Kashmir.



12. UDAN Scheme

Syllabus: GS-3; Infrastructure, airports

Mains: Analysis of UDAN Scheme

Context: Out of the 479 airport routes that were revived by the Union Government, under the Regional Connectivity Scheme, 225 have ceased operations.

About UDAN:

- UDAN (Ude Desh Ka Aam Naagrik) is a regional connectivity scheme launched by the Government of India, as a part of the National Civil Aviation Policy in 2016.
- UDAN, which will be in operation for a period of 10 years (2016-26), envisages providing connectivity to un-served and underserved airports through revival of existing airports and air strips.

Objectives

- The objective of the scheme is to take flying to the masses by improving air connectivity for tier-2 and tier-3 cities, and subsidising air travel on these routes.
- The routes are awarded after a bidding process, and the winning airlines are given certain incentives, along with viability gap funding (or a subsidy) equivalent to 50% of the seating capacity on their aircraft.
- In return, the airlines sell 50% of their seats at a flat rate of Rs 2,500 per hour of flight, in order to make air travel affordable.

Funding Pattern

- Concession by Central Government, State Governments/UTs and airport operators to reduce the cost of operations on regional routes
- Financial Viability Gap Funding (VGF) supports to meet the gap, if any, between the cost of airline operations and expected revenues on such routes.
- VGF will be shared between the Ministry of Civil Aviation and the State Government in the ratio of 80:20 whereas for the States in the North-Eastern region/UTs the ratio will be 90:10.

Performance of UDAN Scheme

- UDAN 1.0: 5 airlines companies were awarded 128 flight routes to 70 airports.
- UDAN 2.0: In Phase 2, helipads were also connected.
 - In this phase, Central government awarded contracts to 15 airliners to operate in 325 routes across hilly, remote areas. It involved connecting 56 new airports and helipads to 36 existing aerodromes, as per the Ministry of Civil Aviation.
 - It involved connecting 56 new airports and helipads to 36 existing aerodromes, as per the Ministry of Civil Aviation.
- UDAN 3.0: Inclusion of Tourism Routes under Phase 3 in coordination with the Ministry of Tourism.
 - Inclusion of Seaplanes for connecting Water Aerodromes.
 - Bringing in a number of routes in the North-East Region under the ambit of UDAN.
- UDAN 4.0: Phase 4 of the scheme was launched in December 2019 with a special focus on North-Eastern Regions, Hilly States, and Islands.
- UDAN 4.1: Launched in March 2021, the UDAN 4.1 round is focused on connecting smaller airports, along with special helicopter and seaplane routes.
 - o In addition to these, some new routes have been proposed under the Sagaramala Seaplane Services in consultation with the Ministry of Ports, Shipping, and Waterways.
- UDAN 5.0: Launched in April 2023, the UDAN 5.0 round is focused on Category-2 (20-80 seats) and Category-3 (>80 seats) aircrafts.
 - o There is no restriction on the distance between the origin and the destination of the flight.
 - Airlines would be required to commence operations within 4 months of the award of the route; earlier this deadline was 6 months.

The Performance

- Of the 225 routes that have ceased operations, 128 routes shut down even before completing the mandatory three-year period under the scheme. Airlines found 70 of these routes to be commercially unviable despite the subsidy, while the remaining 58 have been cancelled either due to "non-compliance" by the airline operator, or the airline surrendering routes, or the airline companies shutting down, as in the case of Air Deccan and Air Odisha.
- As many as 97 routes shut down after completing the three-year period during which the government provides support. The objective of the scheme was that after the three-year period, airlines would be able to sustain operations on their own without government support, but out of the 155 routes that have completed three years, only 58 have survived.
- SpiceJet, which bagged 74 routes or every one in five routes awarded to airlines under the scheme now flies
 on only 20 of them, forcing the AAI to send it multiple show-cause notices, warning that its security deposit would be
 forfeited.



13. Recalibrating India's clean-cooking strategy

Syllabus: GS-3; Energy, Ports, Roads, Airports, Railways, etc.

Mains: LPG Reports, challenges and India's clean-cooking strategy

Background

- The Government of India has made an effort over the past 15 years to mimic the success that the adoption of liquefied
 petroleum gas (LPG) has achieved in urban families, in poorer and rural households.
- In 2009, the Grameen Vitrak Yojana was introduced. From 18% to 60% of the entire LPG distributor base today, the rural distributor base has increased as a result.
- Since 2016, the ambitious Pradhan Mantri Ujjwala Yojana (PMUY) has connected over 9.5 crore new households to LPG.

Challenges

- There are challenges with home delivery and distribution channels, and more funding will be required for subsidies to persuade the underprivileged to use LPG and benefit from its health advantages.
- India's increasing reliance on imported LPG—which reached over 64% in FY23—presents another difficulty.
- In nominal terms, LPG costs for Indian households have nearly doubled since May 2020.
- There are unpredictable worldwide pricing, especially since Russia's war against Ukraine, and a local budget that is heavily reliant on petroleum revenue.
- Due to the high power requirements of the current technology, there are also valid worries regarding the power distribution grid in rural India and its capacity to sustain all-electric cooking.

India's Clean-Cooking Strategy

Diversity in Clean Cooking

- India's clean cooking strategy needs to actively change from an LPG-only approach to the adoption of a variety
 of clean cooking technologies.
- Rural households can switch to electricity for specialised cooking needs if they have access to power hookups at nearly 100% of their homes.
- Nearly 10% of households in urban areas now utilise electrical appliances for cooking, and this can serve as a catalyst for a larger transformation that we want to see in rural areas.

E-cooking Technologies

- One potential strategy for encouraging the change to e-cooking is to telescopically raise LPG costs above a certain level.
- This might replace LPG in higher-use groups, spur the development of new e-cooking models and technologies, and cause a bandwagon effect.
- The domestic manufacturing ecosystem for e-cooking technology can then be stimulated by demand from these early adopters, helping to stop this unchecked reliance on imported LPG and petroleum.

Monetise Carbon Market

- India may actually make money off of avoided emissions thanks to the recently established carbon market and contribute to funding the e-cooking adoption of disadvantaged rural populations.
- The discussion needs to shift from LPG subsidies alone to funding and commercial models that value India's transition to clean cooking for its advantages to the environment and clean air.

Conclusion

After years of consistent rise, LPG use in Indian homes for the first time fell in absolute terms in FY23. Even the potential of the widespread use of LPG in Indian households in the near future has been damaged by the worldwide events that have taken place since the COVID-19 outbreak.

Nut Graf: Due to the benefits to the environment, the discussion needs to shift from LPG subsidies alone to financing and business models that value a clean cooking transition.

14. India passes law allowing private firms to bid for and mine lithium

Syllabus: GS 3- Economy

Prelims: Recent policy changes in the mining sector.

Introduction

• India's Parliament recently passed a law that grants the government the authority to auction and mine its newly discovered reserves of lithium and other minerals. This move aims to boost the mining of critical inputs used in electric vehicle (EV) batteries.



Removal of Lithium and Other Minerals from Atomic Minerals List

- The law removes lithium and other minerals from a previous list of atomic minerals.
- The removal allows private companies to participate in the exploration and mining of these minerals.
- The government stated that this change is expected to significantly increase exploration and mining activities in the country.

Impact on Lithium Reserves

- Earlier this year, significant lithium reserves were discovered in Jammu and Kashmir.
- The government plans to continue searching for more reserves later in the year.

Inclusion of Other Minerals for Mining and Auction

- The law not only applies to lithium but also includes other minerals like titanium, beryl, niobium, and zirconium.
- Previously, only state-run companies were allowed to mine these minerals, leading to limited production.
- The involvement of private firms is seen as a potential 'force multiplier' for increased mining activities.

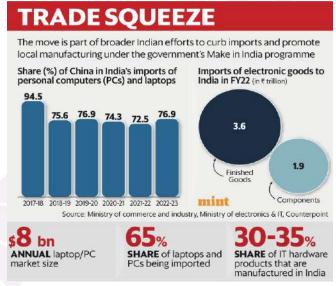
15. Govt. imposes curbs on import of laptops and tablets

Syllabus: GS 3- Economy

Prelims: Import restriction of goods and services and its impact.

New Import Restrictions

- The Indian government announced restrictions on the import of laptops, tablets, and all-in-one and small-factor personal computers (PCs).
- Licences will now be required for these products to be brought into the country and sold to consumers.
- The move is expected to have a significant impact on laptop availability, especially for brands that rely on assembly abroad, such as Dell, HP, Lenovo, and Apple.
- Longer wait times for individual products to clear import and sale formalities in India may result from this notification.



Source: Mint

Exemption for Travellers and Specific Cases

- The restriction on imports will not apply to products brought under the Baggage Rules.
- This means that travellers may still bring one laptop, tablet, or PC back from overseas without facing penalties.
- Online purchases of laptops from foreign websites are still allowed, but individual buyers may incur import duties and shipping fees, making it more expensive.
- Devices imported for research and development purposes and those repaired abroad are exempt from these import restrictions.

Impact on Pricing and Responses

• Electronic goods like laptops are generally sold below the maximum retail price (MRP), allowing manufacturers to adjust prices quickly as needed.

Why it is a bad idea

- The imports of PCs, laptops etc account for just a fraction of total imports
- It will dent the image of India
- Is government returning to license raj?
- It might be indicating underperformance of the govt schemes



- May attract the complaints from other member countries
- The process, timing required for issuing licenses

16. The grammar of commerce in a new age of geopolitics

Syllabus: Indian Economy and issues relating to planning, mobilisation of resources, growth, development and employment.

Mains: Impact of changing geopolitical scenarios on economic activities and global trade relations; Implications of currency choices in international trade.

Prelims: About Vostro account, Internationalisation of rupee

Context: The use of the Indian rupee for international transactions shifted due to the Ukraine-Russia war and sanctions. Russia and India settled trade payments in rupees amidst concerns over surpluses and currency stability.

Introduction

- India's status as a favoured trading partner with substantial market potential has been evident since March 2018.
- A shift in the use of the Indian rupee for international transactions has emerged due to geopolitical events.

Utilising Rupee for International Payments

- The Ukraine-Russia war and subsequent sanctions on Russia by the US and EU led to a change in international payment methods.
- India and Russia chose to settle trade payments in Indian rupees to navigate the sanctions.

Payment Modalities

- Payments from India or Russia are directed to Rupee Vostro accounts in Russian banks, managed by authorised Indian banks.
- Indian importers pay rupees to the Vostro account based on invoices from Russian suppliers.
- The arrangement covers items like mineral fuels, crude oil, and defence systems.

Challenges with Surpluses

- Despite the arrangement, Russia maintained a trade surplus with India, causing concerns about the stability of the Indian rupee.
- Russia hesitated to accumulate more rupees due to the currency's position in the global hierarchy and potential depreciation.

Payment Alternatives

- To address payment difficulties, Indian refiners began settling payments for Russian oil using the Chinese yuan, acceptable to Russia.
- Russia accepts yuan payments due to its oil transactions with China.

Historical Context

- Similar bilateral trade and clearing arrangements were used by India in the 1950s, notably with the former Soviet Union.
- Bilateral trade agreements used rupees for handling trade and credit-related transactions.

Geopolitical and Geoeconomic Shifts

- Current local currency settlements align with a trend of avoiding reliance on the hegemonic currencies of advanced economies.
- Agreements like the recent rupee-dirham pact between India and the UAE aim to avoid exchange risks and promote
 efficient transactions.

Prospects of New Financial Architecture

- The use of local currencies among South countries could lead to a new financial architecture.
- Institutions like the IMF, World Bank, and private capital might play a reduced role in these transactions.

Balancing Geoeconomics and Geopolitics

- Potential political and currency-related issues may arise, especially with China's role.
- However, geoeconomics might outweigh geopolitics in this evolving landscape.

Nut Graf: Amidst geopolitical changes, India and Russia turned to settling trade payments in Indian rupees, navigating the effects of the Ukraine-Russia war and resulting sanctions. This shift reflects a broader trend of local currency settlements and a potential shift in the global financial architecture.



17. Consumption-based poverty estimates have relevance

Syllabus: Indian Economy and issues relating to planning, mobilisation of resources, growth, development and employment.

Mains: Significance and methodology of consumption-based poverty estimates

Prelims: About poverty estimates

Context:

The article discusses India's declining poverty rates based on multidimensional and consumption-based measures. It delves into challenges, critiques of multidimensional indices, and the need for reliable data for accurate poverty assessment

Introduction

- NITI Aayog report reveals a decline in India's poverty rate from 25% (2015-16) to 15% (2019-21).
- UNDP-OPHI Global Multidimensional Poverty Index report indicates a drop in multidimensional poverty from 27.5% (2015-16) to 16.2% (2019-21).
- The relevance of consumption-based poverty estimates in light of multidimensional poverty analysis is to be noted.

Comparison of Poverty Estimates

- Global MPI 2018 report commends India's significant reduction in multidimensional poverty over a decade.
- The Tendulkar Committee methodology shows a decrease of 137 million in poor population between 2004-05 and 2011-12
- Rangarajan Committee methodology highlights a decline of 92 million poor individuals per annum between 2009-10 and 2011-12.
- Tendulkar and Rangarajan methodologies exhibit lower poverty ratios compared to global MPI estimates.

Challenges with Multidimensional Poverty Measures

- Non-income dimensions of poverty may not be directly linked to consumption-based poverty lines.
- Multiple indicators pose problems of measurability, aggregation, and data availability.
- Aggregation challenges arise from the non-commensurability of indicators, such as child mortality and safe drinking water.
- Analytically appropriate aggregation rules require data to relate to the same household, which presents data constraints.

Experts' Views on Multidimensional Indices

- Srinivasan suggests including public services as a dimension of poverty but is critical of multidimensional indices.
- Deaton and Drèze emphasize supplementing expenditure-based poverty estimates with indicators related to nutrition, health, education, and environment.

Relevance of Income and Consumption-based Poverty Measures

- Income and consumption define poverty, with various non-income indicators reflecting inadequate income.
- Official data on consumer expenditure post-2011-12 is unavailable; comparison with the multidimensional poverty index is challenging.
- There are different conclusions from studies using indirect methods and data from CMIE and PLFS sources.

Importance of Consumption Expenditure Surveys and Data Changes

- Current consumption expenditure survey is essential for accurate comparison.
- Poverty reduction is strongly associated with high growth periods; the reduction rate may have slowed in recent years.
- Differences in aggregate consumption estimates between NSS and NAS data sources; widening gap over time.
- The National Statistical Office is urged to study discrepancies and suggest data collection improvements.
- Need to analyse the impact of public expenditure on health and education across different expenditure classes.

Nut Graf: Amidst India's reduced poverty rates, a NITI Aayog report highlights a decline from 25% (2015-16) to 15% (2019-21), while a UNDP-OPHI report notes a shift from 27.5% to 16.2%. This analysis explores the intricacies of these metrics, challenges with multidimensional poverty measures, and views on indices, and emphasizes the significance of consumption-based measures and reliable data collection.



18. What is RBI's new pilot for frictionless credit?

Syllabus: Indian Economy and issues relating to planning, mobilisation of resources, growth, development and employment.

Mains: Economic and Financial Policies, Banking Reforms, Technological Interventions.

Prelims: About Public Tech Platform for Frictionless Credit

Context:

The Reserve Bank of India (RBI) has initiated a pilot program for its 'Public Tech Platform for Frictionless Credit.' The platform aims to streamline the process of delivering digital credit and loans, eliminating hurdles in the flow of essential digital information to lenders. It addresses challenges associated with the credit appraisal process, which is crucial for loan disbursement.

Introduction: RBI's Pilot Programme for Frictionless Credit Platform

- RBI initiated a pilot programme on August 17 to explore the feasibility of the 'Public Tech Platform for Frictionless Credit'
- The platform aims to enhance the seamless flow of digital information to lenders, facilitating frictionless credit delivery.

Purpose and Functionality of the Platform: Improving Digital Credit Delivery

- Credit appraisal process involves assessing borrowers' repayment ability and adherence to credit agreements before loan disbursal.
- Data required for this process is scattered among various entities like governments, banks, credit information companies, etc., causing hindrances in timely lending.
- The proposed platform consolidates all necessary data in a single place to enable smooth rule-based lending.

Pilot Project on Digitalization of KCC Loans: Doorstep Disbursement

- RBI's earlier pilot project focused on digitizing Kisan Credit Card (KCC) loans of less than ₹1.6 lakh, aiming for paperless and hassle-free lending.
- Currently ongoing in select districts of five states, enabling doorstep disbursement without paperwork.

Expansion of Scope: Public Platform for All Types of Digital Loans

- The RBI's public platform expands the concept based on the ongoing projects.
- Developed by RBI's subsidiary, Reserve Bank Innovation Hub (RBIH), the platform features open architecture and APIs for seamless connection of financial sector players.
- Participating banks will extend the platform to include dairy loans, collateral-free MSME loans, personal loans, and home loans.

Incorporating Various Data Sources: Comprehensive Loan Assessment

- The platform integrates Aadhar e-KYC, e-signing, land records, satellite data, PAN validation, transliteration, account aggregation, and more.
- It covers aspects essential for farming operations and financial profiles, minimizing risk assessment.

Benefits and Implications: Promoting Inclusive and Efficient Credit

- Enhanced access to information leads to fact-based and swift credit assessments.
- Facilitates credit extension to a broader range of borrowers with good credit history.
- Reduces borrowers' capital access costs, translating into productive investment spending.
- Streamlines lending processes, reducing costs, and enabling quicker disbursement and scalability.

Conclusion: Transforming Lending with Frictionless Credit Platform

RBI's Public Tech Platform for Frictionless Credit aims to revolutionise lending through consolidated data and seamless
connectivity, fostering financial inclusion and efficiency.

Nut Graf: The RBI's pilot program introduces the 'Public Tech Platform for Frictionless Credit,' aiming to streamline digital credit delivery by integrating data from various entities. The platform reduces costs, expedites disbursement, and promotes data-driven lending.



19. On Smartphone Manufacturing in India

Syllabus: GS-3, Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

Mains: Smartphone Manufacturing in India and PLI Scheme

Context

A recent argument between the Minister of State for Electronics and the former RBI governor concerned the success of a government initiative to increase the production of electronics.

What is the PLI scheme?

- The Indian government made the decision that it wanted more businesses to produce goods in India.
- Manufacturing has a multiplier impact, which economists refer to as having a positive cascading effect on other economic sectors, which is a crucial component of economic growth.
- Manufacturing of smartphones is the sector that has expressed the highest interest in the PLI programme.
- Thus, through the production-linked incentives (PLI) scheme, it has established a crucial set of incentives.

Concerns

- India's infrastructure isn't great, the country's labour laws are archaic, and the workforce isn't very skilled.
- The problem was that many industries didn't want to set up shop in the country.
- Instead, the government is using tax dollars to build a system of low-paying assembly employment that will continue to be mostly dependent on imports.
- It is wrongly assumed that all imports of screens, batteries, etc. are used to make mobile phones.
- It is also argued that not all mobile phone production in India is supported by the PLI scheme, only around 22% so far.

Measures Being Taken

- The government has utilized and continues to adopt a carrot-and-stick strategy to address the problems with electronics manufacturing.
 - The 'carrot' is to offer financial aid and rewards. The production-linked incentives (PLI) scheme is a crucial set of incentives
 - Raising import taxes is the "stick," making it more expensive for businesses to buy goods from outside and sell them in India.
- The local government provides funding to domestic and international businesses that produce goods here.
- The annual payout is determined by a proportion of the profits made over a five-year period.
- This is crucial since low-level assembly work does not create well-paying jobs and does not have the same multiplier effect as possible from manufacturing.

Conclusion

The Minister believes it will take some time before the project's results become apparent. On the other hand, Mr. Rajan, former RBI Governor, feels that there is a missed opportunity if PLI is not successful. Every rupee spent on PLI payments, after all, is money that could have been invested to benefit the Indian economy, for example, by enhancing the educational system. The main disagreement centres on whether the PLI plan would be able to establish India as a manufacturing and supply hub that adds value to the production process and produces long-lasting jobs.

Nut Graf: Recent disagreement between the Electronics Minister and a former RBI Governor has brought to the fore the concerns associated with the PLI scheme in making India's manufacturing sector more growth-oriented and jobgenerating.

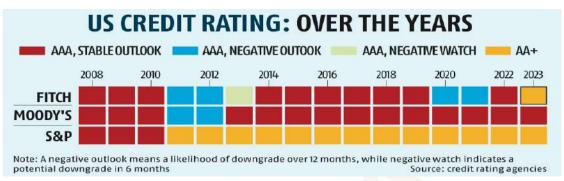
20. Fitch downgrades US sovereign credit rating

Syllabus: GS-3, Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

Prelims: Sovereign credit rating

Context: Global credit ratings agency Fitch has downgraded the credit rating for the United States to AA+ from AAA, its highest possible rating. This is the second time that the US has lost its AAA rating after Standard & Poor's did so in 2011. Fitch cited fiscal deterioration, repeated debt ceiling standoffs and erosion of confidence in fiscal management as the reasons for the downgrade.

	Standard & Poor's*	Moody's	Fitch*
Best quality companies	AAA	Aaa	AAA
Higher risk than AAA	AA	Aa1, Aa2, Aa3	AA
Economic situation can effect finance	Α	A1, A2, A3	А
Medium class which are presently okay	BBB	Baa1, Baa2, Baa3	BBB
Non-investment grade - Speculative or junk bond	BB B CCC CC C D	Ba1, Ba2, Ba3 B1, B2, B3 Caa1, Caa2, Caa3 Ca C	BB CCC CC CC



Source: Credit rating agencies

What is the background of this downgrade?

- The US government has been facing a debt ceiling crisis since May when it reached its legal borrowing limit of \$31.4 trillion. The debt ceiling is a statutory limit on how much the federal government can borrow to finance its spending. If the debt ceiling is not raised or suspended, the government risks defaulting on its obligations, which could trigger a financial crisis and damage the global economy.
- The US Congress and President reached a bipartisan agreement in June to suspend the debt ceiling until January 2025, averting a default. However, Fitch said that this agreement was not enough to restore confidence in the US fiscal management, as it did not address the underlying fiscal challenges and political polarization that have led to repeated debt ceiling crises.

How will this impact India and other markets?

- Higher borrowing costs: A lower credit rating means that investors may demand higher interest rates to lend to the
 US government, which could increase its borrowing costs and widen its fiscal deficit. This could also affect other
 countries that borrow in US dollars or have their currencies pegged to the dollar, as they may face higher financing
 costs and exchange rate pressures.
- Lower confidence: A lower credit rating could also undermine confidence in the US economy and its role as a global leader and reserve currency issuer. This could reduce foreign investment and trade flows to the US and affect its growth prospects. This could also have spillover effects on other countries that depend on the US market or have strong economic ties with it, such as India.
- Higher volatility: A lower credit rating could also increase volatility in global financial markets, as investors may seek safer assets or diversify their portfolios away from US assets. This could create fluctuations in stock prices, bond yields, currency rates and commodity prices, affecting the stability and performance of various markets.

What steps has India can take to mitigate the impact?

- Building foreign exchange reserves, which provide a buffer against external shocks and exchange rate volatility.
 India's reserves cover more than 18 months of imports and are equivalent to 118% of its external debt.
- India has to strengthen its macroeconomic fundamentals by reducing its fiscal deficit, current account deficit, inflation and public debt ratios.
- India has implemented various measures to enhance its economic recovery from the Covid-19 pandemic, such as providing fiscal stimulus, monetary easing, liquidity support, structural reforms and a vaccination drive.



Sovereign Credit Rating

HOW THEY VIEW INDIA

Rating/outlook

Fitch BBB-/stable

S&P BBB-/stable

Moody's Baa3/stable

(All ratings lowest investment grade)

Source: Financial Express

What are the challenges and way forward for India?

- Managing capital flows: India needs to manage capital flows carefully, as it may face both inflows and outflows
 depending on global risk appetite and domestic factors. Inflows may increase if investors seek higher returns in
 emerging markets like India, while outflows may increase if investors seek safer assets or reduce their exposure to
 US assets. India needs to balance the benefits and costs of capital flows, such as growth, inflation, exchange rate and
 financial stability.
- Diversifying trade and investment partners: India needs to diversify its trade and investment partners, as it may face lower demand and competition from the US market. India also needs to explore new opportunities in other markets, such as the European Union, the United Kingdom, Japan, Australia and the Association of Southeast Asian Nations (ASEAN).
- India needs to enhance its trade and investment agreements, such as the Regional Comprehensive Economic Partnership (RCEP), the Comprehensive Economic Cooperation Agreement (CECA) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).
- Pursuing fiscal consolidation: India needs to pursue fiscal consolidation, as it may face higher borrowing costs and
 lower confidence due to the US credit rating downgrade. India needs to reduce its fiscal deficit and public debt
 ratios while maintaining adequate spending on health, education, infrastructure and social protection. India needs to
 improve its revenue mobilization, expenditure efficiency and fiscal transparency.

Conclusion: The US credit rating downgrade is a significant event that could have far-reaching consequences for the global economy and financial markets. India has taken several steps to mitigate the impact of the downgrade, but it also faces several challenges and opportunities in the future. India needs to adopt a prudent and proactive approach to deal with the changing global scenario and enhance its resilience and growth potential.

21. Corporate Debt Market Development Fund (CDMDF)

Syllabus: GS-3, Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

Prelims: Corporate Debt Market Development Fund (CDMDF)

Context: The Corporate Debt Market Development Fund (CDMDF) was launched by the Union Minister of Finance and Corporate Affairs. The initiatives aim to enhance the efficiency and liquidity of the corporate debt markets.

Details

- The Corporate Debt Market Development Fund (CDMDF) is a new initiative by the Government of India to boost liquidity and confidence in the corporate bond market.
- It was announced by the Union Finance and Corporate Affairs Minister in the Union Budget of 2021-22 as a permanent institutional framework to support the secondary market for corporate bonds in both normal and stressed situations.

Features

- Will purchase investment grade debt securities
- With a maturity period of up to 5 years
- Will provide 90% in the form of cash and remaining in the form of CDMDF units
- Will serve the MFs (Mutual Funds) during the times of market stress and not targeted at single MF company

Benefits

- Will provide liquidity to the MFs during the period of stress
- Will develop the market for the corporate debt securities
- Will promote investor confidence in the debt market



22. Semiconductor manufacturing in India

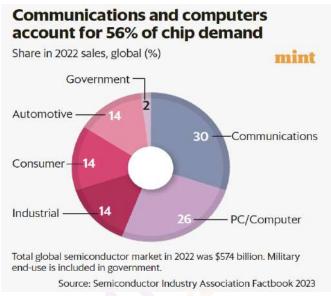
Syllabus: GS-3, Indian Economy and manufacturing

Mains: Semiconductor manufacturing in India challenges

Situation in India

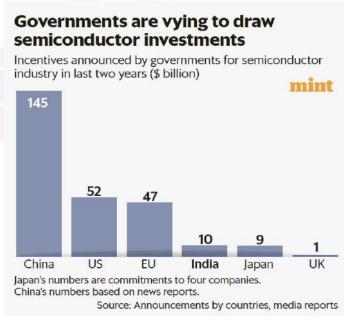
- India does not have high volume chip manufacturing units
- The demand is met through imports
- The demand for the products using chips has been rising
- India has highly skilled labour pool of semiconductor designer engineers who make up about 20% of the global workforce

Uses of semiconductors



Source: Mint

Promotion of semiconductor manufacturing



Source: Mint

Benefits

- Attract investment
- Employment generation
- Import dependence will come down
- Will help in promotion of self-reliance
- The demand for products (requiring the semiconductors) will keep rising



Concerns/Issues

- It is capital intensive and not labour intensive
- Setting up units involves long gestation period and returns are not immediate
- It takes up to 2 to 3 years before the 1st product is out and chip designing requires higher investment
- As chipsets become smaller and functional requirements from them change, the R&D become challenging
- Supply chain disruptions can dampen potential investor confidence
- Large producers have already invested in USA

23. Implementing a car safety programme

Syllabus: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

Mains: Road and Vehicle Safety

Context: The Ministry of Road Transport and Highways introduced the Bharat New Car Assessment Programme (NCAP), a voluntary star-based system, effective October 1, 2023, to rate car safety through crash tests.

About Bharat NCAP(New Car Assessment Programme):

- Testing Criteria: Under this program, car manufacturers can voluntarily nominate vehicles to undergo crash testing based on protocols outlined in the forthcoming Automotive Industry Standard 197.
- Scope: The program applies to passenger vehicles with up to eight seats (including the driver's seat) and a gross vehicle weight not exceeding 3,500 kg. Only the base model of each variant will be tested.
- Rating System: Cars will be assigned a safety rating of one to five stars based on three parameters: adult occupant protection, child occupant protection, and the presence of safety assist technologies in the vehicle.
- Testing Procedures: The safety evaluation involves three main types of tests:
 - Frontal Offset Test: The car is driven at 64 km/h with 40% overlap into a deformable barrier simulating a collision with a car of similar weight.
 - **Side Impact Test:** The car is impacted sideways at 50 km/h.
 - Pole-Side Impact Test: The car is crashed into a rigid pole sideways at 29 km/h.
- Mandatory Testing: While the program is voluntary, certain scenarios may require mandatory testing, such as for
 popular variants (with at least 30,000 units sold) or if recommended by the Ministry of Road Transport and Highways
 based on market feedback or safety concerns.
- **Consumer Empowerment:** The main goal of Bharat NCAP is to enable consumers to make informed decisions when purchasing cars, thereby increasing the demand for safer vehicles.

Evolution of Bharat NCAP:

- Global Influence: The Bharat NCAP's testing protocols are modeled after the Global NCAP, an initiative by the UK-based NGO, Towards Zero Foundation.
- Safer Cars for India Campaign: In 2014, Towards Zero Foundation launched a campaign for safer cars in India, conducting independent crash tests on models like the Suzuki-Maruti Alto 800, Tata Nano, Ford Figo, Hyundai i10, and Volkswagen Polo. Most models scored poorly, highlighting the need for safety improvements.
- Improvement Efforts: Over time, there has been a significant shift towards safer vehicles in India. Manufacturers have strived to achieve four and five-star safety ratings, resulting in a reduction in the number of zero-star models in the Indian market.
- Regulatory Measures: The introduction of safety regulations such as mandatory dual front airbags, anti-lock braking systems, seatbelt reminders, and reverse parking sensors has contributed to enhancing road safety.

Way Forward:

- Enhancing Testing Capabilities: India needs to develop advanced crash testing capabilities, including software systems connected to dummies within vehicles to accurately assess the nature and extent of injuries sustained during collisions.
- Global Alignment: Over time, the Bharat NCAP should align with international standards by expanding testing
 parameters. For instance, the US NCAP includes a roll-over test to assess a vehicle's risk of tipping over in severe
 manoeuvres.
- Incorporating Comprehensive Safety Measures: To truly enhance road safety, Bharat NCAP could incorporate a broader range of safety evaluations, such as electric shock protection, neck injury protection, pedestrian protection technologies, and preventive safety systems like autonomous emergency braking and lane departure prevention.
- **Continuous Improvement:** The program should encourage continuous improvement in vehicle safety standards, with the aim of minimizing road fatalities and making road travel safer for all.

Nut Graf: The Bharat New Car Assessment Programme (NCAP), launched by the Ministry of Road Transport and Highways, is a voluntary initiative assigning one to five stars based on crash test performance. Starting from October 1, 2023, this system aims to enhance car safety awareness and encourage safer vehicle choices among consumers.



24. Cleantech, for an inclusive green future in India

Syllabus: Clean Technology in the aid of farmers

Prelims: Pradhan Mantri MUDRA Yojana, Pradhan Mantri Formalisation of Micro food processing Enterprises (PMFME) scheme, Agriculture Infrastructure Fund

Mains: Cleantech in Agriculture, India's Climate Change Adaptation, Rural Employment creation, Doubling Farmer Incomes

Context:

- Prime Minister Modi has discussed India's efforts to combat climate change in his Independence Day address.
- This has shown that climate action can be sustainable if it aligns with the development aspirations and contributes to
 economic growth. For example, infrastructure such as solar parks and EV charging stations can help combat climate
 change while also aiding growth.
- The challenge lies in integrating this green economy paradigm into broader development goals, such as providing job opportunities for youth, income opportunities for women, and diversifying farmers' incomes.

Case Studies on adoption of Green tech in rural areas

- Examples of successful cleantech solutions include solar dryers for tomato preservation in Andhra Pradesh, biomasspowered cold storage for farmers in Maharashtra (has helped make profits three to five times that of the original price) and solar silk reeling machines in Odisha.
- The rural economy in India faces challenges including unreliable electricity access and reliance on expensive diesel, which clean technology solutions powered by renewable energy could help address.
- According to research by CEEW, 12 specific cleantech solutions such as solar pumps, cold storages have the potential
 to impact 37 million livelihoods or 16% of the rural population.
- Despite these successes, there is still a need for a "structural boost" to fully realize the potential of clean technology in rural India.

Three-fold approach to scaling up the adoption of cleantech solutions in rural areas:

- 1. Leveraging existing government programs that support livelihoods, such as the Pradhan Mantri MUDRA Yojana and the Pradhan Mantri Formalisation of Micro food processing Enterprises (PMFME) scheme, to provide collateral-free loans and support for the adoption of cleantech solutions. Agriculture Infrastructure Fund which has only 15% fund utilization can also support the expansion of biomass powered cold storage.
- 2. Enabling large-scale financing of cleantech solutions by building capacities of bankers to assess creditworthiness, providing partial guarantees to mitigate risks, and structuring loan products to suit the needs of self help groups, farmers etc. For example, 'Powering Livelihoods' initiative has helped with 300 plus loans for cleantech solutions to women, self help groups and farmers by adopting the above principles.
- 3. Creating partnerships between technology innovators, manufacturers, distributors, service providers, financiers, and market-linkage players to build an overall ecosystem that enables access to technology, after-sales service, and market connectivity for rural entrepreneurs.

Conclusion:

By focusing on cleantech for livelihoods and jobs, especially in rural areas, India can make its green future inclusive and achieve its development goals.

Nut Graf: India is adopting clean technology solutions in rural areas to address climate change and create jobs. A three-fold approach to scaling up the adoption of these cleantech solutions will make the development trajectory of India green and inclusive

25. Gig Workers Bill: reading between the lines

Syllabus: Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

Mains: Critical analysis of Gig Workers Bill

Context

The Rajasthan Platform-Based Gig Workers (Registration and Welfare) Bill, 2023, is a first of its type that was introduced by the Rajasthan government.

Concerns over the Bill

Ambiguity of definition:

- o The Bill's definitions of a gig worker and an aggregator give rise to the first problem.
- A "person who performs work or participates in a work arrangement and earns from such activities outside of traditional employer-employee relationships and who works on a contract that results in a given rate of payment" is defined as a "gig worker" in the bill.
- These definitions do not recognise the aggregator as an employer in a way that is obvious or legally binding.
- This deficiency is significant because the aggregator would therefore see gig workers as independent contractors or self-employed rather than as employees.



Issues with regard to Gig Worker:

- A contentious topic across the world has been whether a gig worker or an aggregator may be regarded as an employer or employee, respectively.
- In reality, the ABC Test's central question is whether a gig worker may be classified as an employee rather than an independent contractor.
 - The ABC Test was created in response to a lawsuit involving delivery drivers for Dynamex, a same-day delivery firm, and is now included into California's labor legislation.
- Instead, the Rajasthan Bill uses ambiguous terminology that might lead to divergent interpretations. This is not
 only against international best practices, but it also raises the second, equally important problem.

Issues with gig workers's Database

- The Bill intends to establish a database of gig workers, with the information of all employees onboarded or registered with a platform being transmitted to the proposed gig workers' welfare board.
- The board's database cannot survive 'the duration or time of involvement with app-based platforms'. In other words, whether the workers remain on the platform or not, their registration is 'perpetuity'.
- This progressive aspect might unintentionally act as a barrier. On any one day, a person frequently works for two
 or more aggregators. There is no safeguard against this in the Bill.

Concerns with Social security provisions

- At its core, the bill seeks to ensure social security to gig workers employed by platforms by setting up a representative
 welfare board and a welfare fund. It includes eight key employers or aggregators within its purview.
- It neither identifies assistance programmes that might broadly be considered social security nor defines social security in a definitive manner.
- The welfare board is given the authority to "formulate and notify schemes for social security of registered platform-based gig workers and take such measures as it may deem fit for administering such schemes," leaving this key decision up to their judgment.

Other Limitations of the Bill

- The Bill's capacity to incorporate current labour regulations within its scope is constrained by its failure to define gig workers as employees.
- As a result, the aggregators will continue to be exempt from adhering to labour law requirements and to dodge their need to provide workplace benefits to gig employees.
- The responsibility for ensuring a worker's health and safety while at work or otherwise falls on "a person conducting a business or undertaking (PCBU)".

Conclusion

The 2023 Rajasthan Platform-Based Gig Workers (Registration and Welfare) Bill proposes to provide gig workers with social protection. Thus, due to these shortcomings, whether the Bill can deliver what it promises appears doubtful.

Nut Graf: Despite its good intent and noteworthy features, the Rajasthan Platform-Based Gig Workers (Registration and Welfare) Bill, 2023 appears wanting in important aspects.

26. Understanding curbs on rice exports

Syllabus: Transport and Marketing of Agricultural Produce and Issues and Related Constraints

Mains: Rationale and impact of curbs on rice exports

Context: The Indian government restricts white rice exports, imposes a 20% export duty on par-boiled rice, and allows premium Basmati rice exports, aiming to stabilize domestic prices and ensure food security.

Rationale for Government Imposing Extra Export Duty:

- **Domestic Price Control and Food Security:** The Indian government has taken measures to stabilize domestic rice prices and ensure food security.
- **Export Restrictions:** The export of white rice has been prohibited, and a 20% export duty is imposed on par-boiled rice until October 15.
- Basmati Rice Exception: Basmati rice exports are allowed only for contracts with a value of \$1,200 per tonne or higher.
- **Broken Rice Prohibition:** Since September of the previous year, the export of broken rice has been banned, except for countries with special government permission based on food security needs.

Impact on Domestic Consumer:

- Price Stability: The restrictions on rice exports are expected to prevent steep price increases in the domestic market.
- Minimum Support Price (MSP) Increase: The government has raised the MSP for rice, ensuring better prices for farmers.
- Long-term Availability: Although there's a slight price increase currently, the measures aim to secure long-term rice availability and prevent spiralling prices.
- Consumer Assurance: The measures are likely to provide consumers with a stable supply of rice without excessive price fluctuations.



Reaction of Exporters to this Decision:

- Competitive International Market: Despite the 20% export duty, Indian par-boiled rice remains competitively priced
 in the international market.
- Global Demand: Countries like Indonesia, which are rice exporters themselves, are now importing rice due to high international demand.
- **Exporter's Perspective:** Some exporters believe that the government should differentiate between common rice and specialty rice, suggesting that different export policies should be applied.
- Geographical Indication (GI) Recognition: Certain rice varieties with GI recognition should be exempted from general
 market interventions.
- Basmati Rice Export Concerns: Basmati rice exporters suggest that the government should have either allowed
 exports to continue or set a minimum export value of \$900 per tonne. They argue that such restrictions could
 negatively impact farmers and limit export demand for quality Indian rice.

The Extent of Rice Production and Export in India:

- **Production Decrease:** Rice production during the Rabi season 2022-2023 was 13.8% lower than the previous year, primarily at 158.95 lakh tonnes compared to 184.71 lakh tonnes.
- **Kharif Sowing Increase:** Rice sown during the Kharif season of the current year increased to 384.05 lakh hectares from 367.83 lakh hectares in the same period last year.
- Arrival Challenges: Delayed sowing in some regions due to a shortfall in the southwest monsoon might impact new season crop arrivals, with effects from El Nino also anticipated.
- Price Trends: Paddy prices have increased from ₹27 to ₹33 per kg over a year in Tamil Nadu, indicating potential price
 pressures.
- Export Performance: India holds a significant position as the world's largest rice exporter, commanding a 45% share in the global rice market.
- Export Growth: Rice exports in April-May 2023 were 21.1% higher than the same period in the previous financial year, including notable growth in Basmati and non-Basmati rice shipments.
- Continued Export Growth: Non-Basmati rice exports have been consistently rising for the past three years, and Basmati rice exports in 2022-2023 exceeded the previous year's levels.
- Recent Export Figures: Data until August 17 of the current year indicate a 15% increase in total rice exports (excluding broken rice) compared to the same period the previous year.
- Global Rice Market Dynamics: Other countries like Thailand, Myanmar, Iraq, and Iran are facing production challenges, potentially affecting global rice availability.

Nut Graf: In an effort to stabilize domestic rice prices and ensure food security, the Indian government has implemented measures including prohibiting white rice exports, imposing a 20% export duty on par-boiled rice, and permitting the export of high-value Basmati rice contracts. These actions aim to balance market dynamics while safeguarding consumer interests and farmer livelihoods.



INTERNATIONAL RELATIONS

1. ASEAN challenges

Syllabus: Effect of policies and politics of developed and developing countries on India's interests.

Mains: ASEAN challenges

Context: 56th Foreign Ministers Meeting (FMM) of the Association of Southeast Asian Nations (ASEAN) was held in Jakarta, Indonesia

ASEAN

- ASEAN is the Association of Southeast Asian Nations. ASEAN is a regional intergovernmental organization including ten countries in Southeast Asia, encouraging intergovernmental cooperation.
- ASEAN is an international organization that has 10 member countries in Southeast Asia: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.





Challenges to ASEAN

- Impact of the COVID-19 pandemic
- Economic slowdown
- Ukraine war
- Climate change
- Cold War-type confrontation between the United States and China
- Internal differences on issues like Myanmar's situation
- China's close relations with some ASEAN states hinder collective action on issues such as the South China Sea dispute.



ASEAN Outlook on the Indo-Pacific (AOIP):

- The AOIP was adopted in 2019 and it outlines ASEAN's vision for the Indo-Pacific region.
- The four key areas of cooperation under the AOIP are: Maritime cooperation, Connectivity, UN Sustainable Development Goals 2030, Economic cooperation
- It provides a platform for ASEAN to engage with other countries in the Indo-Pacific region and it can help to promote peace, stability, and prosperity in the region.

India's role in ASEAN

- Convergence between the AOIP and India's Indo-Pacific Oceans Initiative.
- Expanding cooperation in areas
- Cyber
- Financial
- Maritime security.

2. India-Myanmar-Thailand Trilateral Highway

Syllabus: Effect of policies and politics of developed and developing countries on India's interests.

Mains: India-Myanmar-Thailand relations

Context: India has once again stressed the need for early completion of the India-Myanmar-Thailand Trilateral Highway - and its extension to Cambodia - to boost connectivity in the region as part of India's Act East policy.

- India has also urged Cambodia to focus on repairing temples in the nation as well.
- India is involved in the restoration of Angkor Wat and Preah Vihear temples in Cambodia, which depict the cultural and linguistic connect between the two countries.





Source: Created with mapchart.net by Silvia Tieri

Source: Created with mapchart.net by Silvia Teri



India - Myanmar - Thailand Trilateral Highway

- The highway will span a distance of approximately 1,360 kilometers (845 miles), starting from Moreh in Manipur, India, and passing through Myanmar before reaching Mae Sot in Thailand.
- It was first proposed by former Prime Minister Atal Behari Vajpayee and was approved at a ministerial-level meeting between India, Myanmar and Thailand in April 2002.
- The construction of the India-Myanmar-Thailand Trilateral Highway began in 2012 and is being implemented in several phases.
- The India-Myanmar Friendship Road forms the first segment of the IMT Highway. It runs from the border at Tamu/ Moreh to Kalemyo and Kalewa.
- Implementing agencies: On the Indian side, the project is being implemented by the Ministry of External Affairs (MEA)
 with the cooperation of its counterparts in Myanmar and Thailand and budgetary allocation from the Ministry of
 Finance.

India's contribution

- India-Myanmar Friendship Road linking the border of Tamu/Moreh to Kalmeya and Kalewa is also a part of this project.
- India has undertaken the construction of two sections of the highway in Myanmar:
- The construction of the 74 km Kalewa-Yagyi road section.
- The construction of 69 bridges along with the approach road on the 70 km Tamu-Kyigone-Kalewa (TKK) road section.
- By 2023, it is expected to complete the highway's Imphal-Moreh portion on the Indian side.
- India also plans to add a new connection to the IMT highway by upgrading the route from Zokhawthar in Mizoram to Tedim in the Chin state of Myanmar.



Source: Salute magazine

3. The Global South: Origins & Significance

Syllabus: Effect of policies and politics of developed and developing countries on India's interests.

Mains: The Global South: Origins & Significance

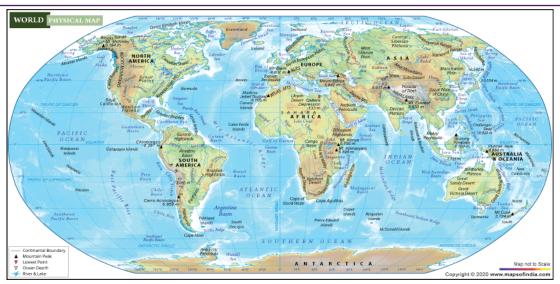
Context: The unwillingness of many leading countries in Africa, Asia and Latin America to stand with NATO over the war in Ukraine has brought to the fore once again the term "Global South."

What is the Global South?

- The Global South refers to countries often characterized as developing, less developed, or underdeveloped, primarily located in Africa, Asia, and Latin America.
- These nations typically experience higher levels of poverty, income inequality, and challenging living conditions compared to the wealthier nations of the Global North.
- The "Global North" is richer nations that are located mostly in North America and Europe, with some additions in Oceania and elsewhere.

The Origin of the Term:

- The term Global South was first coined in 1969 by political activist Carl Oglesby.
- It gained momentum after the dissolution of the Soviet Union in 1991, which marked the end of the "Second World."
- Previously, developing nations were commonly referred to as the "Third World," a term coined by Alfred Sauvy in 1952.
- However, this term became associated with poverty, instability, and negative stereotypes propagated by Western media.
- As a result, the term "Global South" emerged as a more neutral alternative
- Many countries in the Global South have a history of Imperialism and Colonial Rule, particularly evident in African countries.



Significance

- The World Bank (WB) has acknowledged a "shift in wealth" from the North Atlantic to the Asia-Pacific region, challenging conventional notions of economic power distribution.
- Projections indicate that by 2030, three of the four largest economies will belong to Global South countries, with China and India leading the way.
- The combined GDP (Gross Domestic Product) of the BRICS nations (Brazil, Russia, India, China, and South Africa) already surpasses that of the G-7 nations

Challenges

- Limited Human Capacity
- Economic Inequality
- Political Instability
- Climate Change
- Lack of Infrastructure

Initiatives for the South-South Cooperation

- BRICS Forum
- India, Brazil, and South Africa (IBSA) Forum
- Group of 77 (G77)
- International Day for South-South Cooperation

4. Jeddah: Hope for peace in Ukraine?

Syllabus: Effect of policies and politics of developed and developing countries on India's interests.

Mains: Developments in the international arena, India's position on global issues, and the implications of geopolitical events on India's interests.

Prelims: About Ukraine's 10 point peace plan, China's 12-point plan and Other initiatives.

Context:

Saudi Arabia will host peace talks on the Russia-Ukraine war, with participants including the US, some European countries, India, and Brazil. Ukraine seeks support for its 10-point peace plan.

Introduction

• Saudi Arabia is set to host peace talks on the Russia-Ukraine war, inviting countries from various regions, including the United States, some European countries, India, and Brazil. The talks are scheduled for August 5 and 6 in Jeddah, with Ukraine seeking support for its 10-point peace plan proposed last year.

Current Situation of the Conflict

- Russia has shown no signs of retreating from its military operation against Ukraine, which has been ongoing for 17
 months.
- Ukraine has been actively engaging in the conflict and has received substantial military support from Europe and the U.S., including defence funding.
- UN Secretary-General Antonio Guterres expressed doubt about the possibility of peace negotiations at this stage, as both sides believe they can achieve victory.



Stances of Ukraine and Russia

- Ukrainian President Volodymyr Zelenskyy maintains that peace negotiations cannot happen without the withdrawal
 of Russian troops and that Ukraine should be in control of defining its own peace terms.
- Russia rejects Ukraine's peace plan, insisting on considering "new realities," including redrawing borders and retaining the annexed territories.

Previous Peace Negotiations

- Earlier, attempts at temporary ceasefires and humanitarian corridors were made, but direct negotiations have not occurred since May 2022.
- Various countries and blocs have offered their own roadmaps for peace, but no plan has been accepted by both parties.

China's Peace Plan and Other Initiatives

- China proposed a 12-point plan for the "political settlement of the Ukraine crisis," which was seen as skewed in favour of Russia and not accepted by Ukraine.
- African countries proposed a 10-point plan, aiming to recognize the sovereignty of both Russia and Ukraine and calling for peace negotiations to begin.
- Brazilian President Luiz Inacio Lula da Silva suggested leading a "peace club" of non-involved and militarily nonaligned countries to facilitate discussions.

Upcoming Talks in Jeddah

- The United Kingdom, EU, South Africa, and Poland have confirmed their attendance at the talks, with the U.S. National Security Advisor likely to attend.
- Russia, which had rejected Ukraine's peace plan, is not among the invited countries.
- The talks are viewed as an opportunity for constructive third-party mediation and engaging non-aligned countries from the Global South.

Conclusion

 While the talks in Jeddah may not bring an immediate breakthrough for peace, they present a chance for constructive dialogue and mediation involving players beyond the West. Saudi Arabia's role as a mediator becomes significant given its close ties with Moscow and influence in the OPEC+ oil cartel.

Nut Graf: Peace talks on the Russia-Ukraine war are set to take place in Saudi Arabia, involving key nations. Despite doubts about an immediate breakthrough, the talks aim to promote mediation efforts and engage non-aligned countries in seeking a resolution to the conflict.

5. The lessons of Hiroshima must not drift away

Syllabus: Effect of policies and politics of developed and developing countries on India's interests

Prelims: Nuclear Deterrence, The Treaty on the Prohibition of Nuclear Weapons

Mains: Nuclear Deterrence, The Treaty on the Prohibition of Nuclear Weapons, United Nations and role in disarmament

Context:

• Nuclear weapons were dropped on Hiroshima in August 1945. Experts consider that this moment has fundamentally changed the nature of war and weapons use.

Deterrence

- Deterrence is a strategy designed to prevent aggression by making the adversary believe that the cost of an attack would be greater than any benefit it may bring. This is done by emphasizing the scale of the likely military response.
- In other words, deterrence is about convincing others that they will not be able to achieve their goals through aggression because the consequences will be too severe.
- Deterrence can be achieved through a variety of means, such as the threat of nuclear retaliation, the deployment of large military forces, or the development of advanced military technology such as missile systems.
- While the development of nuclear warheads has increased, the taboo associated with it has also increased. Political scientist Nina Tannenwald has highlighted that nuclear weapons have not been used since the Hiroshima and Nagasaki incident because of a rise in global inhibition on using nuclear weapons. This inhibition is based on morality and the devastating potential of nuclear weapons.
- In use, nuclear bombs do not discriminate between those in combat with non-combatants, the environmental damage done is massive, and their impact on generations of individuals such as genetic effects are also high. Hence these are 'absolute weapons' and their use is also considered a global problem.
- However, these taboos have no legal status and are based on moral, humanitarian and philosophical inhibitions.



Are these moral notions and nuclear deterrence being tested?

- In the recent Ukraine crisis, Russia has made several nuclear threats on the use of nuclear weapons. Russia has also ordered the realignment of nuclear forces for combat duty.
- The threats have raised the possibility of nuclear Armageddon in Europe.
- Speculation about Russia using a tactical nuclear weapon has been on the rise due to the not-so-favourable outcomes
 of the Ukraine crisis.
- Nations are trying to differentiate between conventional and tactical nuclear weapons to overcome the taboo. There is no consensus on what constitutes a tactical nuclear weapon which could be used on battlefields.
- For example: The bomb that fell on Hiroshima was 15 kt (kiloton) while the U.S. has tactical weapons ranging from a fraction of 1 kt to 170 kt. So, even though these are called tactical weapons, the devastation caused might still be huge.

Global response to this threat?

- The US has made it clear that any nuclear use would be met with a strong and commensurate response but did not specify that the response would be nuclear.
- The US also did not change its nuclear preparedness levels, hence avoiding fueling nuclear speculation in Europe.
- China has also called on the international community to oppose the use of or threats to use nuclear weapons.
- However, Russia's movement of tactical nuclear weapons to Belarus has shown that the nuclear threat in Europe is far from over.

Way Ahead

- At the height of the Cold War, there were almost 70,000 nuclear weapons scattered around the world. The lessons from Hiroshima and some luck have prevented the use of nuclear weapons.
- The nuclear taboo cannot be an insurance policy by itself. Global efforts such as The Treaty on the Prohibition of Nuclear Weapons should be given more teeth to ensure nations don't use the threat of nuclear exchange to achieve their political ends.

Nut Graf: The use of nuclear weapons in Hiroshima has fundamentally changed the nature of war and weapons use. The taboo against using nuclear weapons has prevented their use since 1945, but this taboo is not legally binding and could be broken. The recent threats by Russia to use nuclear weapons in the Ukraine crisis have raised the possibility of nuclear Armageddon in Europe. The international community must work to strengthen the taboo against nuclear weapons and prevent their use.

6. America's pursuit of Saudi-Israel rapprochement

Syllabus: Effect of policies and politics of developed and developing countries on India's interests

Prelims: Abraham Accords, OPEC +, NATO

Mains: India – West Asia relations, Implications of Saudi – Israel rapprochement on India

Context:

- The United States has been working to bring together Saudi Arabia and Israel through quiet diplomacy. This could have significant implications for the regional balance of power and beyond.
- These discussions are also happening under challenging circumstances. Saudi Arabia was criticized by the US for the murder of Jamal Khashoggi. Prime Minister Netanyahu's efforts to increase Jewish settlements in the West Bank region and to reduce judicial independence in Israel have also been opposed by the US.

Change in West Asia?

- Since 1945, the US and Saudi Arabia have had an agreement in which the US would provide military protection to Saudi Arabia in return for oil and energy security.
- However, the US's efforts to sign the Iran nuclear deal (to contain the threat of Iran's nuclearization) and its lack of
 consistent support for Saudi Arabia in its war efforts in Yemen have not gone well in Saudi Arabia.
- In response, Saudi Arabia has been diversifying its options, including reconciling with Iran with China's mediation, cooperating with Russia on maintaining beneficial global oil prices, etc.
- With the upcoming elections in the US, the Biden administration has been trying to persuade Saudi Arabia to normalize relations with Israel and bring both Saudi Arabia and Israel under its sphere of influence.
- Saudi Arabia has asked for the same security guarantees as NATO members get from the US, access to advanced American weapons, permission to acquire the technology for civilian nuclear power and an Israeli commitment to a two-state solution (with Palestine).



What are the motivations for this reconciliation?

USA

- The United States wants to re-establish its influence in the Middle East.
- China's mediation has led to resumed diplomatic ties between Riyadh and Tehran as part of the historic Saudi-Iran deal
- Russia, on the other hand, has also increased its presence due to the hostilities in Syria and Yemen.
- Possible reconciliation between Saudi Arabia and Israel could help Mr. Biden to come back to power in the upcoming elections

Saudi Arabia

- Saudi Arabia wants to emerge as a powerful regional player.
- The United Arab Emirates has already initiated reconciliation efforts with Israel as part of the Abraham Accords. Saudi Arabia's reconciliation with Israel will help to shape West Asian politics from within.
- Saudi Arabia also wants to balance its reconciliation with Iran and Syria by diplomatic ties with Israel. This will convey
 that Saudi Arabia will stand by its national interest by all possible means. This could also increase access to crucial
 advanced technology from Israel in the future.

Israel

- Israel wants to be accepted as a legitimate state by the Muslim world in West Asia.
- It would also give Israel direct access to Asia, which would help deepen the economic ties with this region.

Implications for the Global Order

- Due to the Israel-Palestine conflict, countries such as Pakistan and Indonesia have not been open to relations with Israel. This could change.
- It could also deepen the polarization of the Palestinian cause. Countries such as Iran and Syria, along with other actors such as Hamas and Hezbollah, could radicalize the issue, leading to violence.
- India's deepening of ties with Israel was in question due to the balancing act with countries such as Saudi Arabia and the UAE. The reconciliation efforts might lead to further engagement between India and Israel. The US will also be supportive of this.

Nut Graf: The United States is working to bring together Saudi Arabia and Israel in a bid to re-establish its influence in the Middle East. This could have significant implications for the regional balance of power, as well as the global order.

7. Learning from the CHIPS Act of the U.S.

Syllabus: GS-2, Effect of policies and politics of developed and developing countries on India's interests

Mains: The CHIPS Act of the U.S and Lessons for India

Context:

The United States' Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022 (CHIPS Act) has completed one year.

What is the CHIPS Act?

- The Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022 (CHIPS Act) was passed into law in 2022.
- It is intended to increase the US's national security, innovation, and competitiveness.
- The law is designed to encourage investments in domestic semiconductor production facilities.
- The CHIPS and Science Act seeks to encourage tech firms to establish semiconductor manufacturing facilities in the nation.

Lessons for India

The CHIPS Act offers a transparent view of the abilities and frameworks required to carry out such initiatives. From an Indian perspective, it is crucial to watch and take notes during the Act's implementation even though its long-term effectiveness is still up for debate.

Coordination between Departments

- The Act requires collaboration and coordination across numerous federal agencies.
- On the other hand, the Ministry of Electronics and Information Technology (MeitY) is primarily in charge of managing India's industrial policy for semiconductors.
- A non-profit organisation founded by MeitY has entrusted the plans for semiconductors to an independent branch known as India Semiconductor Mission (ISM).

Separate Funds

- o For the purpose of carrying out the Act, four distinct funds have been established.
- This arrangement clearly shows how important semiconductors are.
- Companies must submit workforce development plans in order to be eligible for funding under the CHIPS Act.



Collaboration with Private Institutions

- India can quickly establish a competitive edge in the semiconductor business by developing a skilled workforce of semiconductor engineers. In the case of India, numerous private educational facilities train chip designers outside the framework of the traditional university system.
- The Chips2 Startup (C2S) program should concentrate on accrediting top-notch academic or private training programmes.

Structuring Accountability

- The CHIPS Act also established the CHIPS Programme Office (CPO) to establish the standards for judging a project's financial viability.
- To encourage private sector investments, the CPO is hiring Financial Structuring Directors and Investment Principals.
- Even though India has criteria for determining whether ideas are viable, there is still plenty that can be done to increase openness.
- Regular monthly progress reports on the government's semiconductor programme must be released.

Conclusion

The CHIPS and Science Act serves as a good model for industrial policy in the semiconductor industry. The administrative capability that the United States has assembled has institutionalised the Act in a way that will ensure its continuation beyond governments. As India sharpens its focus on the semiconductor industry, it requires a whole-of-government approach.

Nut graf: The CHIPS Act's lesson is that India's strategy has to identify and fund research on emerging technologies.

8. Convention on Cluster Munitions

Syllabus: Bilateral, Regional and Global Groupings and Agreements

Mains: Convention on Cluster Munitions and indiscriminate use of weapons during war

Prelims: Facts and members of the Convention on Cluster Munitions

Context: "Amidst the U.S. sending cluster munitions to aid Ukraine, explore legality, history, and humanitarian concerns of these weapons."

About Cluster Munitions:

- Definition: Cluster munitions, also known as cluster bombs, release multiple bomblets upon deployment.
- Impact: Bomblets explode on impact or remain dormant, posing ongoing dangers to civilians.
- Controversy: Sending cluster munitions from the U.S. to Ukraine sparks global debate.

History of Cluster Munitions:

- Origin: Used since WWII; notable instances of use in Vietnam, Afghanistan, and Iraq.
- Toll: Cluster munitions linked to 56,000 to 86,000 deaths in affected areas since the 1960s.

Convention on Cluster Munitions and its Members:

- Creation: The Convention on Cluster Munitions (CCM) was established in May 2008.
- Signatories: 112 countries, including NATO nations like Canada, Germany, France, and the UK.
- Non-Signatories: Key players like the U.S., Russia, China, Israel, and India haven't joined.
- Obligations: CCM bans use, production, stockpiling, and transfer; mandates victim assistance.

Responsibility of Non-Member Countries:

- Customary International Law (CIL) and Distinction: The cornerstone of armed conflict legality lies in CIL, which draws a clear line between combatants and civilians while prohibiting indiscriminate attacks. Cluster munitions, due to their imprecise nature, breach this fundamental principle.
- Geneva Conventions and Binding Norms: Both Russia and Ukraine are parties to the Additional Protocol I (1949) of the Geneva Conventions, which codifies the essence of CIL. This underscores their commitment to discriminate between military targets and civilians, reinforcing the prohibition of indiscriminate force, as is the case with cluster bombs.
- Indiscriminate Use and Proportionality: The application of cluster munitions disregards the principle of proportionality enshrined in Additional Protocol I to the 1949 Geneva Conventions (Article 51(5)), which limits excessive force that may lead to disproportionate civilian casualties. This further solidifies the violation of international law through the use of cluster munitions.
- U.S. Context and Ethical Considerations: Despite the U.S. not being a party to the Convention on Cluster Munitions (CCM), its supply of such weapons to Ukraine, where they can potentially harm civilians, raises ethical questions about responsibility and the broader humanitarian impact.

Conclusion: To ensure a world free from the hazards of cluster munitions, a universal prohibition is paramount. All United Nations member countries should adhere to the CCM, thus aligning with the broader objectives of the Geneva Conventions and reinforcing the principles of international humanitarian law.



Nut Graf: Amidst the recent U.S. decision to supply cluster munitions to Ukraine, this article delves into the legal, historical, and humanitarian dimensions of these explosive devices, highlighting the Convention on Cluster Munitions and emphasizing the responsibility of non-member nations under the Geneva Conventions.

9. India's G-20 opportunity for an African Renaissance

Syllabus: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.

Mains: India and Africa relation, India's role in South-South cooperation

Context: In the current landscape, Africa is asserting its presence on the global stage through various multilateral platforms like BRICS (Brazil, Russia, India, China, and South Africa), the G-20, and the United Nations General Assembly. Despite being a continent with 54 nations and representing more than a quarter of the "Global South," its representation within BRICS and the G-20 primarily relies on South Africa, which stands as a unique representative from the African continent.

Challenges and Disruptors in Africa:

- **Existential Challenges:** Africa, encompassing 54 countries and a significant part of the Global South, faces critical challenges like misgovernance, unplanned development, tribal dominance, and corruption.
- **Emerging Disruptors:** New challenges include Islamic terror, inter-tribal conflicts, climate change, rising food inflation, urbanization, and youth unemployment.
- Complex Interventions: Previous military interventions by various countries aimed at curbing militancy have often worsened the situation, keeping dictatorships in power for economic interests.
- Return of Generals: Political disorder has led to the resurgence of military rule in various African nations, threatening the progress made against such regimes.

Africa's Eroding International Support:

- China's Changing Role: China, previously a major African trading partner and investor, has reduced its involvement due to economic slowdown and reduced demand for commodities.
- **Debt Concerns:** China's Belt and Road Initiative has led to unsustainable debt levels in some African countries, resulting in ceding control of assets to China.
- **Uncertainty with Russia:** Russia's support through entities like the Wagner Group has become uncertain due to internal issues and lackluster participation in African initiatives.
- Western Powers' Limitations: Traditional colonial powers and the US, UK, and Europe, dealing with economic downturns, have limited capacity to engage with Africa beyond exploiting mineral wealth.
- Migration Concerns: Europe's primary focus on preventing illegal migration from Africa limits its engagement with the continent's broader challenges.

India's Robust Ties:

- **Historical Bonds:** India's ties with Africa are rooted in historical events, including Mahatma Gandhi's fight against apartheid and its role in UN peacekeeping.
- **Diverse Engagement:** While oil imports have decreased, India-Africa trade reached \$98 billion in 2022-23. Investments span education, healthcare, telecom, IT, technology, and agriculture.
- **Investment and Aid:** India is a significant investor, providing over \$12.37 billion in concessional loans. Numerous projects completed and scholarships offered since 2015 underline India's commitment.
- **Indian Diaspora:** Around three million people of Indian origin reside in Africa, making them the largest non-native ethnic group on the continent.

Way Forward to Deepen India-Africa Ties:

- Historic Opportunity: As India hosts the G-20 Summit, it has a unique chance to strengthen its ties with Africa.
- Comprehensive Platform: India can collaborate with like-minded G-20 partners and multilateral institutions to establish a semi-permanent platform addressing security and socio-economic challenges in Africa.
- **Combined Approach:** India's strategy should blend peacekeeping efforts with building socio-political institutions to promote political stability and economic development.
- Leveraging Innovations: India can contribute by sharing innovations such as the JAM trinity (Jan Dhan-Aadhaar-Mobile), DBT (Direct Benefit Transfer), UPI (Unified Payments Interface), and the Aspirational Districts Programme.
- Win-Win Paradigm: By offering a participative alternative rather than exploitative engagement, India can create a mutually beneficial India-Africa ecosystem for the 21st century.

Nut Graf: Africa, with its 54 nations and substantial presence in the "Global South," is increasingly voicing its concerns on international platforms like BRICS and the G-20, where South Africa represents the continent. Amid challenges like governance issues and diminishing external support, India's deep ties with Africa offer a promising avenue for fostering collaboration and progress.



10. India's push for small businesses at the G20 trade summit must be pursued

Syllabus: Bilateral, regional, and global groupings involving India.

Mains: Bilateral and regional relations, India's international engagement, global groupings and agreements affecting India's interests...

Prelims: About G20

Context:

G-20 Trade and Investment Ministers, representing major global economies, concluded their discussions under India's presidency. The summit addressed cross-border commerce challenges and MSME empowerment.

Comprehensive Communiqué and Geopolitical Issues

- G-20 Trade and Investment Ministers representing 80% of the global economy concluded their deliberations under India's presidency.
- China and Russia blocked reference to geopolitical matters linked to the Ukraine conflict, a recurring issue since the G-20 Bali summit last year.

Focus on Cross-border Commerce and Investment

- Despite challenges in global trade and investment, the G-20 agreed to joint actions to reinforce cross-border commerce's role in prosperity and growth.
- India highlighted five action-oriented outcomes, including global standards dialogue and mutual recognition of professional qualifications.

Noteworthy Outcomes for India

 Commerce Minister Piyush Goyal emphasised trade track's significant outcomes, citing generic value chain mapping, digital trade documentation, and empowering MSMEs.

Micro, Small and Medium Enterprises (MSMEs) Enhancement

- 'Jaipur Call for Action' aims to boost MSMEs' access to information.
- Global Trade Help Desk operators (ITC, WTO, UNCTAD) urged to enhance data portal, bridging information gaps for small businesses.

Societal Empowerment and Challenges

- Empowering MSMEs resonates with PM Narendra Modi's call, considering their significant role in employment and GDP.
- India urged to enhance small enterprise capacity, possibly through tailored incentives and reduced bureaucratic obstacles.

Nut Graf: G-20's trade meet, despite geopolitical tensions, emphasises joint actions for cross-border commerce and empowering MSMEs, with India's Commerce Minister highlighting key outcomes.

11. Tehran and New Delhi drop foreign arbitration clause in Chabahar port issue

Syllabus: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.

Prelims: UNCITRAL, Chabahar Port Project, Chabahar-Zahedan railway line, Gwadar Port

Mains: India-Iran Relations, India's West Asia Policy

Context

India and Iran have agreed to drop the clause for arbitration in foreign courts concerning the Chabahar port.

Why is International Arbitration a hurdle for Iran?

- Iran's Constitution doesn't have the provision of arbitration being referred to a foreign court. Any changes in this would require a constitutional amendment and delay the needed clarity in dispute resolution mechanism at Chabahar.
- Currently, India and Iran sign one-year contracts for developing and running the terminal at Chabahar Port.
- India has been pushing Iran to sign a longer-term agreement (usually for a period of 10 years) for more certainty in investment and development plans.
- Both sides have agreed to pursue arbitration under rules framed by the UN Commission on International Trade Law (UNCITRAL) to resolve disputes betweens the users and operators of the port.



Why is the Chabahar Port Project important?

- The Chabahar port is strategically important for India as it gives an opportunity to bypass Pakistan and trade with Central Asia.
- It is located in Iran's southeastern Sistan and Baluchestan provinces and is located around 170 km away from the Gwadar port in Pakistan, which China is developing.
- It has the potential to develop into one of the important commercial hubs in the Indian Ocean and serves as a key transit centre on the International North-South Transport Corridor (INSTC) and India to counter China's influence in the region.

Evolution of India's investment in the Chabahar Port Project

- India has been interested in developing Chabahar port since 2003.
- In 2016, India, Iran, and Afghanistan signed an agreement to develop Chabahar port as a trade and transport corridor.
- India committed \$85 million for the development of Chabahar port, along with a \$150 million line of credit.
- India Ports Global Limited (IPGL) operates the Shahid Beheshti terminal at Chabahar port. Since IPGL began operations in 2018, it has handled more than 6.56 million tonnes of cargo.
- India is also involved in the construction of the 700-km long Chabahar-Zahedan railway line. This will further increase the cargo capacity at the port.
- For the financial year 2022, India has allocated ₹100 crore for the development of Chabahar port.

UN Commission on International Trade Law (UNCITRAL)

UNCITRAL is a subsidiary body of the United Nations General Assembly. It was established in 1966.

UNCITRAL has a range of conventions, model laws, and other instruments for harmonisation of laws on international trade

Members of the Commission are elected for terms of six years and the terms of half the members expire every three years.

Differences between WTO and UNCITRAL

- While the WTO deals with trade policy issues, UNCITRAL deals with the laws applicable to private parties in international transactions.
- For example, WTO focuses on issues like trade liberalization, abolition of trade barriers, and unfair trade practices. UNCITRAL is not involved with "state-to-state" issues such as anti-dumping, countervailing duties, or import quotas
- WTO is usually related to public law while UNCITRAL is associated mostly with private law.

Nut Graf: The Chabahar port is strategically important for India as it gives an opportunity to bypass Pakistan and trade with Central Asia. India and Iran have agreed to drop the clause for arbitration in foreign courts concerning the Chabahar port. This is a significant development as it paves the way for a longer-term agreement between the two countries for certainty in investment and development.

12. India-Japan collaboration in Sri Lanka

Syllabus: India and its neighbourhood – International relations.

Mains: Analysis of India-Japan collaboration in Sri Lanka, its objectives, implications for regional dynamics, and its impact on India's foreign policy in the Indian Ocean region.

Context

India, Japan, and Sri Lanka aim to revive trilateral cooperation after the cancellation of joint projects, including the East Container Terminal, exploring areas like renewable energy and infrastructure development.

Introduction

- After over two years since Sri Lanka's decision to cancel a joint memorandum of understanding (MoU) between India
 and Japan for the East Container Terminal (ECT) project in Colombo, the three nations are now exploring avenues to
 rejuvenate trilateral collaboration.
- The cancellation of the MoU, estimated at \$500 million, and the suspension of the Japanese-funded light rail transit (LRT) project strained relations between Tokyo and Colombo.

Background and Recent Developments

- During the economic crisis, India and Japan offered assistance to Sri Lanka and engaged in debt restructuring.
- President Ranil Wickremesinghe's recent visit to Delhi and Japanese Foreign Minister Hayashi's visit to New Delhi and Colombo aimed to explore renewed cooperation and the return of infrastructure project plans.
- India and Japan share the vision of a Free Open and Inclusive Indo-Pacific (FOIIP), relevant to Sri Lanka and the region.



Proposed Areas of Cooperation

- Conference on trilateral cooperation organised by think tanks NatStrat, Vivekananda International Foundation (India), and Pathfinder Foundation (Sri Lanka).
- Suggested cooperation areas include renewable energy, grid connectivity, the development of Trincomalee as an oil pipeline hub, connectivity, and people-centric projects.
- Projects aligned with the Joint Economic Vision Statement released by President Wickremesinghe and Prime Minister Narendra Modi in July.

Role of Private Sector

- The projects, catalysed by the Indian and the Sri Lankan governments, encourage the private sector to lead investments and execution.
- Consideration of partnerships with Japan to manage the substantial investment required.

Japan's Involvement

- Japan's Ambassador to India, Hiroshi Suzuki, expresses Japan's keen interest in collaborating with India on projects in South Asia.
- Emphasis on equitable treatment of creditors in Sri Lanka's debt restructuring process.

Current Approach

- Uncertainty about whether projects will be executed jointly as planned pre-2020 or in close coordination, as with Bangladesh.
- Joint MoUs unlikely due to previous challenges.
- Japan seeks a partnership model to avoid exclusion from projects.

Nut Graf: Amid diplomatic efforts, India and Japan collaborate with Sri Lanka on joint projects, emphasising private sector involvement and equitable treatment of creditors in debt restructuring for renewed trilateral cooperation.

13. India's Myanmar Quandary

Syllabus: India and its Neighborhood- Relations

Mains: Indian foreign policy dilemma towards Myanmar

Context: India's Myanmar policy, amid ongoing turmoil: Suu Kyi's release, paradoxical stance on democracy/security, future engagement, and refugee concerns.

Chronology of Events Since Coup in Myanmar:

- July 31 and August 1, 2023: Acting President Myint Swe extends 'emergency' for another six months, violating the 2008 Constitution. Military release of political prisoners reduces sentences for Aung San Suu Kyi and Win Myint.
- Military's Justification: Min Aung Hlaing cites failure to establish 'normalcy' as the reason for the emergency extension, causing suffering and leading to higher civilian violence.
- Continued Violence: Armed Conflict Location & Event Data Project (ACLED) reports Myanmar civilians experiencing 2.5 times more violence than in Afghanistan, with over 30 airstrikes per month in 2023.
- **Limited Control:** Tatmadaw (Myanmar's military) controls only 30%-40% of the territory, as confirmed by the Burmese military and the Special Advisory Council for Myanmar (SAC-M), risking the credibility of any future elections.
- Reshuffling and Opposition: Military-backed Union Solidarity and Development Party (USDP's) reshuffling raises concerns about democracy commitment. The National League for Democracy's decision not to participate and exclusion of smaller parties weakened the opposition.

India's Paradoxical Policy:

- **Initial Support:** India aided Myanmar during COVID-19 and the coup, but the focus has waned amid Manipur violence allegations and border community support for refugees.
- Security Concerns and China Relations: India's commitment to democracy contrasts with security concerns in north-east India and rivalry with China. Projects like the Sairang-Hmawngbuchhuah railway counter China's influence.
- Arms Supply Controversy: Reports by Justice for Myanmar, SAC-M, and UN Special Rapporteur indicate increased arms supply by India to Tatmadaw, conflicting with the democracy restoration stance and fueling border tensions.

Future Course of Action for India:

- **Engage with Pro-Democracy Actors:** India can use Suu Kyi's reduced sentence to engage with her and pro-democracy actors, fostering diplomatic ties with the National Unity Government.
- **Refugee Treatment:** Adopt a compassionate approach towards incoming refugees, avoiding blanket securitisation and profiling, and recognising kinship ties.
- Balancing Security and Democracy: India should reconcile its security concerns with its commitment to democracy, considering its role in regional stability and China's influence.



Nut Graf: Amid Myanmar's ongoing crisis, India grapples with a paradoxical policy: supporting democracy while addressing security concerns and China's influence. Suu Kyi's release offers a chance for engagement, as refugee treatment and regional stability weigh on India's approach.

14. The Myanmar junta's empty gestures

Syllabus: GS-2, India and its neighbourhood – relations.

Mains: Crisis in Myanmar and concerns associated with Myanmar Junta Regime

Background

- Aung San Suu Kyi, the 78-year-old former head of state deposed in a coup in 2021, had her prison sentence recently reduced by six years.
- After a year in solitary confinement, the junta placed her under home arrest.
- Aung San Suu Kyi will nonetheless be sentenced to 27 years in prison on false charges.
- Additionally, the junta reduced former president Win Myint's sentence by four years and reportedly freed more than 7,000 additional convicts.

Concerns associated with Myanmar Junta Regime

- Even a heavily staged national vote is difficult for the army's top decision-makers to truly consider maintaining control of enough land.
- People have been voting with their feet in these unsettling times by emigrating abroad or enlisting in a revolutionary mobilisation.
- The majority of the country, which is the second-largest by land area in Southeast Asia, is likely off-limits to government forces.
- The ASEAN (Association of Southeast Asian Nations) political system is one that the regime attempts to manipulate.
- Significant difficulties arise for neighbours Thailand, China, India, and Bangladesh due to an unresolved civil conflict.
- Diplomatic efforts to preserve Myanmar's territorial integrity clash with the unease about doing business with a bloody state that permeates practically everywhere.
- Violence, mistrust, terror, and martial chauvinism have taken the place of the previous political and social infrastructure.
- Young people in Myanmar who heroically disobeyed in the face of tanks and gunfire are no longer allowed to attend universities and are left with few options: the mountains, the jungle, or the border.

Conclusion

The decision to cancel the planned elections exposes the military system's weakness and the rulers' paranoia. Additionally, it provides more proof that the junta cannot be trusted. The maintenance of ties with Russia and China is an important tactic. However, as long as the generals continue to use such brutality against their own citizens, there is no clear road to greater membership in ASEAN. Resistance elements seeking to gradually loosen the army's hold on power will be further energised by the prolonging of the state of emergency and the postponement of imaginary elections. The opposition that is currently raging throughout Myanmar is unlikely to be put out by a useless decrease in the jail terms for the country's elected leaders.

Nut Graf: The Myanmar army's top decision-makers are struggling to keep control of enough territory to consider even a tightly stage-managed countrywide ballot. As a result, Myanmar is now destitute, mainly friendless, and without any kind of future strategy.

15. A 'fab' way to conduct India-Japan tech diplomacy

Syllabus: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.

Mains: India – Japan Relations, India-Japan Tech diplomacy, QUAD

Prelims: QUAD, Society 5.0, Modified Programme for Semiconductors and Display Fab Ecosystem

Context:

- India and Japan agreed to collaborate on semiconductors in July 2023.
- The partnership will focus on five areas: semiconductor design, manufacturing, equipment research, establishing
 resilience in the semiconductor supply chain, and talent development.

Why is there an alignment between India and Japan?

- **Synergy:** There is a rapid expansion in the semiconductor industry and the importance of specialized chips. As Japan aspires to grow its semiconductor industry, India offers a ready market for semiconductor products. This will also help India to become a Chip Maker rather than a Chip Taker.
- Policy: India's "Make in India" initiative and Japan's "Society 5.0" vision call for self reliance in the field of technology.
- Strategic interests: Supply chain disruptions have led to a global chip shortage and geopolitical tensions(between USA and China) have highlighted the need for diversifying semiconductor supply chains. Countries like the USA, Japan are willing to give more teeth to the idea of a free and open Indo-Pacific by containing the rise of China.



- The USA's CHIPS and Science Act of 2022 places restrictions on the expansion of semiconductor manufacturing facilities to countries posing a direct threat to the US, including China.
- The US, Japan, and the Netherlands have restricted exports of semiconductor manufacturing materials required in the making of advanced chips to China.
- **Security:** Semiconductor technology is critical for national security and next generation warfare. For example, Artificial intelligence (AI) in weapon systems, quantum computing and communication, blockchain and big data are possible with the availability of advanced semiconductor chips.
- **Human capital:** The partnership will help human resource development through skill exchange programs, workshops, and training.

Initiatives taken by India to emerge as a leader in technology?

- India, Japan and Australia are also part of the supply chain resilience initiative.
- Efforts are being made by India in partnership with the USA to emerge as a key player in the semiconductor design and manufacturing industry.
 - o Agreement with Georgia Tech University to collaborate on semiconductor research and development.
 - o Investments by Micron Technology and Applied Materials to set up a semiconductor unit and a research and development center in India.
- The Union Cabinet approved the "Modified Programme for Semiconductors and Display Fab Ecosystem" for incentives for the development of semiconductor and display ecosystem with an outlay of Rs 76,000 crore.
- As part of the "Programme for the Development of Semiconductors and Display Manufacturing Ecosystem in India", the
 government aims to establish at least 20 semiconductor design, components manufacturing and display fabrication
 units over the next six years.

Conclusion

- The India-Japan partnership is on track to play a pivotal role in shaping the global semiconductor landscape.
- This partnership will also have far-reaching implications for the global technology ecosystem and the dimensions of geopolitical partnerships in the Indo-Pacific.

Nut Graf: India and Japan agreed to collaborate on semiconductors. The partnership will focus on areas like semiconductor design, manufacturing etc. It is a sign of alignment of strategic and economic interests between the countries in the Indo-Pacific.

16. Why is the BRICS summit important for India?

Syllabus: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.

Mains: Implications of BRICS Summit on India

Prelims: BRICS Group, Johannesburg Declaration, African Union

Context:

The 15th BRICS summit is taking place in Johannesburg, South Africa.

Importance:

- BRICS nations represent around 42% of the world's population and 23% of the world's GDP.
- The group, as a coalition of emerging economies, aspires to reform the current systems of global governance which was established under the leadership of the west.
- Recently, the ongoing crisis in Ukraine and evolving tensions between the US and China has drawn the attention of the world to the BRICS Summit.
- The 15th BRICS summit is the first in-person summit since 2019. Due to the COVID-19 pandemic, the earlier summits
 were conducted virtually.
- Russian President Vladimir Putin will be joining the summit virtually due to a warrant issued by the International Criminal Court (ICC) against him.
- With the USA and EU trying to isolate Russia over the Ukraine crisis, the western countries are keen to look out for any "counter-western" views from the summit.
- Russia is also key to ensuring food, fuel and fertiliser security in these emerging economies and hence is of importance for global security in general.

Main Agenda for Countries

- Prime Minister Narendra Modi and President Xi Jinping will be meeting in person in the context of the border clashes at Line of Actual Control (LAC) beginning in 2020. This could be seen as an opportunity to resolve the situation at LAC.
- India is hosting the G20 summit in 2023. Ensuring the summit is a success by full participation of the members, cooperation of China and Russia for a joint declaration from G20 etc will be high on India's agenda. Differences of opinion on the Ukraine crisis, climate change and debt financing by countries (Example: China's Belt and Road initiative) has led to disagreements on the language of the joint declaration.



- India will try to be careful with China's proposed language for the BRICS economic roadmap and prevent it from promoting initiatives like the Belt and Road Initiative and the Global Development Initiative where there are key differences of opinion. India refused to agree to the economic roadmap of SCO in 2023 for similar reasons.
- 55 countries of the African Union will also be joining the event as special invitees. This could be seen as an attempt by the countries of the Global south to come together on various economic issues.
- The idea of expansion of BRICS will also be discussed. More than 19 countries have applied for the membership of BRICS and there seems to be a consensus on Argentina, Saudi Arabia, the UAE and Iran joining the group.
- Initiatives like New Development Bank, Contingency Reserve Arrangement, R&D centers for vaccines and other scientific discoveries are attracting interest among the developing countries.
- Proposal for intra-BRICS trading in national currencies is also expected to be discussed.
- An equitable transition to a climate-resilient economy, enhanced trade with the African Continental Free Trade Area and the meaningful participation of women in peace processes are some of the areas of interest for South Africa

Nut Graf: The 15th BRICS summit is taking place in Johannesburg, South Africa. The summit is expected to discuss a range of issues, including the ongoing crisis in Ukraine, the expansion of BRICS, and the development of new initiatives to promote economic growth and development.

17. BRICS to add six new member countries

Syllabus: Bilateral, regional, and global groupings involving India.

Mains: Bilateral and regional relations, India's international engagement, global groupings and agreements affecting India's interests.

Prelims: About BRICS

Context:

The article discusses the outcomes of the BRICS summit, where South African President Cyril Ramaphosa presented the Johannesburg Declaration. Indian Prime Minister Narendra Modi announced the expansion of BRICS and welcomed new members, including Iran, Saudi Arabia, and the UAE.

South African President's Address and Reference to Ukraine Conflict

- Cyril Ramaphosa, current BRICS Chair and South African President, presented the Johannesburg Declaration, the summit's outcome document.
- Indirectly referred to the Ukraine conflict, emphasising the group's focus on seeking peaceful resolutions to disputes.

BRICS Expansion and New Members

- Indian Prime Minister Narendra Modi announced agreement on principles, criteria, and procedures for BRICS expansion.
- Welcomed Argentina, Egypt, Iran, Saudi Arabia, Ethiopia, and United Arab Emirates into BRICS.
- Anticipated that new members would infuse new dynamism and energy into BRICS activities.
- Special significance of Iran, Saudi Arabia, and UAE's inclusion due to representing both sides of the energy-rich Gulf.
- Noteworthy that Iran and Saudi Arabia jointly joined BRICS after normalising relations in April.

Expansion Decision and Background

- BRICS expansion was decided 13 years after the previous expansion that added South Africa in 2010.
- BRICS originally comprised Brazil, Russia, India, and China, formed as major economies influencing the post-Cold War world order.

PM Modi's Bilateral Meetings and Initiatives

- PM Modi held discussions with leaders from Senegal, Mozambique, Ethiopia, and Iran.
- Delivered a speech at BRICS-Africa Outreach and BRICS Plus dialogue session.
- Extended invitations to participant countries to join initiatives like International Solar Alliance, Coalition for Disaster Resilient Infrastructure, and more.

Commitment to Multilateralism and Peaceful Resolutions

- President Ramaphosa reiterated commitment to inclusive multilateralism and upholding international law, including UN Charter principles.
- Expressing concern about ongoing conflicts globally, stressed BRICS' dedication to resolving differences through dialogue and inclusive consultation.

Nut Graf: South African President Cyril Ramaphosa presented the Johannesburg Declaration at the BRICS summit, focusing on peaceful dispute resolution. Indian PM Narendra Modi announced the addition of Iran, Saudi Arabia, and the UAE to BRICS, aiming to infuse new energy.



18. The Katchatheevu Controversy

Syllabus: India and its neighborhood- relations.

Mains: Katchatheevu Controversy and India-Sri lanka Relations

Context

Recently, Tamil Nadu Chief Minister revived the debate over Katchatheevu, an uninhabited and barren 285 acre islet about 14 nautical miles off Rameswaram.

Background

- Sri Lanka asserts control over Kachatheevu on the grounds that the islet was under Portuguese rule from 1505 to 1658 CE while the Portuguese were occupying the island.
- India claimed that it belonged to the former Raja of Ramnad because it was a part of his zamin.
- The islet has long been used for fishing by people in the two nations.
- Despite the fact that this feature was acknowledged in the 1974 agreement, it was made plain in the supplemental
 pact in March 1976 that fishing boats and fishermen from the two nations are not permitted to fish in the ancient
 waters

What is Katchatheevu?

- Katchatheevu is a remote deserted island in the Palk Strait. In the fourteenth century, volcanic explosions caused it to form
- During British administration, the 285-acre area was jointly managed by India and Sri Lanka.
- The island of Katchatheevu was formerly owned by the Raja of Ramnad, which is now Ramanathapuram in the Tamil Nadu state, and then joined the Madras Presidency.



Source: WION

Reasons of conflict over Katchatheevu Island

- For a very long time, fishermen from both nations have fished peacefully in each other's territorial waters.
- The problem arose after both nations agreed to four maritime boundary agreements between 1974 and 1976.
- The agreement delineated Sri Lanka's and India's international maritime border.
- The goal of the agreement was to make Palk Strait resource management and law enforcement easier.
- Indian fishermen were no longer permitted to utilise the island for anything other than resting, drying nets, and the yearly St. Anthony's celebration. They are not allowed to fish off the island.
- However, Indian fishermen persisted in entering Sri Lankan territorial waters while looking for a better catch nearby.

India and Sri Lanka Agreement

- The boundary between the two nations would be marked in the historic waters from Palk Strait to Adam's Bridge, according to a 1974 agreement between the prime ministers of India and Sri Lanka at the time.
- A boundary had been established, according to a joint statement, in accordance with historical evidence, legal precedents, and international legal norms.
- Additionally, it is noted that this limit is one mile off the uninhabited island of Katchatheevu's west shore.
- The 1976 supplemental agreement stipulated that fishermen from the two nations were not permitted to fish in each nation's historic waters, territorial sea, exclusive economic zone, or zone of special claim without Sri Lanka's or India's prior written consent.

Significance of Kachatheevu Island

- Fishermen from both countries have always used the islet for fishing.
- The recovery of Katchatheevu, according to some political parties and fishermen in Tamil Nadu, will end the issue of fishermen being forced to illegally breach the International Maritime Boundary Line.
- While fishermen in Sri Lanka's Northern Province claim that this would only make their suffering from fishermen utilising the bottom trawling technique in their territorial seas worse.



Why Do Indian Fishermen Want The Island?

- Between Katchatheevu and Neduntheevu, there have been a lot of arrests in recent months.
- The island should be designated as Indian territory, according to Indian fishermen, who claim that it is a traditional fishing location with good catch availability.
- This would provide them an additional seven to ten nautical miles of fishing grounds, substantially reducing the number of arrests made by the Sri Lankan Navy.
- They further claim that when the Sri Lankan Navy detains them, their boats are taken, causing them to suffer significant losses.
- They argue that not all fishermen purposefully trespass into Sri Lankan waters. Due to engine failure and bad weather, they occasionally unintentionally enter the waters of the neighbouring country where the boundary is not always clear
- Due to fish shortages on the Indian side, Indian fishermen are forced to venture there.

Negotiations between India and Sri Lanka

- Sri Lanka asserted control over Kachatheevu on the grounds that the Portuguese had done so during their 1505–1658 CE occupation of the island.
- Since the beginning, the zamin had control over Kachatheevu.
- However, the decision had been made following extensive examination of historical and other data regarding the islet, according to the then-External Affairs Minister Swaran Singh.

Way forward

The Indian government stated before the Supreme Court that the island could not be regarded as having been ceded because it had long been a contentious issue. Some of the ideas put forth include leasing the island, managing Palk Bay's fishing grounds jointly, and encouraging Indian fishermen to relocate to the Bay of Bengal for deep sea fishing.

Nut Graf: There has long been a call to bring back Katchatheevu. However, it is noteworthy that this demand has arisen at a time when Sri Lanka is going through its worst economic crisis.

19. What are the concerns about drilling in the North Sea?

Syllabus: GS-2, Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.

Mains: Issues associated with drilling in the North Sea

Context

- Even as the globe continues to move closer to irreversible climate disaster, the U.K. Prime Minister recently supported proposals for more fossil fuel drilling off Britain's shore.
- The round is anticipated to issue approximately 100 licenses overall, according to the North Sea Transition Authority (NTSA), which is in charge of overseeing the oil, gas, and carbon storage industries.

History of Drilling

- Geographically speaking, the North Sea is situated between the countries of Norway, Denmark, and Germany on its east, the Netherlands, Belgium, and France on its south, and England and Scotland on its west.
- The North Sea was first explored when the 1958 Geneva Convention on the Continental Shelf became the first piece of international law to establish nations' rights over the continental shelves that are close to their shores.
- In April of that same year, the U.K. Parliament enacted the Continental Shelf Act, and the treaty entered into force shortly after.
- The Act calls for the continental shelf to be explored and exploited in accordance with the 1958 treaty.
- It defined the U.K.'s sovereignty over the oil and gas deposits beneath the seabed close to its coastlines.
- Over a hundred facilities were searching for oil and gas in the North Sea by the 1980s as more British, European, and American corporations continued their exploration.

Offshore Drilling Problematic

- Drilling for fossil fuels in seas and oceans not only makes the threat of climate change worse but also warms the waters and causes sea levels to rise.
- Offshore drilling is linked to direct threats to marine biodiversity as well as indirect dangers from acidic seas due to carbon pollution settling into oceans to coral reefs, shellfish, and the marine environment.

About Climate Commitments

- The second National Adaptation Programme, according to the Climate Change Committee (CCC), which advises the U.K. and devolved governments on emissions targets, has not done enough to get the country ready for climate change.
- According to the Climate Change Act, the government of the United Kingdom is mandated to implement National Adaptation Programmes as legislative programmes to aid in the nation's climate change preparation.
- According to the CCC report, there is "very limited evidence" of adaptation being implemented at the level required
 to adequately mitigate climate risk.

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Conclusion

The United Kingdom's climate activity is not in line with the Paris Agreement, according to the Climate Activity Tracker. The United Kingdom's Nationally Determined Contributions (NDCs) and long-term targets do not fairly represent its contribution to the global effort to combat climate change, despite the country's overall grade of "almost sufficient". According to the Climate Action Tracker website, licensing new plans for oil and gas extraction is incompatible with the 1.5°C limit on the increase in temperature.

Nut Graf: Recent plans for further fossil fuel drilling off the British coast were supported by the U.K., upsetting environmental specialists. Drilling for fossil fuels in seas and oceans not only makes the threat of climate change worse, but also warms the waters and causes sea levels to rise.

20. India and the Northern Sea Route

Syllabus: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.

Mains: Opening of Northern Sea route: Impact on trade and relation with Russia

Prelims: Map-based question on water bodies surrounding the Northern Sea route

Context: Murmansk, an Arctic hub and NSR starting point, sees rising Indian cargo involvement. In 2023's first seven months, India led with 35% of 8 million tonnes at Murmansk port, sparking NSR interest.

Significances of the Arctic region for India:

- Climate Impact: The vulnerability of the Arctic region to climate change could affect India's economic security, water security, and sustainability.
- Resource Potential: The Arctic holds substantial untapped hydrocarbon reserves, estimated at over 40% of global oil and gas reserves, along with coal, zinc, and silver.
- Sustainable Development: India's approach to Arctic development aligns with UN Sustainable Development Goals, emphasizing responsible economic growth.

Why is India involved in Murmansk's Cargo Traffic?

- Cargo Share: India accounted for 35% of the eight million tonnes of cargo handled by Murmansk port in the first seven months of 2023.
- **Economic Interests:** The Northern Sea Route (NSR) presents a shorter shipping route for India's trade with Europe and Asia-Pacific countries.
- Resource Imports: India's increasing import of crude oil and coal from Russia contributes to the growing cargo traffic.

India's history of engagement with the Arctic region:

- Early Engagement: India's Arctic engagement dates back to the signing of the Svalbard Treaty in 1920.
- Scientific Studies: India has conducted various scientific studies and research in the Arctic, focusing on atmospheric, biological, marine, hydrological, and glaciological studies.
- Research Stations: India established the Himadri research station in Svalbard and launched observatories and laboratories for Arctic research.
- Observer-State: In 2013, India became an observer-State of the Arctic Council, alongside other nations like China.

About the Northern Sea Route (NSR):

- Shortest Route: NSR is a 5,600 km shipping route in the Arctic Ocean, offering shorter transit between Europe and the Asia-Pacific compared to traditional routes via Suez or Panama.
- Distance Savings: The NSR can potentially save up to 50% in distance compared to alternative routes.
- Suez Canal Blockage: The 2021 Suez Canal blockage heightened interest in the NSR due to its reliability as an alternative route.

Northern Sea Route



Source: The Hindu

How does Russia ensure the navigability of the NSR?

- Icebreaking Assistance: The Arctic Ocean remains icebound for much of the year, so Russia provides icebreaking assistance to ensure safe navigation.
- Nuclear-Powered Fleet: Russia operates a nuclear-powered icebreaker fleet, with seven nuclear icebreakers and more planned for commissioning.
- Infrastructure Operator: Rosatom State Nuclear Energy Corporation manages the NSR infrastructure, ensuring navigability and safety.

Impact of the Chennai-Vladivostok Maritime Corridor (CVMC) on NSR:

- CVMC Project: The CVMC project, connecting Chennai and Vladivostok, is being explored to link with the NSR for international container transit.
- Reduced Transport Time: CVMC could cut transport time to 12 days, significantly shorter than the existing St. Petersburg-Mumbai route.
- Cargo Types: Coking coal, crude oil, LNG, and fertilizers are among the cargoes that could be imported from Russia to India through CVMC.

Future Developments:

- NSR Cargo Targets: Russia aims for cargo traffic targets of 80 million tonnes (2024) and 150 million tonnes (2030) as part of the NSR development plan.
- Indian Participation: A Russian delegation engaged with Indian businesses to encourage their involvement in NSR-related projects.
- CVMC Workshop: A workshop involving stakeholders from India and Russia is planned in October to discuss the CVMC project's impact and potential.

Nut Graf: Murmansk, the gateway to the Northern Sea Route (NSR) in the Arctic, is witnessing increased Indian cargo activity, with India accounting for 35% of the eight million tonnes handled in seven months. This surge highlights India's growing interest in the NSR due to strategic economic and trade considerations.

21. Old ties

Syllabus: Effect of policies and politics of developed and developing countries on India's interests,

Mains: India Greece Relations

Context

- The Indian Prime Minister recently emphasised that despite the fact that no Indian Prime Minister has visited Greece since 1983, bilateral relations between India and Greece have not "diminished" and remain friendly.
- But since there haven't been any high-level contacts, there aren't any strong strategic relations as India has with other surrounding European nations.

Recent Developments and India-Greece Ties

- Along with plans for a skilled migration and mobility alliance, India and Greece also announced intentions to form a "Strategic Partnership" and a consultation mechanism between their National Security Advisers.
- It also intends to build collaboration in order to finish talks for the India-European Union (EU) Free Trade Agreement on Connectivity.
- Without a more comprehensive bilateral plan in place, exchanges between the two nations have been mostly based on tourism, trade, and labour migration.



- Furthermore, India and Greece, both of which were stolen by colonial forces, have had debates about the restoration
 of antiques.
- They may find common ground in lobbying UNESCO to help restore some of their historical property.

Concerns

- Given the difficulties between Delhi and Ankara over Kashmir and Turkey's OIC involvement, India may find some common ground in Greece's improved connections with Israel and Cyprus.
- In addition, the maintenance of marine security in accordance with international norms is a priority for India and Greece, two former historic maritime powers.

Conclusion

The connection between the earliest democracy and the most populous democracy offered "favourable omens" in India-Greece ties. This advises that both nations take advantage of the current favourable conditions to chart a route for increased collaboration without waiting another decade.

Nut Graf: On geopolitical, global, and regional problems, particularly the Indo-Pacific, India and Greece enjoy strong collaboration. India and Greece are rekindling a centuries-old friendship.

22. The U.K.-India relationship is alive with opportunity

Syllabus: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.

Mains: India and U.K. relation, Free trade agreements

Context: An anticipated meeting between the U.K. Business and Trade Secretary with Indian counterpart to discuss bilateral trade, investment, and economic collaboration.

India and U.K. Economic Ties:

- India's prominent role as the host of the G-20 underscores its rising stature in global affairs and its pivotal role in fostering international collaboration.
- The U.K. is a steadfast advocate for the principles of free and equitable trade, actively promoting these values within the framework of the World Trade Organization. The U.K. seeks to establish robust trade agreements with dynamic economies like India.
- Collaborative efforts to enhance the resilience of global value chains and digitize trade processes are vital for maximizing the benefits of international trade.
- The trading relationship between the U.K. and India thrived in 2022, with bilateral trade reaching an impressive £36 billion, exemplifying the strength of their economic ties.
- The projected growth of India's middle class, expected to encompass around 250 million consumers by 2050, presents a lucrative market for U.K. businesses to tap into.

People-People Connect:

- The U.K.-India partnership extends well beyond economic collaboration, encompassing cultural, educational, and societal dimensions.
- The metaphor of a "living bridge," coined by Prime Minister Modi, poignantly captures the enduring and dynamic connection between the two nations.
- The popularity of Bollywood films in the U.K. serves as a vibrant channel for cultural exchange, often featuring iconic movies shot against the backdrop of picturesque U.K. landscapes.
- The Indian diaspora, comprising over 1.6 million individuals, makes significant contributions across sectors, enriching the social fabric and economy of the U.K.
- Indian students constitute a substantial portion of the international student body in the U.K., fostering a diverse and globally oriented-learning environment.

The Ambitious Free Trade Agreement (FTA):

- The ongoing negotiations for an ambitious Free Trade Agreement (FTA) between the U.K. and India signal the intent to elevate their bilateral trade partnership to new heights.
- These negotiations encompass a diverse spectrum of areas, including the exchange of goods, services, and investment, underscoring the comprehensive nature of the agreement.
- The envisioned FTA aims to strike a balance that not only advances economic interests but also creates an environment conducive to fostering business growth and innovation.
- Noteworthy successes include Tata Group's substantial investment in establishing their first Gigafactory outside India, a move expected to generate a substantial number of employment opportunities and invigorate the U.K. 's automotive sector.



Marketing Campaign "Alive with Opportunity":

- The launch of the £1.5 million "Alive with Opportunity" campaign underscores the depth and potential of the multifaceted U.K.-India relationship.
- This campaign serves as a platform to illuminate the interplay of people, ideas, culture, and investment, fostering greater understanding and collaboration.
- Aligned with the strategic objective of doubling trade with India by 2030, the campaign aims to ignite interest and demand for U.K. products and services.
- By catalyzing trade links with India and attracting fresh Indian investments, the campaign seeks to bolster the growth trajectory of U.K. enterprises.
- Through extensive media coverage and strategically positioned billboards, the campaign sustains a year-long celebration of the U.K.-India relationship, spotlighting the myriad opportunities it presents, including substantial Indian investments in the U.K. As of the latest data, India remains the U.K.'s second-largest source of investment, with 118 new projects in the last financial year creating 8,384 new jobs across the U.K.

Nut Graf: The U.K. and India forge economic ties, fueled by £36 billion bilateral trade. Talks on an ambitious Free Trade Agreement continue, aiming to enhance partnerships. Cultural affinity, strong people-to-people bonds, and a £1.5 million marketing campaign further catalyze this thriving relationship.

23. China's worldview, its postulates and a reality check

Syllabus: GS-2, Effect of policies and politics of developed and developing countries on India's interests

Mains: China's worldview and impact on global politics

Background:

Chinese authorities frequently speak of "changes unseen in a Century," implying the fall of the West-promoted "rules-based order" and the advent of a new Chinese-promoted international order.

What is the 'Changes unseen in a Century' Principle?

- One of the core ideas of 'Xi Jinping Thought' is "changes unseen in a century."
- This assumes that the contest for future domination is centred not only on military security but also on technological, cultural, and biological factors.
- This indicates that China's growth, aided by technology and shaped by its economic might and demographic potential, is unstoppable.

Different Aspects of China's worldview

• U.S. as the main threat

- The Chinese officials felt that the biggest threat came from the US.
- The growing divisiveness within US society, as well as the loss of power around the world, were influencing US attitudes, causing tensions between the US and China.
- o China was also concerned that the Ukraine conflict will lead to the US becoming more confrontational on Taiwan.
- China's retaliation has been to extend its Global Security Initiative (GDI) and the China-led Shanghai Cooperation Organisation (SCO).

China's growing influence in Global Area

- China's influence had grown in a number of international organisations, including the World Health Organisation.
- Another group of accusations contends that China has gained a dominant voice in several international standardsetting bodies.

Taiwan Issue

- Strategic analysts believe that Taiwan is only one of numerous areas where China and the United States will clash in the future years.
- o Taiwan is also a worldwide issue that appears to be a big conflict along the lines of the Ukraine crisis.
- Any such conflict would have a significant and negative impact on the global economy. Despite this, neither the United States nor China can abandon the Taiwan problem.

Conclusion

The COVID-19 epidemic, which forced the implementation of extreme measures, including an unprecedented three-year lockdown, has resulted in a serious economic setback, in addition to hardship for its people. Several restrictions adopted by China to combat the pandemic have once again harmed China's reputation around the world. China's crackdown on key technological businesses and the real estate sector has further added to the worries of investors who have already lost several billion dollars in market value.

Nut Graf: If China is to surpass the West's free market conceptions and beliefs, it may need to develop an alternative ideology of modernity, but the odds are stacked against it.



24. Malabar Exercise

Syllabus: GS-2, Effect of policies and politics of developed and developing countries on India's interests

Prelims: Malabar Exercise

Details:

- The 31st edition of the Malabar multilateral exercise is set to take place from August 11 to 21, off the coast of Sydney,
- Participating Countries: India, Australia, Japan, and the United States.
- This marks Australia's first time hosting the Malabar war games.
- The exercise aims to enhance cooperation and interoperability among the participating naval forces.
- Venue: The East Australian exercise area, a vast designated region located a few hundred miles off Sydney.
- Phases: The exercise will comprise both a harbour phase and a sea phase.
- Noted Complexity: Malabar is renowned as one of India's most intricate naval exercises.
- India-Australia Sea Power Conference 2023:
 - Australia is hosting the Sea Power conference from November 7 to 9.
 - Australia extended an invitation to India to attend the conference.
 - o India is likely to participate in the conference, as per defence sources.
- Follow-up Naval Exercise:
 - Following Exercise Malabar, the India-Australia bilateral naval exercise called AUSINDEX will take place.
- The exercises are geared towards fostering stronger naval ties, coordination, and strategic collaboration among the participating nations.

25. India-UAE Naval Exercise

Syllabus: GS-2, Effect of policies and politics of developed and developing countries on India's interests

Prelims: India-UAE Naval Exercise

Details:

- The Navies of India and the UAE carried out a military exercise as part of efforts to boost maritime security cooperation.
- The Indian naval ships INS Visakhapatnam and INS Trikand were part of the exercise. The ships arrived at Port Rashid in Dubai on August 8.
- The two Navies conducted the bilateral maritime partnership exercise, aimed to enhance the interoperability and synergy by cross training on tactics, techniques and procedures
- INS Visakhapatnam is one of the largest operational destroyers in the Indian Navy and INS Trikand is an advanced stealth frigate commissioned in 2013.

26. ECOWAS

Syllabus: GS-2, International organisations

Prelims: ECOWAS

Details:

- ECOWAS (Economic Community of West African States) is convening a meeting of its leaders to discuss the crisis in Niger.
- The crisis involves the military rulers of Niger who have disregarded ECOWAS' ultimatum to relinquish power.
- The ultimatum given to Niger's military rulers is to cede power or potentially face military intervention.
- The summit is scheduled for 10 August and will be hosted in Abuja, Nigeria.
- Bola Tinubu, the President of Nigeria, currently holds the position of ECOWAS chairman.

27. Asian Development Bank, Centre to open climate change and health centre in Delhi

Syllabus: GS-2, International organisations

Prelims: Asian Development Bank

Context: India will open a climate change and health hub in New Delhi in partnership with the Asian Development Bank (ADB).

- The hub will aim to provide leadership on global health matters pertaining to climate change, and to enhance the resilience of health systems against the impact of climate change.
- Asian Development Bank
 - o The Asian Development Bank (ADB) was established in 1966 with its headquarters in Manila, Philippines.
 - The ADB has 67 member countries from the Asia-Pacific region.
 - The ADB was modelled after the developmental work undertaken by the World Bank.



- Japan holds the largest share in the ADB with 15.677%, followed by the USA (15.567%), China (6.473%), and India (5.812%).
- The ADB's primary goal is social development through reducing poverty in the Asia-Pacific region with inclusive growth, sustainable growth, and regional integration.
- The ADB invests in various sectors such as infrastructure, health, public administration systems, and helps nations mitigate the effects of climate change and manage natural resources.

Alliance for Transformative Action on Climate and Health

- Alliance for Transformative Action on Climate and Health (ATACH) was an outcome of the COP 26 meet in Glasgow.
- It aims towards building climate-resilient and sustainable health systems under the WHO framework by knowledge sharing, technical support, capacity development between the countries.
- o It includes both government entities and non-State entities like NGOs.





SCIENCE AND TECHNOLOGY

. Bedaquiline drug

Syllabus: Science and Technology- Developments and their Applications and Effects in Everyday Life, Indigenization of Technology and Developing New Technology.

Prelims: Bedaquiline drug, TB

Context

- Bedaquiline has now become the cornerstone to cure drug-resistant tuberculosis (DR-TB).
- Recently, a major barrier for drug resistant TB care ended, when Johnson & Johnson's patent on Bedaquiline expired on July 18.
- This long-awaited expiry will allow generic manufacturers to supply the drug.

What is the threat from tuberculosis?

Tuberculosis was the world's deadliest infectious disease, as declared by the WHO, before COVID-19 swept the world. Each year, nearly half a million people develop drug-resistant TB and nearly 10.4 million people develop drug-sensitive TB. One-third of the world's population has latent TB, a version of the disease that can turn active as immunity falls. Nearly 2.8 million patients, the most in the world, live in India making it a national public health emergency. Globally, DR-TB is a major contributor to antimicrobial resistance and continues to be a public health threat.

What is drug-resistant TB?

As of 2017, India accounted for around one-fourth of the world's burden of multi-drug-resistant (MDR) TB and of extensively-drug-resistant (XDR) TB.

MDR TB resists treatment by at least isoniazid and rifampicin, the two frontline drugs in TB treatment. XDR TB resists these two drugs as well as fluoroquinolones and any second-line injectable drug. XDR TB is rarer than MDR TB: there were 1,24,000 cases of the latter in India (2021) versus 2,650 cases of the former (2019).

TB incidence in India has been on the decline, but MDR TB and XDR TB endanger initiatives to locally eradicate the disease. During the COVID-19 pandemic, there were indications that TB treatment was hit by disrupted supply chains, availability of healthcare workers for non-pandemic work, and access to drug-distribution centres.

A peer-reviewed 2020 study reported that TB becomes isoniazid-resistant when a person doesn't fully adhere to the treatment regimen whereas rifampicin-resistance emerges due to other factors. It also found that the incidence of MDR TB (i.e. resistance to both drugs) was "strongly correlated with treatment failure and spread through contact, and not to treatment compliance".

What has J&J done?

J&J has filed secondary patents over bedaquiline till 2027, which were granted in 66 low-and middle-income countries. It includes 34 countries with a high burden of TB, multidrug-resistant TB (MDR-TB), and TB/H1V. Over the past week, 1.5,1 has faced public outrage for seeking to extend its patent on bedaquiline.

In India, a 'pre-grant opposition' was filed by a patient group and two TB survivors — Nandita Venkatesan from India, and Phumeza Tisile from South Africa — both of whom had to endure the more toxic DR-TB treatments that lasted up to two years and caused excruciating side effects: they both lost their hearing. As a result of their legal challenge, in a landmark decision before World TB Day, the Indian Patent Office rejected the U.S. corporation JELTs secondary patent which would have extended its monopoly for four more years. Indian manufacturers will now be able to supply affordable, quality assured generic versions of bedaquiline in India as the primary patent expired on July 18. However, they will not be able to export the medicine to 34 of the 43 countries with a high burden of TB.

2. Somatic Mutations of the cell

Syllabus: Recent developments in science & technology and their applications and effects in everyday life, General awareness in the fields of IT, Space, Computers, Robotics, Nanotechnology, bio-technology

Mains: Importance of somatic mutations, their impact on health and diseases, Advances in genetic research and implications.

Prelims: About Somatic Mutations



Context:

The human genome's complexity, with 23 chromosome pairs, carries genetic blueprints from parents. Despite high replication accuracy, somatic genetic variants arise, impacting health, cancer, and evolution.

Introduction: The Blueprint of Life

- The human genome consists of 23 pairs of chromosomes inherited from each parent.
- Genomic makeup serves as the blueprint of an individual's genetic traits.
- Ovum and sperm transport parental genetic blueprints.
- After fertilisation, a single cell with 23 chromosomes divides, generating trillions of cells forming the human body.
- DNA replication during cell division is remarkably accurate due to error-correcting proteins.

Mutation Occurrence and Impact

- Despite high replication accuracy, an estimated error rate of 0.640.78 mutations per billion base pairs per division
 exists.
- Errors' effects vary based on developmental stages or life-cycle points.
- Somatic genetic mutations occur after birth but during development.
- Tissues with high turnover rate exhibit more somatic mutations with age.
- Some mutations lead to "driver mutations" enhancing cell fitness, potentially causing tumour formation.
- The human body is a mosaic of cells with subtle genomic variations.

Diverse Role of Somatic Variants

- Somatic variants are essential for physiological processes, e.g., immune cells creating diverse antibodies.
- Advanced sequencing techniques reveal functional diversity within cells.

Cancer Development and Detection

- Somatic variants contribute to cancer development and progression.
- Specific mutational signatures are characteristic of certain cancers.
- Detection of escaped tumour DNA in blood aids early cancer diagnosis.
- Variations in tumours can track disease progression and therapy response.

Genetic Diseases and Somatic Variants

- Somatic genetic variants contribute to genetic diseases not inherited from parents.
- Disease severity depends on when the mutation arises during development.
- Somatic changes can alleviate genetic disease severity through revertant mosaicism.
- Example: Wiskott-Aldrich syndrome cases with revertant mosaicism show reduced disease severity.

SMaHT Network: Exploring Somatic Mosaicism

- The U.S. National Institutes of Health launched the "Somatic Mosaicism across Human Tissues" (SMaHT) Network.
- Aims to understand somatic variants' breadth, biological significance, and clinical impact.
- SMaHT Network invests \$140 million to characterise somatic variants in various tissues from post-mortem samples.
- Data-centric approach to provide novel biological insights.

Nut Graf: The intricacies of the human genome's 23 chromosome pairs yield genetic diversity through accurate replication and somatic variants. These variants influence health, cancer, and evolutionary understanding, prompting novel research initiatives.

3. Fast Radio Bursts

Syllabus: Science and Technology- Developments and their Applications and Effects in Everyday Life, Indigenization of Technology and Developing New Technology.

Prelims: Fast Radio Bursts

Context: Recently, an international team of astronomers studied repeating Fast Radio Bursts (FRB), FRB 20190520B, using the Green Bank Telescope in the U.S. and the Parkes Observatory in Australia. The report was published in the journal Science.

What are Fast Radio Bursts?

- They are mysterious emissions of radio light (or Radio Waves) that come from the far reaches of the universe.
- FRBs reach Earth from faraway galaxies, emitting as much energy in a millisecond as the sun does over weeks.
- They are the **brightest radio bursts found in nature.**
- Astrophysicists have only been able to 'see' FRBs momentarily using large radio telescopes, but their precise
 origins and causes are unknown.
- Some FRBs are 'one-off' phenomena, while others are repeaters, flashing earth intermittently.



What are the Key Highlights of the Study?

Highly Variable Faraday Rotation Measure:

- The astronomers discovered that the Faraday rotation measure of the repeating FRB 20190520B was highly variable and reversed direction twice.
- This measure is an indicator of the FRB's magnetic field strength.

Binary Star System:

- The variation in the FRB's magnetic field strength and the direction of the reversal led the researchers to conclude that the FRB source is likely orbiting a binary star system, where the companion star is possibly a massive star or a black hole.
- This led to the raising of the possibility that "all repeating FRBs could be in binaries." However, further monitoring and research are required to confirm this hypothesis.

Turbulent Magnetized Plasma Environment:

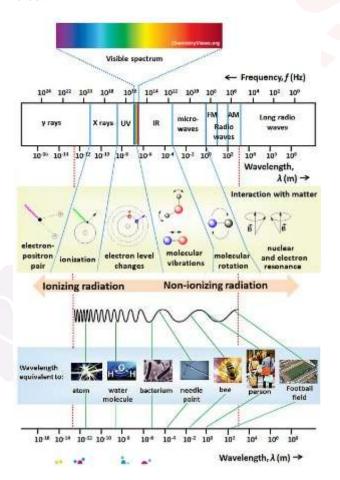
- The observed changes in the magnetic field and electron density around the FRB source suggest the presence of a turbulent magnetized plasma environment.
- This environment likely influences the behavior of the FRB signals.

• Importance of Radio Telescopes:

- The study underscores the significance of **advanced radio telescopes** in studying FRBs and other **intergalactic phenomena.**
- These telescopes, such as the Very Large Array and the Deep Synoptic Array-110, enable precise localization of FRBs and provide valuable data for understanding their sources and characteristics.

Unraveling Cosmic Mysteries:

• The study emphasizes the **role of radio astronomy in unraveling cosmic mysteries** and deepening our understanding of the universe.



4. Hybrid EVs

Syllabus: Science and Technology- Developments and their Applications and Effects in Everyday Life, Indigenization of Technology and Developing New Technology.

Mains: Potential and challenges of Hybrid EVs

Context: A crucial element of the world's transition to becoming net-zero is electric vehicles (EVs). However, hybrid electric vehicles (EVs) present a big opportunity for economically developing countries to begin the transition instead of waiting.



Background for Hybrid EVs

- The world is transitioning to net-zero emissions, and electric vehicles (EVs) are a key part of this transition.
- The adoption of EVs has been slower in economically developing countries, due to a number of factors
- Lack of infrastructure, High costs, Unreliable power grids.

What are Hybrid EVs?

- Hybrid EVs combine an internal combustion engine (ICE) with an electric motor.
- Benefits of Hybrid EVs for Developing Countries
- Improved fuel economy: Hybrid EVs can achieve fuel economy that is 1.5-2x times higher than conventional ICE vehicles.
- Lower purchase price: The purchase price of hybrid EVs is only 5-15% higher than conventional vehicles.
- Flexibility

Types of EVs:

- Electric Vehicle (EV): Any vehicle powered by an electric drivetrain using electricity from a portable source.
- Hybrid EV: Combines an internal combustion engine (ICE) with an electrical generator to produce electricity, with a small battery as an energy buffer.
- Full EV (Battery EV/Plug-in EV): Has no ICE and relies entirely on electricity from the grid, featuring a larger battery for storage.
- Plug-in Hybrid EV: A hybrid EV with a larger battery that can be charged from the grid, allowing electric mode operation for most daily commutes.

Challenges to Adopting Hybrid EVs in Developing Countries

Fast Charging Infrastructure:

- Successful transition to full EVs requires fast charging infrastructure along highways to alleviate range anxiety.
- Fast charging enables long-distance trips with 10-20 minute stops to gain significant ranges.
- o Indicative prices for EV fast chargers range from \$500-\$1,000/kW with service and maintenance at 5% per year.

Grid Reliability:

- Lack of access to a reliable grid in many economically developing nations may hinder EV adoption.
- High charging power requirements for slow and fast charging accentuate generation and transmission capacity challenges.

Vehicle Cost:

- Mass-market price points in economically developing countries are much lower than EVs' current prices.
- High battery costs contribute to the price disparity.

Advantages of Hybrid and Plug-in Hybrid EVs:

- Hybrid EVs offer a practical and cost-effective solution in the short term.
- 1.5-2x higher fuel economy reduces fuel costs, emissions, and oil imports.
- Regenerative braking and engine start-stop mechanisms enhance fuel economy in urban and hilly conditions.
- Hybrid cars' purchase price is only 5-15% higher than conventional vehicles, irrespective of the vehicle range.

Way Ahead:

- Regenerative braking in hybrid EVs (recovering the kinetic energy of the vehicle) can improve fuel economy in urban areas and in hilly conditions.
- An engine start-stop mechanism can also save fuel at traffic junctions and in heavy traffic.
- The above steps will not only help to improve fuel economy of hybrid EVs, it will also help in net emissions reduction.

Conclusion

In places where transitioning to renewables for power and building fast-charging infrastructure will take a decade or more, there is the need to switch to hybrid EVs as a short-term solution due to the fuel-economy and emissions benefits.

5. NaVIC

Syllabus: Science and Technology- Developments and their Applications and Effects in Everyday Life, Indigenization of Technology and Developing New Technology.

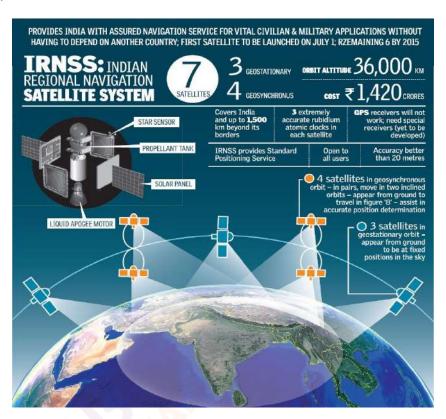
Mains: Challenges in use of NaVIC

Context: The Navigation with Indian Constellation or (NavIC), which consists of seven satellites and India's version of the American GPS (global positioning system), will soon be integrated into Aadhaar enrolment devices, the Department of Space (DoS).



Details:

- Currently the Aadhaar enrolment kits that are used to collect and verify personal details are linked to GPS. NavIC
 offers two services: Standard Position Service (SPS) for civilian users and Restricted Service (RS) for strategic users.
- These two services are provided in both L5 (1176.45 MHz) and S band (2498.028 MHz). The NavIC coverage area includes India and a region up to 1,500 km beyond the Indian boundary. Newer satellites will have an additional band called L1 that will be compatible with civilian use.
- The Centre has been pushing cell phone makers in India to make their instruments compatible with NavIC, a process that will involve hardware alterations.
- Disaster alert
- The National Disaster Management Agency was already utilising NavIC as an alert dissemination system for major natural disasters like landslides, earthquakes, floods, and avalanches. The Indian National Centre for Ocean Information System (INCOIS) relies on it to broadcast cyclones, high waves, and tsunamis alert messages to fishermen venturing into the deep sea.



Satellite Navigation Systems

- Global Positioning System (GPS)- Initiated in 1978 and achieved global coverage in 1995 and is owned by the United States government and operated by the United States Air Force. It consists of 24 to 32 medium Earth orbit satellites in six different orbital planes.
- Global Navigation Satellite System (GLONASS)- Operated by Roscosmos, a state corporation responsible for the space flight and cosmonautics program for the Russian Federation. It became operational in 1982 and achieved global coverage in 1996, and again in 2011 (after the system had fallen into disrepair). It has full global coverage with 24 satellites.
- GALILEO- It was initiated in 2005 by the European Space Agency and projected to provide global coverage by 2020 with 30 satellites.
- Quasi-Zenith Satellite System (QZSS)- It is operated by the Japanese government. It is a four-satellite regional time
 transfer system and enhancement for GPS covering Japan and the Asia-Oceania regions. Its services have been
 available on a trial basis since January 2018.

6. Deep tech startups taking brave risks

Syllabus: Science and Technology- Developments and their Applications and Effects in Everyday Life, Indigenization of Technology and Developing New Technology.

Mains: Role of Startup in the Economy and Making India Atmanirbhar

Context: Deep tech startups in India, their impact on various sectors, and the need for government support through "Startup India 2.0" to foster further growth and innovation in real sectors.



What is a deep technology startup?

- Deep tech startups go beyond consumer Internet and e-commerce, focusing on areas such as space and remote sensing, Artificial intelligence and robotics, biotech and pharma, electric vehicles, drones, defence, telecommunications, semiconductors, and more.
- These startups have a significant impact on various sectors of the economy, leading to industrialization in newer areas and creating more job opportunities.
- They are also instrumental in bringing scientific and technological discoveries from public sector labs to the market.

Success Story of Startup in India:

- The Great Indian Startup Boom of the last decade, coupled with the government's Startup India movement, fostered an environment of entrepreneurship in India.
- The movement has reached beyond metro cities, attracting entrepreneurs from suburban and rural areas, with about half of the recognized startups coming from Tier 2 and Tier 3 cities.
- Deep tech entrepreneurship has gained momentum, with startups emerging in fields like space and aviation, biotech, and more
- Incubation centres like IIT Madras's Research Park, C-CAMP, and the National Chemical Laboratory's Venture Centre have played a crucial role in supporting deep tech startups.
- Faculty members in academia find it easier to spin out their discoveries through startups founded by themselves or their alumni, boosting India's historical investments in science and technology.

Govt. floats draft National Deep Tech Start-up Policy

- After collaborating with various government departments, academia, and stakeholder firms, the Principal Scientific Adviser to the Government has published a draft of the National Deep Tech Start-up Policy (NDTSP) for public feedback.
- The main goal of the policy is to ensure India's global prominence in the deep tech value chain, with a specific focus on areas such as semiconductors, Artificial Intelligence (AI), and space technology.
- It aims to support research and development in deep tech startups that focus on fundamental and technical challenges
 rather than monetizing technology with distinct business models.
- The policy proposes measures to provide critical financing to deep tech startups before they enter the market with their products or ideas.
- Simplification of the intellectual property regime and easing of regulatory requirements are also key components of the policy.
- The NDTSP suggests the creation of an Export Promotion Board to facilitate the entry of Indian deep tech startups into foreign markets and advocates for the inclusion of clauses to ease market access in foreign trade agreements.

Way forward for Startup India 2.0:

- The government should prioritize a second phase of entrepreneurship, Startup India 2.0, with a special emphasis on the real sectors, including deep tech areas.
- Larger risk capital needs to be made available for deep tech startups, and the existing SIDBI Fund of Funds should prioritize investments in these sectors.
- The industry should contribute by increasing and directing its research funds towards financing deep tech startups.
- To enable mass procurement of indigenously developed technologies, a concerted push across various government ministries is essential. Sectors like defence, smart cities, and health have already started this initiative, but it should be expanded further.
- Industry bodies and stakeholders can aggregate demand in their sectors to encourage the development and procurement of locally-made technologies.
- Incubators should play a role in co-creating products and solutions, followed by rapid testing, certification, and support for the procurement of innovative goods at scale.
- Startup India 2.0 should aim to align the efforts of Indian entrepreneurs towards building domestic industrial and public capabilities, which would contribute to economic growth, job creation, national security, and overall national capabilities.

Nut Graf: The Great Indian Startup Boom has led to the emergence of deep tech startups in India, venturing into diverse fields such as space, Al, biotech, and more. These startups have the potential to revolutionize the economy, create jobs, and commercialize scientific discoveries from public labs. To further fuel this growth, "Startup India 2.0" should focus on providing increased risk capital and enabling mass procurement of indigenous technologies.



7. Why did Meta block Canada's access to news reports?

Syllabus: Science and Technology- developments and their applications and effects in everyday life.

Mains: Online News Act and its impact on digital platforms

Background

- In a recent statement, Meta stated that it would prevent users from Canada from posting to or accessing news articles
 on its Facebook and Instagram services.
- This is following the implementation of Canada's Online News Act, which mandates that significant digital companies like Meta and Google pay news publishers for information made available on their platforms.

What is the Online News Act?

- The Online News Act requires digital platforms that provide news to negotiate equitably with Canadian news organizations for the use of their news material on their services.
- Essentially, Google and Meta will be required by the government to enter into reimbursement agreements with recognised Canadian news providers.
- According to the law, the platforms must make a minimal contribution based on their earnings in Canada.
- The bill also permits the government to limit how news items or themes are treated by digital platforms, such as algorithmically elevating or downplaying them.

Australian Experience

In 2021, Australia passed the News Media and Digital Platforms Mandatory Bargaining Code, which became the blueprint for Canadian law and similar laws are being considered in Europe and many other countries.

Need of Such Regulation

- Due to the shift of readers and advertisers online, printed periodicals recently suffered a fall in revenue in industrialized economies.
- Google and Meta now dominate internet ad revenue and content distribution, raising concerns about the news publishers' excessive revenue share.
- Although Australia and Canada have legislation that allow them to negotiate and set reasonable conditions, critics
 contend that they only favor huge media businesses. Similar legislation is being considered in India.
- These attempts are part of a global techlash aimed at limiting the power of large tech giants in numerous fields.

Conclusion

The Online News Act mandates digital platforms with strategic market dominance, such as Google and Meta, to negotiate reasonably for the use of their material with Canadian news organizations. This legislative effort stems from the asymmetric interdependence that has evolved between a few large digital platforms and news producers. However, for internet behemoths like Meta and Google, regulated news does not constitute a large or commercially useful portion of content.

Nut Graf: Under government supervision, Google and Meta will be obliged to engage into compensation agreements with permitted news publishers in Canada, with a minimum contribution based on their revenue in the country.

8. Importance & concerns of Starlink

Syllabus: Science and Technology- Developments and their Applications and Effects in Everyday Life, Indigenization of Technology and Developing New Technology.

Mains: Importance & concerns of Starlink

Prelims: about Starlink

Context:

• The article discusses the impact of Starlink's satellite internet service, controlled by Elon Musk, on global geopolitics, particularly its significance in the Russia-Ukraine war and the need for more satellite constellations.

Introduction

- In January 2023, images of an unmanned Ukrainian drone with a retrofitted Starlink satellite dish circulated on Telegram channels in Russia.
- Pro-Russian paramilitary groups claimed that the integration of Starlink's satellite internet service allowed remote control of the drone, raising concerns about its potential use in the Russia-Ukraine war.
- Elon Musk's tweet denying the use of Starlink for long-range drone strikes highlighted how a tech CEO could alter the rules of engagement in a conflict.

Starlink's Importance in Ukraine

- Starlink's high-speed satellite internet access became crucial for communication in war-stricken Ukraine after the outbreak of the Russia-Ukraine war in 2022.
- The Ukrainian government faced challenges in controlling internet access as it depended on Musk's Starlink service, giving him significant control over connectivity in the country.



Warping the Internet's Functionality

- Traditional infrastructure operates on a public utility principle, but satellite internet companies like Starlink can
 exert control over connectivity due to the lack of regulation and the technology's nature.
- After the protests in Iran, the government shut down internet access, but Starlink provided connectivity, enabling
 activists and protestors to communicate securely.
- However, Starlink's monopoly raises concerns when Musk denies countries' requests for connectivity or restricts specific uses, leaving decisions to tech company employees rather than governments.

• The Need for More LEO Satellite Constellations

- Starlink's monopoly results from several factors, including Musk's foresight and light regulation from the Federal Communications Commission (FCC).
- Rival firm OneWeb faced challenges when Russia demanded their satellites not be used against Moscow, showing the importance of government-specific projects for satellite constellations.
- The European Union and China have initiated plans for their satellite constellations to compete with Starlink, emphasising the need to decentralise the power concentrated in one company.

9. Beyond the hype

Syllabus: General awareness in the fields of IT, Space, Computers, Robotics, Nanotechnology, bio-technology.

Mains: Recent developments in the field of superconductivity

Prelims: About Superconductivity and LK-99

Context: Researchers in South Korea claimed a breakthrough in condensed matter physics, asserting that a material named LK-99 displays room-temperature superconductivity and ambient pressure. This claim has ignited interest and debate in the scientific community.

Introduction

- Claims of room-temperature superconductivity create global attention and excitement in condensed matter physics.
- Recent announcement from South Korea: Researchers in South Korea released preprint papers on arXiv, claiming a room-temperature superconductor named LK-99.

Characteristics of Conventional Superconductors

- Conventional superconductors display four distinct features, including zero loss in electric current transmission.
- Industrial, research, and diagnostic applications greatly benefit from zero-loss electric current transmission.
- Scientists were in search of a material that achieves superconductivity at room temperature, without requiring it to be cooled to low temperatures or needing the application of extreme pressure.

LK-99: A Promising Candidate

- LK-99 is a copper-substituted lead apatite, claimed to exhibit superconducting properties at room temperature and ambient pressure.
- The group's preprint papers provide accessible data and instructions for synthesising and testing LK-99's properties.
- The term "apatite" is ironically derived from the Greek "to deceive."

History of Room-Temperature Superconductors

- Many claims of room-temperature superconductors in the past century lacked independent verification.
- LK-99's claim receives heightened interest due to available data and synthesis instructions.

Crucial Role of Independent Verification

- The significance of a room-temperature and pressure superconductor demands thorough independent verification.
- Rush to publish results before verification may compromise the scientific process.
- The South Korean group must share all data for rigorous scrutiny.

Challenges in Verifying Superconductivity

- Verification of superconducting properties demands sophisticated equipment and precise synthesis information.
- Previous claims, like one this year, have faced criticism for not sharing necessary samples.

Caution for Non-Experts

- Despite the potential of revolutionary technology, patience is needed for independent verification.
- Qualified research groups' confirmation is essential before forming definitive conclusions.



Update:

LK 99 not a superconductor

- Recently scientists found that LK-99 is probably not a superconductor.
- In July 2023, a group of scientists in South Korea uploaded two preprint papers claiming that a lead apatite material was an ambient condition superconductor.
- Apatites are materials that have a regular arrangement of tetrahedrally shaped phosphate ions (i.e. one phosphorus atom and four oxygen atoms). When lead ions sit in between these phosphate motifs, it is lead apatite.
- The novelty of the South Korean group's work was to replace 10% of the lead ions in lead apatite with copper, to produce the supposed wonder material that they had christened LK-99 (after their own last names).
- The group's two papers elicited a mixture of surprise and scepticism in the scientific community, surprise because of the apatite, and scepticism because of the history of superconductivity.
- Researchers in Australia, China, India, the U.S., and several European countries followed them and tried to replicate the South Korean team's findings but no one found conclusive evidence of superconductivity in their samples.
- In fact, the Indian group, from the CSIR-National Physical Laboratory, New Delhi, was one of the first to report that it didn't find any signs of superconductivity in LK-99.

Nut Graf: Amid claims of a new room-temperature superconductor, South Korean scientists have announced LK-99's superconducting abilities. While previous claims often lacked verification, the need for independent scrutiny remains vital for this potentially revolutionary development.

10. Superconductivity: stay in the flow

Syllabus: GS 3- Science & Technology

Prelims: Basic understanding of superconductivity and related concepts.

Introduction

- Superconductivity stands as a crucial phenomenon within materials science due to its unique property of offering zero electrical resistance.
- This phenomenon has intrigued scientists for its potential to overcome energy loss and heat generation caused by resistance during electric current flow.

Defining Superconductors

- Superconductors possess the exceptional capacity to carry electric current without any resistance when they are in a superconducting state.
- Additionally, they exhibit the intriguing characteristic of repelling weak magnetic fields, a defining feature of their unique state.

Historical Discovery

- In 1911, Dutch physicist Heike Kamerlingh Onnes made a monumental breakthrough by uncovering superconductivity.
- Onnes' pivotal experiment involved investigating mercury, which revealed that its electrical resistance vanished when cooled below an astonishingly low temperature of -268.95°C.

Practical Applications

- The modern world benefits from superconductors through their application in diverse fields, including MRI (Magnetic Resonance Imaging) machines and particle accelerators.
- Moreover, superconductors play an instrumental role in high-speed trains, reducing friction and enhancing efficiency.

Challenges and Quests

- While some materials exhibit superconductivity at elevated temperatures under specific pressure conditions, a significant challenge remains unsolved.
- This challenge centres on discovering a superconductor that operates at room temperature and standard atmospheric pressure, a pursuit that eludes scientists.

Conclusion

- The pursuit of practical superconductors holds promise for revolutionising various industries by minimising energy loss and enhancing efficiency.
- Within the realm of modern physics, a pivotal question remains: Can researchers uncover a material capable of achieving superconductivity at room temperature and normal pressure.



11. India to remove animals from drug testing

Syllabus: Ethical, scientific, and environmental aspects of drug testing, impact on animal welfare, and alternative testing methods.

Mains: Ethical considerations in scientific research, animal rights, and alternatives to animal testing.

Context: An amendment to India's New Drugs and Clinical Trial Rules (2023) aims to replace animal testing in drug research with advanced human-relevant methods, including 3D organoids and organs-on-chip.

Shift towards Human-Relevant Methods

- The amendment enables researchers to utilize technologies like 3D organoids, organs-on-chip, and advanced computational methods for drug safety and efficacy testing.
- Current drug development relies on animal testing, yet these tests often fail to accurately predict human responses due to biological complexities.

Challenges of Conventional Testing

- The conventional drug development process involves testing in animals, which often mismatches human reactions.
- Despite investments, most drugs fail during human clinical trials due to this mismatch.

Advancements in Testing Alternatives

- Researchers are turning to technologies like 3D organoids and organs-on-chip using human cells, capturing complex human biology more effectively.
- Organoids replicate specific organs in miniature, while organs-on-chip simulate blood flow and physiological signals.
- 3D bioprinting enables the creation of human tissues using bio-ink, offering personalised testing approaches.

Global Regulatory Progress

- Several countries have embraced alternative methods to animal testing in drug development.
- The European Union, the U.S., South Korea, and Canada have introduced regulations favouring human-relevant testing.
- India, in March 2023, amended its Clinical Trials Rules to integrate these technologies into the drug development process.

Indian Challenges and Potential Solutions

- Multidisciplinary knowledge is required for organ-on-a-chip development.
- Lack of focused training and resources pose hurdles to exploiting advanced methods.
- Need for dedicated institutes like the Wyss Institute for interdisciplinary research.
- Proposed establishment of a Centre for Excellence to bring experts together for preclinical human models.
- Resource gaps exist, with most materials imported from developed countries.

Quality and Validation Considerations

- Researchers minimise components for disease simulation, leading to variability in lab protocols and data.
- Guidelines on quality criteria and standards for these systems are essential.
- Animal testing requirements must be re-evaluated considering advancements in cell-based and gene-editing therapeutics.

Nut Graf: India's amended Clinical Trial Rules emphasise innovative non-animal methods like 3D organoids and organs-on-chip for drug research, moving away from conventional animal testing in line with global trends.

12. Small Nuclear Modular Reactors

Syllabus: Science and Technology- Developments and their Applications and Effects in Everyday Life.

Mains: Small Nuclear Modular Reactors: Features and role in reducing carbon emission

Context: Small modular reactors (SMRs) offer safer, compact nuclear energy for grid stability, emissions reduction, and India's energy security.

What are small nuclear modular reactors?

- Small Modular Reactors (SMRs) are a type of nuclear reactor with a capacity of up to 300 MW.
- They are designed to be smaller and more compact compared to conventional nuclear power plants (NPPs).
- SMRs are often built in factories and then assembled on-site, which can reduce construction time and costs.

What differentiates them from conventional nuclear power plants?

- Enhanced Safety: SMRs are designed with lower core damage frequency and radioactive contamination potential.
- Passive Safety Features: They incorporate passive safety systems, minimizing the risk of uncontrolled radioactive releases.



- Simplified Design: SMRs have simpler designs compared to conventional NPPs.
- Repurposing Sites: SMRs can be installed on existing thermal power plant sites, minimizing land acquisition and displacement.
- Lower-Enriched Uranium: Many SMR designs use low-enriched uranium, making it accessible to more countries.

How can they contribute to decarbonisation?

- Grid Stability: SMRs provide 24/7 low-carbon electricity, enhancing grid reliability alongside variable renewable energy sources.
- CO2 Emission Reduction: Nuclear power, including SMRs, helps reduce CO2 emissions by avoiding fossil fuel combustion.
- **Energy Security:** SMRs improve energy security by diversifying the energy mix and reducing dependence on critical minerals.
- Complementing Renewables: SMRs can be integrated into decarbonized electricity systems to ensure reliable power supply.

How will they affect India's demand for and use of uranium?

- **Diversified Uranium Sources:** SMRs' use of low-enriched uranium can be supplied by multiple countries with Uranium mines and enrichment facilities.
- **Reduced Concentration Risk:** SMRs decrease the concentration risk associated with critical minerals, promoting energy security.
- Reduced Uranium Demand: SMRs' efficient design and smaller size lead to lower uranium consumption compared to conventional NPPs.

What legal and regulatory changes do they entail?

- **Private Sector Participation:** Amendments to the Atomic Energy Act are needed to allow private sector involvement in SMR deployment.
- Safety Oversight: Creation of an independent regulatory board to oversee all stages of the nuclear power generation cycle.
- Government Control: Security aspects around SMRs remain under government control, while operations can involve
 private entities.
- Public Perception: Improve public perception by transparently sharing environmental and public health data of civilian reactors.

Nut Graf: Amidst the quest for clean energy (SDG 7), small modular reactors (SMRs) emerge as a solution, ensuring grid stability, emission reduction, and energy security. Their compact design and enhanced safety features address challenges in decarbonizing power sectors globally, including India's transition towards sustainable, reliable, and modern energy.

13. Metagenome sequencing technology is transforming pathogen surveillance

Syllabus: Recent developments and their applications and effects in everyday life

Mains: Analyzing the role of metagenome sequencing technology in revolutionizing pathogen surveillance and understanding its applications in health and safety.

Prelims: About Metagenome sequencing technology.

Context:

The article highlights the transformative role of genome sequencing in pathogen surveillance, with metagenomics leading to rapid identification. The application of these techniques during the COVID-19 pandemic and their continued use in various scenarios is discussed.

Introduction

The COVID-19 pandemic has been a transformative global event. Unprecedented in scale, it led to collaborative
efforts to swiftly combat its impact. The pandemic also prompted a shift in pathogen identification methodologies,
with genome sequencing playing a pivotal role.

Metagenomics: Rapid Pathogen Identification

- During COVID-19's early stages, unbiased genome sequencing techniques were applied directly to infected patient samples, a method called metagenomics.
- Metagenomics enabled quick identification of SARS-CoV-2 as the virus responsible for COVID-19, avoiding the traditional microbiology route.
- This new approach drastically altered pathogen identification strategies and led to rapid results, making SARS-CoV-2 one of the most sequenced organisms globally.



Genome-Based Technologies: A Paradigm Shift

- Genome sequencing spurred the development of numerous technologies, such as the CovidSeq assay, which aided
 the establishment of national and international SARS-CoV-2 genome surveillance efforts.
- Platforms like GISAID facilitated the submission of SARS-CoV-2 genome data, driving high-throughput genome surveillance
- Genomic data influenced public health policies and showcased the importance of genomic surveillance.

India's Initiative and Impact

- India initiated a national SARS-CoV-2 genome sequencing and surveillance program, setting an example for applying genomic technologies for pathogen surveillance.
- The success of India's program highlighted the potential of advanced genomic technologies in unbiased and high-throughput pathogen detection.

Nigerian Case Study

- Scientists at the Nigerian Centre for Disease Control used metagenomic sequencing to identify viruses in different patient cohorts.
- The approach helped identify various viruses affecting individuals, enabling disease diagnosis and public health response.

Genomic Surveillance for Avian Influenza

- Genome sequencing technologies adapted during COVID-19 have been instrumental in understanding and managing the global mpox virus outbreak.
- Avian influenza viruses, known for their rapid spread and impact on birds and humans, also benefit from genome surveillance.
- The deployment of genome sequencing infrastructure during COVID-19 has enabled efficient avian influenza genomic surveillance.

Future Prospects: Beyond COVID-19

- Genome sequencing techniques have relevance beyond COVID-19, being applied to other seasonal pathogens like Zika and dengue.
- Pathogen surveillance through advanced genome sequencing aids in early response strategies, emerging strain identification, and risk-based surveillance.
- These technologies are poised to play a significant role in tackling future pathogens, bolstering our preparedness against emerging threats.

Nut Graf: Genome sequencing, particularly metagenomics, has revolutionised pathogen surveillance, enabling swift identification. This approach, utilised extensively during the COVID-19 pandemic, has not only transformed identification methods but also influenced public health policies. It has empowered nations like India to establish successful genome surveillance programs and holds promise for future pathogen detection and response strategies.

14. Want to catch a supernova? There's a new app for that

Syllabus: GS 3- Science and Technology

Prelims: General awareness in the fields of IT, Space, Computers, Robotics, Nanotechnology

Introduction

- The night sky appears serene but conceals a universe of constant movement and transformation.
- Planets, asteroids, comets, stars, supernovae, and black holes shape this dynamic cosmos.
- Astronomers observe these cosmic events through telescopes.

Smartphones Revolutionise Stargazing

- Smartphones play a crucial role in collecting astronomy data, benefitting both professionals and enthusiasts.
- Apps transform smartphones into powerful tools for stargazers, aiding observation and alignment.
- Smartphone cameras enhance low-light capabilities, becoming virtual windows to the heavens.

Apps for Space Enthusiasts

- Numerous space-focused apps are available for Android and iOS phones, offering free access to sky phenomena.
- Apps like Google Sky Map locate and identify stars, planets, and nebulae.
- NASA's app provides space mission updates, images, and videos.

ZARTH App: Merging Science and Gaming

- ZARTH (ZTF Augmented Reality Transient Hunter) was developed by Ashish Mahabal and his team.
- Inspired by Pokemon Go, ZARTH lets anyone 'hunt' for optical transients, fleeting cosmic events.
- Utilises Sky Map and adds daily data from Zwicky Transient Facility (ZTF) telescope at Palomar Observatory.
- ZTF scans the northern sky every two days and aids in tracking asteroids and studying supernovae.



How ZARTH Works

- Players catch transients by touching them on the app.
- Around 200 transients are added daily, out of 100,000 detected by ZTF.
- Transients include supernovae, flaring stars, white dwarf binaries, and more.
- ZARTH ranks transients based on rarity and importance, users compete to score points.

ZARTH's Impact and Future

- ZARTH aims for astronomy outreach and citizen science involvement.
- Expected to enhance transient data as citizen scientists contribute.
- Potential for classroom integration, stimulating interest in STEM education.
- Plans to expand to iPhones, elevating astronomical event detection.

Conclusion

- ZARTH app bridges science and gaming, enabling smartphone users to engage in astronomy.
- Human-Al collaboration enhances astronomical discoveries.
- Smartphone technology transforms stargazing, making the universe more accessible to all.

15. Bhashini

Syllabus: GS 3- Science & Technology

Prelims: Bhashini

Context: Prime Minister highlighted India's role as a testing ground for innovative solutions during the G20 Digital Economy Working Group Ministers Meet. 'Bhashini', India's Al translation platform to promote digital inclusion across India

Details:

- Digital India BHASHINI is India's Artificial Intelligence (AI) led language translation platform.
- A Bhashini Platform will make Artificial Intelligence (AI) and Natural Language Processing (NLP) resources available to MSME (Medium, Small and Micro Enterprises), Startups and Individual Innovators in the public domain.
- Bhashini Platform is a part of the National Language Translation Mission.

Significance

- Digital Inclusion: It will empower Indian citizens by connecting them to the Digital Initiatives of the country in their own language thereby leading to digital inclusion.
- Digital Government: Mission will create and nurture an ecosystem involving Central/State government agencies and start-ups, working together to develop and deploy innovative products and services in Indian languages.
- Increase the Content in Indian Languages: It also aims to increase the content in Indian languages on the Internet substantially in the domains of public interest, particularly, governance-and-policy, science & technology, etc., thus will encourage citizens to use the Internet in their own language.

16. Understanding the failure of Luna 25

Syllabus: GS-3, Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

Mains: Luna 25 and Chandrayaan 3 Missions

Context: Russia's Luna-25 spacecraft crashed into the Moon after it spun into an uncontrolled orbit.

Background

- The Russian space agency launched its Luna 25 spacecraft aboard a Soyuz 2 rocket on 10 August 2023.
- However, Roscosmos said that Luna 25 experienced a fault and landed on the moon's surface the day before, thereby terminating the mission.
- The lunar mission was Russia's first since 1976, when it was part of the Soviet Union. Only three governments have managed successful moon landings: the Soviet Union, the United States and China.

About Luna 25

- The Luna 25 was originally known as the Luna-Glob, but the name was modified to make the mission part of the Luna series.
- The objective was to provide Russia's guaranteed access to the moon's surface a reference to the moon's rising prominence as a spaceflight destination.



Significance

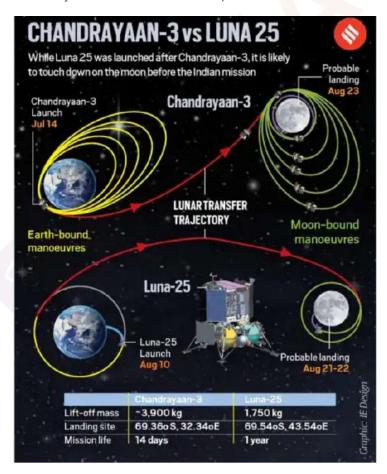
- In contrast to the Artemis Accords, which were headed by the United States, Russia and China are jointly in charge of the International Lunar Research Station (ILRS). However, Russia has not carried out a successful interplanetary mission in 34 years.
- According to some observers, Russia planned Luna 25 to be a display of the country's economy, including the spaceflight sector.

Failure of Luna 25

- According to Roscosmos, the spacecraft had a technical fault that caused it to operate outside of the parameters set for the mission.
- According to reports, as Luna 25 attempted to change its circular orbit around the moon to a lower pre-landing orbit, it applied more power than was necessary, sending it careening to the moon's surface.
- Roscosmos lost touch with Luna 25 while it was completing this move, implying that the maneuver knocked it out of lunar orbit.

Reasons why Luna 25 and Chandrayaan 3 Missions are not in a race

- The Luna 25 and Chandrayaan 3 missions were launched at the same time and were both intended to try soft landings on the moon within a few days of each other.
- However, the launch vehicle, the mass of the spacecraft, the earth-moon trajectory, and the availability of sunlight at a given point on the moon all influence these mission parameters.
- While Roscosmos has been working on Luna 25 since the early 2010s, Chandrayaan 3 has been in development since 2019.
- Both expeditions were additionally hampered by the COVID-19 epidemic.
- Roscosmos and the Indian Space Research Organisation (ISRO) have previously collaborated; the former is also assisting in the training of Indian astronauts for the Gaganyaan mission.
- As a result, Luna 25 and Chandrayaan 3 could not have competed.



Sanctions on Russia and Impact on Lunar Mission

- Currently, NASA and the European Space Agency are assisting ISRO in tracking Chandrayaan 3 around the moon. Their antennas will keep in touch with the 'Vikram' lander as it seeks a smooth landing.
- However, once Russia invaded Ukraine, it lost the trust of many countries throughout the world, prompting economic sanctions.
- In other words, Roscosmos could only communicate with Luna 25 while it was directly above Russia.
- One less-noticed repercussion was that Russia lost its ability to employ satellite tracking systems run by governments all around the world.



Way Forward

Russia is lagging behind in terms of travelling to the moon. Prior to the ILRS, Russia collaborated with NASA to create a near-moon space station. However, even before it left the partnership in 2021, its function in the firm was shown to be quite small.

Roscosmos has already scheduled Luna missions 26 and 27 as part of the first phase of operations, which includes technology demonstration and site selection for future lander missions, under the ILRS.

Nut Graf: The failure of Luna 25 and Western sanctions will have an influence on the launch of Russia's future Luna missions, restricting Russia's involvement in interplanetary missions.

17. India lights up the dark side of the moon

Syllabus: Achievements of Indians in science & technology, General awareness in the fields of IT, Space, Computers, Robotics, Nanotechnology, bio-technology

Mains: Space technology, Lunar missions, ISRO's achievements.

Prelims: About Chandrayaan- 3

Context:

India achieved a momentous feat by successfully landing Chandrayaan-3's lander module and rover on the moon's surface, joining a select group of countries that have accomplished lunar landings.

Introduction

• India achieved a successful lunar landing with Chandrayaan-3's lander module and rover on the moon's surface at 6.03 p.m.

Joining Elite Lunar Achievers

- India now stands among the exclusive countries that have accomplished lunar landings: the United States, Russia, and China.
- India's achievement is notable for being the first successful landing on the moon's polar region.

Confident Soft Landing

- ISRO Chairman S. Somanath confirmed a soft landing with most nominal landing conditions fulfilled.
- Lander's velocity during touchdown was under 2 metres per second, ensuring the lander's health for planned experiments.

Anticipation for Experiments

- Mr. Somanath expressed excitement for the upcoming 14 days, expecting successful execution of planned experiments and rover deployment.
- Pragyan rover's deployment is a highlight of the next phase.

Communication Link Establishment

 A communication link was established between the lander and MOX-ISTRAC, Bengaluru, facilitating data exchange and control.

Human-Centric Approach

- The mission's success resonates globally with the motto 'One Earth, One Family, One Future.'
- This approach garnered universal support, aligning with India's lunar mission philosophy.

Global Inspiration and Collaboration

- Success is seen as a triumph for all humanity, inspiring other countries in space exploration.
- Opens doors for global cooperation and collaboration in space research.

Reaching the Lunar South Pole

 Prime Minister Narendra Modi lauded the accomplishment of reaching the moon's South Pole, highlighting India's scientists' dedication and talent.

Rover's Scientific Objectives

- Deployed rover will conduct in-situ chemical analysis of the lunar surface during mobility.
- Equipped with scientific payloads to perform experiments, contributing to lunar research.

Chandrayaan-3 Mission Overview

- Launched on July 14 from Satish Dhawan Space Centre in Sriharikota.
- Comprises indigenous lander module, propulsion module, and rover.
- Objectives include demonstrating safe landings, rover mobility, and conducting scientific experiments.



Comparison with Russian Luna-25

 Chandrayaan-3's successful landing contrasts with Russia's Luna-25 spacecraft, which crashed into the moon due to loss of control.

18. Why did Chandrayaan3 land on the near side of the moon?

- The Chandrayaan-3 mission landed Vikram, its lander, on the near side of the moon, about 600 km from the South Pole.
- The near side of the moon is the side that is always visible from Earth. This is due to tidal locking i.e Earth's tidal forces have slowed the moon's rotation in such a way that the same side of the moon is visible from earth.
- Consequently, the "other side" of the moon, (the far side) is never fully visible from Earth. Spacecrafts such as the USSR's Luna 3 have brought to light the topography of this side of the moon.
- The near side is relatively smoother and has more maria (volcanic plains) than the far side. The far side has huge craters that were likely caused by asteroids.
- Due to a thinner crust in the near side, volcanic lava has been able to reach the surface more easily and fill up the craters. This makes the near side of the moon conducive to space missions.
- China's Chang'e 4 lander is the only spacecraft to have successfully landed on the far side of the moon. It landed in the Von Karman crater.
- Vikram lander was sent as close as possible to the south pole to shine more light on the permanently shadowed regions of the moon and hence increase the chances of finding frozen water-ice.
- But, the Vikram lander itself is not in a permanently shadowed region to ensure access to sunlight and charge its solar batteries. Hence it landed on the near side of the moon.
- Additionally, landing on the far side of the moon would have meant no direct communication with Earth, which would have made it difficult to control the lander and rover.

Nut Graf: India's Chandrayaan-3 mission marked a historic achievement as the lander and rover softly touched down on the moon's surface. India now stands with the United States, Russia, and China in the elite circle of lunar achievers. The successful landing showcases India's scientific prowess and sets the stage for further exploration and global collaboration in space research.

19. What next for ISRO after the Chandrayaan-3 mission?

Syllabus: GS 3- Science & Technology

Prelims: ISRO Missions and Initiatives

Upcoming ISRO Missions and Initiatives

- XPoSat: Polarimetry Mission Ready for Launch: XPoSat, India's first dedicated polarimetry mission, set to study X-ray sources in extreme conditions, is prepared for launch.
- Aditya L1: Solar Study Observatory Launch: India's space-based solar observatory, Aditya L1, likely to be launched in the first week of September, focuses on sun observation.
- INSAT-3DS: Earth Observation Satellite Launch: INSAT-3DS, an earth observation satellite, scheduled for launch by ISRO.
- **Test Vehicle Mission for Crew Escape System:** Launch of a test vehicle mission to validate the crew escape system for Gaganyaan, India's maiden human space flight program, anticipated soon.
- NISAR: India-U.S. Synthetic Aperture Radar: ISRO to launch NISAR, a low-earth orbit observatory developed in collaboration with NASA, for consistent global data on earth's ecosystems, ice mass, vegetation, sea-level rise, and more.
- Security Satellite Development: ISRO to construct a significant number of satellites for national security purposes in the near future.
- NISAR's Dual Band Synthetic Aperture Radar: NISAR will utilise L and S dual band synthetic aperture radar employing sweep SAR technique for large swath coverage with high resolution.
- Preparations for Uncrewed Missions: Before Gaganyaan human spaceflight, ISRO plans two uncrewed module missions, with the first expected in early next year.
- Gaganyaan Program's Objectives: Gaganyaan program aims to demonstrate ISRO's capability to transport humans to low-earth orbit using the human-rated Launch Vehicle Mark-3.
 - Orbital Module Details: The orbital module comprises crew and service modules. The pressurised crew module serves as living quarters for a small crew.
 - **Test Flight Details:** The orbital module will be placed in a circular orbit at around 400 km altitude for one to three days during the test flight.
 - Safe Descent and Landing: The crew module will descend and return to Earth, landing at a predetermined sea location
- ISRO's dynamic agenda includes a diverse range of missions, from solar observation to earth monitoring, security satellites, and advancing human space flight capabilities, signifying India's significant strides in space exploration and technology.



20. After Chandrayaan3, what are ISRO's plans?

Syllabus: Achievements of Indians in Science & Technology; Indigenization of Technology and Developing New Technology

Prelims: Gaganyaan Mission, Aditya L1, NISAR, LUPEX, Shukrayaan Mission

Mains: Achievements of ISRO, New technologies under development by ISRO

Context:

ISRO has several key projects planned for 2024 and the future. Some of the key missions include:

- Gaganyan mission: It aims to demonstrate human spaceflight capability by launching a crew of 3 to an orbit of 400 km for a 3-day mission. Launch Vehicle Mark-3 (LMV-3) is being re-configured to meet human rating requirements and renamed Human Rated LVM3 (HLVM3) for the purpose. As part of this mission, Gaganyaan G1 and G2 flights are planned in 2024. These are uncrewed test flights of the human rated LVM-3 rocket that will pave the way for India's first manned space mission.
- Aditya-L1: Aditya-L1 will be India's first space-based mission to study the Sun. The spacecraft will be placed in a halo orbit around the Lagrange point 1 (L1) of the Sun-Earth system, located approximately 1.5 million kilometers from Earth. Lagrange points are special places in space where objects sent there will stay still. This happens because the gravity pulling from celestial objects on a satellite is balanced by the force that keeps it moving around them. Spacecraft can use these spots to save fuel and stay in one place without using too much energy. The L1 point offers the advantage of continuous views of the Sun without any occultation or eclipses.
- NISAR Satellite: The NASA-ISRO Synthetic Aperture Radar (NISAR) mission is a collaborative mission between the National Aeronautics and Space Administration (NASA) and the Indian Space Research Organisation (ISRO) to develop a Low Earth Orbit (LEO) observatory. The primary objective of NISAR is to generate high-resolution, globally comprehensive datasets of Earth's surface over a period of 12 days, enabling the study of various terrestrial and atmospheric phenomena.
- Launch of the GSAT-20 communications satellite: The satellite will augment the communication infrastructure supporting India's Smart Cities Mission by providing additional data transmission capacity.
- Small satellite launches: ISRO will continue to launch small satellites for various applications, including Earth observation, navigation, and technology demonstration.
- Reusable Launch Vehicle-Technology Demonstrator (RLV-TD): This is a reusable launch vehicle that can carry
 payloads of up to 20,000 kg to low-Earth orbit. It is expected to reduce the cost of access to space for both India and
 other countries.
- Methalox propellant development: ISRO is working on developing a methane-based propellant that is safer and more efficient than traditional fuels. This fuel is a mix of methane and liquid oxygen.
- **Electric propulsion system development:** ISRO is also working on an electric propulsion system for satellites, which would be lighter and more efficient than traditional chemical propulsion systems. This could increase the lifespan of satellites in future.
- Transfer of technology to private sector: ISRO plans to transfer technology related to telecommunications and electronics to the private sector, and eventually, the Small Satellite Launch Vehicle (SSLV) as well.
- Lunar Polar Exploration (LUPEX) mission: In collaboration with Japan Aerospace Exploration Agency (JAXA), ISRO is planning a mission to explore the lunar south pole, including a lander and rover (more sophisticated than Chandrayaan 3) that can survive the harsh lunar environment. The rover will have the capability to drill and extract subsurface samples of the moon for analysis. The mission will demonstrate 'night survival' capabilities i.e while the solar panels will power the lander and rover during the day, alternative energy sources will be used at night. Electronic components in the mission must be able to withstand extreme temperatures (night temperatures can drop to as much as -180°C). JAXA will provide the launch vehicle and rover while ISRO will provide the lander
- **Future moon missions:** ISRO plans to continue exploring the Moon with future missions, including Chandrayaan-5, -6, and possibly more.
- International collaborations: With Russia under sanctions due to the conflict in Ukraine, ISRO is expanding its
 collaboration with international space agencies and companies to provide launch services and explore new
 opportunities.
- Missions to Mars and Venus: ISRO has plans to return to Mars and develop missions to study Venus, including the 'Shukrayaan' mission.

Nut Graf: ISRO has several key projects planned for 2024 and the future, including the Gaganyaan mission to demonstrate human spaceflight capability, the Aditya-L1 mission to study the Sun, and the NISAR mission to generate high-resolution images of Earth's surface etc which could cement India's position in the elite space agencies of the world.



21. As Pragyaan digs deeper into the moon, VSSC lab looks to the Sun

Syllabus: GS 3- Science & Technology

Prelims: Aditya-L1 mission

Preparation for Mission Lift-off

- Scientists at the Space Physics Laboratory of the Vikram Sarabhai Space Centre (VSSC) are gearing up for the Aditya-L1 mission to study the sun's secrets.
- The mission is scheduled to lift off from Sriharikota in the first week of September.
- The Aditya-L1 mission aims to unravel the mysteries of solar wind, the continuous stream of charged particles from the sun.

PAPA Payload for Deeper Insights

- The Plasma Analyser Package for Aditya (PAPA) payload, developed by the SPL, is one of seven scientific payloads on the Aditya-L1 mission.
- PAPA is designed to gain deeper insights into the phenomenon of solar wind.
- Solar wind is the term used for the constant flow of charged particles from the sun.

Composition and Variations of Solar Wind

- The PAPA payload will focus on studying the composition of the solar wind.
- It will analyse the energy of electrons, as well as the energy and mass of protons and ions within the solar wind.
- The study will also encompass angular variations in the solar wind.

Mission Details and Payload Integration

- Aditya-L1 is described by ISRO as the "first space-based Indian mission to study the sun."
- The mission involves studying the sun from a halo orbit around Lagrangian point 1 (L1) of the sun-earth system.
- PAPA payload weighs around 8 kg and shares space with six other payloads developed by ISRO units and scientific
 establishments collaborating with ISRO.
- The combined payloads are designed to study different layers of the sun using electromagnetic and particle detectors.

Launch and Travel Details

- The Aditya-L1 spacecraft will be launched using an XL variant of the Polar Satellite Launch Vehicle (PSLV).
- Once launched, the spacecraft will take 125 days to reach its destination at Lagrangian point 1 (L1).

Chandrayaan-3 Mission Contributions

- Earlier, during the Chandrayaan-3 mission, the Space Physics Laboratory (SPL) contributed two payloads to the Vikram lander.
- These payloads were the Chandra's Surface Thermophysical Experiment (ChaSTE) and the Radio Anatomy of Moon Bound Hypersensitive Ionosphere and Atmosphere (RAMBHA).

22. Smooth operation of 'LAM' critical to Aditya-L1 success

Syllabus: GS 3 – Science & Technology

Prelims: Aditya-L1 Mission and Liquid Apogee Motor (LAM)

Role of LAM in Aditya-L1 Mission

Importance of LAM in Aditya-L1 Mission

- The 'LAM' (Liquid Apogee Motor), developed by ISRO's Liquid Propulsion Systems Centre (LPSC), is crucial for the Aditya-L1 mission.
- LAM will enable placing the Aditya spacecraft in a halo orbit at Lagrangian Point L1 to study the sun.

LAM's Track Record

- LAM has a successful history, being used in significant missions like the Mars Orbiter Mission (MOM), Mangalyaan, and Chandrayaan-3.
- Used for orbital adjustment manoeuvres of satellites and spacecraft in orbit.

Consistency in LAM

- Aditya-L1 will employ the same LAM engine design as used in the Mars and Moon missions.
- $\circ\quad$ Developed by LPSC, ISRO's liquid and cryogenic propulsion centre.

Challenges and Propulsion System

Upcoming Aditya-L1 Mission

ISRO plans to launch the Aditya-L1 mission on September 2 using a Polar Satellite Launch Vehicle (PSLV-XL).

Propulsion System Composition

- Aditya spacecraft's propulsion system comprises the 440 Newton LAM engine, eight 22 Newton thrusters, and four 10 Newton thrusters.
- These thrusters correct spacecraft orientation during the journey.



Critical Restart Challenge

- A significant challenge is restarting LAM precisely to 'brake' the spacecraft as it approaches its destination, Lagrangian Point L1.
- This manoeuvre requires nudging the spacecraft into the desired halo orbit at L1.

Technical Details and Orbital Objective

Propulsion Module System

- Aditya-L1's propulsion system closely resembles that of Chandrayaan-3.
- o The LAM engine, propellant combination, and functionality remain similar, with minor differences in tank sizes.

Lagrangian Point L1

- Located around 1.5 million kilometres from Earth and the sun, L1 is a unique equilibrium point in the sun-Earth system.
- Aditya spacecraft aims to occupy a halo orbit at L1, providing a vantage point for solar studies with its scientific payloads.

23. Pragyan confirms sulphur near south pole of moon; search on for hydrogen

Syllabus: GS 3- Science & Technology

Prelims: Chandrayaan 3

Pragyan Rover's Findings

- Pragyan, the rover of Chandrayaan-3 mission, has verified the existence of sulphur on the moon's south pole.
- It's actively seeking hydrogen presence on the lunar surface.
- The rover employs Laser-Induced Breakdown Spectroscopy (LIBS) for on-site elemental composition analysis.

LIBS Technique for Elemental Analysis

- LIBS is a scientific method using intense laser pulses to analyse material composition.
- Material is exposed to laser pulses, generating localised plasma.
- Collected plasma light is analysed by charge coupled devices.
- Specific wavelengths of light emitted in plasma state determine elemental composition.

Discovered Lunar Elements

- Initial analysis identifies elements: Aluminum (Al), Sulphur (S), Calcium (Ca), Iron (Fe), Chromium (Cr), Titanium (Ti).
- Further observations reveal presence of manganese (Mn), silicon (Si), and oxygen (O).
- Ongoing investigation aims to confirm the presence of hydrogen (H).

Recognition and Celebration

- The Union Cabinet commends the Chandrayaan-3 mission as a triumph for ISRO and India's global stature.
- August 23 is designated as National Space Day to commemorate the achievement.

24. News media vs ChatGPT

Syllabus: Science and technology, new developments

Prelims: ChatGPT

Mains: News media vs ChatGPT

Context: A group of news media organisations, including The New York Times, Reuters, CNN and the Australian Broadcasting Corporation, recently shut off OpenAl's ability to access their content.

Background:

• The development comes in the wake of reports that The New York Times is planning on suing the artificial intelligence (AI) research company over copyright violations, which would represent a considerable escalation in tensions between media companies and the leading creator of generative artificial intelligence solutions.

What does OpenAl do?

- The company is best known for creating 'ChatGPT', which is an Al conversational chatbot.
- Users can ask questions on just about anything, and ChatGPT will respond pretty accurately with answers, stories and essays.
- It can even help programmers write software code. The hype around ChatGPT specifically, the breathtaking advancements in the field of AI required to create it has propelled OpenAI into becoming a \$30 billion company.



What started the face-off between news outlets and OpenAl?

- Software products like ChatGPT are based on what AI researchers call 'large language models' (LLMs).
- These models require enormous amounts of information to train their systems. If chat bots or digital assistants need to be able to understand the questions that humans ask them, they need to study human language patterns.
- Tech companies that work on LLMs like Google, Meta or Open AI are secretive about what kind of training data they use. But it's clear that online content found across the Internet, such as social media posts, news articles, Wikipedia, e-books, form a significant part of the dataset used to train ChatGPT and other similar products.
- This data is put together by scraping it off the Internet. **Tech companies use software called 'crawlers' to scan web** pages, hoover up content and put it together in a dataset that can be used to train their **LLMs**.
- This is what news outlets took a stand against last week when The New York Times and others blocked a web crawler known as GPT bot, through which OpenAl used to scrape data. They told OpenAl that the company can no longer use their published material and their journalism to train their chat bots.

Tech terminologies

- Large language models, or LLMs, are a type of Al that can mimic human intelligence. They use statistical models to analyze vast amounts of data, learning the patterns and connections between words and phrases.
- "Crawler" (sometimes also called a "robot" or "spider") is a generic term for any program that is used to automatically discover and scan websites by following links from one web page to another. Google's main crawler is called Googlebot.

Why are media companies upset?

- Search engines like Google or Bing also use web crawlers to index websites and present relevant results when users search for topics.
- The only difference is that search engines represent a mutually beneficial relationship. Google, for instance, takes a
 snippet of a news article (a headline, a blurb and perhaps a couple of sentences) and reproduces them to make its
 search results useful. And while Google profits off of that content, it also directs a significant amount of user traffic to
 news websites.
- OpenAl, on the other hand, provides no benefit, monetary or otherwise, to news companies. It simply collects publicly available data and uses it for the company's own purposes.

What is the way forward?

- If all media publications across the world refused to provide access to OpenAI, it's likely that the final product would be of lower quality. And, of course, if every single creator of online content turned down OpenAI, then ChatGPT would almost certainly not exist.
- However, at the same time, it's clear that OpenAl does believe some data is worth paying for. Last month it signed a
 licensing arrangement with The Associated Press, in a deal that would allow the company to use the news agency's
 archival content as a training dataset.
- But what happens when people refuse to accept payment and sue OpenAl for copyright infringement, the way a group of novelists did last year?

Conclusion: The legal battles ahead will have interesting implications for journalism, intellectual property and the future of artificial intelligence.

Nut Graf: As projected OpenAl can become a \$30 billion company, but if open access to content is restricted to Al then it will face quality impact on the output.

25. What are the changes to the process for the sale of SIM cards?

Syllabus: Basics of Cyber Security

Mains: Illegal sim card and cyber threat due to this and steps taken to curb this menace

Context: Telecom Minister Ashwini Vaishnaw introduced reforms like the Sanchar Saathi portal, bulk SIM procurement change, and stricter POS registration to fight cybercrime.

Features of the Citizen-Centric Portal Sanchar Saathi:

- Mobile Connection Analysis: Sanchar Saathi is a portal aimed at combating cybercrimes and financial fraud related to mobile connections.
- Connection Verification: Citizens can use the portal to verify mobile connections registered under their names.
- Stolen/Lost Phone Blocking: Users can block stolen or lost mobile phones through the portal.
- Fraudulent Connection Reporting: The platform allows users to report fraudulent or unnecessary mobile connections.
- Device Genuineness Verification: Before making a purchase, users can verify the authenticity of a device using its IMEI (International Mobile Equipment Identity) number through the portal.
- **Data Statistics:** The portal has analyzed 114 crore active mobile connections, flagging 66 lakh suspicious connections and disconnecting 52 lakh connections due to re-verification failure.
- Action Against Fraud: It has resulted in blocking 66,000 WhatsApp accounts and freezing eight lakh bank/wallet accounts. Over 300 FIRs have been filed against 1,700 dealers.



Latest Revisions in Registering Final Point of Sale by Providers:

- Mandatory Registration: Franchisees, agents, and distributors of SIM cards (Point of Sale or PoS) must now be registered with telecom network operators.
- **Indisputable Verification:** Telecom operators are responsible for thoroughly verifying the PoS, including mandatory police verification of the dealer.
- Transition Period: Existing SIM card providers are given 12 months to comply with the new registration requirements.
- Consequences of Illegal Activities: If a PoS is found engaged in illegal activities, it faces termination of the agreement, blacklisting for three years, and a penalty of ₹10 lakh.
- **Objective:** These measures aim to identify and eliminate rogue PoS while encouraging ethical practices.

How Will These Measures Tackle Cybercrime?

- Bulk SIM Card Revisions: The system of bulk procurement of SIM cards is replaced by 'business' connections, requiring KYC completion for all end-users.
- **Preventing Misuse:** Previously, bulk SIMs were misused for automated calls. The new system ensures that businesses procuring connections complete KYC for each user, preventing misuse.
- **Demographic Details and QR Code:** To avoid misuse of printed Aadhaar, demographic details must be scanned from the QR code on the printed Aadhaar during KYC.
- SIM Replacement KYC: Subscribers must undergo full KYC for SIM replacements, with outgoing and incoming SMS barred for 24 hours.
- **Enforcement and Safeguards:** Experts emphasize the need to ensure proper enforcement, especially at local stores, and implement necessary safeguards for dealing with sensitive data during the process.

Nut Graf: To address cybercrimes, the government launched reforms, introducing the Sanchar Saathi portal for mobile connection verification and fraud prevention. The changes involve mandatory registration of SIM card Points of Sale (PoS), strict verification, and transition to business connections for bulk procurement. These measures aim to eliminate illegal activities and enhance cybersecurity.

26. What to do with spent nuclear fuel?

Syllabus: General awareness in the fields of IT, Space, Computers, Robotics, Nanotechnology, bio-technology etc. Recent developments and their applications and effects in everyday life.

Mains: Issues relating to technology, nuclear energy and waste management, advancements in nuclear technology.

Prelims: About nuclear technology and nuclear reactors.

Context:

Japan releases treated radioactive water from the Fukushima nuclear plant, triggering discussions about nuclear waste management challenges and its relevance in the transition to clean energy.

Introduction

- Japan releases treated radioactive water from the Fukushima nuclear plant, highlighting nuclear waste management challenges.
- Nuclear energy is an alternative to carbon-based power for climate change mitigation, contributing 10% of global electricity.

Clean Energy Transition and Nuclear Energy

 Countries like the U.S., India, and China are considering increasing nuclear energy for net-zero emissions and clean energy transition.

Nuclear Energy Challenges

- Safe storage and disposal of nuclear waste are major challenges.
- Temporary solutions exist but a permanent one is necessary due to the waste's dangerous persistence.
- Nuclear waste's radioactivity duration varies from days to decades, depending on isotopes.

Temporary Storage Options

- Temporary storage methods include pools and dry casks for spent fuel.
- Burying waste in near-surface disposal facilities with protective covering and backfilling.

High-Level Waste Challenge

- High-level waste management is more complex.
- Deep geological disposal is the most feasible option.
- Finland's Onkalo repository uses copper canisters, and bentonite clay, buried 400 metres deep.



Finland's Approach

- The Onkalo repository employs the Swedish KBS-3 concept with three protection layers.
- Measures like release barriers ensure waste isolation from surroundings.
- Finland plans to leave waste undisturbed for 100 millennia, studies site changes and safety evolution.

Long-Term Planning

- Site tested for geological changes like ice ages and earthquakes.
- Posiva, the Finnish company, anticipates 100-120 years for the repository to become full.

Nut Graf: As nations consider nuclear energy for climate goals, Japan's release of treated radioactive water highlights the urgent need to address nuclear waste management, seeking lasting solutions for safe storage and disposal.



DEFENCE AND INTERNAL SECURITY

1. 'Namoh 108' Lotus

Syllabus: GS 3 - Science and technology

Prelims: 'Namoh 108' Lotus

Context: Science Minister Jitendra Singh unveiled a variety of lotus called 'Namoh 108' at a function in the CSIR-National Botanical Research Institute, Lucknow.

Namoh 108 Lotus:



- The lotus has 108 petals and was discovered several years ago in Manipur and kept at the institute as part of its collection of flowers and plants, on which the institute conducts research.
- The Namoh 108 lotus variety flowers from March to December and is rich in nutrients. This is the first lotus variety whose genome is completely sequenced for its characteristics.
- Dr Jitendra Singh also released apparel made from lotus fibre and perfume 'Frotus', extracted from lotus flowers and developed by the NBRI under the Lotus Research Programme in collaboration with FFDC, Kannauj.
- The Minister also released the new variety of Aloe vera named 'NBRI-Nihar', a clonal selection having approximately 2.5 times high gel yield in comparison to Aloe vera.

2. Astra air-to-air missile test-fired from Tejas in 'textbook launch'

Syllabus: GS 3- Security challenges and defence technology

Prelims: Astra Missile

Context: Astra air-to-air missile test-fired from Tejas in 'textbook launch'

- Astra Missile Test-Fire
 - Astra beyond-visual-range air-to-air missile successfully test-fired from Tejas aircraft off the Goa coast.
 - Missile release conducted at around 20,000 ft altitude, meeting all test objectives.
- Defence Ministry's Statement
 - Defence Ministry hailed the test as a "perfect textbook launch."
 - o Test launch witnessed by Aeronautical Development Agency, DRDO, HAL, and other relevant authorities.
- Astra's Objective and Significance
 - Astra missile designed for engaging and destroying highly maneuvering supersonic targets.
 - Defence Minister Rajnath Singh highlighted the test's importance in enhancing Tejas' combat capabilities and reducing dependence on imported weapons.



- IAF's LCA Programme Review
 - Air Chief Marshal V. R. Chaudhari reviewed the LCA programme at Air Headquarters.
 - All contracted fighter variants of LCA Mk-1 already delivered to IAF.
 - Earlier contracts included 40 LCA Mk-1, 83 LCA Mk1A contracted in 2021 with deliveries set to start from February
- Induction Plans
 - Air Chief expressed plans to induct LCA Mk1A into a newly raised squadron at an operational IAF base by early next year.
- The successful Astra missile test-firing from Tejas demonstrates India's growing indigenous defence capabilities, bolstering the combat prowess of the aircraft and fostering self-reliance in weaponry production.

3. President Murmu launches warship Vindhyagiri

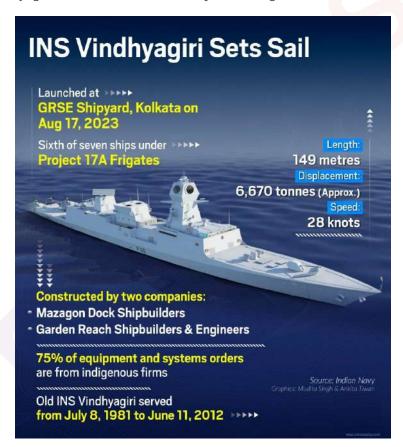
Syllabus: GS 3- Security challenges and defence technology

Prelims: Vindhyagiri

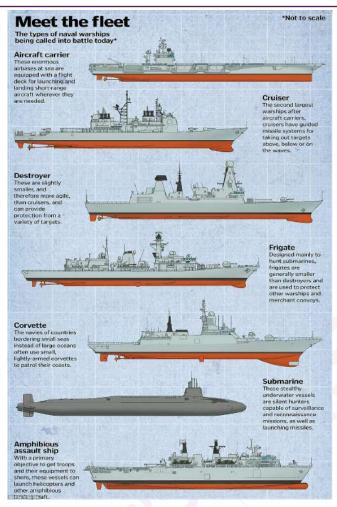
Context: President's launch of INS Vindhyagiri, in the Project 17A (Alpha) frigates series, marked a significant milestone for India's maritime strength and self-reliance.

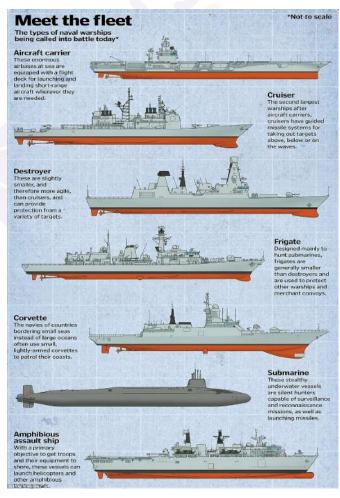
INS Vindhyagiri:

• The launch of INS Vindhyagiri, the sixth vessel in the Project 17A Frigates series, carries forward India's naval legacy.



- INS Vindhyagiri is the sixth ship of the Project 17A Frigates series, showcasing India's commitment to indigenous defense technology and self-reliance.
- After INS Nilgiri, Udaygiri, Himgiri, Taragiri, and Dunagiri, INS Vindhyagiri derives its name from a mountain range in Karnataka.
- Employs a cutting-edge propulsion system enabling speeds of over 28 knots, ensuring rapid response and agility in various operational scenarios.
- Over 75% of the equipment and systems used are sourced from indigenous firms, including Micro, Small, and Medium Enterprises (MSMEs).







- Project 17 Alpha frigates (P-17A) were launched by the Indian Navy in 2019.
- The first stealth ship launched was the Nilgiri, launched in 2019.
- The project was launched to construct a series of stealth guided-missile frigates, which are currently being constructed by two companies:
 - Mazagon Dock Shipbuilders (MDL) and
 - o Garden Reach Shipbuilders & Engineers (GRSE).
- These guided-missile frigates have been constructed with a specific stealth design, which has radar-absorbent coatings and is low-observable which can make its approach undetectable for the enemies.
- The new technology also reduces the infrared signals of the ship.

4. Akira Ransomware

Syllabus: GS 3- Security

Prelims: Cyber security, Akira ransomware, CERT-In

Context: Recently, the Indian government's Computer Emergency Response Team (CERT-In) issued a warning about the Akira ransomware, which has emerged as a significant cybersecurity threat, targeting both Windows and Linux devices.

What is Ransomware?

- Ransomware is a type of malware that encrypts files or devices and forces victims to pay a ransom in exchange for decryption.
- Locker ransomware completely locks users out of their devices.
- Crypto ransomware encrypts all or some files on a device.
- Double extortion ransomware encrypts and exports users' files. This way, attackers can receive payment from the ransom and/or the selling of the stolen data.

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What is Akira?

- Malicious software poses data security risks, attacking Windows and Linux systems, encrypting data, and demanding ransom for decryption.
- In case a user refuses to pay, the ransomware actors threaten to release their data on the dark web.





Working of Akira

- It uses VPN services to trick users into downloading malicious files.
- Once infected, Akira encrypts the victim's files using a strong encryption algorithm.
- The ransomware leaves behind a ransom note with information about the attack and a link to a chat system where
 victims can communicate with the ransomware gang.

How to Protect Yourself from Akira?

- Keep your Windows system up to date with the latest security patches.
- Use a reputable antivirus and anti-malware program.
- Backup your files regularly.
- Be careful about what files you open, especially if they come from an unknown source.

If you are infected with Akira ransomware:

- Do not pay the ransom.
- Report the attack to the authorities.
- Contact your IT department or a cybersecurity professional for help.
- Keep a copy of the ransom note for evidence.

5. Maya Operating System

Syllabus: GS 3- Security

Prelims: Cyber security, Maya Operating System

- In response to rising cyber and malware attacks targeting defence and critical infrastructure, the Defence Ministry is taking proactive measures to enhance cybersecurity.
- The Ministry is replacing the Microsoft Operating System (OS) in all internet-connected computers with a new opensource OS named "Maya," based on locally developed Ubuntu.
- Maya offers a user-friendly interface and similar functionalities to Windows OS, ensuring a smooth transition for users.
- As part of the cybersecurity strategy, an 'end point detection and protection system' called 'Chakravyuh' is also being implemented in these systems.
- At present, Maya is being integrated into the Defense Ministry's systems, excluding computers connected to the Service networks.
- The three Services (Navy, Army, Air Force) have reviewed Maya and plan to adopt it for their respective networks soon.
- The Navy has already approved Maya, while the Army and Air Force are currently assessing its suitability.
- Maya was developed within a six-month timeframe by government development agencies.
- Maya's implementation is aimed at thwarting malware and cyberattacks, countering the recent surge in such incidents.
- India has experienced various malware and ransom attacks, including on critical infrastructure, prompting the need for robust cybersecurity measures.



6. Narcotics smuggling

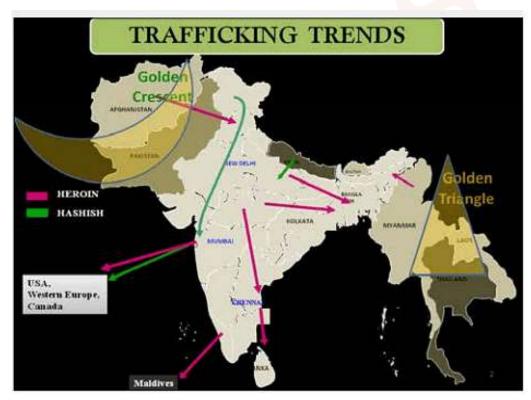
Syllabus: Security challenges and their management in border areas, Various Security forces and agencies and their mandates.

Prelims: BSF and Narcotics smuggling

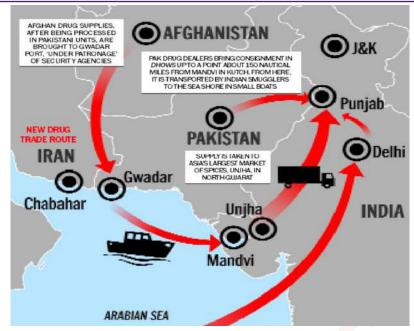
Context: Border Security Force (BSF) troops shot dead a Pakistani intruder who was trying to smuggle narcotics into India through the International Border (IB) in Jammu and Kashmir's Samba district.

From where the Illegal Drugs are trafficked in India?

- Threats from Death (Golden) Crescent: Comprises Afghanistan, Iran, and Pakistan.
- Parts of Pakistan adjoining Afghanistan are also used by Pakistani drug traffickers to convert Afghan opium to heroin and then sent to India.
- Threats from Death (Golden) Triangle: Consists of Vietnam, Thailand, Laos and Myanmar.
- The Shan and Kachin provinces of Myanmar bordering China also pose challenges.
- China Factor: These heroin and methamphetamine-producing areas have porous borders and are, reportedly, under the control of rebel groups, indirectly supported by the Chinese.
- Illicit arms are manufactured here and supplied to underground groups active in India.
- According to the latest annual report by the Narcotics Control Bureau (NCB), drug trafficking through sea routes in the Arabian Sea and the Bay of Bengal, estimated to account for around 70% of the total illegal drugs smuggled into India



Source: en.rattibha.com



Source: tribuneindia.com

What are the Initiatives taken by India to curb the Drug Menace?

- The Narcotic Drugs and Psychotropic Substances Act, (NDPS) 1985: It prohibits a person from producing, possessing, selling, purchasing, transporting, storing, and/or consuming any narcotic drug or psychotropic substance.
- National Action Plan for Drug Demand Reduction: The Ministry of Social Justice and Empowerment has prepared a plan for Drug Demand Reduction for the period of 2018-25. This plan focuses on: Preventive education, Awareness generation
- Identification, counselling, treatment and rehabilitation of drug dependent persons
- Training and capacity building of service providers through collaborative efforts of government and NGOs.
- National Fund for Control of Drug Abuse: It was created in accordance with a provision of the NDPS, 1985 for meeting
 the expenditure incurred in measures taken for:
 - Combating illicit trafficking
 - Controlling abuse of drugs and substances
 - o Identifying, treating and rehabilitating addicts
 - Preventing drug abuse
 - Educating public against drug abuse
- Nasha Mukt Bharat Campaign: Nasha Mukt Bharat Abhiyaan (NMBA) was launched in 2020 to tackle the issue of Substance Abuse and a vision to make India Drug Free. It is a three-pronged attack combining:
 - The supply curb by Narcotics Control Bureau
 - o Outreach and Awareness and Demand Reduction effort by Social Justice and Empowerment
 - Treatment through the Health Department.
- Initiatives of Indian Coast Guards: The Indian Coast Guard (ICG) has developed a good synergy with the security
 agencies and with the coast guards of Sri Lanka, Maldives and Bangladesh for seizure of such drugs.
- It seized 2,160 kgs of meth in two different instances recently near the Andaman and Nicobar Islands.
- International Treaties and Conventions to Combat Drug Menace: India is signatory of the following international treaties and conventions:
 - United Nations (UN) Convention on Narcotic Drugs (1961)
 - UN Convention on Psychotropic Substances (1971).
 - UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988)
 - UN Convention against Transnational Organized Crime (UNTOC) 2000



7. The Inter-Services Organisations (Command, Control and Discipline) Bill, 2023

Syllabus: Security challenges and their management in border areas: Various Security forces and agencies and their mandates

Prelims: Integrated Service Organisations, Joint Commands

Mains: Integrated Theatre commands, Border Management Reforms, The Inter-Services Organisations (Command, Control and Discipline) Bill, 2023

Context:

- Aim: The bill gives the Commander-in-Chief and Officer-in-Command of Inter-Services Organisations (ISOs) the power to discipline and manage all personnel who work in or are attached to those organizations.
- Scope of services covered: Existing Inter-services organisations such as Andaman and Nicobar Command, the Defence Space Agency, and the National Defence Academy will also come under the provisions of the bill.

Provisions:

- The central government may constitute an Inter-services Organisation which has personnel belonging to at least two
 of the three services: the Army, the Navy, and the Air Force.
- The bill applies to all personnel (from services such as the army, navy, air force, etc) serving in or attached to an ISO.
- The bill gives the Commander-in-Chief, Officer-in-Command, or any other officer appointed by the Central Government the power to take disciplinary and administrative action against personnel serving in or attached to an ISO.
- The bill also empowers the Commanding Officer of an ISO to take disciplinary and administrative action against personnel serving in or attached to that ISO.
- The bill does not change the existing Service Acts/Rules/Regulations, but it does give the heads of ISOs more power to take disciplinary action against personnel.

Need for Inter-Service Organisations

- Inter-Services Organisations are an example of theatre commands. It is part of the overhaul of India's military that would bring the separate arms of the military under a single-unified command structure.
- Theatre commands would enable the military to combine resources and optimally use them for offensive and defensive operations.
- Some of the ongoing plans for theatre commands include one for the northern front with China, one for the western borders with Pakistan, and one for the maritime command towards Southern India.

Renefits

- Improved discipline: The bill will help to maintain effective discipline in inter-service establishments by giving the heads of ISOs more power to take disciplinary action against personnel.
- No requirement to revert personnel: The bill will no longer require personnel under disciplinary proceedings to be reverted to their parent service units. This will save time and money, and it will also allow the heads of ISOs to take more effective action against those who break the rules.
- Expedited disposal of cases: The bill will help to expedite the disposal of cases of misdemeanour or indiscipline. This will ensure that cases are dealt with promptly and fairly, and it will also help to protect the reputation of the Armed Forces.
- Saving public money and time: The bill will help to save public money and time by avoiding multiple proceedings. This is because the heads of ISOs will be able to take disciplinary action against personnel without having to refer the matter to their parent service units.
- **Greater integration and jointness:** The bill will pave the way for much greater integration and jointness amongst the three Services. This will help to ensure that the Armed Forces are able to operate more effectively in the future.
- Improved logistics management and communication processes among the service units.

Challenges

- Inertia from existing services to realign the operational SOPs and commands.
- Lack of a coherent National Security Strategy (NSS) which brings clarity on the responsibilities etc.

Nut Graf: The Inter-Services Organisations Bill, 2023 gives the Commander-in-Chief and Officer-in-Command of Inter-Services Organisations (ISOs) the power to discipline and manage all personnel who work in or are attached to those organizations. This will help to improve discipline, expedite the disposal of cases, save the public money and time, and pave the way for greater integration and jointness amongst the three Services.



8. Assam Rifles

Syllabus: Security challenges and their management in border areas, Various Security forces and agencies and their mandates.

Prelims: About Assam Rifles

Mains: Assam Rifles mandates

Context: The Assam Rifles Manipur Police have registered a case against the oldest paramilitary force deployed in the region, accusing its personnel of obstructing duty.

About Assam Rifles

- It is the oldest paramilitary force of India which was formed under the British in 1835.
- The history of the Assam Rifles dates back to 1835 when it was raised by the British as 'Cachar Levy' to protect its settlements from tribals living in the hilly areas.
- Additional units were subsequently merged into the 'Frontier Force' that extended the administrative control over remote tribal areas.
- During the First World War, 3,000 men were sent to Europe and West Asia as part of the British Army.
- It was christened the 'Assam Rifles' in 1917, in recognition of its services for fighting alongside the rifle regiments of the British Army.
- By the Second World War, the Assam Rifles performed multifarious tasks.
- Besides evacuating refugees from Myanmar (then Burma), it was part of a resistance group, the Victor Force, which countered the Japanese on the Indo- Burmese border.
- Post -Independence, it took part in the 1962 and 1965 wars after which its operational control was given to the Army.
- The Assam Rifles was part of the Indian Peace Keeping Force (IPKF) in Sri Lanka in 1987 and tackled tribal unrest and insurgency in the northeast.
- It is primarily led by officers of the Indian Army. The northeast is its main area of operation.
- Currently, the Assam Rifles guards the India -Myanmar border
 - Integral part
 - The Assam Rifles has been an integral part of the counter-insurgency operations, which earned it the sobriquet of
 the 'sentinels of the northeast'. The paramilitary force, however, has had strained relations with the northeastern
 region, primarily because of the controversial Armed Forces Special Powers Act (AFSPA).
 - The Act has repeatedly come under public scrutiny, with the locals accusing the security forces of staging encounters, killing civilians and violating human rights.

Nut Graf: Ambiguity in the command and control of the Assam Rifles has added to its problems. The force operated under the MEA under the North East Frontier policy till 1965. Currently, it is administratively under the Ministry of Home Affairs (MHA), while the operational control is with the Ministry of Defence. This duality has been part of a drawn-out tussle. In 2019, the MHA proposed to take over operational control by merging the force with the Indo-Tibetan Border Police (ITBP). The Army, however, believes that shifting the operational control will jeopardise the surveillance along the LAC and impact the assistance the force provides. The tug of war continues.

9. Scan the internal dimension on the road to 2024

Syllabus: Role of external state and non-state actors in creating challenges to internal security.

Mains: Threats to internal security of India

Background

- All throughout the Indian continent, several different projects are now underway.
- These must be appropriately evaluated in order to prevent any of the scenarios from spiralling out of control.
- Every event has a will of its own. The country may be in a tough situation if many of them, or even a few of them, decide to unite as elections get closer.

Recent developments and Threats

Challenges in the northeast

- Myanmar is an example in point, with the potential to envelop the whole northeast area. The predominance of many tribes with varied affinities across the northeast necessitates immediate handling of the situation.
- Manipur may appear to the uninitiated as a little blip on India's security horizon, yet it is a microcosm of issues that impact the whole northeast.
- The Nagas of Nagaland are affiliated with many groups, some of which are located in Myanmar. There are many weapons and weaponry available throughout the whole Assam region, which is reason for alarm.
- The short point is that quiet spells in the northeast frequently mask the stress undercurrents hiding just under the surface.



Maoism

 Although the risks offered by militant contests may range in origin and substance, they frequently have a greater degree of intensity.

105

- The CPI (Maoists) are one of the top terrorist organisations in the world, according to specialists from all around the world.
- These analysts disagree with the idea that the Maoist danger has been neutralised.
- A selective merger and demerger procedure, as well as a new leadership pattern, have shifted their goals, although they claim significantly stronger support for their ideals in urban regions.
- Their claim to have become 'influencers of public opinion' in metropolitan places is not as implausible as many people believe.

Naxalism and right-wing terror

- Other elements that are now in play might also have an influence on the situation on the ground. The problem of right-wing terror is a serious one.
- Thus, the Naxalites will continue to pose a possible danger as the nation approaches the general election next year.
- Geopolitics frequently affects the trajectory of right-wing terrorism, thus given the current status of the globe, India needs to remain vigilant.
- It has also developed regular supply routes to procure cutting-edge weaponry, notably those of the North Atlantic Treaty Organisation.
- Experts have frequently said that right-wing terror is on the rise. The recent decrease in bloodshed in Jammu and Kashmir should not lead to the mistaken notion that the terror danger has abated; terror networks are being built in many other places, including the South.

Religious Polarization

- The return of communal violence and rioting in the nation is another regrettable trend that has recently emerged
 and that might get worse in a year leading up to elections. The reason for this is said to be the growing religious
 division.
- All around the country, there have suddenly been a number of localised areas of racial conflict.
- Though extremely significant violence has lately surfaced in Haryana and Maharashtra, they are not limited to one State or area.
- The gap between the Muslim and Hindu populations is widening quickly. Communal violence is also now affecting communities that were previously thought to be largely devoid of such issues.

Way Forward

Despite the odds, India's well-earned reputation for hosting peaceful elections necessitates even greater monitoring. India must exercise caution to avoid polarisation along communal lines tarnishing the country's existing image as a bulwark of democratic principles. As a result, India's false sense of security produced by the lack of a big terror strike for a long time would have to be reassessed. The political elite, as well as security and law enforcement services, must exercise extreme caution. The attention must be on a number of separate trends occurring across India, which may erupt in the run-up to the general election next year. Although perpetual watchfulness is the price of liberty, it is also necessary to ensure that the biggest democracy in the world successfully completes yet another general election. Only this will show how really strong and valuable India is.

Nut Graf: India is hosting the G-20 summit and is celebrating the success of its moon mission, therefore it would be wise for its leaders to take note of the Chandrayaan project's lesson that "instead of focusing on achieving success, we focused on eliminating failures."

10. Indian Army signs deals for 130 tethered drones and 19 tank-driving simulators

Syllabus: GS 3- Security challenges and defence technology

Prelims: Tethered drones and tank-driving simulators

- The Indian Army has secured contracts for Emergency Procurement (EP) for 130 tethered drones and 19 tank-driving simulators.
- The equipment is set to be delivered within 12 months as part of the fourth tranche of EPs approved by the Defence Ministry.
- Acquisition of these assets will significantly enhance operational readiness and preparedness of the Indian Army.
- The tethered drone systems, valued at around ₹250 crore, are designed for extended flight endurance and are suitable for deployment in high-altitude regions.
- In the past three years, amidst the Ladakh standoff, the Army had previously entered contracts with Indian startups for smaller surveillance and load-carrying drones.
- Notable startup contracts include Raphe mPhibr Pvt. Ltd., which received orders for 48 mR-20 logistics drones and 100 quadcopter drones, and ideaForge, which secured a repeat order for 200 Switch Vertical Take Off and Landing (VTOL) mini-Unmanned Aerial Vehicles (UAVs).
- Another contract was awarded to NewSpace, a Bengaluru-based firm, for drones capable of precision strikes with 5-10 kg explosives.



ENVIRONMENT AND ECOLOGY

1. Biological Diversity (Amendment) Bill

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

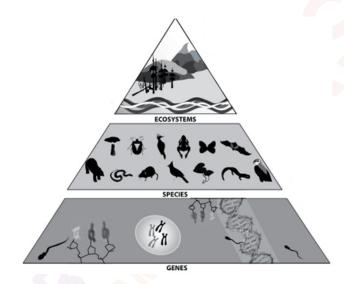
Mains: Biological Diversity (Amendment) Bill

Context:

- The Lok Sabha has passed the Biological Diversity (Amendment) Bill, 2021.
- The Bill aims to amend the Biological Diversity Act, 2002.
- It seeks to address concerns of several central ministries, state governments, researchers, industry, and other stakeholders, regarding the implementation of the 20-year-old law.

Biological Diversity Act of 2002

- Biological diversity refers to all kinds of life forms animals, plants and microorganisms their gene pools, and the
 ecosystems that they inhabit.
- The 2002 Act was a response to the global need to protect and conserve biological resources, which are under threat due to human activities.



- The Biological Diversity Act, 2002 was framed to give effect to the United Nations Convention on Biological Diversity (CBD), 1992.
- 3 Goals of CBD:
 - Conservation of biological diversity
 - Sustainable use of the components of biological diversity
 - Fair and equitable sharing of the benefits arising out of the utilization of genetic resources and associated traditional knowledge
- It formulates a three-tier structure consisting of:
 - National Biodiversity Authority (NBA) at the national level
 - o State Biodiversity Boards (SBBs) at the State level
 - Biodiversity Management Committees (BMCs) at the local level
- The primary responsibility of the BMCs is to document local biodiversity and associated knowledge in the form of a People's Biodiversity Register.

Biological Diversity (Amendment) Bill, 2021

- The Bill amends the Biological Diversity Act, 2002 to simplify compliance requirements for domestic companies.
- Users of codified traditional knowledge and AYUSH practitioners will be exempted from sharing benefits with local communities.
- The Bill removes research and bio-survey activities from the purview of benefit-sharing requirements.
- Benefit sharing will be based on terms agreed between the user and the local management committee represented by the National Authority.
- The Bill decriminalizes all offenses under the Act.



The key changes through the amendment are:

- Access to biological resources: The Bill modifies the classification of entities and activities requiring intimation while introducing exemptions to certain cases.
- IPR: The Bill suggests that approval will be required before the actual grant of the IPR, not during the application process.
- Exemption to AYUSH practitioners: It seeks to exempt registered AYUSH medical practitioners and people accessing
 codified traditional knowledge, among others, from giving prior intimation to State biodiversity boards for accessing
 biological resources for certain purposes.
- Benefit sharing: The Bill removes the applicability of benefit-sharing requirements from research, bio-survey, and bio-utilization.
- Penalties: The Bill decriminalizes the offenses in the Act and introduces fines ranging from one lakh to fifty lakh rupees instead.

Significance

- The bill aims to reduce pressure on wild medicinal plants by encouraging the cultivation of medicinal plants.
- It is trying to encourage the Indian system of traditional medicine.
- The bill seeks to facilitate the fast-tracking of research, the patent application process, etc., without compromising the objectives of the UN Convention on Biological Diversity and its Nagoya Protocol.
- It decriminalizes offenses and encourages foreign investment in the sector.
- The Bill also amends the Act to include references to the Nagoya Protocol.

Why is the Bill Considered Problematic?

- The proposed amendments exempt "codified traditional knowledge" and the AYUSH industry from benefit sharing, denying local communities fair compensation for their resources.
- Ambiguity in the definition of "codified traditional knowledge" may lead to exploitation and misuse of traditional knowledge.
- Critics argue that these exemptions are regressive and go against the original intent of ensuring fair and equitable benefit-sharing.

How Does the Industry View the Act?

- The industry, particularly the AYUSH sector, has expressed discontent with the existing regulations.
- Several companies have faced legal challenges for allegedly using biological resources without complying with the Act's provisions.
- Representatives from various sectors, including the Indian system of medicine, seed, and industry, have urged the government to simplify and streamline compliance burdens to encourage research and investment.

Nut Graf: The Biological Diversity (Amendment) Bill, 2021, has faced opposition due to concerns over potential exploitation, lack of fair benefit sharing, and the prioritization of "ease of doing business" over environmental protection. The Act's implementation challenges have further added to the scepticism surrounding the proposed amendments. As the debate continues, balancing economic interests and environmental conservation remains a crucial aspect for policymakers and stakeholders alike.

2. Mhadei Wildlife Sanctuary

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Prelims: Mhadei Wildlife Sanctuary

Context: A decision by the Goa bench of the Bombay High Court to direct the Goa government to set up a tiger sanctuary in the Western Ghats region has evoked mixed reactions and set off a debate on its implications for Karnataka's Mahadayi project.

About Mhadei wildlife sanctuary:

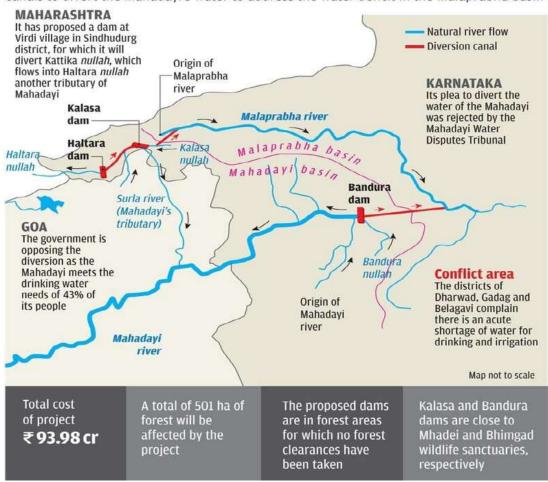
- Mhadei wildlife sanctuary is located in the Northern Part of Goa, near the village of Valpoi.
- There are a number of picturesque waterfalls within the sanctuary boundaries. The most prominent are the Vazra Sakla Falls and the Virdi Falls.
- The cliff face near the Vazra falls is notable for being the nesting grounds of the critically endangered Long-billed vultures.
- Flora: The sanctuary is thickly forested with moist deciduous vegetation and some evergreen species too. The sanctuary is particularly well-known for its sacred groves that protect rare and indigenous trees.
- Fauna: Indian gaur, Barking deer, Sambar deer, Asian palm civet, small Indian civet, Wild boar, Indian hare etc.
- The sanctuary is a huge attraction for herpetologists since it contains a large variety of snakes including all of the 'big four' of Indian venomous snakes which are the Indian krait, Russell's viper, Saw-scaled viper and Spectacled cobra





Controversial water diversion plan

Under the Kalasa Bandura project, the Karnataka government has proposed dams and canals to divert the Mahadayi's water to address the water deficit in the Malaprabha basin



Mahadayi River

• The Mahadayi/Mandovi River's described as the lifeline of the Indian state of Goa. The Mandovi and the Zuari are the two primary rivers in the state of Goa. Mandovi joins with the Zuari at a common creek at Cabo Aguada, forming the Mormugao Panaji. The state capital and Old Goa, the former capital of Goa, are both situated on the left bank of the Mandovi.



3. State-wise Tiger Census Data

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: State-wise Tiger Census Data

About:

- Prime Minister Narendra Modi had released the "Status of Tigers 2022" to mark the completion of 50 years of "Project Tiger" in April 2023.
- Based on initial estimates, the government had said there are at least 3167 tigers in India.
- Tiger census is held every four years in the country.
- State-wise Tiger Census Data:
- The number of tigers in India has increased from 2,967 in 2018 to 3,682 in 2022, an annual rise of 6%, according to the latest government data released on the International Tiger Day.
- With this, India has become home to approximately 75% of the world's tiger population.
- There are a maximum of 3925 tigers in the country. The average number is 3,682.
- With a 50% increase in the last four years, Madhya Pradesh has the maximum number (785) of tigers in the country, followed by Karnataka (563), Uttarakhand (560), and Maharashtra (444), according to the data.

4. Climate Change and Ocean Colour

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Climate Change and Ocean Colour relation

Context: Over 56 per cent of the oceans, more than the total land area on the planet, has experienced the shift in colour, significantly over the past two decades, most likely due to human-induced climate change



Satellite image of the Tyuleni Archipelago, an island group in the north-eastern Caspian. (Representational image/NASA)

Colouration:

- When the sunlight falls on deep and clear water, colours with longer wavelengths, such as red, yellow and green, are absorbed by the water molecules but blue and violet, which have a much shorter wavelength, are reflected back.
- Instrument: Moderate Resolution Imaging Spectroradiometer (MODIS), aboard NASA's Aqua satellite, which has been monitoring ocean colour since 2002

Reasons for Oceans Appearing Blue or Green

- Oceans appear blue or navy blue in most regions due to the absorption of longer wavelength colors like red, yellow, and green by water molecules, while shorter wavelength colors like blue and violet are reflected back.
- Certain parts of the oceans appear green due to the presence of phytoplankton on the upper surface of the water. Phytoplankton contain the green-colored pigment chlorophyll, which reflects green light.

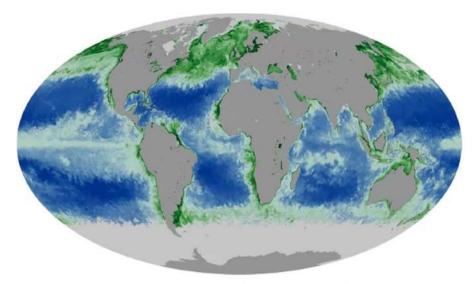
Impact on Ocean Stratification

- The study suggests that ocean stratification, the natural separation of ocean water into horizontal layers by density, has increased due to climate change.
- Increased stratification hinders the mixing of water layers, affecting the ocean's ability to absorb carbon dioxide from the atmosphere and limiting proper oxygen mixing with cooler ocean waters below.



Consequences for Marine Ecosystems

- Changes in plankton populations, particularly phytoplankton, can be observed in regions with higher concentrations
 of these organisms.
- This shift in plankton populations may impact marine food webs, as plankton are crucial for supporting marine life, including fish, crabs, and sea stars.



The map shows concentration of chlorophyll across the world as of May 2023. Places where chlorophyll amounts were very low, indicating very low numbers of phytoplankton are blue. Places where chlorophyll concentrations were high, meaning many phytoplankton were growing, are dark green. Credit: NASA

Implications of Findings

- The study's results highlight the profound impact of climate change on ocean ecosystems and the need to address these changes seriously.
- Understanding the consequences of ocean color changes is essential for preserving marine life, maintaining the carbon absorption capacity of the oceans, and ensuring the overall health of marine ecosystems.

5. Forest Conservation (Amendment) Bill 2023

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Provisions of Forest Conservation (Amendment) Bill 2023

Context: Recently, the Forest (Conservation) Amendment Bill 2023 has been passed by the Lok Sabha, and it aims to bring significant changes to the Forest (Conservation) Act, 1980, which is a crucial central statute for the conservation of forests in India.

Key Pointers

- One of the Bill's goals is to satisfy the "need to fast track" projects of strategic importance, national security, and public utility within 100 km of the international borders and in "Left Wing Extremism affected areas".
- These include land notified as a forest under the Indian Forest Act, 1927 or in government records after the 1980 Act came into effect.
- The Act will not be applicable for land converted to non-forest use before December 12, 1996.
- The Bill also allows the central government to specify terms and conditions for carrying out certain surveys without its approval. These include reconnaissance, prospecting, investigation or exploration, and seismic surveys.
- The state government requires prior approval of the central government to assign any forest land to a private entity.
- The Act specifies some activities that can be carried out in forests, such as establishing check posts, fencing, and bridges. The Bill also allows running zoos, safaris and eco-tourism facilities.

Exemptions

- Forest land along a rail line or a public road maintained by the government providing access to a habitation, or to a rail, and roadside amenities up to a maximum size of 0.10 hectare.
- Land situated within 100 km from international borders, Line of Control, or Line of Actual Control, for construction of a strategic linear project of national importance and concerning national security,
- Land up to 10 hectares, for constructing security-related infrastructure,
- Proposed to be used for constructing defence related projects, camps for paramilitary forces, or public utility projects up to five hectares in a left-wing extremism affected area.



Issues and concerns

Objection on Hindi Name:

 There were objections to the Act's new name (which is now in hindi) on the grounds that it was "non-inclusive" and left out many among the "(non-Hindi speaking) population both in South India and also in the North-East.

Impact on Ecologically Sensitive Areas:

- The proposed exemptions in the Bill, particularly those related to strategic projects near international borders, have raised concerns about the potential clearance of forests in ecologically sensitive areas, such as the Himalayan, trans-Himalayan, and northeastern regions.
- o Bill, 2023 (FCA) will erase the rights of indigenous communities living on India's borders.
- Without appropriate "assessment and mitigation plans," such clearances could threaten biodiversity and trigger extreme weather events.

Limited Applicability:

The Bill restricts the legislation's ambit only to areas recorded as forests on or after October1980. This exclusion may result in leaving out significant sections of forest land and biodiversity hot spots from the Act's purview, allowing them to be potentially sold, diverted, cleared, and exploited for non-forestry purposes.

• Concurrent List and Center-State Balance:

- Some State governments have argued that forest conservation falls under the Concurrent List, which means both the Center and States have a role in the matter.
- They believe that the proposed amendments could tilt the balance towards the Center and may impact the rights and authority of the State governments in forest conservation matters.

Way Forward

- There is a need to conduct a thorough and comprehensive assessment of the proposed amendments and their potential impacts on forests, biodiversity, and local communities.
- This assessment should consider ecological, social, and environmental factors and involve input from diverse stakeholders, including experts, NGOs, tribal communities, and State governments.
- Continue engaging in meaningful consultation and dialogue with all stakeholders to understand their perspectives and address their concerns. This will promote transparency, inclusivity, and better decision-making.

6. At Delhi summit, demonstrate climate leadership

Syllabus: Conservation, environmental pollution and degradation, environmental impact assessment.

Mains: Climate leadership and India

Background

- The G-20 members generate the majority of the world's fossil fuels and emit the majority of its greenhouse gas emissions.
- The majority of them have also vowed to utilise "net-zero" emissions and less fossil fuels.
- The G-20 must behave as a single entity that advances its own shared climate ambition via cooperation, coordination, and competitiveness.
- Recently, G-20 nations have demonstrated some commitment to the transition to clean energy: in 2021, renewable energy sources accounted for 29% of their energy mix, up from 19% in 2010.
- The third-largest producer of renewable energy in the world, India has made considerable strides in the past ten years to achieve this goal. The country has also set goals to increase installed renewables to 50% of energy output by 2030.
- Governments need to make a greater shift since demand is rising and the world's carbon budget is depleting more quickly than anticipated.

Significant Aspects Climate leadership

Clear Governance Structures

- G-20 nations must enhance their governance structures at the national and municipal levels to ensure equitable energy transitions.
- To guarantee that the transition process is inclusive and the outcomes equitable, governments should set up clear governance frameworks and minimize compartmentalized functioning.
- In order to create cogent delivery strategies that may entice investment, this requires defining roles and mandates throughout ministries and across government levels. Indicators of progress should go beyond the conventional ones, such as net job creation, levels of community resilience and creativity, and who has access to these.
- For the purpose of coordinating their efforts in the energy transition, G-20 nations may form multi-ministerial task forces or collaborations between governmental and non-governmental organizations.
- The development of practical frameworks, road maps, or action plans can help other G-20 members expedite their own energy transitions.

Aiding Decarbonisation

 The G-20 should view this transformation as a chance to diversify the economies of its members in order to guarantee long-term economic stability, livelihoods, and public income sources, as the Indian G-20 chair has acknowledged.



• The G-20's joint commitment to green public procurement will hasten the decarbonization of challenging industries like steel and cement. Collaboration within and among G-20 countries is vital, nevertheless, for a comprehensive and successful reform of public procurement.

International financial institutions

- International financial institutions must coordinate their investments and risk-taking in order to quickly install significant amounts of renewable energy and grid infrastructure, as well as to promote industrial innovations with very low carbon emissions and energy efficiency.
- The G-20 countries play a crucial role in increasing the production of low-carbon steel since they account for 90% of world steel production and 80% of global steel consumption.
- They may encourage investments in the transition to green steel in poor and emerging economies by establishing explicit mandates for international financial institutions, such as multilateral development banks and international climate financing.

Need for Transparency

- o In order to accomplish fair energy transitions, the G-20 should take the lead in simplifying international efforts.
- The G-20 Energy Transitions and Sustainable Finance Working Groups, as well as the Just Energy Transition Partnerships (JET-Ps), will support these initiatives with significantly increased openness and accountability.
- The G-20 should also urge nations that produce fossil fuels to disclose current, comparable, and trustworthy information on their plans and projects for producing oil, gas, and coal, as well as how these plans and projects match with both national and global climate goals.

Way Forward

The G-20 summit is a significant opportunity for the in attendance Heads of State and Government to adopt a bold leader's declaration pledging their commitment to a shared goal to address climate change. The destructive repercussions of climate change have been abundantly obvious during the past several months. One cannot compete alone in the fight to decarbonize industry, deploy renewable energy for everyone, or accomplish a just and inclusive transformation. To fully use the potential of green public procurement, governments must put in place effective monitoring, establish explicit mandates for low-carbon procurement, "upskill" procurement officials, and establish time-bound goals.

Nut Graf: The G-20 Summit has to make a firm commitment to taking action together to tackle climate change.

7. Himalayan blunders that are ravaging the Himalayas

Syllabus: Conservation, environmental pollution and degradation, environmental impact assessment.

Mains: Infrastructure Projects in Himalayan regions and Environmental concerns

Context

Recent tragedies involving bridges, roads, and buildings being carried away by surging rivers in the hill states of Uttarakhand and Himachal Pradesh epitomize a misguided development paradigm institutionalized in an eco-fragile region.

Infrastructure Projects and Environmental Issues

- The Chardham Mahamarg Vikas Pariyojna, a huge infrastructure project involving road widening, was undertaken in Uttarakhand in 2016.
- The project has claimed lakhs of trees and acres of forest area, as well as numerous human and animal lives and the fragile Himalaya's precious topsoil. Tonnes of mud have been created, clogging water supplies.
- A project of more than 100 kilometers in length is required by law to get environmental approval. However, ambitious tourism initiatives and plans resulting from electoral agendas are time-bound.
- The rich forests that surround Chamba, Rudraprayag, and other lush green spots are decreasing.
- The Bhagirathi Eco Sensitive Zone (BESZ) features the last natural free flow of the Ganga river and was designated a protected site under the Environment Protection Act of 1986 in December 2012.
- The approval of the BESZ monitoring committee was overseen by the majority of State authorities on the committee without any discussion or proposals.

Violations of Rules

- The Ministry of Road Transport is just contradicting itself by expanding hill roads. These difficulties develop as a result of hill slope destabilization and the increasing deterioration of road alignments and infrastructure.
- The Supreme Court addressed this inconsistency in a civil appeal when a Bench led by Justice R. Nariman chastised
 the Ministry and instructed that its own notification be implemented prospectively and retrospectively. However, the
 government created the justification for national security.
- While scientists have frequently stated that Uttarakhand's Chardham temples are already overcrowded, their carrying capabilities have been raised beyond all scientific logic.
- However, in light of Mother Nature's recent warnings, the state governments of Uttarakhand and Himachal Pradesh have proposed a reconsideration of carrying capacity.
- The Supreme Court, too, has formed a committee to investigate the matter, but the greater concern is whether the findings will be adopted.



Conservation of Gangotri Glacier

- Conservation of the Gangotri glacier, which is also the fastest retreating glacier, is one of the most difficult concerns
 for Ganga rejuvenation. With increased motor traffic and forest fires, black carbon deposits are accumulating on the
 glacier, hastening its melting.
- According to a 2023 Standing Committee study on water resources, "black carbon absorbs more light and emits infrared radiation, which raises the temperature." As a result, an increase in black carbon in the high Himalaya contributes to accelerated glacier melting."

Way Forward

Regulation is a relatively straightforward answer to all of the ongoing and pressing issues that the hills confront in the ongoing argument between the environment and hill development. The only practical and sustainable answer is to widen highways to an intermediate width with little environmental damage. If decreasing a few meters of road width helps assure the preservation of the Ganga's sole pristine length and the protection of the Himalaya, then we must make serious attempts to change the plan. Greed, along with deceptive political, bureaucratic, and real estate lobbies, is ruining the Himalayan forests and rivers, as well as the lives of local residents.

Nut Graf: The Himalayan area of India is being devastated by greed outweighing necessity, as well as the efforts of manipulative political, bureaucratic, and real estate lobbies.

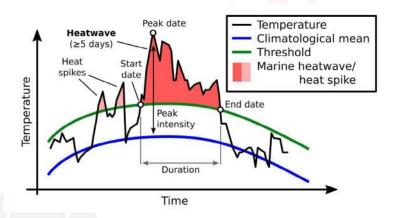
8. Marine Heat Waves

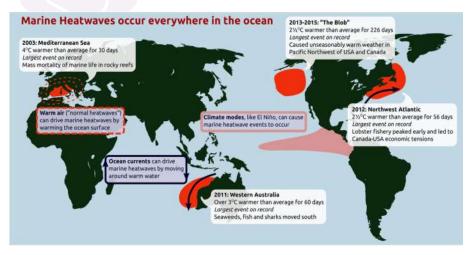
Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Impact of Marine Heat Waves

What is it?

 A marine heat wave is an extreme weather event. It occurs when the surface temperature of a particular region of the sea rises to 3 or 4 degree Celsius above the average temperature for at least five days. MHWs can last for weeks, months or even years



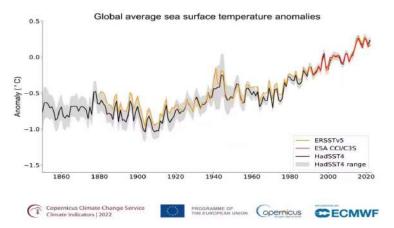


Impact

- Sudden fish kills
- Coral bleaching and mortality
- Changed animal behaviour
- Large scale marine migrations
- Resource deficiency



- Greater frequency of storms
- The oceans have absorbed 90 per cent of the additional heat caused by the release of greenhouse gases into the atmosphere from burning fossil fuels and deforestation in recent decades.



Annual global average sea surface temperature (degree Celsius), relative to the average for the 1991–2020 reference period. Data sources: HadSST4.0.1.0 (1850–2022, black; grey shading indicates the uncertainty), ERSSTv5 (1880–2022, orange), and ESA CCI/C3S SST Climate Data Record v3.0 (1991–2022, red). (Credit: C3S/ECMWF/UK Met Office)

9. Plastic Overshoot Day

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Prelims: Plastic Overshoot Day

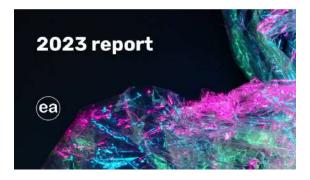
Context: Recently, the Earth witnessed Plastic Overshoot Day on July 28, 2023. This marks the point in the year when the amount of plastic waste generated exceeds the global waste management capacity.

About Plastic Overshoot Day:

- The Plastic Overshoot Day Report by Swiss-based research consultancy Earth Action (EA) sheds light on the alarming issue of plastic pollution and its implications on the environment.
- Definition: Plastic Overshoot Day is the date at which the amount of plastic produced and used in a year exceeds the global waste management capacity.

PLASTIC
VER
SHOOT
DAY
This is the day when the generation of pleoft word to exceeds the opposity of weste management, leading to environmental pollution.

July 28, 2023





- Every country has its own Plastic Overshoot Day, corresponding to the day at which a country's waste management capacity is fully exhausted.
- Beyond this day, all waste generated by the country becomes mismanaged, ultimately finding its way into the natural environment.



Mismanaged Waste Index (MWI)

- The Mismanaged Waste Index (MWI) measures the imbalance between plastic production and waste management capacity.
- India: India ranks fourth in MWI, with 98.55% of generated waste being mismanaged.



Major findings of the Plastic Overshoot Day Report?

- India is among the 12 countries responsible for 52% of the world's mismanaged plastic waste
- Short-life plastics, such as plastic packaging and single-use plastics, make up a significant portion of India's plastic waste
- Projections: Under current scenarios, global plastics pollution is projected to triple by 2040.





- Iceland: Iceland tops the list of worst offenders in plastic consumption, with annual consumption of 128.9 kg per person.
- India: India's annual per-person plastic consumption is 5.3 kg, significantly lower than the global average of 20.9 kg.

Issues associated with plastic waste in India

- Poor waste management infrastructure
- Single-use plastic products
- Marine pollution
- Health impacts

Solutions

- Extended Producer Responsibility (EPR)
- Waste-to-energy plants
- Phasing out single-use plastics by Designing alternatives

Conclusion

- Plastic Overshoot Day is a wake-up call that highlights the urgent need to address plastic pollution.
- India must take action to reduce plastic pollution and protect its environment.

10. Circular economy

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Significance of Circular economy

Context:

- In today's world, there is a widespread recognition of the need to switch from the 'take-make-dispose' to 'reduce-reuse-recycle' model.
- And, India under its G20 presidency, has prioritised 'Resource Efficiency and Circular Economy' as one of the three
 core themes for deliberations in the G-20 forum.

Resource Efficiency and Circular Economy



MAKE

CIRCULAR ECONOMY



• A circular economy is a model of production and consumption, which involves reusing, repairing, refurbishing and recycling existing materials and products for as long as possible.



- Resource efficiency and circular economy are powerful strategies that can effectively minimise dependence on natural resources, curtail waste and encourage sustainable design practices.
- In the collective global endeavour to ensure sustainable development and realise the SDGs, decoupling resource utilisation from economic growth is going to be the key.
- In the last century the world has seen an unprecedented increase in the use of natural resources and materials. Global raw material use rose at almost twice the rate of population growth.
- A study by OECD finds that efficient use of resources and furthering the transition to a circular economycan help not only material security, but improve environmental and economic outcomes as well.

India's Priority Areas for the Circular Economy During its G-20 Presidency

• Circularity in the Steel Sector

- o In order to ensure growing resource consumption in an environmentally responsible manner, there is a need to raise the current recycling rates of 15%-25%.
- o Given the crucial role of steel in infrastructure development, its efficient utilisation is important.
- The demand for steel is only going to grow especially in growing economies such as India. Globally, about 7% of energy sector emission is attributed to iron and steel production.
- Transitioning towards a circular steel sector is a key strategy to tackle steel sector emissions.
- The key lies in ensuring collaboration among the G-20 member countries for knowledge sharing, technology codevelopment and technology transfer.
- The presidency document for knowledge exchange on the 'Circular Economy in [the] Steel Sector' is a potential blueprint for a net zero pathway for the steel industry, reducing resource utilisation and minimising wastage.

Extended Producer Responsibility (EPR)

- OECD definesEPR as an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle.
- An EPR policy is characterised by
- The shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities
- The provision of incentives to producers to take into account environmental considerations when designing their products.
- Under India's G-20 presidency, there is an emphasis on the significance of the EPR framework in integrating circularity throughout the value chain.
- As different countries have implemented different EPR models, it is necessary that G-20 member-countries share best practices to accelerate the transition to a circular economy.
- Effective implementation of EPR plays a pivotal role in promoting the growth of the recycling infrastructure and establishing a streamlined waste collection system.
- With over 20,000 registered Producers, Importers, and Brand Owners (PIBOs) and over 1,900 plastic waste processors on the centralised EPR portal, India boasts one of the largest frameworks for EPR.
- The combined EPR obligation of registered PIBOs crosses 3.07 million tons.
- India has also notified comprehensive rules for e-waste and battery waste management.

Adopting a CircularBioeconomy and Biofuels Approach

- Since 1970, the consumption of biological resources in G-20 member countries has risen 2.5 times.
- Biowaste such as municipal and industrial waste and agricultural residue has become a global issue as much of it is burned, causing pollution, biodiversity loss and global warming.
- Combined with crops well-suited for degraded lands, biowaste can serve as valuable primary raw materials and viable substitutes for mineral resources.
- Adopting a circular bioeconomy approach will reduce the need for extracting virgin resources and provide an effective waste disposal solution.

Establishing Industry Level Coalition

- As industries are crucial in advancing resource efficiency and circular economy practices, India has envisioned an industry coalition in these areas.
- The coalition will also aim to achieve enhanced technological collaboration, build advanced capabilities across sectors, mobilise de-risked finance, and facilitate a proactive private sector engagement.

Initiatives Taken by the Gol in the Field of Bio-Economy and Bio Fuels

- The Pradhan Mantri JI-VAN Yojana provides financial support to integrated bio-ethanol projects to set up second generation (2G) ethanol projects.
- 2G bioethanol technology produces bioethanol from waste feedstock such as crop residues and municipal solid waste that would otherwise have no value.
- India has also made it mandatory for coal-burning thermal power plants to use a 5% blend of biomass pellets along with coal.
- The Galvanizing Organic Bio-Agro Resources (GOBAR) Dhan scheme was launched to convert cattle dung and other organic waste into compost, biogas, and biofuels to promote sustainable agriculture and reduce pollution.
- With over 500 functional biogas plants, the scheme has also helped create rural livelihoods and ensured improved sanitation.
- The Sustainable Alternative Towards Affordable Transportation (SATAT) Scheme, launched in 2018 to promote the use of Compressed BioGas (CBG) as an alternative green transportation fuel.



Importance of G20 Nations in the Transition to Resource Efficiency and Circular Economy

- Most G-20 member countries have committed to net zero ambitions and are working to mitigate greenhouse gas emissions.
- Global platforms such as the G-20 can play an important role in addressing key issues and presenting solutions by adopting a collaborative approach.
- The G20 group consists of the largest economies therefore is well placed to tackle almost every problem financially and technologically.

Conclusion

- Resource efficiency and circular economy have emerged as key solutions in collective efforts in tackling triple planetary challenges Climate Change, Air Pollution, and Biodiversity Loss.
- India's G-20 presidency has focused extensively on these approaches which offer promising pathways towards a
 more sustainable and resilient future.

11. Amazon Cooperation Treaty Organization

Syllabus: Environment, Important organizations

Prelims: About Amazon rainforest.

Mains: Significance of conservation of Amazon rainforest to world climate.

Context: In a landmark move, 8 South American countries have joined forces to address the critical issue of deforestation in the Amazon rainforest at the Amazon Cooperation Treaty Organisation (ACTO) summit, hosted by Brazil. It is intriguing to know that this summit is the first gathering of its kind in 14 years since the group was established.

About ACTO:

- Formation: ACTO is an international organization established to safeguard the Amazon basin and facilitate its sustainable development through international collaboration.
- Founding Treaty: The Amazon Cooperation Treaty was crafted and signed on July 3, 1978, by Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela.
- Evolution into ACTO: In 1995, these countries formalized their commitment by founding ACTO to actively pursue the
 objectives set forth in the original treaty.
- Multilingual Platform: ACTO operates in four official languages: Dutch, English, Portuguese, and Spanish.

Need for ACTO

- Deforestation
- Climate Feedback Loop: Deforestation disrupted the Amazon's role as a carbon sink, potentially turning it into a carbon source and exacerbating climate change.
- Illegal Logging
- Indigenous Land Encroachment
- Forest Fire

ACTO's Conservation and Development Initiatives

- Amazonian Management: The ACTO member nations recognize that effective management of the Amazon basin is pivotal for advancing the well-being of its inhabitants.
- Programs and Agreements: Collaborative programs and agreements have been established to ensure biodiversity preservation, promote conservation efforts, and manage the region's resources.
- Project GEF Amazonas: Funded by the Global Environment Facility, this program aims to secure agreement on a renewable and integrated water supply for sustainable development.
- ACTO Biodiversity Program: This program focuses on maintaining a harmonious biological equilibrium to prevent fragmentation of Amazonian ecosystems.
- Key Milestone: The Manaus Declaration (2004)
- Purpose: ACTO played a pivotal role in formulating the Manaus Declaration in 2004, which coordinated the development of the vast rainforest area covering approximately 2.9 million square miles.
- Commitment Reiteration: The declaration reaffirmed member countries' dedication to fostering social and economic development in the Amazon while preserving its unique cultures.

Amazon Rainforest

- The Amazon Rainforest is a tropical rainforest situated in South America, primarily covering the Amazon Basin.
- It extends across nine countries: Brazil, Peru, Colombia, Venezuela, Ecuador, Bolivia, Guyana, Suriname, and French Guiana.
- Renowned for its unparalleled biodiversity, the Amazon Rainforest harbors around 10% of Earth's known species, making it one of the most diverse ecosystems on the planet.
- Encompassing approximately 5.5 million square kilometers, the Amazon Rainforest constitutes over half of the world's remaining tropical rainforests.
- Often referred to as the "lungs of the Earth," the Amazon Rainforest plays a crucial role in global climate regulation by absorbing carbon dioxide and releasing oxygen through photosynthesis.



12. On protecting the biodiversity of the northeast

Syllabus: GS-3, Conservation, environmental pollution and degradation, environmental impact assessment.

Mains: Vulnerable Biodiversity of Northeast India and Environment Laws

Background

- In the recent case of Cleanliness of Umiam Lake vs. State of Meghalaya (2023), the division Bench of the Chief
 Justice held that "the natural beauty of the State should not be destroyed in the absence of any other employment
 opportunities and in the name of promoting tourism."
- The Meghalaya High Court was deliberating on a Public Interest Litigation (PIL) over the cleanliness of Umiam Lake.
- The Meghalaya Water Bodies (Preservation and Conservation) Guidelines, 2023, were criticized by the court for failing to address the "most serious aspect of buildings and construction mushrooming around water bodies."

Vulnerable Biodiversity of Northeast India

- Northeast India is a green belt region due to its immense natural resources such as oil, natural gas, minerals, and freshwater.
- Some of the most significant biodiversity hotspots include the Garo-Khasi-Jaintia highlands and the Brahmaputra river.
- Despite the northeast's economic backwardness, deforestation, floods, and existing industries are wreaking havoc on the region's ecology.
- According to the Ministry of Development of the North-eastern Region's environmental assessment of the North East Rural Livelihood Project, "Northeast India lies within an ecologically fragile, biologically rich region, highly prone to climatic changes, located in trans boundary river basins." Deforestation, mining, quarrying, and shifting farming are all threatening the regions' biodiversity and fauna.

Environmental Laws and Government role

- Environmental offences have been classified as "public nuisance" in the Indian Penal Code (IPC), 1860.
- The Sixth Schedule of the Constitution restricts the State's power over issues falling under the District Councils' purview, notably the use of property, by granting the District Councils autonomy. In many cases, District Councils do not impose any restrictions for the preservation and conservation of land, particularly surrounding bodies of water.
- Environmental litigation erupted as a result of PILs and judicial activism fostered by Articles 32 and 226 of the Constitution.
- The implementation of rigorous restrictions and the application of harsh fines by judicial and quasi-judicial authorities of the state frequently saves these regions' ecologically delicate flora and wildlife.
- The North East Industrial Development Scheme (NEIDS), 2017's 'Negative List' is a step in the right direction. If an entity does not meet environmental criteria, it will not be eligible for any NEIDS incentives and will be placed on the "negative list."
- Similarly, the 'Act Fast for Northeast' strategy should cover not only "trade and commerce" but also "environment and ecology" preservation in the region.

Conclusion

Central and state governments must improve infrastructure, generate money, and create jobs through long-term policy. Aiming for a 10-trillion-dollar economy while failing to safeguard India's ecology is a futile objective. The government should investigate the possibility of developing consistent environmental law that addresses environmental challenges at all levels of government.

Nut Graf: Fostering tourism, executing building projects, and expanding infrastructure are all methods for a state to earn cash and provide job possibilities. Some of them, though, come at a high environmental cost.

13. One more cheetah dies at Kuno Park, taking the toll to six

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Protection of cheetah in India

- Wildlife authorities confirmed the death of another cheetah at Kuno National Park in Madhya Pradesh.
- The deceased cheetah, named Dhatri, was sourced from South Africa and is believed to have contracted a parasitic infection due to repeated scratching and self-wounding.
- This marks the sixth reported death among the 20 cheetahs brought in from Namibia and South Africa. Previous deaths were likely caused by infections resulting from chafing by radio collars worn by the cheetahs. The collars made their skin fragile in the humid climate, exposing them to parasites against which they have no natural immunity.
- These animals might be unable to adapt to local parasites carried by fleas and ticks, leading to fatal consequences.
 Future sourcing of animals for the program may need reconsideration due to the cheetahs' extreme sensitivity to the climate.
- The Environment Ministry and the National Tiger Conservation Authority stated to the Supreme Court that the cheetah
 deaths were a result of natural causes, dismissing the likelihood of accidents.



14. MP strategy for Tigers can help Cheetahs

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Conservation of tiger and cheetahs, Need for principles of active prey management for cheetah conservation.

Context

Madhya Pradesh's tiger population surged by 50%, securing the top spot in the 2022 tiger census, attributed to the state's strategic active management of predator and prey populations.

Introduction

- The success of Madhya Pradesh in achieving a 50% increase in its tiger population, securing the top spot in the 2022 tiger census, can be attributed to a strategic approach of actively managing predator and prey populations.
- This approach has been lauded by tiger experts and holds potential for the formation of a viable cheetah population
 in the state, despite challenges faced in translocating African cheetahs to Kuno National Park.

Madhya Pradesh's Tiger Population Surge

- Madhya Pradesh reported 785 tigers in the 2022 tiger census, representing a 50% rise since the previous census.
- The state has achieved the highest tiger count for the second time in the last three censuses.
- The Forest Department's strategy of actively moving tigers and prey within the state to balance predator and prey populations played a crucial role in this success.

Active Management Practices

- Madhya Pradesh Forest Department demonstrated remarkable commitment and success in active management practices to restore low-density areas.
- Strategies include incentivized voluntary village relocations, prey supplementation, and reintroduction of species such as Barasingha and Gaur to new habitats like Satpuda, Bandhavgarh, and Sanjay Dubri Tiger Reserves.
- Prey species such as chital have been successfully supplemented in various reserves through translocation from high-density areas.

Tiger Reserves in Madhya Pradesh

- Madhya Pradesh accounts for six out of India's 53 tiger reserves.
- Five out of the six tiger reserves in Madhya Pradesh have over 50 tigers, indicating successful conservation efforts.
- Additionally, 563 tigers have been reported outside the reserves but within the state's forest divisions.

Significance of Active Prey Management

- While nature corrects imbalances between predator and prey populations, the process can be slow, and various pressures on wild habitats necessitate active prey management.
- Active prey management involves identifying regions with abundant prey and moving some to areas with lower prey densities.
- Once prey populations reach critical numbers in the new area, tigers can be translocated safely to maintain balance.

Applicability to Cheetah Conservation

- Kuno National Park in Madhya Pradesh is currently home to African cheetahs, but the translocation project has faced challenges, with six out of 20 cheetahs dying since September 2022.
- Learning from tiger conservation practices, experts believe that active prey management principles could help establish a viable cheetah population in the state.
- Similar to the approach used for tigers, maintaining balanced predator and prey populations is essential for successful cheetah conservation.

Conclusion

- Madhya Pradesh's successful tiger population surge can be attributed to the Forest Department's active management practices in balancing predator and prey populations.
- This approach holds promise for the establishment of a viable cheetah population in the state.
- As both tigers and cheetahs play critical roles in maintaining ecosystem balance, such conservation efforts are vital
 for preserving India's rich wildlife heritage.

Nut Graf: Balancing predator and prey populations was crucial in achieving a 50% rise in Madhya Pradesh's tiger population, making it the top state in the 2022 census. This successful approach also holds promise for forming a viable cheetah population, despite challenges faced in translocating African cheetahs to Kuno National Park.



15. 5% of birds in India are endemic: ZSI

Syllabus: Biodiversity and conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Protection of birds in india

- A recent publication by the Zoological Survey of India (ZSI) reveals that 5% of the bird species found in India are endemic, meaning they are not reported in other parts of the world.
- On the 108th foundation day of the Zoological Survey of India (ZSI), the publication called "75 Endemic Birds of India" was unveiled.
- India is home to 1,353 bird species, representing approximately 12.4% of the global bird diversity. Out of these, 78 (5%) are endemic to the country.
- Three of the endemic species mentioned in the publication have not been sighted in recent decades:
 - The Manipur bush quail (Perdicula manipurensis) is categorized as "endangered" by the IUCN Red List, and its last recorded sighting dates back to 1907.
 - The Himalayan quail (Ophrysia superciliosa) holds a "critically endangered" status, and its last sighting was recorded in 1876.
 - Jerdon's courser (Rhinoptilus bitorquatus) is classified as "critically endangered," and its last confirmed sighting occurred in 2009.
- ZSI Director Dhriti Banerjee emphasized the importance of conserving the habitats of endemic bird species to prevent them from dwindling out.
- The publication aims to raise awareness among the general public, especially students, about the presence of endemic bird species in restricted spaces.
- The Western Ghats region has the highest number of endemic species, with 28 bird species recorded, including the Malabar grey hornbill, Malabar parakeet, Ashambu laughingthrush, and the white-bellied sholakili.

16. Over nine lakh trees likely to be axed for Great Nicobar Project

Syllabus: Conservation, Environmental pollution and degradation and Environmental impact assessment

Mains: Environmental consequences of the government's developmental projects

Prelims: About the Great Nicobar Project.

Context:

The Centre's ambitious ₹72,000 crore Great Nicobar Project aims to develop infrastructure on the Great Nicobar Island, including a transshipment port, international airport, township, and a gas- and solar-based power plant. However, concerns have been raised about the potential impact on the island's evergreen tropical forests and diverse flora and fauna.

Ambitious Project with Tree Felling

- The Centre is undertaking the ambitious ₹72,000-crore Great Nicobar Project on the Great Nicobar Island.
- The project aims to build a transshipment port, an international airport, a township, and a 450 MVA gas and solar-based power plant.
- The Minister of State (Environment) revealed in the Rajya Sabha that around 9.64 lakh trees may be felled for the project, not the previously estimated 8.5 lakh trees.

Environmental Clearance and Challenge

- The Great Nicobar Project, spanning over 130 square km of pristine forest, received environmental clearance from an expert committee.
- However, the clearance decision was challenged in the National Green Tribunal (NGT).
- The NGT subsequently formed an expert committee in April 2023 to investigate aspects of the clearance.

Project's Strategic Importance and Lack of Public Information

- Normally, details of projects undergoing environmental clearance are made available on a public portal maintained by the Environment Ministry.
- Surprisingly, details of the Great Nicobar Project have not been disclosed, following instructions from the Union Home Ministry, which classifies the project as "strategically important."

Ecological Impact

- The Great Nicobar Island is known for its evergreen tropical forests with rich biological diversity.
- The island is home to almost 650 species of flora and 330 species of fauna.
- The proposed tree felling for development in the project area would impact this unique ecosystem.

Tree Felling Plan and Compensatory Afforestation

- Minister clarified that the estimated number of trees to be felled in the earmarked forest area is 9.64 lakh.
- Approximately 15% of the development area will be preserved as green and open spaces, potentially reducing the number of trees to be cut.



- The tree felling will be carried out in phases.
- In order to offset the loss of trees, compensatory afforestation will be carried out in Haryana, as the opportunity for planting trees in the Andaman and Nicobar Islands is restricted.

Nut Graf: Minister of State (Environment) revealed that the Great Nicobar Project may cut down 9.64 lakh trees, surpassing the initial estimate of 8.5 lakh, for development. Limited public disclosure is due to its strategic importance, despite environmental clearance. The area is known for its diverse flora and fauna, and compensatory afforestation in Haryana is planned.

17. Species in news:

Endangered Himalayan vulture	 Endangered Himalayan vulture, bred in captivity for the first time in India Researchers at Assam State Zoo, Guwahati, India, have achieved a significant milestone by successfully documenting the inaugural occurrence of captive breeding for the Himalayan vulture (<i>Gyps himalayensis</i>). The Himalayan vulture holds a 'near threatened' status on the IUCN Red List of threatened species. It regularly migrates to the Indian plains during winter and resides in the high Himalayas throughout the year. The breeding was considered a challenging task as the species naturally breeds in snowclad mountains. However, the birds acclimatised to the tropical environment in the zoo, facilitating the breeding process. The conservation breeding of Himalayan vultures in Guwahati is the second such instance in the world, after France, where the species has been bred in captivity. The Vulture Conservation Breeding Centre (VCBC) at Rani in Assam, along with three other centres, is involved in the conservation breeding of other vulture species. The three resident Gyps vulture species, including the Himalayan vulture, are categorised as 'Critically Endangered' due to unprecedented declines in their populations.
Clouded leopards	 Clouded leopards play hide and seek in woods Conservation Status IUCN Red List – Vulnerable, CITES Appendix I It is also the state animal of Meghalaya Scientific name of clouded leopards: Neofelis nebulosa The clouded leopard is an arboreal cat (spends most of its time in trees). The average lifespan of the clouded leopard is 12 to 15 years National Parks where it is seen in India Balphakram National Park, Meghalaya Buxa National Park, West Bengal Clouded Leopard National Park, Tripura Dibru Saikhowa National Park, Assam Kanchanjunga National Park, Sikkim Manas National Park, Assam Phawngpui National Park, Mizoram
Indian Eagle Owl	 In the IUCN Red List, it is considered Least Concern and part of the CITES Appendix II list. Its scientific name is Bubo bengalensis. Habitat: They are found in light – medium forests throughout the Indian mainland predominantly in the rocky regions. Cultural significance: The ornithologist Salim Ali recorded a folktale about an eagle owl. According to the tale, if an eagle owl is trapped and starved, it will speak in a human voice and predict the future of those who are listening.
Whale species	 A 340 tonne whale species lived 39 million years ago Perucetus colossus is an ancient whale species which might have been the largest animal discovered on record. It could have weighed anywhere between 85 to 340 tonnes.



Flying Fox Bat	 India's largest species of bats, named after a canine fabled to be sly, spends 7% of its day-roosting time being environmentally vigilant, a new study has said. The nectar and fruit-eating flying fox (Pteropus giganteus) is generally considered a vermin as they raid orchards. It had a similar official status under the Schedule V of the Wildlife (Protection) Act of 1972 until it was put on the Schedule II list, entailing a higher degree of protection. As a keystone species causing seed dispersals of many plants in tropical systems, the flying fox has fascinated zoologists over the years. The Indian flying fox roost gregariously and externally in tree canopies. In such conditions, hierarchy and competition for preferred roosting positions may result in the social structuring of animal aggregation. Vigilance is a manifestation of competition in canopy roosting bats, which can vary temporally, and according to the spatial position.
White-bellied sea eagle	 IUCN Red List: Least Concern Habitat: Sea Coasts of India, Eastern coasts of Bangladesh, Sri Lanka and the coasts of South East Asia up to Australia They fall under the category of raptors (or birds of prey) because they hunt and feed on other mammals, small birds etc. They usually feed on sea snakes and fishes. Habitat loss is a major concern and these birds are making their nests on towers holding high tension power wires. This is due to the lack of natural nesting sites such as trees. Nesting at heights helps the birds to scan the marine areas for food.

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HISTORY, ART AND CULTURE

. Law on protection of Indian manuscripts

Syllabus: History and culture of India, Indian Constitution, Amendments, Significant provisions

Prelims: Manuscripts of India

Mains: Significance of Manuscripts for India culture

Context: Many Indian manuscripts lie in libraries across the globe or are with private collectors, both in India and abroad. So the government is planning to introduce the National Manuscripts Bill, 2023, possibly in the Winter Session of Parliament.

According to the National Mission for Manuscripts (NMM), India possesses an estimated 10 million manuscripts in 80 ancient scripts like Brahmi, Kushan, Gaudi, Lepcha, and Maithili.









Source: The Hindu

Manuscript

- A manuscript is a handwritten composition on paper, bark, cloth, metal, palm leaf or any other material dating back at least 75 years and has significant scientific, historical or aesthetic value.
- Manuscripts are found in hundreds of different languages and scripts. Often, one language is written in a number
 of different scripts. For example, Sanskrit is written in Oriya script, Grantha script, Devanagari script and many other
 scripts.
- Manuscripts are distinct from historical records such as epigraphs on rocks, firmans, revenue records which provide direct information on events or processes in history.
- Manuscripts have knowledge content. For example, the Bakhshali manuscript is an ancient Indian mathematical text written on birch bark, and is considered to be the earliest recorded example of the use of zero.

National Mission for Manuscript

- NMM was launched in 2003 with the mandate of identifying, documenting, conserving and making accessible the
 manuscript heritage of India. These cover a variety of themes, textures and aesthetics, scripts, languages, calligraphies,
 illuminations and illustrations.
- Motto of NMM 'Conserving the past for the future'.
- According to the NMM, while 75% of the existing manuscripts are in Sanskrit, 25% are in regional languages.
- The NMM has digitised 3.3 lakh manuscripts, containing about 3.1 crore folios. Even though more than 1.18 lakh manuscripts have been uploaded, only about 70,000 have been made available online for public access.

Objectives of the National Manuscripts Bill, 2023

- Document and catalogue Indian heritage texts wherever they may be, in India or abroad,
- Maintain accurate and up-to-date information about them
- Detail the conditions under which they may be consulted.
- The Bill envisages setting up a 10-member National Manuscripts Authority (NMA), with the Union Minister of Culture would be the Chairperson of this body.
- The NMA would be the apex policy making body with regard to digitisation, conservation, preservation, editing, and publication work of manuscripts.



- The NMA would have the powers of a civil court to regulate the allocation of access to manuscripts and would also
 have an investigation wing for the purpose of conducting an inquiry into thefts and desecration of texts.
- It would also ensure that the manuscripts are not lost by damage or theft.
- It can collaborate with universities and other educational institutions or agencies to provide fellowships and scholarships for study of manuscripts.
- The NMA will also prepare a dedicated digital portal for indexing, cataloguing, uploading, and downloading copies of manuscripts.

Bakhshali Manuscript

- The Bakhshali Manuscript is an ancient mathematical document. It was discovered in 1881, buried in a field in Bakhshali village near Peshawar (Pakistan). It is written in Sharda Script.
- It predates the work of Brahmagupta, a 7th-century mathematician, and an inscription in the 9th-century Gwalior's Chaturbhuj Temple. The manuscript is composed of 70 fragile leaves made of birch bark.
- It contains hundreds of mathematical notations, including the use of zero as a placeholder.
- Zeros in the manuscript are represented by dots that serve as placeholders for different place values. In 1902, the manuscript was presented to the University of Oxford's Bodleian Library, where it has been preserved since.
- The manuscript is a compilation of mathematical material from multiple periods. Some pages date as far back as the 3rd to 4th century, while others are from the 8th and 10th centuries.

Conclusion:

With the aim to document and catalogue Indian heritage texts wherever they may be in India or abroad, this bill holds great significance for Indian culture.

2. Kalbelia Dance

Syllabus: History and culture of India, Important dance forms

Prelims: Kalbelia Dance

- The Kalbelia dance is a traditional folk dance that is integral to the Kalbelia culture of Rajasthan.
- The dance is also known as the Sapera dance, as the Kalbelias are known for their traditional snake charming skills.
- Both males and females participate in the dance, with the females as the primary dancers and males providing accompaniment on various musical instruments.
- The dance is accompanied by a variety of instruments such as the pakhawaj, dholak, jhanjhar, harmonium, and sarangi.
- The pungi or been is the characteristic musical instrument of the dance.
- These arts are being celebrated as part of the National festival of India's folk and tribal expressions "Utkarsh" and the international literature festival "Unmesh".
- Sangeet Natak Akademi and Sahitya Akademi of the Union Ministry of Culture, are organizing this event along with the Government of Madhya Pradesh.

3. Seethakali Folk Art

Syllabus: History and culture of India

Prelims: Seethakali Folk Art

- Seethakali folk art originates from the Perinad region in Kerala. It is a blend of songs, storytelling and fast movements
- It is believed to have originated 150 years ago among Veda and Pulaya communities
- The art form recreates episodes from Ramayana, depicting Seetha's journey.
- Seethakali songs are orally passed on from one generation to the next.
- It is usually performed during the Onam festival.
- Performers visit houses, using natural props and instruments (bamboo, palm leaves) with costumes and make-up.
- Vivid make-up, dynamic music, traditional instruments, spontaneous movements are some of the key characteristics of this art form.

4. Sant Ravidas

Syllabus: History and culture of India, Important personalities

Prelims: Sant Ravidas

• Laying the foundation stone for a temple dedicated to Sant Ravidas, a 14th century poet and social reformer revered by the Scheduled Castes (SC) in north and central India, to be built at an estimated ₹100 crore in Sagar, Madhya Pradesh, Prime Minister Narendra Modi said marginalised sections of society were the biggest beneficiaries of his government's policies.



About Ravidas:

- Ravidas, or Raidas, was an Indian mystic poet-saint of the bhakti movement and founder of the Ravidassia religion during the 15th to 16th century CE.
- He is venerated as a guru (teacher) in the modern regions of Uttar Pradesh, Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Punjab and Haryana.
- He was a poet, social reformer and spiritual figure.
- The life details of Ravidas are uncertain and contested. He was born in Varanasi into untouchable leather-working Chamar caste.
- He valued the worship of a formless God.
- o Ravidas's devotional Verses were included in the Sikh scriptures known as Guru Granth Sahib.
- o The Panch Vani text of the Dadupanthi tradition within Hinduism also includes numerous poems of Ravidas.
- He taught removal of social divisions of caste and gender, and promoted unity in the pursuit of personal spiritual freedom.
- Along with Kabir, he was one of the most noted disciples of Bhagat Ramanand.
- o 41 verses of Bhakta Ravidas are incorporated into Sikh's religious book, Adi Granth.
- He was vocal against the varna (caste) system





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SOCIAL JUSTICE

I. National Research Foundation (NRF) Bill, 2023

Syllabus: Government Policies & Interventions in various sectors such as Health, Gender, Education, Poverty, Economics, etc.

Mains: Provisions of National Research Foundation (NRF) Bill, 2023

Context: Recently, the Parliament passed the National Research Foundation (NRF) Bill, 2023. The bill will establish NRF, an apex body to provide high-level strategic direction of scientific research in India as per recommendations of the National Education Policy (NEP), at a total estimated cost of Rs. 50,000 crores during five years (2023-28).

Subsumption of SERB:

• The bill will repeal the Science and Engineering Research Board (SERB) established by an act of Parliament in 2008 and subsume it into NRF which has an expanded mandate and covers activities over and above the activities of SERB.

Structure

- The Department of Science and Technology (DST) will be the administrative Department of NRF which will be governed by a Governing Board consisting of eminent researchers and professionals across disciplines.
- The Prime Minister will be the ex-officio President of the Board and the Union Minister of Science & Technology & Union Minister of Education will be the ex-officio Vice-Presidents.
- NRF's functioning will be governed by an Executive Council chaired by the Principal Scientific Adviser to the Government of India.

Objective:

- To ensure that scientific research was conducted and funded equitably and greater participation from the private sector was forthcoming.
- It will focus on creating a policy framework and putting in place regulatory processes that can encourage collaboration and increased spending by the industry on R&D.
- The NRF aims to involve colleges and universities in scientific research, as currently, less than 1% of the nearly 40,000 higher learning institutions in India are engaged in research.
- The NRF plans to build research capacities in universities by encouraging active researchers to take up NRF professorships, regardless of age, and collaborate with existing faculty.

Significance:

- Promoting Research other than Natural Science
- National Priorities-It seeks to identify priority areas where science and technology interventions can contribute to national objectives such as clean energy, climate change, sustainable infrastructure, improved transportation, and accessible and affordable healthcare.
- Enhanced Funding: It seeks to increase funding for scientific research in India, both from government and private sources.
- Currently, India's spending on research and development is below 0.7 % of its GDP, when even countries like Egypt or Brazil spend more.
- The US, China, Israel, Japan, and South Korea spend anywhere between 2 to 5% of their respective GDPs on scientific research.
- Insufficient funding has directly affected the quality and quantity of research output in India. The initial allocation of Rs 50,000 crore over five years for the NRF does not represent a substantial increase but is expected to grow as the NRF gains recognition and demonstrates progress.

2. Organ shortage continues to cost lives

Syllabus: Issues arising out of design and implementation of government intervention

Prelims: National Organ and Tissue Transplant Organization

Mains: Organ donation

Organ shortage continues to cost lives

Current Statistics:

- o India has a waiting list of over 3 lakh patients for organ transplants. At least 20 persons die each day waiting for an organ.
- The number of organ donors (including cadavers) grew from 6,916 in 2014 to only 16,041 in 2022.
- India's deceased organ donation rate is currently under 1 donor per million population, but it needs to increase to 65 donations per million population to meet the demand for organs. Spain and the U.S. have better organ donation systems, clocking 30-50 donations per million.



Reasons for fewer organ donors?

- Lack of awareness: Many people in India are not aware of the importance of organ donation or the process of donating organs. Even when aware, it is restricted to living donors (For Eg – Kidney transplants). In India, living donors comprise 85% of all donors.
- **Religious and Cultural beliefs:** Some religious beliefs discourage organ donation. The idea that the body should be "whole" to perform funeral rites might hold them back from organ donation.
- Fear of exploitation: Some people fear that their organ donation will be an exploitative experience after death.
- Lack of trust in the medical system: Some people do not trust the medical system and are afraid that their organs will not be used for the intended purpose and sold in the black markets instead.
- Lack of infrastructure: The infrastructure for organ donation in India is not as developed as in other countries.
 Only 250 hospitals have registered with India's National Organ and Tissue Transplant Organization (NOTTO), which coordinates the country's organ transplant program.
- Lack of incentives for doctors: For example, doctors are unwilling to ask the deceased family members for donation of organs. There is also the fear that this request could escalate to violence.

Way Forward:

- Need to train trauma and ICU doctors to help patients' families to come forward and donate.
- The demand for deceased donors is substantial because many families lack suitable living donors. Therefore, relying on deceased donors can help partially meet demand for organs.
- Organ donation pledges in India need to translate into actual donations and for that, medical staff need to be educated.
 Awareness campaigns (as done for blood donation) can be increased.
- Hospitals should include organ donation SOPs and counseling centers. They must be able to recognise, identify, inform, and counsel families about brain death and the importance of organ donation.
- Hospitals registered with the National Organ and Tissue Transplant Organization should be increased.

Nut Graf: India has a severe shortage of organ donors. The number of organ donors has increased but this is still not enough to meet the demand for organs. There are many reasons for the shortage of organ donors, including lack of awareness, religious and cultural beliefs, fear of exploitation, and lack of trust in the medical system.

3. Kerala HC: Issue norms for sex-selective surgeries on intersex infants

Syllabus: Government Policies & Interventions in various sectors such as Health, Gender, Education, Poverty, Economics, etc.

Mains: Gender-related health issues and legal measures for protection.

Context

The Kerala High Court has issued a directive to the State government, emphasising the need for regulation of sex-selective surgeries on intersex infants, bringing attention to ethical and constitutional concerns.

Introduction

- Kerala High Court issues directive to State government for regulating sex-selective surgeries on intersex infants and children.
- Justice V.G. Arun's order emphasises the need for oversight and ethical considerations.

Conditional Permission for Sex-Selective Surgery

- Until regulations are established, sex-selective surgeries are permitted only based on the opinion of a State Level multidisciplinary committee.
- The committee's assessment must confirm that surgery is necessary to save the child's life.

Origin and Context of the Directive

- Directive arises from a writ petition by parents seeking permission for genital reconstructive surgery on their child born with ambiguous genitalia.
- Balancing medical necessity with individual rights is a central concern.

Role of the Multidisciplinary Committee

- The court directs the government to form a State Level multidisciplinary committee comprising a paediatrician/paediatric endocrinologist, paediatric surgeon, and child psychiatrist/child psychologist.
- Committee's task is to determine if ambiguous genitalia pose a life-threatening situation for the child.

Constitutional Considerations

- The court underscores that granting permission for genital reconstructive surgery must respect constitutional rights.
- Conducting surgery without proper consent infringes upon the child's dignity and privacy.



Anticipating Psychological Implications

- The court acknowledges the potential for severe emotional and psychological issues if the child identifies with a different gender during adolescence.
- This highlights the importance of informed decision-making.

Transgender Rights and Legal Framework

- Referring to the Transgender Persons (Protection of Rights) Act, the court notes that individuals with intersex variations fall within the definition of transgender (Section 2(k)).
- Protections under the Act are extended to such individuals.
- Section 4(2) of the Act guarantees the right to self-perceived gender identity.

Individual's Right to Choose Gender

- The court firmly establishes that the right to choose one's gender identity solely belongs to the individual.
- Even the court does not have the authority to determine an individual's gender identity.

Nut Graf: The court mandates State-level regulation and committee approval for sex-selective surgeries on intersex infants, addressing potential life-threatening situations and upholding individual rights.

4. Climate events & an umbrella for urban health

Syllabus: Issues Relating to Development & Management of social sector/services such as Health, Education and Human Resource.

Mains: Issues Relating to Development & Management of health

Context: The monsoon season in India has brought widespread devastation and raised concerns about water and vector-borne diseases, especially in vulnerable urban areas like slums.

Monsoon Impact and Health Concerns

- The monsoon season in India has brought widespread destruction, including cyclonic storms, floods, and heavy rainfall.
- The focus shifts to health challenges posed by common water and vector-borne diseases like typhoid, cholera, dysentery, malaria, and dengue.

Urban Vulnerability and Disease Spread

- Urban households, especially in underdeveloped areas like slums, are highly vulnerable due to poor socio-economic conditions.
- Urban areas are more likely to experience malaria and dengue outbreaks compared to rural areas.

Climate Change and Disease Vulnerability

- Vulnerability to diseases like malaria is higher in climatically vulnerable states.
- Climate change-related events increase susceptibility to vector-borne illnesses.

Challenges in Disease Management

- After the monsoon, health officials focus on containing water and vector-borne diseases.
- Coordination between states and urban areas is crucial due to people's movement.

Resilient Urban Health Care System

- Urgent need to rebuild the urban primary health care system to withstand extreme climatic events.
- System should prioritise vulnerable urban populations, especially in slums and peri-urban areas.

Public Investment and Health Resilience

- Increased public investment is required for urban health care, with an emphasis on vulnerable areas.
- The National Urban Health Mission has initiated improvements, but financial constraints hinder progress.

Special Funding for Urban Health

- A special fund from institutions like the Finance Commission is needed to build resilience in urban health care.
- Attention should extend to towns beyond cities.

COVID-19 Experience and Urban Health Governance

- COVID-19 revealed the complexities of urban health governance, highlighting the need for coordination and cooperation.
- Public health emergencies require cooperation among various stakeholders, including data sharing and regulation.



Strengthening Surveillance and Information Systems

- Universalize and strengthen surveillance and information systems like the Integrated Disease Surveillance Programme.
- Comprehensive information sharing is crucial for effective response to health crises.

Comprehensive Health System Approach

- Shift from vertical disease control programs to a comprehensive health system approach.
- Integration of front-line workers across disease management programs can create a versatile public health cadre.

Preparedness for Climate Change Events

- Plan and manage health systems considering the increasing frequency and intensity of climate change events.
- Better preparation is necessary on a global scale.

Nut Graf: As India grapples with monsoon-related challenges, a resilient urban health care system, public investment, and comprehensive strategies are crucial to address health vulnerabilities exacerbated by extreme climatic events.

5. AB-PMJAY

Syllabus: Issues Relating to Development & Management of social sector/services such as Health, Education and Human Resource.

Mains: Performance of AB-PMJAY

Introduction: The Centre's flagship health insurance scheme, Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (PMJAY), has come under scrutiny due to irregularities revealed by the Comptroller and Auditor General (CAG). The Health Ministry has responded, defending the scheme's approach and clarifying its usage of mobile numbers.

Issues Highlighted by CAG

- CAG's performance audit report presented in the Lok Sabha revealed several issues with PMJAY.
- Instances of treatment being provided to patients who were declared dead.
- Cases of thousands of beneficiaries using the same Aadhaar or invalid mobile phone numbers.
- Over 7.5 lakh beneficiaries were linked to a single mobile number (9999999999).
- In Tamil Nadu, 4,761 registrations were made against just seven Aadhaar numbers.

Health Ministry's Defense

- The Health Ministry issued a statement in response to the CAG report, explaining its stance and clarifying its utilisation of mobile numbers.
- Mobile Numbers and Beneficiary Verification: The Ministry emphasised that mobile numbers are not used for beneficiary verification.
- Usage of Mobile Numbers: Mobile numbers are used solely for communication and feedback purposes, not for beneficiary verification.
- Aadhaar-based e-KYC: The scheme identifies beneficiaries through Aadhaar-based e-KYC, matching details with the source database to approve or reject Ayushman card requests.

Impact of Invalid Mobile Numbers

- Validity of Beneficiary Claims: The Health Ministry clarified that the absence of a valid mobile number or changes in mobile numbers would not impact the validity of beneficiaries' claims.
- Treatment Not Withheld: Treatment cannot be withheld based on mobile number issues.

Multiple Beneficiaries Sharing the Same Mobile Number

- Initially, mobile number validation was not mandatory during beneficiary verification.
- The Ministry confirmed that the correctness of the verification process and the validity of claims were not affected.
- Necessary changes have been implemented in the IT portal to capture only valid mobile numbers.

6. On IDay, Stalin seeks transfer of education back to State List

Syllabus: Issues Relating to Development & Management of social sector/services such as Health, Education and Human Resource.

Mains: Debate on shifting education back to the state list.

- Tamil Nadu's Chief Minister M.K. Stalin wants to move education control back to the State level in the Constitution's Seventh Schedule. This shift would help stop centralised exams like NEET.
- Education used to be a State matter, but during the Emergency, the central government under Indira Gandhi moved it to a shared list with the States.
- On Independence Day, while raising the national flag at Fort St. George, Mr. Stalin remembered past Chief Ministers like C.N. Annadurai and M. Karunanidhi who wanted more autonomy for Tamil Nadu.
- Mr. Stalin believes that things that directly affect people should be under State control. He specifically mentioned that education should be given back to the State to manage.



7. 14 States yet to join education scheme

Syllabus: Issues Relating to Development & Management of social sector/services such as Health, Education and Human Resource.

Mains: National Education Policy (NEP) issues

MoU Pending in 14 States and UTs:

 Kerala, Tamil Nadu, West Bengal, and 11 others have not signed a memorandum of understanding (MoU) with the Union Education Ministry for implementing the National Education Policy (NEP) and receiving funds of around ₹13,000 crore under the Pradhan Mantri Uchchatar Shiksha Abhiyan (PMUSHA) for state-run higher education institutions.

Budget Allocation Details:

- o PM-USHA, aimed at enhancing higher education quality, receives ₹12,926.1 crore from 2023-24 to 2025-26.
- The MoU signifies states' intent to partake in the scheme, enhancing its execution. So far, 22 states/UTs have signed the MoUs.

Funding and NEP Concerns:

- Some states expressed concerns about the MoU's implications.
- The MoU doesn't allocate extra funds for NEP reforms, while states need to contribute 40% of the PM-USHA budget themselves.
- States argue NEP changes demand additional financial support.

Discussion and Adaptability:

- The Centre is engaging in discussions with the 14 pending states/UTs to address their concerns and highlight the NEP's significance.
- PM-USHA's National Mission Authority's co-vice chairperson, M. Jagadesh Kumar, emphasised the scheme's adaptability to varying state needs.

Integration of NEP and PM-USHA:

- The MoU focuses on planning, implementing, and monitoring the scheme effectively.
- Commitment to align state proposals with NEP principles enhances the integration between NEP and PM-USHA.

State Flexibility:

o States and UTs can choose target districts based on indicators, offering flexibility in the scheme's execution.

8. Why is Bihar's caste-based survey facing legal challenges?

Syllabus: Issues Relating to Development & Management of social sector/services such as Health, Education and Human Resource.

Mains: Issues with caste-based survey

Introduction

- The Supreme Court is scheduled to hear petitions challenging Patna High Court's decision to uphold the Bihar government's ongoing caste survey on August 18.
- The Bihar government launched a two-phase caste survey on January 7, aiming to gather detailed socio-economic data to formulate better policies for disadvantaged groups.
- The survey covers a population of 12.70 crore across 38 districts.
- Phase one involved a house listing exercise from January 7 to January 12. The second phase was paused due to a High Court stay order on May 4 but resumed on August 2.
- The second phase collects data on castes, sub-castes, and religions. The final survey report is expected in September, close to the 2024 elections.

Importance of Caste Census

- The decennial Census records Scheduled Castes (SCs) data but lacks comprehensive information on Other Backward Classes (OBCs) and other groups.
- The central government rejects a socio-economic caste census due to administrative difficulties, despite conducting a 2011 survey with unreleased data.
- Bihar's move was seen as an attempt to revive Mandal politics

Challenges and Opposition

- Petitions against the survey claim the Bihar government's order is unconstitutional since only the central government can conduct a census as per the Constitution.
- Petitioners argue the state government lacks authority to appoint District Magistrates without central government notification under the Census Act.
- Petitions challenge the High Court verdict for violating privacy, as personal data is collected through an executive order.
- The High Court defended the state's authority to create policy and dismissed privacy concerns, referencing the Puttaswamy judgement.



9. WHO chief asks nations to unlock power of traditional medicine

Syllabus: Issues Relating to Development & Management of social sector/services such as Health, Education and Human Resource.

Mains: Power of traditional medicine

Context: Global Centre on Traditional Medicines in Jamnagar, Gujarat, established by the WHO, is the first such center in a developing country.

Global Summit on Traditional Medicine

- WHO Director-General Tedros Adhanom Ghebreyesus urges countries to harness the potential of traditional medicine.
- Seeks evidence-based suggestions for a global strategy at G-20 Health Ministers' meeting in Gandhinagar.

Integration into National Health Systems

- o Ghebreyesus hopes the "Gujarat Declaration" will embed traditional medicine in national health systems.
- Calls for merging traditional medicine and science to maximise its potential.

Ayush Ministry's Role

- Co-hosted by Ayush Ministry, the event aims to unlock traditional medicine's power.
- Emphasises the importance of science-backed traditional healing practices.

Health-Related Sustainable Development Goals

- Health Minister Mansukh Mandaviya highlights G-20's collective potential for the UN's health-related Sustainable Development Goals.
- Envisions a world united under the ethos of "One earth, one family, one future."

Global Centre for Traditional Medicine

- WHO's Global Centre for Traditional Medicine, headquartered in Jamnagar, Gujarat, advances traditional medicine worldwide.
- Accelerates global progress in traditional medicine practices.

Medical Value Travel

- Minister Mandaviya launches Advantage Healthcare India portal for medical value travel.
- Medical value travel facilitates specialised resources and services sharing for unmet global healthcare needs.
- o Ghebreyesus suggests leveraging medical value travel for offering unique and unavailable healthcare solutions.

What is Traditional Medicine?

- According to the WHO, traditional medicine is the total sum of the "knowledge, skills and practices indigenous and different cultures have used over time to maintain health and prevent, diagnose and treat physical and mental illness".
- Its reach encompasses ancient practices such as acupuncture, ayurvedic medicine and herbal mixtures as well as modern medicines.

10. Global Initiative on Digital Health

Syllabus: Issues Relating to Development and Management of Social Sector/Services relating to Health, Education, Human Resources.

Mains: Global Initiative on Digital Health, Sustainable Development Goals, National Digital Health Mission

Prelims: Global Initiative on Digital Health, WHO

The Global Initiative on Digital Health (GIDH) is a WHO initiative to facilitate the implementation of the Global Strategy
on Digital Health 2020-2025.

Why is there a need?

- Digital health is being seen as a proven way to improve health outcomes and achieve Universal Health Coverage and Sustainable Development Goals.
- For example, India's National Digital Health Mission aims to establish the following:
 - Health ID: A unique health identifier for individuals, similar to an Aadhaar ID.
 - Digi Doctor: A repository of doctors with their contact information, qualifications, and specializations.
 - Health Facility Register (HFR): A repository of health facilities in India, including their contact information and services offered.
 - Personal Health Records (PHR): An electronic record of an individual's health information, which they can control and update.
 - Electronic Medical Records (EMR): A web-based system that contains a patient's medical history and treatment information.
- The acceleration of digital health transformation is challenged by fragmentation in resource allocation, a lack of uniform definitions of digital solutions, and a lack of quality assurance.
- Countries also need support to move from isolated digital health initiatives to establishing a national digital health infrastructure which brings all digital health initiatives under one wing.
- There is a lack of alignment of investments in digital health, which makes it difficult to reduce duplication and optimize impact.



 Global Initiative on Digital Health acts as a global platform to respond to digital health needs by aligning investments, strengthening the enabling environment, and enhancing quality-assured technical support.

What are the 4 pillars of the Global Initiative on Digital Health?

- Country Needs Tracker: This pillar will help to ensure that digital health investments are aligned with the needs of countries. It will do this by collecting data on country priorities, needs, and gaps in digital health. This information will then be used to inform the development and implementation of digital health interventions.
- Country Resource Portal: This pillar will help to identify and connect countries with traditional and innovative resources for digital health. This includes funding, technical assistance, and other forms of support. The portal will also help to reduce the risk of duplication by providing a central repository of information on available resources.
- Transformation Toolbox: This pillar will provide countries with quality-assured tools and resources to support their digital health transformation journey. This includes tools for planning, implementation, monitoring, and evaluation.
- **Convening and Knowledge Exchange:** This pillar will promote collaboration and knowledge exchange across global, regional, and national networks in digital health.

11. ALS patients and caregivers struggle with multiple issues related to disease

Syllabus: Issues Relating to Development & Management of Social Sector/Services like Health, Education, Human Resource etc.

Mains: Analysis of the challenges in ALS diagnosis, the mental health impact on patients and caregivers, and the role of government policies in providing financial support.

Prelims: About Amyotrophic Lateral Sclerosis (ALS)

Context: Amyotrophic Lateral Sclerosis (ALS) inflicts severe challenges on patients, some of whom have to communicate through blinking due to paralysis. Caregivers also bear immense physical and emotional burdens.

Introduction

- Amyotrophic Lateral Sclerosis (ALS) is a neurodegenerative disease affecting motor neurons controlling voluntary functions.
- Muscles dependent on these neurons atrophy, leading to loss of movement and function.

ALS Progression and Challenges

- ALS affects motor neurons controlling respiratory muscles, impacting breathing.
- No effective cure; the best therapies involve drugs and interventions to extend life.
- Survival time averages three years; disease progression varies in individuals.

Diagnosis Challenges

- Onset to diagnosis takes 8 to 15 months on average due to the absence of definite biomarkers.
- Motor cell failure detection is required in at least 2 regions of the body for ALS diagnosis.
- Diagnosis complexity leads to an agonising wait for caregivers and patients.

Impact on Caregivers

- Caregivers' lives drastically change; they become primary support for Persons with ALS (PALS).
- Challenges include daily care, emotional stress, and altered routines.

Mental Health Impact

- The high prevalence of depression among ALS patients affects the quality of life and mobility.
- PALS lose independence, leading to social withdrawal and depression.

Infrastructural Inefficiencies

- Lack of wheelchair accessibility affects the quality of life.
- Buildings and public spaces are often not wheelchair-friendly.
- Financial demands: Medications, nurses, physiotherapy, and modifications cost significantly.

Financial Challenges and Government Policy

- ALS imposes substantial financial burdens on patients and caregivers.
- National Policy for Rare Diseases (NPRD), 2021, offers financial assistance for rare diseases.
- ALS qualifies as a 'rare disease' as per global epidemiological studies, but classification criteria vary.

Conclusion

- ALS patients' struggles encompass physical, emotional, and financial challenges.
- Caregivers face significant lifestyle changes and mental health impacts.
- Government policies like NPRD offer some relief but criteria for 'rare disease' classification need clarity.



Nut Graf: Amyotrophic Lateral Sclerosis (ALS) debilitates patients causing paralysis and communication through blinking. Caregivers face life-altering adjustments, emotional stress, and financial strains. Government intervention in the form of assistance and making public spaces wheelchair friendly is of utmost importance.

12. Vishwakarma scheme

Syllabus: Government Policies & Interventions in various sectors such as Health, Gender, Education, Poverty, Economics, etc.

Prelims: Vishwakarma scheme

Context: In the recent Independence Day address, the Prime Minister unveiled two significant initiatives aimed at empowering artisans and women's self-help groups (SHGs) across India.

• The two initiatives are: the Vishwakarma Yojana and the provision of drones for women SHGs under Lakpati Didi Scheme.

What is Vishwakarma Yojana?

- The Vishwakarma Yojana is a pioneering scheme designed to uplift individuals skilled in traditional craftsmanship, particularly from the Other Backward Classes (OBC) community.
- This scheme, named after the divine architect and craftsman Vishwakarma, seeks to preserve and enhance the gurushishya parampara (teacher-pupil tradition) of passing down skills within families engaged in various artisanal trades.

Features

- Recognition and Support: Artisans and craftspeople enrolled in the scheme will receive a PM Vishwakarma certificate and an identity card.
- They will also be eligible for collateral-free credit support of up to ₹1 lakh (first tranche) and ₹2 lakh (second tranche) at a concessional interest rate of 5%.
- Skill Development and Empowerment: The Vishwakarma Yojana has been allocated a budget ranging from ₹13,000 crore to ₹15,000 crore for five financial years from 2023-2024 to 2027-2028.
- The scheme offers a stipend of ₹500 for skill training and ₹1,500 for the purchase of modern tools.

What is the Lakhpati Didi Scheme?

- The government's goal is to create two crore "lakhpati didis" (prosperous sisters) in villages. This scheme aligns with the broader mission of poverty alleviation and economic empowerment.
- Under this scheme, women will be provided skill training so that they can earn over Rs 1 lakh per year.

Features

- This initiative aims to leverage technology to transform the agricultural landscape while empowering women in rural communities.
- Around 15,000 women's SHGs will be given training in operating and repairing drones.
- This training will not only create new avenues for income generation but also equip women with cutting-edge skills.
- Drones have the potential to revolutionize agriculture by enabling precision farming, crop monitoring, and pest control.
- Under the scheme, women will be trained in skills like LED bulb making, plumbing, among others.

13. National Curriculum Framework proposes Board exams twice a year

Syllabus: Government Policies & Interventions in various sectors such as Health, Gender, Education, Poverty, Economics, etc.

Mains: Reforms in Education

Languages Learning Framework

- Students in Classes 9 and 10 required to learn three languages, with at least two being Indian languages.
- In Classes 11 and 12, students must learn two languages, one of Indian origin.
- National Curriculum Framework (NCF) released by NCERT, following National Education Policy (NEP), 2020.

Literary Proficiency in Indian Languages

- NCF aims for a "literary level" of linguistic capacity in at least one Indian language.
- Reflects NEP's emphasis on preserving and promoting Indian languages.

Board Exam Changes

- Students are allowed to take Board exams twice in a school year, with best score retained.
- A significant departure from the earlier annual Board exam system.

Curriculum Changes

- NCF drafted by the National Steering Committee led by former ISRO Chairman K. Kasturirangan.
- Curriculum changes in line with NEP, impacting textbooks from Classes 3 to 12 under CBSE.
- Classes 1 and 2 already have updated textbooks released by NCERT.



Subject Structure

- Mandatory subjects increased from five to seven for Classes 9 and 10, and six for Classes 11 and 12.
- Optional subjects grouped into three categories: arts, social sciences, and interdisciplinary; science, maths, and computational thinking.

Term-Based Assessment

- NCF recommends long-term shift to semester or term-based assessments.
- Assessment aligned with learning progress, reduces content load per exam.

Localised Social Science Curriculum

- For Classes 6 to 8, social science curriculum: 20% local content, 30% regional, 30% national, 20% global.
- Emphasis on diverse perspectives and global awareness.

Flexible Secondary Stage

- Redesigned "secondary stage" offers flexibility in subject combinations.
- o Blur between academic and vocational, science, social science, arts, and physical education.

Environmental Education Emphasis

 Environmental education integrated throughout schooling, culminating as a separate study area in the secondary stage.

Future-Oriented Textbook

Textbooks for Classes 3 to 12 aligned with 21st-century needs, rooted and futuristic.

14. Missed childhood TB cases impede achieving 2025 goal

Syllabus: Issues Relating to Development and Management of Social Sector/Services relating to Health, Education, Human Resources

Prelims: National Strategic Plan 2017-2025, Tuberculosis, WHO's End TB strategy

Mains: National Strategic Plan 2017-2025, Sustainable Development Goals

Introduction:

 There is a significant gap in the detection and notification of tuberculosis (TB) cases among children in India. TB is a leading cause of death among children and early diagnosis and treatment are essential for improving their survival rates.

What does the data say?

- According to the National Strategic Plan 2020-2025 report, children continue to be underrepresented in the national TB surveillance system, with limited capacity for case detection and lack of sensitive diagnostics being major challenges.
- In 2022, while the total notified cases were over 2.4 million, pediatric TB cases notified were only 1,35,734, which is 5.6%. In contrast, according to the 2022 pediatric TB management guidelines for India, children contribute to more than 13% of the TB case load. This shows that there is a difference of around 4-5% between the notified cases and incidence of the disease.
- This implies that over 2,00,000 children with TB were missed in 2022 alone, with the cumulative number of missed cases being much higher considering the consistent gap in detection over the years.

Challenges in diagnosing TB in children?

- Diagnosing TB in children is challenging due to difficulties in obtaining quality samples of sputum (for testing), low bacterial load in them, and the need for highly sensitive molecular tests.
- Moreover, the use of smear microscopy instead of molecular tests (more sensitive to detect cases in children) poses a significant challenge in TB diagnosis and drug-resistance screening.
- Only a small portion of children and extrapulmonary TB patients are successfully screened for drug resistance.
- There is a reduction in BCG vaccination coverage during the COVID-19 pandemic which may have contributed to the increase in TB cases among children.
- While the coverage has improved slightly in recent years, it still remains lower than pre-pandemic levels.

What are the National Strategic Plan 2017-2025 targets?

- The National Strategic Plan 2017-2025 aims to reduce TB incidence to 44 new cases or 65 total cases per lakh population by 2025.
- The estimated TB incidence for 2021 was 210 per lakh population, making it a challenging task to achieve the target.
- The program also aims to reduce TB mortality to 3 deaths per lakh population by 2025, while the estimated mortality for 2020 was 37 per lakh population.
- The plan aims to eliminate catastrophic costs for affected families, but 7-32% of drug-sensitive TB patients and 68% of drug-resistant TB patients still experience such costs. If the financial burden due to TB is above 20% of the household income, then it is considered a catastrophic cost.
- The Indian government's goals align with the World Health Organization's End TB strategy, which aims for an 80% reduction in new cases, 90% reduction in mortality, and zero catastrophic cost by 2030.

Conclusion

• Focus should shift towards improved diagnostics, enhanced case detection, and increased BCG vaccination coverage to address the significant gap in TB detection and control among children in India.

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Nut Graf: India has a significant gap in the detection and notification of tuberculosis (TB) cases among children. This is due to a number of factors, including the difficulty of obtaining quality samples for testing, the low bacterial load in children, and the need for highly sensitive molecular tests. The National Strategic Plan 2017-2025 aims to reduce TB incidence and mortality among children, but it will be challenging to achieve these targets without improved diagnostics, enhanced case detection, and increased BCG vaccination coverage.

15. The state of scholarships for minorities

Syllabus: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Concerns with reduced budget of scholarships for minorities

Background

- To investigate the social, economic, and educational condition of Muslims in India, the UPA administration established the Sachar Committee.
- In its Strategy Document-2018, the Niti Aayog emphasizes the need of affirmative action in improving the socioeconomic
 position of religious minorities, notably Muslims.

Need of scholarships for religious minorities

- Religious minorities number more than 30 crore people in India. Under Section 2(C) of the National Commission for Minorities Act of 1992, six faiths have been notified.
- Muslims are the largest religious minority among them, although facing challenges in a variety of sectors.
- Their participation in paid employment is limited, and much labor in the informal sector, which is defined by poor wages, insufficient social security, and horrible working conditions.
- The Justice Rajinder Sachar Committee was constituted to look into the social, economic, and educational standing
 of Muslims in India. According to the Sachar Committee, the Muslim minority is being disregarded in virtually every
 facet of development.

Welfare Schemes for Minorities

- The Pre-Matric Scholarship Scheme was one of the Ministry of Minority Affairs' initial central sector schemes.
- The Post-Matric Scholarship Scheme sought to provide minority students with access to high-quality higher education by awarding scholarships ranging from ₹2,300 and ₹15,000.
- The Scholarship Scheme based on Merit and Means targeted professional and technical courses at the undergraduate and postgraduate levels.
- The Maulana Azad National Fellowship (MANF) is a central sector initiative that gives financial support to research scholars from institutions approved by the University Grants Commission (UGC) for a period of five years.
- Padho Pardesh was established to give greater possibilities for higher education overseas to students from economically disadvantaged minority populations.
- The Maulana Azad Education Foundation (MAEF) established the Begum Hazrat Mahal National Scholarship for deserving ladies to pursue upper secondary education.
- The Naya Savera project was developed separately to give free coaching to minority students for admission to technical and professional degrees as well as competitive tests.
- The plan was allocated 30 crore in the Union Budget 2023-24, however the Centre has subsequently canceled the scheme, claiming that the New Education Policy 2020 does not support coaching activities.

Reduction in budget of schemes

- The Centre for Budget and Governance Accountability (CBGA) identified a "declining trend" in the proportion of total budget expenditure allocated to minorities in its 2022 report. The CBGA determined that the distribution of funding for the fiscal year 2022-23 did not correspond to proportionate representation of minorities.
- According to the most recent Ministry of Minority Affairs data, beneficiaries of the first six central educational initiatives stated above fell by roughly 7% between 2019 and 2022.
- The current distribution of cash for the Ministry's initiatives reflects the decrease in minority students receiving educational help.
- The budget allocation for the Ministry of Minority Affairs has been lowered by 38% this fiscal year compared to 2022-23.
- While the government spent 1,350 crore on pre-matric scholarships in 2021-22, it spent 400 crore on the post-matric plan.
- One of the few programmes that witnessed an increase in the number of participants between 2019 and 2021 was
 the merit-cum-means scholarship for professional and technical degrees, which also saw budget decreases this year.



Necessity of the educational aid

- According to the Ministry of Education's All India Survey on Higher Education (AISHE), 2020-2021, Muslim students lag well behind other populations in terms of higher education enrollment.
- As the Niti Aayog stated in its Strategy Document-2018, affirmative action is critical to improving the socioeconomic situation of religious minorities, notably Muslims, who continue to fall behind the rest of the population in various categories.
- There is a large discrepancy in education accessibility between Muslims and the broader population, with Muslim enrolment reducing as one advances in education.
- Experts are concerned that eliminating scholarships and reducing the scope of others, such as the pre-matric scholarship and the Begum Hazrat Mahal National Scholarship, will harm the community and reduce enrolment rates, which are already low.

Conclusion

Niti Aayog has proposed increasing pre-matric, post-matric, and merit-based scholarships, as well as MANF and national abroad scholarships, by 15% each year beginning in 2019-20. It also suggested increasing the number of scholarships for minority females by 10% each year.

Nut Graf: In recent years, the Centre has canceled two significant educational projects for religious minorities, reduced the scope of another, and steadily reduced investment on several Ministry of Minority Affairs programmes.

16. Population Growth not a panacea

Syllabus: Government Policies & Interventions in various sectors such as Health, Gender, Education, Poverty, Economics, etc.

Mains: Population Growth potential and issues

Context: India's growing population can help boost its labour force but it is not enough to make the economy stronger, says Moody's; The ratings body says strong education and quality infrastructure are also key to reaping the benefits of a larger population.

Uncertain dividend

India's growing population expected to aid economic growth, but quality of education could be a spoiler: Moody's



- Moody's clubs India's current education outcome levels with that of Pakistan and Bangladesh
- There remains a considerable gap in the quality of education between India compared with peers like China
- Gender disparity in educational achievements is the most pronounced in India and Bangladesh

Source: The hindu

- India's population growth would raise its labour force availability but that alone won't be enough to make the economy stronger or improve fiscal outcomes, due to the quality of education in the country, Moody's Investors Service said in a report.
- Emphasising that better educational outcomes will help countries like India avoid potential job losses from digitalisation and Artificial Intelligence in the long run, especially in services like call centres and BPOs, Moody's bracketed India's current education outcome levels with that of Pakistan and Bangladesh.
- In a report titled 'Population growth alone will not drive credit benefits for emerging economies', the rating major said it expects continued population growth in the region to support economic expansion as working-age populations will remain large compared with younger and older citizens.
- However, the availability and scale of labour inputs alone will not drive materially stronger economic strength or better fiscal outcomes. Other conditions such as strong education and quality infrastructure are also key to reaping the benefits.
- There remains a considerable gap in the quality of education between Pakistan, Bangladesh and India compared with China and other peers in South East Asia, which contributes to labour force participation imbalances.
- India, Bangladesh, Indonesia, Pakistan, the Philippines and Vietnam will account for a third of the global population increase over the next 20 years and 40% of the uptick in the working age population.
- Moody's said the difference in the proportion of the male and female population that has completed an upper secondary education was most pronounced in India and Bangladesh.



17. In India, 74% can't afford a healthy diet: UN agency report

Syllabus: GS-2, Issues relating to Poverty and Hunger.

Mains: Nutritious food and a healthy diet are still distant goals for many people in India even after a reduction in poverty.

Context: The 'SOFI 2023' report by FAO and UN agencies highlights India's low cost but high inability (74%) to afford a healthy diet due to stagnant incomes.

About 'State of Food Security and Nutrition in the World' (SOFI) 2023 Report:

- The 'State of Food Security and Nutrition in the World' (SOFI) 2023 report is published by the Food and Agriculture Organization (FAO) in collaboration with United Nations agencies.
- It assesses the food security and nutrition status globally, focusing on various aspects such as the affordability of healthy diets, income levels, and regional trends.
- The report includes data from multiple countries, comparing their ability to afford and maintain a healthy diet, and it highlights the challenges faced by different regions.

Cost of a Healthy Diet in India:

- The SOFI 2023 report reveals that the cost of a healthy diet in India has increased over recent years, but it remains
 the lowest among BRICS nations and neighbouring countries.
- The calculation of a healthy diet's cost is based on the cheapest local food items that fulfil dietary guidelines.
- The report finds that India has the lowest cost for a healthy diet among the countries considered, with a per-person cost of 3.066 PPP dollars per day in 2021.
- PPP (Purchasing Power Parity) dollars are used to account for differences in the cost of living between countries.

Population Deprived of a Healthy Diet:

- The SOFI report indicates that despite the relatively lower cost of a healthy diet in India, a significant portion of the population cannot afford it due to stagnant or decreasing income levels.
- In India, 74% of the population was unable to afford a healthy diet, making it one of the countries with the highest percentage of people facing this challenge.
- The assessment of affordability is based on whether the cost of the diet exceeds 52% of the average income in each country.
- Income distribution within a nation is considered to determine the percentage of people unable to afford the specified diet.

Change in the Cost of a Healthy Diet Over the Years:

- The SOFI report analyzes the change in the cost of maintaining a healthy diet across different regions over a specific time frame.
- Between 2019 and 2021, there was a nearly 9% increase in the cost of a healthy diet in Asia, which was the highest increase among regions.
- The analysis indicates that economic factors, including inflation and changing food prices, contribute to this upward trend.
- The increasing cost of a healthy diet poses challenges for individuals and families striving to meet nutritional needs.

Nut Graf: The 'SOFI 2023' report reveals a concerning disparity in India. While the cost of a healthy diet remains relatively low, an alarming 74% of the population cannot afford it due to economic constraints. This disparity should be addressed as soon as possible.



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GOVERNANCE

1. The debate on data

Syllabus: GS-2; Government policies, transparency and accountability

Mains: National Surveys, debate and issues associated with it

Background

- India's National Surveys and the data it generates have been the subject of a recent wave of writing.
- Both inside and outside the administration, people actively participated in the discussion that followed.
- The discussion must also be viewed in light of India's expanding economic influence on the world stage and India's
 election to the UN's top statistics body for a four-year term.

Debate on Data and Three Issues

There is a critical need for immediate action to address the issue of the lack of reliable, comprehensive data on the economy and society. In the absence of such information, politicians search for quick fixes and congratulate themselves on the results of small samples.

- The Quality and Credibility of Data: Without precise and reliable data, it is impossible to develop policies, carry them out, or conduct research. Since surveys are the source for official unemployment, poverty, and other statistics that influence policy, it is crucial to collect data accurately. Given the fundamental changes in the economy, only a realistic sample can provide an accurate representation of the economy and society.
- Redundancy of Agencies: Several organisations offer data on the same set of indicators for the same sector, but with
 varying results. The challenge presented by this is selecting an adequate data collection to develop policy. Technical
 issues hampered the MCA21 portal. Accessing documents and uploading filings both had issues.
- Issue with High-Quality Data: The third problem is the system's capacity and capability to produce and distribute high-quality data. In recent years, surveys have not only been postponed but even the disclosure of processed survey results has been blocked. This has made it more difficult to collect micro-level statistics on crucial factors like consumption that are needed to determine the severity of poverty. The same applies to macroeconomic statistics.

Way Forward

- Economic and social data should be considered a public good. Like many other public goods, it is the government's responsibility to provide them.
- Although there are many private data-generating and publishing businesses, their exorbitant prices and limiting access rules exclude data users.
- The relationship between data producers and users needs to be improved. A move away from dashboards and towards more open data dissemination should be made.
- Revisions are long needed for both the consumer price index and the wholesale price series that are used to measure inflation. Estimates of national income need to be updated in order to measure economic growth.

Nut Graf: There is a critical need for immediate action to address the issue of the lack of reliable, comprehensive data on the economy and society. A good place to start could be to revisit the Rangarajan Committee Report and evaluate what has been accomplished.

2. The IIM Bill is a bold move

Syllabus: Government policies and interventions aimed at development in various sectors and issues arising out of their design and implementation.

Mains: Autonomy of educational institutions, Government intervention in educational institutions, Governance issues in educational institutions, Governance structures in educational institutions.

Context:

The article discusses the Indian Institutes of Management (IIM) Act and the introduction of the IIM (Amendment) Bill to address governance issues and accountability in the IIM system.

Background

- The 2017 Indian Institutes of Management (IIM) Act granted extensive autonomy to IIMs, including a clause for periodic independent reviews.
- However, few IIMs have complied, raising concerns and leading to the introduction of the IIM (Amendment) Bill in 2023.



Key Provisions of the Bill

- The 2023 Bill aims to reverse certain provisions of the 2017 Act.
- It establishes the position of the Visitor, the President of India, who will hold authority over crucial appointments and reviews
- The Visitor can initiate inquiries, approve director appointments, and remove directors independently.

Motivation Behind the Bill

- Government dissatisfaction with IIMs' responsiveness and governance issues.
- Turbulence within the IIM system, including conflicts over decisions and internal dynamics.
- Lack of checks and balances on directors' authority under the 2017 Act.
- Rise in MBA course fees without proportionate justification.

Comparative Analysis

- Private U.S. universities' board effectiveness is attributed to factors like endowments, research funding, and competitive environments.
- Government control in educational institutions, as seen in the California system and the IITs, hasn't hindered their global prominence.
- IIMs flourished under government control with operational autonomy for several decades.

Government's Intention

- The government seeks to restore accountability and oversight in the IIM system.
- The 2023 Bill aims to address the lack of checks and balances and enhance democratic accountability.
- Ensuring accountability to the government and Parliament is seen as preferable to unchecked autonomy.

Nut Graf: The IIM (Amendment) Bill aims to undo provisions of the 2017 Act, create the position of "Visitor" for key appointments, and restore accountability in the IIM system, addressing governance concerns.

3. Digital Personal Data Protection Bill

Syllabus: GS-2, E-governance- applications, Government Policies and Interventions for Development in various sectors

Mains: Threats associated with Digital Personal Data Protection Bill

Context: The Data Protection Bill was recently introduced in the Lok Sabha after a six-year gap since the Supreme Court recognized privacy as a fundamental right under the Constitution.

Provisions of the Bill:

- **Protection of Digital Data:** The Bill aims to enhance the protection of digital data collected from individuals, designating them as 'data fiduciaries' and 'data principals'.
 - **Data Fiduciaries:** These are the entities or companies that collect and process personal data from individuals. They are entrusted with this data and have the responsibility to handle it in a secure and lawful manner.
 - **Data Principals:** This refers to the individuals whose personal data is being collected and processed by the data fiduciaries. They have the right to know what data is being collected, and for what purposes it will be used, and they retain control over their data.
- **Data Protection Measures:** Companies are required to clearly inform users about the data being collected and its purpose, appoint a data protection officer, and grant users the right to delete or modify their personal data.
- Fines for Non-compliance: The Bill proposes fines ranging from ₹50 crore to ₹250 crore for companies that fail to protect user data or violate disclosure requirements. These fines can be compounded for each violation.
- Additional Requirements: The Union government will notify additional requirements for firms classified as 'significant'
 data fiduciaries, subjecting them to more stringent regulations such as data audits and impact assessments.
- **Data Protection Board:** The Bill paves the way for the establishment of the Data Protection Board of India, with its members appointed by the Union government.
- Subordination through Notification: Many aspects of the Bill's implementation, such as the effective date, registration of consent managers, reporting of data breaches, erasing user data timelines, and modalities of audits for significant data fiduciaries, will be notified later through the Gazette of India.
- Removal of Section 43A: The Bill strikes off Section 43A of the Information Technology Act, 2000, which required companies to compensate users for mishandling data. Compensation will now be addressed through civil tort law.

Range of Exemptions:

- Exemptions for the State and its Instrumentalities: The Bill provides wide-ranging exemptions for the "state and its instrumentalities," allowing the processing of personal data in the interest of India's sovereignty, integrity, and security, and for fulfilling legal obligations.
- Non-Disclosure in Case of Lawful Interception: While firms are required to disclose the identity of other firms
 processing users' data, they are exempted from disclosing and sharing data in the case of lawful interception. Similar
 obligations apply to the government as well, except in cases like medical emergencies and disasters.



Threat to Transparency, Accountability

- The Right to Information (RTI) Act which has given millions of Indian citizens more authority, will be amended under the Data Protection Bill of 2022.
- The DPDP Bill 2022 aims to broaden its scope and exempt any personally identifiable information from disclosure. It is not necessary to change the current RTI law in order to implement a data protection law.
- The country's system of accountability and transparency is in danger because of this provision.

Discretionary Powers to Government

- One of the fundamental goals of any data protection law is to reduce the misuse of personal data, particularly financial fraud.
- Given that the government holds the largest amount of data, a successful data protection law must not grant the government a broad range of discretionary rights.
- Unfortunately, the DPDP Bill, 2022 gives the administration the authority to make rules and notices on a wide variety
 of topics.
- This could allow the government to arbitrarily exempt its allies and institutions like the Unique Identification Authority of India (UIDAI), leading to serious privacy violations.
- Small non-governmental organisations, on the other hand, would need to build up procedures to abide by the strict duties of a data fiduciary.

No Autonomy

- The Data Protection Board's autonomy is not guaranteed by the proposed Bill.
- It is crucial that the oversight body established by the Act be sufficiently independent to take action on violations of the law by governmental organizations in order to achieve the goal of protecting personal data.
- The establishment of a fully government-controlled Data Protection Board opens the door for the administration to utilize it as a political tool.

Criticism related to the bill:

- Parliamentary Standing Committee's Concerns: The Bill faced criticism from opposition members of the Parliamentary Standing Committee on Communications and Information Technology, who accused the government of obfuscation and lack of examination of the new version by the committee.
- **Demands for Examination:** Opposition members demanded that the new version of the Bill should be sent for examination by the standing committee, as it impinges on fundamental rights related to privacy.

Conclusion

- Without any discussion or debate, the country's inhabitants could wind up with legislation strengthening the federal
 government while limiting people's democratic freedom to access information and utilize it to hold the powerful
 accountable.
- The data protection law must preserve peoples' fundamental rights, including both the right to information and the right to privacy, and must not have the flaws that the previous draft did.
- In a democracy, citizens require access to information, including many categories of personal data, to properly hold their governments accountable.

Nut Graf: The Digital Personal Data Protection Bill, 2023, introduced in Lok Sabha, aims to enhance digital data protection by defining the roles of 'data fiduciaries' (companies collecting data) and 'data principals' (individuals). It requires transparent data collection, appointing a data protection officer, and grants users the right to delete or modify personal data. The Bill proposes fines for non-compliance and allows for exemptions for the state and its instrumentalities.

4. An Act to cement digital authoritarianism

Syllabus: Governance, E-governance

Mains: Provisions of Data protection bill and debate between the Right to privacy and state limit to surveillance.

Context: Digital Data Protection Act challenges democracy; Critics warn of surveillance, privacy erosion; Call for comprehensive constitutional reform.

Puttaswamy Case: Rejection of Total State Control

- The Puttaswamy case of August 2017 stands as a significant milestone, wherein the Indian Supreme Court decisively rejected the notion of all-encompassing state control over citizens' lives.
- The case reinforced the essential right to privacy, emphasizing its intrinsic value in safeguarding individual freedoms.

Steps Towards Surveillance State: Examples of Total Control

- The 'Digital India' initiative, launched in July 2015, showcased the government's ambition to leverage technology for citizen empowerment. However, this vision seems to have taken a misstep by placing excessive faith in technology to solve complex issues, inadvertently giving rise to the concept of a surveillance state.
- The tie-up between surveillance capital and welfare is evident, leading to the creation of digital public goods that utilise personal data for governance. Examples like Aarogya Setu and Co-Win highlight how seemingly beneficial platforms have been subject to privacy and transparency concerns, challenging their actual impact.



The 'Smart Cities Mission,' aiming for urban development, has raised alarms due to its focus on integrated command
centres that collect real-time data from residents. Despite its intent, this mission has missed deadlines and failed to
create a discernible sense of security or smartness in cities.

Concerns with Digital Personal Data Protection Act, 2023

- The introduction of the Digital Personal Data Protection Act in 2023 has sparked significant apprehension. Critics
 express concern over its potential to undermine transparency and accountability, jeopardizing the foundations of a
 democratic society.
- It has been pointed out that the Act's provisions seemingly prioritize data collection and processing by both government and private entities, rather than focusing on robust data protection mechanisms.

A Warning to Heed: Dystopian Realization

- The government's dismissal of concerns as "scaremongering" is juxtaposed against the proposed idea of the Data
 Act as a new social contract for digital participation. However, this concept is rooted more in partisan allegiance than
 constitutionally safeguarded rights, raising scepticism about its long-term impact.
- Worries intensify as a trend emerges wherein various legislations, such as the Criminal Procedure (Identification) Act
 and the Registration of Births and Deaths (Amendment) Act, are creating databases that encroach upon fundamental
 rights. This alarming trend highlights the risk of gradual democratic erosion in the digital era.

A Call for a Wider Constitutional Reboot

- The journey since the Puttaswamy case underscores the need for a comprehensive approach to combat the encroaching digital authoritarianism. The Supreme Court's earlier ruling, which upheld the Aadhaar program while limiting its scope, now takes on renewed significance. The analogy drawn from Aleksandr Solzhenitsyn's experience in Stalinist Russia underscores the importance of a robust data protection framework to ensure citizens' liberty and dignity.
- Incremental amendments or specific rulemaking may not suffice to counter the pervasive state coercion represented
 by the Data Act. A broader constitutional reboot is required to address the deeper civic rot and prevent further
 entrenchment of digital authoritarianism. This holistic approach will help India navigate the complexities of the digital
 age while preserving its democratic principles and safeguarding individual rights.

Nut Graf: India's Digital Personal Data Protection Act, 2023, is accus<mark>ed</mark> of cementing digital authoritarianism by undermining transparency, enabling state control, and compromising privacy. Critics warn of a surveillance state, urging constitutional reform to counter this erosion of democracy and protect citizens' rights in the digital era.

5. Word choice in data protection law, a dilution of rights

Syllabus: Governance, E-governance

Mains: Provisions of the Data Protection Act and debate between the Right to privacy and state limit to surveillance.

Context: India's Data Protection Act 2023 raises concerns: weak consent standards, convenience over necessity, erosion of rights, and multipurpose data use.

Introduction: India's long-awaited data protection law, the Digital Personal Data Protection Act, 2023, has been finalized. While progress is better than inaction, a critical analysis is needed to gauge its impact on privacy rights. The effectiveness of the law hinges on two fundamental aspects: **consent-based** and **non-consent-based** use of personal data.

Standard Situations and Concerns:

- Consent Conundrum: The core challenge in data protection is defining the consent standard. Do individuals truly have a say in how their data is used? For instance, online behaviour might be scrutinized for personal profiling.
- **Provisions in the Act:** The law introduces provisions requiring informed consent through explicit positive actions. However, these provisions are weakened by a clause permitting data use if individuals haven't explicitly refused consent. This phrasing implies that non-indication of refusal equates to consent, fostering ambiguity.
- **Ambiguity and Confusion:** The vague language raises concerns about interpreting consent standards, leading to legal confusion and business uncertainty. The weaker provision could potentially overshadow the stronger one.

Balancing Convenience and Necessity:

- Navigating Public Functions: The law acknowledges that strict consent might hinder certain public functions like identity verification or welfare distribution.
- Previous Drafts vs. New Law: Earlier drafts emphasized data use without consent only if "necessary" for specific state functions. The new law alters this criterion, permitting data processing if it is "for" certain legitimate uses, not strictly required necessity.
- **Impact on Privacy:** This subtle wording shift significantly impacts the level of privacy protection by allowing convenience-driven data processing rather than necessitated use.



Rights Erosion and Lack of Control:

- Notification and Correction Rights: When data is used without consent, individuals remain uninformed and lack the right to rectify incorrect or unnecessary data. The inability to correct or erase non-consensual data undermines informational privacy principles.
- Data Multipurpose Use: The law allows data collected for one non-consensual purpose to be freely used for other purposes. This contradicts established principles like necessity and purpose limitation upheld by the Indian Supreme Court.

Broader Concerns and Conclusion:

- **Deeper Concerns:** Critics highlight concerns about the law's impact on rights to information, free speech, surveillance reform, and regulatory structure.
- **Policy Choices Over Legalities:** While some might view the issues discussed as mere legal details, they represent deliberate policy choices that erode potential privacy rights.
- **Enhancing Data Protection:** To ensure the data protection law effectively safeguards personal information, addressing these flaws and ambiguities becomes imperative.

Nut Graf: Data Protection Act 2023, through its word choices and provisions, introduces ambiguities that could undermine privacy rights. Balancing convenience with necessity, notification rights, and data multipurpose use raise concerns about its effectiveness. It's crucial to address these issues to create a more robust and meaningful data protection framework.

6. India's mining policy shift

Syllabus: GS-2, Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Mines and Minerals (Development and Regulation) Amendment Bill, 2023 and India's mining policy shift

Background

- The Mines and Minerals (Development and Regulation) Amendment Bill, 2023, was just enacted by Parliament.
- It intends to promote private sector investment in the country's exploration of important and deep-seated minerals.
- Six minerals, including lithium, which is utilised in electric vehicle batteries and other energy storage systems, are included in the Bill's list of "critical and strategic" minerals.
- These six minerals, originally categorised as atomic minerals, were traditionally restricted to government-owned companies.

Significance of India's critical minerals

- India's distinct geological and tectonic context is favourable to the hosting of significant mineral resources. Minerals of many types are essential to a country's manufacturing, infrastructure, and advancement.
- Furthermore, the clean energy transitions of nations such as India, which are attempting to reach their net-zero emission targets, are dependent on the supply of essential minerals and others such as cobalt, graphite, and rare earth elements (REEs).
- These are also necessary for the production of semiconductors used in smart electronics, defence and aerospace equipment, telecommunication technologies, and other applications.
- The scarcity of such minerals leads to import dependency, supply chain weaknesses, and potential supply disruption.

Need of private sector for critical minerals exploration

- Mineral exploration is the first step in discovering mineral deposits and, eventually, economically viable reserves.
- The stages of exploration are classified as G4 (Reconnaissance), G3 (Prospecting), G2 (General Exploration), and G1 (Detailed Exploration) by the United Nations Framework for Classification of Resources.
- There haven't been many notable mineral discoveries in the country in the recent few decades, and the majority of exploration efforts have been carried out by government organisations.
- For many years, India's mining policy barred private-sector explorers from conducting greenfield mineral exploration. Companies also reported a lack of appropriate incentives.
- Exploration necessitates procedures such as aerial surveys, geological mapping, and geochemical analysis, and it is
 a highly specialist, time-consuming, and financially risky business, with less than 1% of investigated sites developing
 into commercially viable mines.

Global Experience

- In Australia, private mining firms called junior explorers, engage in risk-taking by putting their expertise and limited financials into explorations to find potential mines.
- Once discovered, these private companies can sell these to bigger mining companies who then develop and run
 these mines.
- This helps multiply exploration projects and accelerate the pace of exploration owing to private participation.



India's mining policy and private sector participation

- The Mines and Minerals (Development and Regulation) Act (MMDR Act), 1957, the principal mining legislation in the country, has been revised numerous times since its inception, most recently in 2015, 2020, and 2021.
- The MMDR Act was revised in 2015 to allow private businesses to bid for Mining Leases and Composite Licences (CLs) in government auctions.
- Due to the Evidence of Mineral Content (EMT) regulation, however, only government-explored projects were auctioned, limiting private-sector participation.
- The amendment also allowed private companies to register as exploring agencies, with the National Mineral exploration Trust (NMET) supporting exploration from G4 to G1, but private participation remained limited.

How does the Mines and Minerals Bill 2023 aim to encourage private players?

- The Mines and Minerals Bill 2023 excludes at least six of the previously stated atomic minerals from a list of 12 that cannot be mined economically.
- Pitting, trenching, drilling, and subsurface excavation are prohibited as part of reconnaissance, which includes mapping and surveys. The Bill permits these illegal actions.
- The Bill also proposes a new form of licence to encourage private sector reconnaissance—level and or prospective stage exploration.
- It also stipulates the maximum exploring area; activities in up to 1,000 square kilometres will be permitted under a single exploration licence.
- It also stipulates that after the first three years, the licensee will be able to keep up to 25% of the originally authorised territory by submitting a report to the State government outlining the reasons for keeping the area.
- The Bill also authorises the national government to hold auctions for composite licences and mining leases for selected important and strategic minerals.

Concerns with the Bill's proposals

- Organisations and professionals in the industry have recommended changes to the proposed revisions and highlighted several problems.
- A part of the premium paid by the miner would be the major source of revenue for a private business with an exploration licence.
- The explorer would not know how much money they would make because the auction premium would not be known until the mine was successfully auctioned.

Conclusion

India's reliance on imports for vital and deep-seated minerals has been a source of concern, resulting in supply chain vulnerabilities and import reliance on countries such as China, Russia, and Australia. According to the new regulation, only the government can auction off what an explorer has discovered, and the latter would only receive a portion of the premium at a later date. In contrast, in other global jurisdictions, individual explorers can sell their discoveries to miners.

Nut Graf: The Mines and Minerals (Development and Regulation) Amendment Bill, 2023, seeks to attract private sector investment in the country's exploration of important and deep-seated minerals. India's ability to locate and exploit economically viable reserves has been hampered by a lack of private sector participation in mineral exploration.

7. Bulldozing the law and the Constitution

Syllabus: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Concerns associated with Ethnic cleansing

Background

- Recently, people's homes and businesses were demolished in the Haryana districts of Nuh and Gurugram.
- These are the people who are accused in criminal situations, particularly those involving offences with racial or ethnic sensitivity, without following the legal process.
- The Punjab and Haryana High Court intervened in an unusual manner, taking judicial notice Suo Motu and stopping the demolition campaign.
- The High Court's inquiry into whether the State is engaging in ethnic cleansing brings us to the crux of the matter.

About Ethnic cleansing

- Ethnic cleansing is a deliberate programme designed by one ethnic or religious group to remove the civilian population of another ethnic or religious group from certain geographic areas by violent and terror-inspiring means.
- The UN-appointed Commission of Experts (1992), whose task it was to investigate war crimes in the former Yugoslavia, is credited with using it for the first time.
- Ethnic cleansing is the result of state measures such as arbitrary arrest, incarceration, damage of property, forcible removal, displacement, deportation, and extrajudicial execution.



Ethnic Cleansing Law in India

- Ethnic cleansing is not defined in the Indian Penal Code or international law.
- Any such subversive act is gravely hostile to the constitutional protections under Part III of India's Constitution, despite
 the lack of official recognition.
- According to Article 21 of the Indian Constitution, no one may be deprived of their life or personal freedom unless
 doing so in accordance with legal procedures.
- It is a constitutional outrage that elected governments show such scant regard for such fundamental values despite such a broadening of the reach of Article 21.

Concerns over High Court intervention

- The High Court acknowledged that the demolition campaign had violated the law's established procedure by proceeding without demolition orders or notices.
- As a result, there is concern and judicial action under Article 226 of the Indian Constitution.
- In order to advance selective social control, the administrative act of demolishing homes and buildings without giving notice or consulting the affected parties requires court intervention.
- Any argument in the opposite direction undermines the legitimacy of the constitutional process.

Rule of Law

- Rule by law is the opposite of all that the rule of law stands for, despite the fact that it is acknowledged as a fundamental
 aspect of the Constitution.
- Since that time, Article 21 of the Indian Constitution has reflected this civilisational journey and had its boundaries
 increased by the Supreme Court.
- When rule by law is implemented, this progressive journey is brutally turned around.
- Rule by law is when a political goal is carried out by using the law as a tool of social control, repression, and oppression.

Conclusion

The Constitution breaks down when the state frequently engages in religious persecution. Such occurrences are anticipated to be avoided by constitutional courts. It is one thing to pursue the offender; it is quite another to evict his family or a neighbour, where the republic's hope lies.

Nut Graf: While no one disputes that persons who cause societal turmoil should be dealt with according to the law, what is criticised is the administrative enmity that morphs into a colorable exercise of power.

8. Dalit Christians — exclusion by society, church, state

Syllabus: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Issues associated with Dalit Christians

Background

- The Union Government established a commission in 2022 to investigate the potential for granting Dalit Christians Scheduled Caste (SC) classification.
- The Tamil Nadu Assembly has approved a resolution to make this change to the 1950 Presidential (SC) decree.
- The Justice Ranganath Misra Commission (2007) suggested allowing Dalits to apply for SC quota advantages after making a conversion to Christianity.

Issues associated Dalit Christians

- The main defence is that the underlying dream of equality has not been fully accomplished.
- Millions of Hindu Dalits migrated to more egalitarian religions, notably Christianity, to escape the horrors of casteism.
- Contradictions and ambiguities in their identity have resulted from this, and they have not experienced the predicted upward social mobility.
- This is also a result of their fellow believers' resistance to abandoning the long-standing custom of untouchability in society and bringing it into the church.

Theory of Intersectionality

- The result of intersectional discrimination is the uniqueness of discrimination that Kimberlé Crenshaw, the founder of the Theory of Intersectionality, introduced.
- The 'Theory of Intersectionality' provides a more comprehensive explanation of the Dalit Christian quandary by allowing for the integration of caste and religion as well as a composite concept of Dalit Christians as both Dalits and a religious minority group.
- The insufficiency of the "single-axis framework" of the laws of the state of India, which offers legal protection to isolated categories, is also extrapolated from this.
- It demonstrates how different oppressive systems including those based on race, gender, sexual orientation, and ability cannot be understood independently of one another.
- These power structures interact with one another to provide unique individual social experiences.



Intersectionality and identity

- Identity refers to a person's assertion of belonging to specific social categories and social identities linked to numerous social categories that are prevalent in society.
- As a result of the flawed logic that holds that Christianity does not acknowledge casteism and that, as a result, a Hindu Dalit who converts to Christianity no longer qualifies as a Dalit, the phrase "Dalit Christians" is sometimes used as an oxymoron.
- This is the same viewpoint that the government of India has towards Dalit Christians, despite the fact that Dalit Christians' infirmities persist even after conversion and the government just sees them as "Christians."

A 'single-axis' framework

- In the Soosai Etc versus Union Of India And Others case (1985), a Dalit Catholic shoemaker asked the Supreme Court of India for an extension to put up a kiosk on a platform in Madras so that he may compete with Hindu shoemakers.
- 'It is necessary to prove further that the disadvantages and handicaps incurred from such caste membership in the social order of its genesis Hinduism,' the court ruled in dismissing the complaint.
- This indicates that the Dalitness of Soosai was completely disregarded when the single-axis framework technique
 was used.

Conclusion

Caste prejudice exists in Hinduism, Sikhism, and Buddhism, and while these religions give privileges to its Dalits, they exclude Dalit Christians on the grounds that Christianity is of "foreign import," calling their democratic citizenship into question.

Due to the state's unwillingness and in spite of overwhelming evidence in their favour, the 'single-axis' communal framework of the law has prevented Dalit Christians from being included to the SC list. The addition of Dalit Christians to the SC list in the 1950 Presidential (SC) decree represents a step in the right direction.

Nut Graf: The underlying dream of equality has not been fully accomplished for Hindu Dalits who became Christians.

9. Why is the Cauvery water sharing issue flaring up again?

Syllabus: GS-2, Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: Current issues associated with Cauvery water-sharing dispute

Background

- The Tamil Nadu government has asked the Supreme Court to order Karnataka to discharge 24,000 cubic feet per second (cusecs) from its reservoirs immediately.
- Additionally, it sought the Court to order Karnataka to see that the 36.76 TMC mandated in the final decision of the Cauvery Water Disputes Tribunal (CWDT) is released.

Cauvery Water Sharing

- Karnataka, the upper riparian State in the Cauvery basin, has a monthly plan in place for releasing water to Tamil Nadu.
- The Cauvery Water Management Authority (CWMA) and Cauvery Water Regulation Committee (CWRC) were constituted four months after the SC issued its ruling in 2018 regarding the CWDT's 2007 award to ensure the execution of the ruling.
- The two organisations have been meeting ever since to assess the issue.

Current Issue

- According to the water sharing plan, Karnataka must make a total of 177.25 TMC accessible to Tamil Nadu at Biligundlu during a "normal" water year (June to May).
- From this total, 123.14 TMC is to be distributed between June and September, which also happens to be the southwest monsoon season.
- Tamil Nadu was reportedly irritated by Karnataka's failure to adhere to the quantity decided upon at the CWRC meeting during the meeting.

Karnataka's Response

- Karnataka has argued that the poor inflow to its own reservoirs is a result of reduced rainfall in the Cauvery basin, notably in Kerala.
- Karnataka released water to Tamil Nadu whenever more water entered the reservoirs. Karnataka, however, was not in that situation this year.
- Tamil Nadu had pressed Karnataka to abide by a formula for sharing in financial hardship, but Karnataka had refused.

Way Forward

Tamil Nadu is eager to learn whether Karnataka will at least abide by the Authority's judgement. With barely 20 TMC, the Mettur reservoir in Tamil Nadu has dangerously low storage levels and will run out of water in 10 days after accounting for dead storage and drinking water needs. The Supreme Court's perspective on the situation is still to be determined.

Nut Graf: The Cauvery water-sharing dispute has been a cause of contention between Karnataka and Tamil Nadu since the British Raj. Tamil Nadu and especially its farmers in the Cauvery delta are eagerly awaiting word on whether Karnataka will at least abide by the Authority's ruling.

10. Understanding the MoEFCC's U-turn

Syllabus: Ministries and Departments of the Government, Government policies and interventions aimed at development in various sectors and issues arising out of their design and implementation.

Mains: Government policies and the idea of the formation of integrated regional offices by merging different environmental bodies.

Context

The Ministry of Environment, Forests and Climate Change (MoEFCC) initially planned to merge key environmental bodies into integrated regional offices. This faced criticism for potential loss of authority and adverse effects.

Ministry's Quiet Reversal on Integrated Regional Offices

- MoEFCC issued a notification reversing its plan to merge the Forest Survey of India (FSI), NTCA, WCCB, and CZA under integrated regional offices.
- The original idea faced criticism for the potential loss of authority for key environmental bodies.

Ministry's Rationale and Legal Disputes

- MoEFCC justified the merger for "ease of doing business," while NTCA opposed it citing administrative confusion.
- A petitioner argued against the merger plan in Karnataka High Court, MoEFCC clarified it wasn't a merger.
- Karnataka High Court disposed of the petition with conditions, allowing future challenges.

Unsuccessful Merger Plan

- MoEFCC dropped the merger plan after two years, likely due to technical and administrative complexities.
- Different bodies affected: NTCA (Project Tiger), FSI (forest data), WCCB (enforcement), CZA (zoos).

New Notification and Regional Office Reorganisation

- A new notification proposing reorganising existing regional offices has been criticised for lacking objective criteria.
- Example: Bengaluru regional office's jurisdiction criticised for grouping diverse states and territories.

Concerns Over Project Tiger and Elephant Mergers

- The Indian government announced the Project Tiger and Elephant merger, raising concerns about NTCA autonomy and Project Elephant's legal backing.
- Decision criticised for lack of discussion in the MoEFCC wildlife division.

Changing Ministry Approach

- Experts advocate for focused efforts, stronger environmental monitoring, and decentralised infrastructure.
- Regional offices' roles expanded for environmental approvals and compliance monitoring.
- Lack of clarity on funding and infrastructure support for expanded roles.

Expert Perspective on Decentralization

• Kanchi Kohli, environmental law researcher, suggests an internal mechanism for reviewing office actions to balance regulatory outcomes and environmental protection while upholding social justice.

Nut Graf: The MoEFCC's move to merge environmental bodies under integrated offices drew criticism for undermining authority. Legal disputes, concerns over Project Tiger and Elephant mergers, and lack of clarity on funding for expanded roles were highlighted, raising questions about the ministry's approach and the need for balanced regulatory outcomes while upholding environmental protection and social justice.



11. New Bills and a principled course for criminal law reforms

Syllabus: Important Aspects of Governance, Transparency and Accountability

Mains: Need for criminal law reform and provision of the recent bill introduced

Context: Recent Bills proposed criminal law reform in India. Debate, inclusivity, principles, efficacy, and state power are crucial considerations.

Introduction of Recent Criminal Law Reform:

- Recent Bills and their significance: The Bharatiya Nyaya Sanhita, Bharatiya Nagarik Suraksha Sanhita, and Bharatiya Sakshya Bill were introduced to reform India's criminal laws.
- Varied reactions and the need for productive debate: The Bills sparked diverse opinions, necessitating balanced discourse on sustainability, efficacy, rule of law, and justice delivery.

Some Reformatory Measures:

- Moderate modifications promoting inclusivity: Bills reflect changes such as gender inclusivity, modernization of terms, and punishments for minor and serious offences.
- Integration of technology and innovative measures: Embracing technology, introducing trial in absentia, and community service as commendable steps.
- Alignment with judicial decisions: Removal of attempted suicide and adultery, tempering the offence of sedition, and
 introduction of new offences like terrorism and mob lynching.

The Test for the Bill:

- **Upholding fundamental principles:** Examination of whether reforms adhere to criminal jurisprudence fundamentals and address the needs of those impacted by the criminal justice system.
- Balancing state security and individual liberties: Necessity to strike a balance between security imperatives and individual freedoms.
- Addressing class divides and public trust: Ensuring equality, equitability, and building public trust to remedy legitimacy deficiencies.
- Bridging rhetoric and reality: Ensuring reforms effectively translate into meaningful change and enhance the criminal
 justice system's functionality.
- **Impact on vulnerable and marginalized:** Measuring the impact of reforms on vulnerable groups, victims, and the underprivileged.

State's Power Asset:

- Criminal law as a strategic tool: Historical and contemporary use of criminal law as a pre-emptive tool by the political executive.
- Concerns of preventive approach: Scrutiny of the proliferation of preventive criminal law and its implications.
- As the Bills under consideration by the select committee, there is an expectation for enhanced engagement to refine
 the drafts, and accommodate victims' rights, hate crime provisions, bail regulations, sentencing framework, and legal
 aid. The overarching goal of the envisioned criminal law reforms is to reinforce the rule of law and bolster the pursuit
 of justice.

Nut Graf: India's recent criminal law reform Bills have ignited varied opinions. Balancing public aspirations, state perspectives, and adherence to justice delivery, the Bills address inclusivity, technology integration, and judicial alignment. Crucially, they must uphold fundamental principles, bridge rhetoric with reality, and mitigate class divides while empowering the vulnerable.

12. Gaps in Births and Deaths Registration (Amendment) Act

Syllabus: Government Policies and Interventions for Development in various sectors and Issues arising out of their Design and Implementation.

Mains: Provision of Registration of Births and Deaths (Amendment) Act, 2023 and how will it improve service delivery?

Context: The Registration of Births and Deaths Act (1969) is amended through the Registration of Births and Deaths (Amendment) Act, 2023 to enhance data management, service efficiency, and transparency.

Introduction:

- The existing Registration of Births and Deaths (RBD) Act of 1969 is undergoing an overhaul through the Registration of Births and Deaths (Amendment) Bill, 2023.
- Recently approved by Parliament and the President of India, this amendment seeks to address the limitations of the original legislation.



Lacunae in the Act:

Aadhaar Number for Births and Deaths:

- The Amendment Bill requires the Aadhaar number of parents during birth registration, yet remains silent on collecting Aadhaar numbers for deceased individuals.
- This omission impedes the comprehensive updating of databases and transparent public service delivery.

Central and State Databases:

- Although the Amendment Act reinforces the roles of Registrar General and State Chief Registrars, the necessity
 of a national-level database is questioned.
- The potential to transmit data directly from state-level databases to other systems could render a separate national database redundant.

Cause of Death Certificate:

- The Amendment Act mandates cause-of-death certificates for medical institution deaths.
- However, challenges arise due to uncertain diagnoses, differences in alternative medicine systems, and unavailability of practitioners during non-medical deaths.

Positive Expected Outcome:

Efficient Public Service Delivery:

- The Amendment Act's central and state-level databases aim to enhance service provision efficiency.
- Expected to facilitate updates to various critical systems, including Aadhaar, electoral rolls, etc.

Streamlined Birth and Death Registration:

- Central and state-level databases reduce redundancy and enhance coordination in data management.
- Anticipated streamlined issuance of birth and death certificates.

Enhanced Data Sharing:

- o The Amendment Act enables more efficient data flow to systems like Aadhaar, electoral rolls, etc.
- Holds the potential to significantly improve public service delivery and data accuracy.

Timely Certificates in Tragedy:

- Proposed 'presumed death' provision could expedite death certificates for families affected by natural disasters or accidents.
- A compassionate approach to alleviating the distress of waiting for extended periods.

Recognized Proof Documents:

- o The Amendment Act acknowledges birth certificates as valid proof for various purposes.
- This provision, although not requiring an amendment to the Act itself, underscores the potential for more efficient service delivery through rule changes or executive orders.

Nut Graf: The Registration of Births and Deaths Act (1969) is undergoing transformation via the Registration of Births and Deaths (Amendment) Act 2023. While it addresses limitations and streamlines data management, concerns arise over potential misuse, parliamentary oversight, and challenges in accurately recording causes of death, posing questions about practical implementation and outcomes.

13. The importance of states in space missions

Syllabus: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Mains: The role of government policies, state intervention, and collaborations in achieving scientific and development goals, highlighting the case of space exploration.

Context

The recent soft landing of Chandrayaan-3's lander module on the moon underscores India's scientific prowess despite economic constraints. This success prompts a closer examination of how resource-limited nations excel in space exploration.

Introduction

- India achieved a significant milestone by landing the Chandrayaan-3's lander module on the moon on August 23.
- India became the fourth country to achieve a soft landing on the moon, after the Soviet Union, the U.S., and China.
- The accomplishment highlights India's ingenuity and ability to achieve ambitious scientific goals at a relatively low cost.

Factors Enabling Resource-Constrained Nations' Success

- The ability of resource-constrained economies to achieve ambitious programs raises questions about the factors driving their success.
- The Soviet Union, China, and India, despite being less economically developed, have demonstrated scientific achievements.
- Large populations and investments in science and technology are key factors contributing to success.
- These nations emphasise science and technology in their development trajectory, yielding current successes.

Role of State and Collaboration

- The UAE's success in space exploration disproves the sole reliance on population size as a determinant.
- The "triple helix model" in the UAE, where government, private sector, and academics collaborate, plays a crucial role.
- The state's active and capable role helps overcome financial constraints and enables the harnessing of skilled workers.
- Governments have enabled moon landings, indicating their importance in space exploration.

Balancing Resources and Development Needs

- Concerns about diverting resources from development needs to ambitious programs are valid.
- Similar concerns were raised during the Apollo moon landings, but they are now considered triumphs of human achievement.
- Space missions contribute to knowledge, attract business, and demonstrate capabilities for private players.

Role of State in Modern Economy

- The success of governments in moon landings showcases their competence and power as actors.
- Economist Mariana Mazzucatto's work highlights how the state fosters innovation and success in economies.
- Balancing social concerns and well-defined objectives provides a roadmap for addressing global challenges.

Nut Graf: Resource-constrained nations like the Soviet Union, China, and India have achieved space exploration milestones due to factors like large populations, investment in science, and active state participation. These successes illuminate the role of collaboration, and the state's intervention, suggesting a roadmap for addressing broader societal challenges.



DISASTER MANAGEMENT

I. Urban flooding

Syllabus: Environmental pollution and degradation, Disasters, Disaster Management

Mains: Urban flooding management

Context: In the past few weeks, three major cities — Delhi, Ahmedabad, Mumbai — have been flooded.

Why has damage and disruption caused by flooding have increased after independence?

- Due to unplanned urbanisation and population growth, there has been a surge in construction, particularly in low-lying areas. It has resulted in the depletion of water bodies.
- The process of concretization has reduced rainwater percolation. It has led to an increase in stormwater run-off.
- Most Indian cities are situated on the bank of rivers, having extensive floodplains and wetlands. India has lost 40% of its wetlands in the last three decades.
- For instance, Baroda experienced a 30% decline in its wetlands between 2005 and 2018. This loss of natural "blue infrastructure" has heightened the risks of flooding.



Source: hindustantimes.com

What should be done to stop flooding?

- Understand the gravity of the problem: It is essential to conduct studies in all cities to assess the catchment area and flooding risks associated with urban water bodies and land use.
 - Comprehensive lake and river management plans need to be developed. Active involvement from the local community is needed to ensure proper maintenance and the removal of encroachments.
 - Geographic information systems can be utilised to tag local water bodies. It will aid in the monitoring of encroachments and understanding their seasonal variations.
 - There is a need to enhance early warning systems for providing real-time updates on local weather patterns.
 Local rainfall data should be integrated with the Central Water Commission and regional flood control efforts to improve flood preparedness.
 - As rainfall patterns change, simulations will be essential. These simulations can be incorporated into flood risk maps and insurance products.
 - City-wide databases should also be established to facilitate immediate relief efforts in the event of a floodingrelated disaster.
- Improve drainage and stormwater networks: Most of India's cities and towns lack a well-functioning sewerage network. In Delhi, the drainage system has a limited capacity. Its stormwater drains are quite old.
 - o In Delhi, there are areas where the drainage slopes are incorrectly positioned, leading to issues against gravity. In other places, there is no clear distinction between drainage and stormwater drains.
 - o To address these issues, most cities need to develop comprehensive drainage master plans.
 - It is essential to conduct surveys of existing pipelines to identify locations prone to waterlogging.
 - o There is a need to ensure that stormwater networks remain separate from the drainage network.
- Improving urban planning: In Delhi, the city drainage system is managed by a range of civic agencies. It leads to coordination challenges. Information is not shared or shared with delay. It leads to a lack of transparency. Coordination between agencies and institutions must improve.



- Awareness generation: Furthermore, there is a need to enhance awareness about wetland and water body conservation.
 - The efforts made by the Central government, such as promoting the National Mission for Clean Ganga, conducting
 a Census on Pan-India water bodies, are encouraging steps. However, a well-defined urban water policy is
 necessary.
 - Regulatory bodies like the Central Wetland Regulatory Authority should be granted statutory powers to enforce conservation measures. Additionally, involving local communities in the conservation efforts would be beneficial.

• Identify and replicate local examples:

- Mangalore: Earlier, wastewater flowed through open drains and into the city's water bodies, polluting the freshwater sources.
- The Mangalore City Corporation established wastewater treatment plants and created connections for end-users, particularly for industries. These industries faced challenges due to a limited and irregular water supply.
- To address this, the MCC proposed supplying treated effluent to industries to fulfil its industrial water requirements.
 Private entities within MSEZL contributed to 70% of the operations and maintenance costs for the pumps and sewage treatment plant.
- Kaikondrahalli Lake in Bengaluru: It suffered from sewage inflow and eutrophication. There was encroachment on the lake bed.
 - BBMP went for a community-driven approach to revive the lake in a phased manner. BBMP demarcated the lake's boundaries.
 - Pollution was tackled by diversion of sewage flow through tapping pipelines.
 - Development of inlets and outlets for the lake was carried out. Embankments and a pathway around the waterbody were created. All of this was done with local participation.

2. Disaster risk reduction

Syllabus: Environmental pollution and degradation, Disasters, Disaster Management

Mains: Concept of Disaster risk reduction

Context:

- The world is at the midpoint of the Sendai Framework for Disaster Risk Reduction 2015-2030, which is the global road map for reducing disaster risks and losses.
- While progress has been made, we are not where we need to be. Disasters around the world are claiming more and more lives. The consequences of climate change are already on our doorstep.

Recent Disasters

- Ten days ago, three continents were gripped by heat waves. Massive forest fires have ravaged parts of Greece and Canada.
- Two weeks ago, the river Yamuna breached the highest flood level, recorded 45 years ago, and inundated parts of Delhi.

Sendai Framework 2015-2030

- The Sendai Framework works hand in hand with the other 2030 Agenda agreements, including The Paris Agreement
 on Climate Change, The Addis Ababa Action Agenda on Financing for Development, the New Urban Agenda, and
 ultimately the SDGs.
- It was endorsed by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR).
- It advocates for the substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries.
- State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector, and other stakeholders.

Challenges to Disaster Risk Reduction Mechanism

- The lack of competent financial risk management and insurance has provided a fertile breeding ground for these risks to proliferate and intensify.
- There is also a scarcity of investment in a development-oriented approach that unites all parties into a transparent framework of action at the national level.
- Significant difficulty in collecting and analysing data on hazards and exposures.
- The lack of technical and institutional capacity for risk assessment and modelling.
- Achieving comprehensive coverage of disaster risks.

India's Initiative Under its G20 Presidency: Disaster Risk Reduction Working Group

- Countries are finally coming around to the value of disaster risk reduction, which India has elevated as a priority for G20 through its presidency of the group.
- India has established the first G20 Disaster Risk Reduction (DRR) Working Group.
- Five priorities have been outlined in the first meeting of the working group.
- Coverage of early warning systems to all,



- Focus on disaster and climate-resilient infrastructure,
- Improving financing frameworks for national DRR,
- Improving systems and capabilities for response to disasters and,
- Application of ecosystem-based approaches to disaster risk.

Disaster Risk Reduction Working Group's (DRRWG) Objectives

- The DRRWG will strive to address all the key components of a comprehensive financial management strategy for disaster risks.
- The DRRWG will offer an extensive overview of disaster risk assessment and financing practices across a wide range
 of economies.
- It can also support the harmonisation of definitions and methodologies for data collection and analysis to improve access to international (re)insurance markets.
- DRRWG will offer affordable and comprehensive insurance coverage of disaster risks, financial assistance and compensation for affected individuals and businesses, and risk transfer mechanisms.
- It will help issuers, investors, and other stakeholders to identify and classify disaster-resilient investments, assets, and entities in a more effective and evidence-based manner.
- The DRRWG could channel more capital towards DRR investments, while also creating new opportunities for innovation in sectors less commonly associated with disaster resilience, such as health, social protection, and natural capital.

G20's Priorities in Reducing the Risk of Disasters

Early Warning System

- Expanding disaster early warning and early action systems is a top priority. Inclusive and multi-hazard early warning systems are among the most effective means of reducing disaster deaths and economic losses.
- During Cyclone Biparjoy, effective systems for end-to-end early warning and action helped achieve zero deaths from the event in India
- Preparedness of the power sector helped reduce the disruption time in power supply in the aftermath of the cyclone.
- The promise of disruptive technologies can help many countries leapfrog into a regime where they can use global capacity for forecasting to meet local needs.
- To that end, the G20 is working to realise the goal of the UN Secretary General's Early Warnings for All Initiative, which seeks to create universal coverage for everyone by the end of 2027.

Resilient Infrastructure

- Enhancing the resilience of infrastructure to withstand climate and disaster risks is another global priority.
- From New Zealand, which saw the flooding of Auckland airport, to the U.S., where a pharmaceutical plant was
 destroyed by a tornado, every country can benefit from assessing and enhancing the resilience of its critical
 infrastructure.
- o Infrastructure has a long-life cycle, and if built well, can lock-in resilience as opposed to risk.
- That same infrastructure also becomes the lifeline of recovery during a crisis.
- Hence, infrastructure, whether economic or social, is ultimately about people and it must lead to sustainable development outcomes for them.
- That is why India launched with the UN in 2019 the Coalition for Disaster Resilient Infrastructure (CRDI), to spur policy development and capacity support for disaster resilient infrastructure, especially in developing countries.
- We are currently collaborating to create a global methodology for conducting infrastructure resilience reviews and stress testing, based on the Principles for Resilient Infrastructure.

New Approach to Financing DRR

- Developing a new approach to financing disaster risk reduction is needed to transform risk reduction plans into concrete actions.
- This effort must be led by finance and economy ministries in collaboration with the private sector because the current funding deficit for DRR is too large for governments to manage alone, and many of the risks generated are by the private sector.
- G20 nations like Indonesia and India have used risk metrics to allocate resources at the sub-national and local levels for DRR. These need to be studied and scaled.

Importance of G20's efforts in the Implementation of the Sendai Framework

- The G20 provides a broader platform to drive global goals on DRR. The perspectives that G20 as a group will bring to the table would be unique.
- For example, any talk about risk financing will not be merely about additional financial resources, it will also include more efficient, effective, and predictable financing mechanisms.
- The G20 can maximise the impact of the financial resources available from multiple sources such as governments, multilateral institutions, capital markets, insurance companies and philanthropies and communities.



Way Forward

- The world needs to do more to prevent the risk of losses from all disasters.
- Building on priorities set by G20, scaling up ecosystem-based approaches and enhancing national and local response capacities will be the responsibility of the next G20 presidents.
- Brazil, which will assume the Presidency of the G20 in December, has committed to continuing the working group and building on what India has started is a welcome step.

Conclusion

- For too long, countries have spent billions responding to disasters rather than paying a little upfront to prevent or reduce their impact.
- By prioritising disaster risk financing for the first time, the G20, under India's presidency can convert good intentions into opportunities for investment.

3. Maui Wildfires

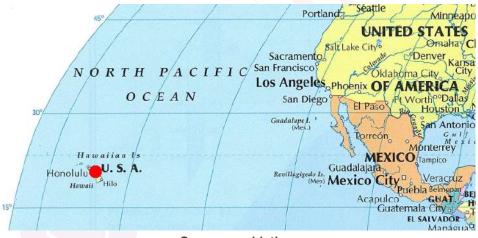
Syllabus: Environmental pollution and degradation, Disasters, Disaster Management

Prelims: Recent Wildfires

Mains: Causes and management of Wildfires

Context: A devastating wildfire swept through Maui, Hawaii, leading to destruction, fatalities, and evacuations.

- Maui is an island in the Central Pacific, part of the Hawaiian archipelago. The Hawaiian Islands are an archipelago of eight major volcanic islands, several atolls, and numerous smaller islets in the North Pacific Ocean, extending some 1,500 miles from the island of Hawai i in the south to the northernmost Kure Atoll.
- Formation: The Hawaiian Islands were formed by a hot spot occurring in the middle of the Pacific Plate. While the hot spot itself is fixed, the plate is moving. So, as the plate moved over the hot spot, the string of islands that make up the Hawaiian Island chain was formed.



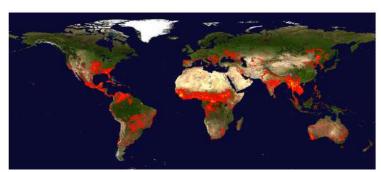
Source: worldatlas

Causes of forest fires

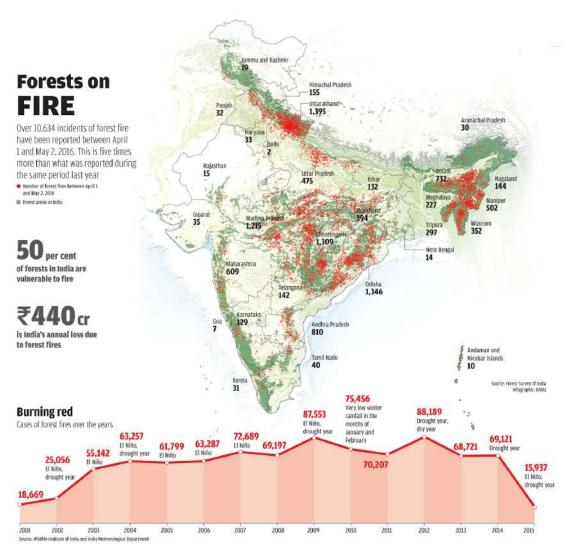
- Natural causes like lightning can set fires on trees which may be spread by wind. Sometimes, high atmospheric temperatures and dryness (low humidity) offer favourable circumstances for a fire to start.
- Man-made causes are usually the ones that become dangerous. Fire is caused when a source of fire like a naked flame, cigarette, electric spark, or any source of ignition comes into contact with inflammable material.
- Other human-led causes are land clearing and other agricultural activities, maintenance of grasslands for livestock management, extraction of non-wood forest products, industrial development, resettlement, hunting, negligence, and arson.



Global Fire Map



Source: NASA



Source: Forest Survey of India

Impact of forest fires

- Variations in the mineral composition and geochemical transformations that deplete soil health.
- Affects the density and diversity of insects like grasshoppers, amphibians and other reptiles.
- Cause great havoc to the habitat of the wildlife species.
- Cause the release of large quantities of carbon dioxide, carbon monoxide and other fine particulate matter into the atmosphere causing air pollution.
- Attempting to clear weeds with fires has in some cases been a further catalyser of its growth and spread.



Management of forest fires:

- The Forest Survey of India along with state disaster management has chalked several forest fire management plans
 that operate at various levels.
- Classification of fire-prone areas into high, medium and low-risk areas.
- Taking account of the quantum of inflammable content i.e. fuel load (dry vegetation, history of forest fires and human activities).
- Operationalization of fire plans at the station, range, divisional and circle levels.
- Use of fire breaks or fire lines that are small areas of cleared ditches and counter fires that act as efficient barrier to reduce the intensity and further spread of fires
- Check on local community activities like during festivals peaking in summer, people setting forests on fire is common.
- Engaging local communities who can act as fire watchers of the fire gangs.
- Use of robust technology to map and detect forest fire, use of GIS, Satellite-based remote sensing like MODIS (Moderate Resolution Imaging Spectro-radiometer) and SNPP-VIIRS (Suomi-National Polar-orbiting Partnership – Visible Infrared Imaging Radiometer Suite).

National initiative for forest fire management:

- Forest fire prevention and management scheme for states to deal with forest fires.
- National action plan for forest fires (NAPFF) 2018 by informing and creating awareness among local communities and incentivizing them for helping in forest fire mitigation.

Conclusion:

The forests serve as efficient means to mitigate climate change serving as carbon sinks. However, their burning has turned them into carbon producers further negatively contributing to climate change. The forest department along with the local communities need to work in tandem to control this serious issue that has multiple adverse environmental impacts.

Nut Graf: Wildfires are caused naturally also but human-led actions are increasing their intensity and spread; it is imperative that the government along with NGOs, scientists, local communities and all other stakeholders take active preventive measures and spread awareness of this issue.



GEOGRAPHY

1. Cyclone frequency may rise over Indian coast from the warming of Pacific

Syllabus: Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclones etc.

Mains: Warming of oceans and its impact on cyclone formation and frequency.

Prelims: About Pacific Decadal Oscillation and El Nino Southern Oscillation

Context:

Equatorial cyclones, historically subdued, could become more frequent due to a combination of global warming and the Pacific Decadal Oscillation (PDO), as per a recent study.

PDO (Pacific Decadal Oscillation):

• PDO is a long-term pattern of climate variability in the Pacific Ocean. It involves shifts in sea surface temperatures and atmospheric pressure, alternating between warmer (positive) and cooler (negative) phases over multi-decadal periods. It influences weather patterns and can impact phenomena like cyclone activity.

ENSO (El Nino Southern Oscillation):

• ENSO refers to the periodic variation in ocean temperatures and atmospheric pressure in the tropical Pacific Ocean. El Nino (warmer waters) and La Nina (cooler waters) are two phases of ENSO. They influence global weather patterns, affecting rainfall, droughts, and cyclone activity in various regions.

Equatorial-Origin Cyclones and Changing Patterns

- Recent Subdued Cyclone Activity
 - Equatorial cyclones, though historically destructive, have been less active in recent years.
 - Last major cyclone of this type was Cyclone Okchi in 2017, impacting Kerala, Tamil Nadu, and Sri Lanka.
- Potential Increase due to Global Warming and PDO
 - Study in "Nature Communications" suggests that global warming and the Pacific Decadal Oscillation (PDO) might lead to increased equatorial cyclone frequency.
 - PDO, repeating every 20-30 years, influences cyclone activity.

Impact of PDO on Cyclone Occurrence

- 1981-2010 Period
 - Equatorial cyclones decreased by 43% during 1981-2010 compared to 1951-1980.
 - PDO in "warmer" or positive phase contributed to this decline.
- ENSO Phenomenon and Equatorial Conditions
 - El Nino: Warming of Central Equatorial Pacific, associated with reduced rainfall over India.
 - La Nina: Cooler Eastern Pacific, linked to excessive rainfall.
 - The ENSO phenomenon repeats in the Pacific over 2-7 years.
- Distinct Nature of PDO
 - o PDO is not annual; alternates between warm Western and cooler Eastern Pacific over longer timeframes.
 - o "Positive" or "warmer phase" of PDO detected after several years of ocean temperature measurements.
- Potential Increase in Cyclones
 - o In 2019, PDO shifted to a cooler, negative phase.
 - Negative PDO might lead to more equatorial-origin cyclones after monsoon months.

Implications of Equatorial Cyclones

- Effects of Warm Waters
 - o Rare for cyclones to form near the Equator, but warm waters can intensify cyclone moisture and intensity.
- El Nino's Impact
 - Developing El Nino in the Pacific affecting central and southern India.
 - Recorded rainfall deficits of 7% and 17% in central and southern India, respectively.

Nut Graf: Recent equatorial cyclones decline attributed to PDO's warmer phase. A shift to a cooler phase in 2019 might increase such cyclones, driven by warm waters and potential El Nino impacts.



2. North India more affected by El Nino

Syllabus: Important Geophysical phenomena

Prelims: About El Niño and La Niña

Mains: Impact of various phenomena such as El Niño and La Niña on Indian climatic conditions

Context: Ahead of every monsoon, meteorologists track, with a degree of nervousness, temperatures in the central and eastern Pacific Ocean. Six in 10 years, a half degree or more rise in an El Nino corresponds to diminished rainfall in India. The converse, or a La Nina, is linked to increased rain. A study last week however suggests that this cyclical swing called the El Nino Southern Oscillation (ENSO) affects vast regions of India differently.

Key Points in the Article

- In the central and eastern Pacific Ocean, 6 in 10 years, a half degree or more rise an El Nino corresponds to diminished rainfall in India.
- The converse, or a La Nina, is linked to increased rain.
- A study last week however suggests that this cyclical swing called the El Nino Southern Oscillation (ENSO) —
 affects vast regions of India differently.
- Monsoon rainfall over Central India known as the monsoon core zone and where agriculture is largely rainfed
 — is increasingly getting disassociated from the ENSO with only 10% of droughts or excess rains linked to ENSO
 fluctuations.
- On the other hand, the ENSO link to North India was strengthening, with 70% of rainfall fluctuations linked to the ENSO cycle. In Southern India, the relationship has remained largely stable. The study notes that the ENSO-Monsoon inverse relationship started getting stronger from 1901 to 1940, became stable from 1941 to 1980 and then the relationship has weakened 1981 onwards.
- Monsoon rainfall, which accounts for 80% of India's annual rainfall, is influenced by two broad factors:
 - The external one is the impact of ENSO which influences the trade winds and their ability to carry warm, moist air towards India around monsoon.
 - The other, internal, is the 'monsoon trough' an elongated low-pressure area which extends from over Pakistan to the Bay of Bengal.
- This trough swings between north and south India through the monsoon bringing rain wherever it is active and is fed on moisture brought in from the Bay of Bengal (and the Arabian Sea to a lesser extent) in the form of low-level cyclones called 'depressions'.

Rise in Temperature

- In the last few decades, the role of climate change has dramatically increased ocean temperatures in the Indian Ocean.
- This was influencing the number of depressions that formed during the season and consequently rain over Central
- However, these depressions weren't reaching out as strongly towards North India as it was in the past.
- Consequently, this has left North India more vulnerable to the impact from El Nino, which is known to affect the trade winds and the monsoon circulation over India.
- For the rainfall over South India, the influence of ENSO and strength of monsoon trough have been consistent over the entire period.

Conclusion: Indian agriculture is heavily dependent on the monsoons and because of this, lesser rainfall during the monsoons generally translates to below-average crop yields. Thus, tracking ENSO is very important for the Indian economy.

Nut Graf: The Impact of ENSO on the Indian climate and weather system is significant and climate change linked to it is an important factor which needs to be studied in detail.

3. Places in news

Kattupalli Port	 It is located in Tamil Nadu near Ennore. It is a minor port which is currently being operated by Adani Kattupalli Port Private Limited.
Novorossiysk port	 It is located in the Black Sea region close to the Crimea region which has been under dispute between Ukraine and Crimea.
Niger	 Niger is a landlocked nation bordered by countries such as Libya, Nigeria, Mali, Burkina Faso and Algeria. The river Niger flows through the country. Hausa, Zarma, Songhay and Tuareg are some of the major ethnic groups in the country.



Tampara lake	 The National Green Tribunal, Eastern Zone, has directed the Odisha government not to go ahead with 'illegal' construction in and around Tampara Lake, a designated Ramasar site and one of the largest picturesque freshwater lakes of the State. About Tampara lake Rich in fauna. Spread across 337.86 ha with a length of 5.8 km and a width of 670 metres in the Ganjam district, Tampara Lake supports at least 60 species of birds, 46 species of fishes, at least 48 species of phytoplanktons, and more than seven species of terrestrial plants and macrophytes. There is a patch of forest with a width of 2 km that separates the Bay of Bengal from the lake. As per submissions made by WSO, the wetland is an important habitat for vulnerable species such as Cyprinus carpio, common pochard (Aythya ferina), and river tern (Sterna aurantia). Tampara is already placed in the Wetland Atlas prepared by the Ministry of Environment, Forest and Climate Change in 2010. It was alleged that water sport activity including surfing, kayaking and scuba diving are in the offing in Tampara as part of efforts to make it an ecotourism hub. The permanent construction includes restaurants, hotels, Tampara resorts and cottages and concrete structures. They have been constructed within the water area and 50 metres of Tampara Lake.
Asian Highway 1	 In early May 2023, when violence broke out in Moreh, a commercial town bordering Myanmar, beginning a cascading effect that has led to the turmoil in Manipur, 230 Indian nationals from the Meitei ethnic group went across the border. Moreh, through which the Asian Highway 1 runs, connecting Tokyo to Turkey, is currently surrounded by the Kuki-Zo tribes. AH1, or Asian Highway 1, runs 20,557 km from Tokyo, Japan via Korea, China, Southeast Asia, Bangladesh, India, Pakistan, Afghanistan, and Iran to the border between Turkey and Bulgaria west of Istanbul. Highway 1 east end is in Tokyo, Japan, and the west end is in Kapıkule, Turkey. Asian Highway 1 is the second longest Highway in the world. It is a part of the Asian Highway Network (AH), also known as the Great Asian Highway. It stretches from Turkey to Japan.
Suru River	 The cold mountains of Kargil in the Union Territory of Ladakh are witnessing a rare humanitarian crisis. The growing number of accidents and flash floods in the Suru river have swept away several local people across the Line of Control (LoC) into Baltistan in Pakistan-occupied Kashmir (PoK) over the past two months. The Suru River is a tributary of the Indus River that flows largely through the Kargil district of Ladakh, India. The Suru Valley is coextensive with the Kargil tehsil, with the town of Kargil situated on its banks.



Islamic State – Khorasan Province

- NATO-calibre weapons were being transferred to the Islamic State Khorasan Province (IS-K) by groups affiliated with the Taliban and al-Qaeda, such as Tehrik-e-Taliban Pakistan, according to a UN report
- The Afghan offshoot of the terror organization "Islamic State," known as ISIS-Khorasan, IS-K or ISIS-K claimed responsibility for the attacks.
- The group takes its name from the Khorasan Province, an area that once included wide swaths of Afghanistan, Iran and central Asia in the Middle Ages.



The Economist

Source: The economist

Tsushima Strait

- The Tsushima Strait is a waterway that connects the Sea of Japan, the Yellow Sea, and the East China Sea. It is located between the Japanese island of Tsushima and the Korean Peninsula.
- The Tsushima Strait is a major shipping route, and it is also important for fishing and tourism.

Haiti

- It is a country located between the Caribbean Sea and the Atlantic Ocean.
- Mulattoes are an ethnic group which is associated with this country.
- Haiti is also associated with the disputed Navassa Island. The Island is claimed by Haiti but is currently controlled by the USA.



MISCELLANEOUS

. Centre owes ₹6,366 cr. in MGNREGS wages to 18 States, Union Territories

- The Union Rural Development Ministry informed Parliament that it owes ₹6,366 crore in wage payments under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) to States.
- West Bengal has the highest amount owed at ₹2,770 crore, while Rajasthan and Bihar follow with ₹979 crore and ₹669 crore respectively.
- The Centre has blocked over ₹7,500 crore in payments to West Bengal under Section 27 of the MGNREGA for "non-compliance of directives."
- Except for West Bengal, there is no wage payment pending for more than five months for any MGNREGS worker.
- The Centre also has a liability of ₹6,266 crore in the material component for 30 States and Union Territories.
- Delay in material component payments has a domino effect, impacting future projects and causing reluctance among vendors to supply raw materials.

2. GI tags given to crafts from Rajasthan, mangoes grown in Goa

The Geographical Indications Registry in Chennai awarded the Geographical Indication (GI) tag to seven products from various regions in India, with four of them hailing from Rajasthan.

- Jalesar Dhatu Shilp (Metal Craft): Located in Jalesar, Etah district, Uttar Pradesh, known for decorative metal craft and brassware.
- Goa Mankurad Mango: Mango variety named "Mankurad," originally called "Malcorada" by the Portuguese, means "poor coloured" but transformed to "Mankurad aamo" (mango in Konkani). Filed by All Goa Mango Growers Association, Panaji, Goa.
- Goan Bebinca: A traditional Indo-Portuguese dessert, known as the "Queen of Goan desserts," filed by the All Goa Bakers and Confectioners Association.
- Udaipur Koftgari Metal Craft: Udaipur artisans practise ancient Koftgari art, making ornamental weaponry with intricate designs, gold, and silver wire embedded into metal. Weapons are embellished using a complicated process of etching, heating, cooling, and polishing.
- Bikaner Kashidakari Craft: Craftsmanship majorly used for making gift items associated with marriages, characterised by mirror work.
- Jodhpur Bandhej Craft: Traditional Rajasthani art of tie and dye, used to print diverse patterns on fabrics.
- Bikaner Usta Kala Craft: Also known as gold nakashi work or gold manauti work, characterised by a prominent golden colour and known for its longevity.

3. Govt. kicks off contractual dispute settlement scheme

- The Centre has introduced a settlement scheme, named 'Vivad se Vishwas II (Contractual Disputes),' to address contractual disputes with vendors or suppliers associated with the government.
- The scheme was announced by Finance Minister Nirmala Sitharaman during the Union Budget and the guidelines for its operation were indicated by the Department of Expenditure earlier.
- The deadline for firms to submit their claims for consideration under the scheme is October 31.
- To be eligible for settlement, disputes should have secured an arbitral award by January 31, 2023, or a court order by April 30, 2023.
- The scheme is valid for all contractual disputes within the country where either the Government of India or organisations under its authority are parties involved.
- The maximum settlement amount provided to the contractor for disputes related to court judgments will be limited to 85% of the net amount granted or confirmed by the court.
- In the case of arbitral awards, the threshold for settlement will be "up to" 65% of the net amount awarded.

4. Kuruvai Crop Season

- It is one of the agricultural sowing and cultivation seasons in the Cauvery Delta region.
- Mostly, paddy is grown in this season with water being utilised from the Cauvery River.
- The duration of this agricultural season is less than 120 days and sowing starts from June July.

5. UN Population Fund (UNFPA)

- A project of the United Nations Population Fund (UNFPA) for gender sensitivity in Rajasthan has received support from experts working for the elimination of customs promoting patriarchy.
- The four-month-long project aims at promoting gender equality and shaping public opinion to end gender-based discrimination.
- The UNFPA has signed an agreement with Haridev Joshi University of Journalism (HJUJ), Jaipur, for capacity building
 of its students on issues related to gender norms, sexual violence, and human rights.



About UNFPA:

- It is a subsidiary organ of the UN General Assembly and works as a sexual and reproductive health agency.
- The UN Economic and Social Council (ECOSOC) establishes its mandate.
- It was established as a trust fund in 1967 and began operations in 1969.
- In 1987, it was officially renamed the United Nations Population Fund but the original abbreviation, 'UNFPA' for the United Nations Fund for Population Activities was retained.
- Objective: UNFPA works directly to tackle Sustainable Development Goals on health (SDG3), education (SDG4) and gender equality (SDG5).
- Fund: UNFPA is not supported by the UN budget, instead, it is entirely supported by voluntary contributions of donor governments, intergovernmental organizations, the private sector, foundations and individuals.

Nehru Trophy Boat Race



Source: The hindu

- The Nehru Trophy Boat Race is a popular Vallam Kali (boat race) held in the Punnamada Lake near Alappuzha, Kerala
 on the second Saturday of August every year.
- The most popular event of the race is the competition of Chundan Vallams (snake boats). Hence the race is also known as Snake Boat Race in English.
- Other categories of boats such as Churulan Vallam, Iruttukuthy Vallam, Odi Vallam etc. also participate in the competition.
- It is organized by the Nehru Trophy Boat Race Society under the guidance of the district administration.
- Vembanad is the longest lake in India, which spans several districts in Kerala. It is known as Punnamada Lake in Kuttanad, Kochi Lake in Kochi.

7. Bindeshwar Pathak, who brought in public toilet revolution, dies at 80

- Who: Bindeshwar Pathak, founder of Sulabh International, a well-known social worker and recipient of the Padma Bhushan award, has died at the age of 80 due to a heart attack at AIIMS in Delhi.
- Achievements: Bindeshwar Pathak is credited with introducing the innovative Sulabh Complex public toilet system in India, which played a significant role in reducing open defecation and manual scavenging.
- **Legacy:** Bindeshwar Pathak was active in his non-profit work until his last days. He is survived by his wife, son, and two daughters.
- Condolences: Prime Minister Narendra Modi expressed his grief over Dr. Pathak's death. He acknowledged Bindeshwar Pathak's visionary efforts for societal progress and empowering marginalised communities. He praised Pathak's contribution to the Swachh Bharat Mission.
- Accomplishments: Born and educated in Bihar, Pathak founded Sulabh International in 1970 to introduce a public toilet system across India, positively impacting many towns. He was awarded the Padma Bhushan in 1991 and became an ambassador for the Swachh Bharat Mission.
- Welfare Initiatives: Sulabh International not only advanced sanitation but also helped those involved in manual scavenging transition out of this occupation. The organisation received the Gandhi Peace Prize in 2016.
- **Tributes**: President Droupadi Murmu also expressed her condolences, acknowledging Pathak's revolutionary contribution to cleanliness and social welfare.

8. Pipeline work leads to vast megalithic site in Kerala

- Hat stones belonging to the Megalithic period were recovered from an excavation site in Nagaparamba(Kerala).
- Hatstones are locally referred to as "Thoppikkallu". These are made of laterite and used as lids on burial urns.
- Megalithic Period
 - Megaliths can be used to denote one or more rocks hewn in a definite shape for special purposes. It has been
 used to describe structures built by people from many parts of the world living in many different periods.

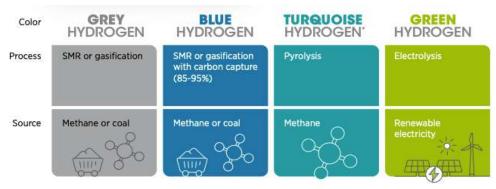


- 163 Megaliths in India are dated before 3000 BC, with recent findings dated back to 5000 BC in southern India.
- Megaliths are found in almost all parts of southern India. They are also found in central India and the upper Indus
- A large section of these structures are associated with burial or post burial rituals of people. 0
- Some of the important megalithic sites in India are Adichanallur, Thrissur, Nagarjunakonda, Junapani, Maski, 0 Brahmagiri, Piklihal, Hallur etc.

9. Green Hydrogen Standard for India

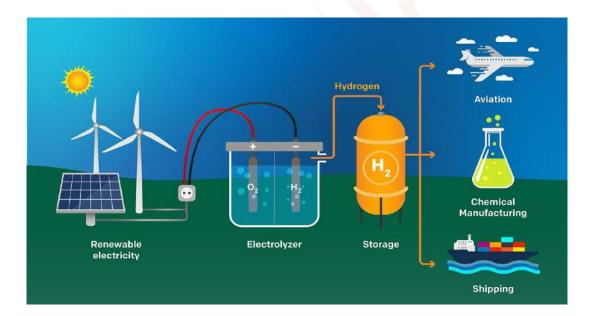
Context: In a significant move for the progress of the National Green Hydrogen Mission, the government has notified the Green Hydrogen Standard for India.

Details:



Note: SMR = steam methane reforming.

Turquoise hydrogen is an emerging decarbonisation option.



- The standard issued by the Ministry of New and Renewable Energy (MNRE), Government of India outlines the emission thresholds that must be met in order for hydrogen produced to be classified as 'Green', i.e., from renewable sources. The scope of the definition encompasses both electrolysis-based and biomass-based hydrogen production methods.
- It has decided to define Green Hydrogen as having a well-to-gate emission (i.e., including water treatment, electrolysis, gas purification, drying and compression of hydrogen) of not more than 2 kg CO2 equivalent / kg H2.
- The notification also specifies that the Bureau of Energy Efficiency (BEE), Ministry of Power shall be the Nodal Authority for accreditation of agencies for the monitoring, verification and certification for Green Hydrogen production projects.

Banasthali Vidyapith gets Rajiv Gandhi Sadbhavana Award

- The 25th Rajiv Gandhi National Sadbhavana Award was presented to Banasthali Vidyapith, a women's educational institution in Raiasthan.
- Siddhartha Shastri of the institution received the award from former vice president M. Hamid Ansari.
- The award, established in 1992 during the Quit India Movement's golden jubilee, recognizes individuals or institutions contributing to peace, communal harmony, and national unity.
- Carries a cash reward of ₹10 lakh and a citation.
- Presented on the birth anniversary of former Prime Minister Rajiv Gandhi.



11. Bharat NCAP: India to get its own car crash testing programme from October

- From October 1, car manufacturers can participate in the Bharat New Car Assessment Programme (Bharat NCAP) for crash safety ratings.
- Bharat NCAP is based on the Global New Car Assessment Programme (Global NCAP), promoting universal motor vehicle safety standards.
- Applicable to passenger vehicles with up to eight seats and gross vehicle weight under 3,500 kg.
- Based on Automotive Industry Standard 197, Bharat NCAP assigns star ratings indicating crash safety.
- 30 car models offered for testing by manufacturers; involves evaluation of adult occupant protection, child occupant protection, and safety assist technologies.
- Evaluation involves three tests: frontal offset test (64 kmph, 40% overlap), side impact test (50 kmph), and pole-side impact test (29 kmph).
- Manufacturers nominate models for testing; base variants are selected randomly for testing by Bharat NCAP representatives.
- Test results approved by Bharat NCAP Standing Committee, will be published on website, and certified by Central Institute of Road Transport (CIRT).
- Program is voluntary but mandatory for certain cases (e.g., popular variants with high sales, Ministry recommendation for safety).

12. Neeraj Chopra crowned world champion

- Neeraj Chopra secured a World title in addition to his Olympic gold, achieving a best throw of 88.17m.
- His winning throw was recorded in the second round of the competition, establishing his dominance early on.
- Pakistan's Arshad Nadeem won the silver medal with a throw of 87.82m.
- The Czech Republic's Jakub Vadlejch claimed the bronze medal with a throw of 86.67m.



YOJANA AUGUST 2023

. Vision for Industry

Introduction:

The road to 75 years has not been easy, yet India has come a long way — from a country that saw its wealth drained by its colonial masters to a major player in the global economy. As India enters the Kartavya Kaal, it is time for the country to realise its potential and emerge as a world leader in this post-Covid New World Order.

The Potential of India in the Manufacturing Sector:

- According to a FICCI-McKinsey report, by 2047, a growing India is expected to become a high-income nation with six times its current per capita income and to create 60 crore jobs to gainfully employ its growing workforce.
- Achieving this potential will make India an approximately Rs 1500 lakh crore (\$19 trillion) economy in real terms by 2047.
- Manufacturing has the highest potential of all sectors to propel job growth, with the potential to create 60 million to
 70 million jobs by 2030.
- India could aim to:
 - Boost overall manufacturing productivity fivefold by 2030 (by tripling labour productivity and doubling capital productivity),
 - Achieve 70-80% digital adoption by MSMEs, and
 - Increase the number of World Economic Forum lighthouses tenfold to drive IOT and automation adoption and boost productivity.



Focusing on the following areas to realise the full potential in manufacturing:

New-age Factory of the World:

- **Supply chain:** India could ensure the supply chain and capture an increased share of key global supply chains valued at between \$800 billion and \$1.2 trillion by 2030. India is well-positioned to leverage Global Value Chains (GVC) for higher economic growth and job creation.
- **New-age sectors:** India has selected multiple new-age sectors such as mobile phones, solar PV modules, drones, wearables and semiconductors. These new-age sectors would help India gain prominence as a manufacturing hub.
- **Plug-and-play cluster zones:** State governments could support efforts by creating plug-and-play cluster zones based on their manufacturing strengths.

Embracing the Digital Revolution in Manufacturing:

- Industry 4.0 solutions: As per a recent NASSCOM report, the Indian manufacturing industry spent between US 5.5 and US 6.5 billion dollars on Industry 4.0 solutions in FY21.
- Digitisation could improve reliability and value chain resilience.
- **Technology grants and international joint ventures** could help secure technology expertise that would help propel manufacturing into the digital future.
- Smart manufacturing: The ongoing 5G rollout would play a key role in the transformation to 'smart manufacturing' like Connected Warehouses, Logistics, Fleet Management, etc.
- **Skill development programmes:** India needs to invest in robust skill development programmes and collaborate with educational institutions and industry bodies to bridge the skills gap.



Leaping towards Sustainable Manufacturing:

- The future of manufacturing is sustainability. Customers are looking for products and partners who follow eco-friendly
 practices, adopt green policies, and share a commitment to sustainability.
- Manufacturers need to prioritise the creation of green alternatives, such as
 - Bio-based feedstock
 - Sustainable packaging
 - Green building materials
 - 'Zero Defect Zero Effect'

Strengthening Infrastructure:

- India has inefficiencies in terms of a large number of goods transitioning within an industrial value chain, as well as the high cost and lengthy time for transition.
- The country is solving infrastructure challenges with a variety of interventions, such as
 - o Industrial Corridor Development Programme,
 - o PM Gati Shakti National Master Plan, and
 - National Logistics policy.
- Additionally, state and central governments could strengthen infrastructure in key manufacturing hubs through
 - o Public-private partnerships (PPPs) and
 - o Special-purpose vehicles and
 - Expand smart-city coverage.

Conclusion:

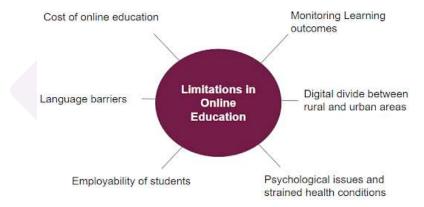
FICCI is confident that as India moves ahead on the path towards India@100, the process of reforms will further gather pace and strengthen the foundation on which India will have a world-class industrial sector that is efficient, productive, sustainable, and imbibe a major export orientation.

2. Leveraging Technology for Accessible Quality Education

Introduction: Modern technologies like Augmented Reality (AR), Virtual Reality (VR), Extended Reality (ER), Artificial Intelligence (AI), and Machine Learning (ML) have revolutionised education enhancing learning experiences. The National Education Policy 2020 (NEP 2020) also envisions sweeping reforms in the education sector through technology to create accessible, equitable, and high-quality education for all.

The sudden push for online education was driven by the disruption caused by the Covid-19 pandemic. The availability of online classes, internet through fibre connectivity and DTH content delivery through satellites helped to ensure high-quality education delivered at home during this period.

Limitations in Online Education:



Government initiatives to promote education through technologies:

- National Programme on Technology Enhanced Learning (NPTEL): NPTEL, started in 2005, provided high-quality recorded engineering lectures delivered by IIT professors. Subsequently, in 2008, Virtual labs were started to provide simulation-based experiments for all students.
- Teacher training platforms:
 - The Amrita Virtual Interactive E-Learning World (A-VIEW), a collaboration between AMRITA University and the Ministry of Human Resource Development (MHRD), was established with the purpose of providing online training to educators.
 - IIT Bombay and IIT Kharagpur launched the 'Train 10,000 Teachers' (T10kT) program, which focuses on augmenting the teaching skills of teachers in core engineering and science subjects.
 - AICTE Training And Learning (ATAL) Academy was instituted to facilitate the dissemination of high-quality technical education across the nation.
- **SWAYAM platform:** SWAYAM platform stands as the world's largest online free e-learning portal, meticulously designed to realise the goals of accessibility, equity, and quality education across all educational tiers.



- The National Internship Portal was established to foster connections between students and industries, including Micro, Small, and Medium Enterprises (MSMEs).
- The National Educational Alliance for Technologies (NEAT) scheme, implemented by the All India Council for Technical Education (AICTE), aims to act as a bridge between ed-tech companies, academic institutions and students.
- **Anuvadhani**, an artificial intelligence-based translation tool developed by AICTE, is developed to bridge the language gap and provide equal learning opportunities to students across the country. It can translate text files, and enable speech-to-text typing, and editing.
- National Digital Library Project by IIT Kharagpur provides free access to digital books and documents.
- Academic Bank of Credit (ABC): Initiated by the National Education Policy (NEP) 2020, students can store their
 academic credits and credentials earned in Digilocker. It serves as a credit bank for students that allows them to
 accumulate, verify, transfer, and redeem their credit which ensures flexibility and enhances learning opportunities for
 students.

Conclusion: The NEP 2020 aims to achieve a Gross Enrollment Ratio (GER) of 100% in school education and 50% in higher education. Technology plays a pivotal role in achieving this goal by bridging the gap and ensuring access, upholding equity, maintaining quality, increasing affordability, and fostering accountability across the education sector.

3. Atal Innovation Mission

Introduction: Innovation is the process of creating value by applying novel solutions to meaningful problems. The article discusses the importance of building a holistic innovation ecosystem in India to foster innovation and entrepreneurship, solve societal challenges, and contribute to the country's economic growth.

Innovation's Role in Economic Growth:

- Historical perspective: Early GDP growth was tied to consumption due to population increase, with limited real
 growth (0.1% annually) until 1700 AD.
- **GDP after the industrial revolution:** Post-1750s, the industrial revolution triggered exponential GDP growth through technology and innovation-driven changes.
- **Technology-led innovation:** Technological innovation fueled economic progress by enhancing productivity, and efficiency, and creating opportunities in various sectors.
- **TFP's significance in GDP growth:** Total Factor Productivity (TFP) significantly impacts GDP growth by improving output efficiency through innovation and technological advancement.
- **Leading nations' technological innovation:** Technologically advanced nations (e.g., USA, UK, Germany, Japan) have driven GDP growth through substantial investments in research and innovation.

Terms

- Total Output: Total output is the amount of goods and services produced by an economy, industry, or firm.
- Labour: The collective human effort, skills, and work put into the production process.
- Capital: The financial and physical assets, tools, equipment, and resources used for production.
- Total Factor Productivity (TFP): TFP is a measure of how efficiently inputs are used to produce output.

Government's Role in Fostering Innovation:

- State-sponsored initiatives have contributed to the development of new technologies and industries. For example, Israel and the USA showcase effective government-led innovation initiatives that have yielded significant results.
- National Innovation Foundation (NIF): India established NIF to empower grassroots technological innovations and preserve traditional knowledge.
- Science, Technology, and Innovation Policy: This policy aims to position India as a global scientific leader and establish a robust Science, Research, and Innovation system (SRISHTI).
- Supporting Innovation Culture: In a diverse country like India, government support is pivotal in cultivating an innovation culture.
- Atal Innovation Mission (AIM): AIM was initiated by the Government of India in 2016. AIM's primary objective is
 to cultivate innovation and entrepreneurship and it aims to create an environment conducive to generating and
 implementing innovative ideas.

Programs under AIM's Holistic Approach:

- Atal Tinkering Labs (ATLs):
 - Establishes tinkering labs in schools to encourage innovative thinking among students.
 - Nurtures creativity, problem-solving, and hands-on learning from an early age.
- Atal Incubation Centres (AICs):
 - Focuses on supporting innovators during the transition from idea to prototype to market.
 - o Provides necessary infrastructure, mentoring, and resources to foster start-up growth.
- Atal Community Innovation Centres (ACICs):
 - Aims to expand innovation beyond major cities to tier-2 and tier-3 locations.
 - o Promotes innovation within local communities by providing resources and guidance.
- Atal New India Challenge (ANIC):
 - Offers a platform for start-ups to solve pressing national challenges through innovation.
 - Provides funding, mentorship, and resources for the development and implementation of solutions.



Conclusion: India's strategic innovation adoption aligns with its goal of a \$5 trillion economy by 2025. Its progress is evident as it moved from 57th to 40th in the Global Innovation Index, delivering global-scale innovations like Aadhaar and UPI. A collective effort is now crucial to unlock India's economic potential and tech-driven decade.

4. Agriculture – A Journey from Shortage to Surplus

Introduction:

In the span of 75 years since India's independence, its agricultural landscape has undergone a phenomenal transformation. From struggling with food shortages and depending on foreign aid, India has emerged as a self-sufficient nation in terms of food production and a significant player in the global agricultural arena.

The Green Revolution: From Scarcity to Surplus

- At the dawn of independence, India faced acute food scarcity, barely able to meet its population's basic needs.
- The turning point came with the Green Revolution, catalyzed by the introduction of high-yielding and disease-resistant crop varieties.
- Scientist **Dr. Norman Borlaug's** innovations in **wheat varieties boosted yields**, and coupled with government support under the leadership of doctor **MS Swaminathan**, led to record-breaking harvests.
- This surge in productivity, termed the Green Revolution, not only ensure food security but also paved the way for self-sufficiency and agricultural exports.
- India leads in sugar, ranks 2nd in rice (after China), and holds 14.14% global wheat production share in 2020.

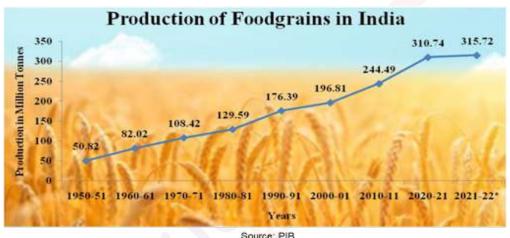


Image: Data for 2021-22 is from 4th Advance estimates of food grain production

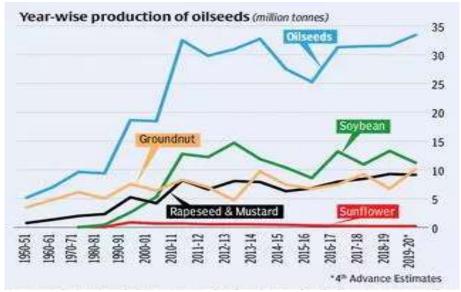
Figure: Data for 2021-22 is from 4th Advance estimates of food grain production
Source: PIB

International Year of Millets: A Nutritional Resurgence

- Recognizing the significance of millets, India celebrated the International Year of Millets in 2023, rebranding them as
 'Shree Δnna'.
- With targeted strategies and government support, millet production has surged, aiding nutritional security.
- The cultivation of millets has soared, setting the stage for India to become a global hub for these nutrient-rich grains.

Yellow Revolution: Triumph in Oilseeds Production

- The Yellow Revolution marked a breakthrough in oilseed production.
- Innovative cultivation practices and the introduction of advanced crop production technologies led to a dramatic increase in oilseeds output.
- India's oilseed production grew from 108.30 lakh metric tons in 1985-86 to an impressive 400,000 million tons in 2022-23, establishing self-reliance in this crucial sector.



Source: Agricultural Statistics 2020; Govt of India- Ministry of Agriculture & Farmers Welfare

The White Revolution: From Milk Crisis to Global Leadership

- In a similar vein, the White Revolution addressed India's milk crisis. With per capita milk availability dwindling, the National Dairy Development Board (NDDB) chaired by Verghese Kurein launched Operation Flood in the 1970s.
- This initiative established a network of village-level milk cooperatives, modern processing plants, and a seamless supply chain.
- India has been a global leader in milk production for over a decade, with a total production of around 22 crore tonnes in the year 2021-22.

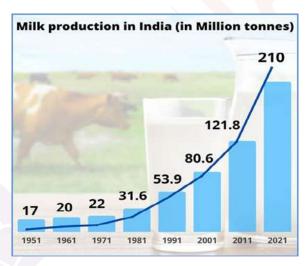


Figure: Milk production in India Source: PIB

The Blue Revolution: Empowering Fisheries

- Post-independence efforts in the fisheries sector resulted in the Blue Revolution.
- India transformed into the second-largest fish-producing country globally, with policies promoting both marine and inland fisheries.
- The Blue Revolution not only boosted fish production but also elevated India's status as a leading seafood exporter.

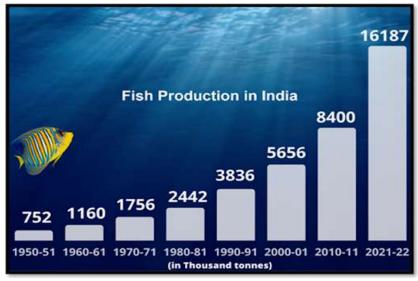
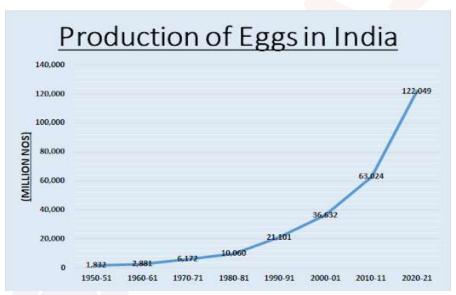


Figure: Fisheries production in India Source: PIB

The Silver Revolution: Poultry Powerhouse

• Rising to become the **third-largest egg producer globally,** India's poultry industry has added another feather to its agricultural cap.



Source: Department of Animal Husbandry & Darying and Department of Fisheries

Challenges and the Road Ahead:

- As India's agricultural success story continues, challenges such as climate change, resource depletion, and productivity constraints must be addressed.
- Initiatives like the **National Mission on Sustainable Agriculture and Agri-Tech Infrastructure Fund** focus on sustainable practices and technology integration.
- Digital tools, precision agriculture, and market linkages are redefining modern farming.
- From financial support to crop insurance and institutional credit, these initiatives empower farmers.
- The National Agriculture Market (e-NAM) is revolutionizing agricultural marketing, ensuring fair prices and market access.
- India's agricultural journey is a testament to scientific innovation, political will, and the unwavering toil of farmers.



5. Indian Economy – Historical Perspective

Introduction: After independence, India adopted a mixed economic model that blended socialist policies with market economy elements. It helped in nation-building and industrialisation while pursuing self-sufficiency through Public Sector Enterprises and import substitution. However, this approach also inadvertently gave rise to issues like bureaucratic inefficiencies, limited competition and stifled innovations.

Macroeconomic imbalances of the 1990s and structural reforms:

Causes of macroeconomic imbalance: High combined deficit of central and state governments, elevated inflationary pressure and unsustainable current account deficit triggered the balance of payment crisis.

Economic liberalisation and reforms from 1990-2014:

- **Liberalisation, Privatisation, and Globalisation (LPG) reform:** The government implemented policies that dismantled licence raj, encouraged foreign direct investment and promoted privatisation.
- Flexible exchange rate with full convertibility of rupee in the current account and partial convertibility in the capital account.
- **New Telecom Policy of 1999:** It catalysed the information technology (IT) sector boom in India, generating widespread benefits for other sectors as well.
- The Department of Disinvestment was established to further the disinvestment and privatisation of public sector enterprises.
- Fiscal Responsibility and Budget Management (FRBM) Act: The act was passed to address the fiscal deficit of central and state governments.
- Structural reform in the banking sector: SARFAESI Act 2002 and the deregulation of interest rates were introduced to help banks burdened with bad debts.

These reforms have helped in achieving an average growth rate of over 8% during the 2003-2008 period where the global growth averaged at 4.8%.

New age reforms after 2014:

- Since 2014, the government's economic policy focus has been to restore India's growth potential by easing business conditions and significantly enhancing physical and digital infrastructure.
- **Simplifying regulatory frameworks:** The Insolvency and Bankruptcy Code (IBC) and the Real Estate (Regulation and Development) Act (RERA) were enacted to enhance the ease of doing business.
- Tax reforms: Adoption of Goods and Services Tax (GST), reduction in corporate and income tax rates, abolishment of the retrospective tax, etc. have reduced the tax burden on individuals and businesses.
 - GST implementation resulted in broadening the tax base, free flow of goods across states and the formalisation of the economy.
 - Average monthly gross GST collections are consistently rising from INR 0.9 lakh crore in FY18 to INR 1.5 lakh crore in FY23 and INR 1.7 lakh crore in the first quarter of FY2024.
- Capital expenditure: Capital expenditure of the central government has increased from 2.8 % of GDP in 2013-14 to 3.8% in 2022-23. This has improved connectivity and modernised infrastructure across the country.
- National Infrastructure Pipeline (NIP) was established to fund infrastructure investment projects of around INR 111 lakh crore spread over five years until 2024-25.
 - More than 9,000 NIP projects, with a total investment of over INR 108 lakh crore, are at various stages of implementation.
- Atmanirbhar Bharat and Make in India initiatives to enhance India's manufacturing capabilities and promote exports
 across various industries.
- Production Linked Incentives (PLIs): implemented across various sectors to attract domestic and foreign investments
 in the manufacturing sector.
- A New Public Sector Enterprise policy was implemented to limit governments' presence to a few strategic sectors.
- **Decriminalising minor economic offences** under the companies act 2013 to improve the ease of doing business. 1400 archaic laws have been repealed in the last nine years
- Micro Small and Medium Enterprise (MSME): Emergency Credit Line Guarantee Scheme (ECLGS), revision in the
 definition of MSMEs, TReDS to address the delayed payments for MSMEs to enhance resilience in the MSME sector.

Conclusion: A robust financial sector, coupled with increased public spending, digitalisation reforms, formalisation of the economy, enhanced financial inclusion, expanded economic opportunities, and substantial upscaling in research and development, will constitute the essential drivers for India's economic growth in the 'Kartavya Kaal'.



KURUKSHETRA AUGUST 2023

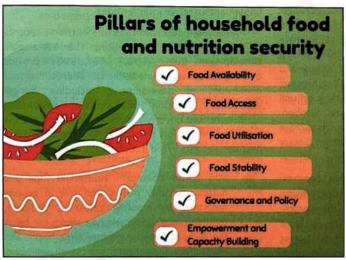
Promoting Household Food and Nutritional Security

Introduction:

As per UN FAO, 'food and nutrition security' exist when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care allowing for a healthy and active life.

Pillars of Household Food and Nutrition Security:

- Food Availability: It focuses on ensuring an adequate and consistent supply of diverse food options.
- Food Access: It includes factors such as affordability, physical access to markets, infrastructure for storage and transportation, and social safety nets.
- Food Utilisation: This focuses on maximising the nutritional value of food and ensuring optimal health outcomes.
- Food Stability: This refers to the ability of households to maintain access to food during shocks and crises.
- Governance and Policy: It involves the development and implementation of coherent policies, strategies, and programmes that address all dimensions of food security.
- **Empowerment and Capacity Building:** It plays a crucial role in enhancing household food and nutrition security. It can include training on sustainable farming practices, nutrition education, entrepreneurship, and leadership skills.



Source: Kurukshetra

Methods to be Employed for Food and Nutritional Security:

- Sustainable Practices: This involves promoting sustainable farming practices that enhance agricultural productivity
 while minimising environmental impact.
- **Diversification of Food Production:** This includes promoting traditional and underutilised crops, horticulture, agroforestry, and aquaculture.
- Access Inputs and Technologies: This includes promoting the development and dissemination of improved crop varieties, resilient seeds, and appropriate technologies for smallholder farmers.
- Social Protection Programmes: It includes implementing targeted social protection programmes to address immediate food needs and reduce vulnerability.
- Nutrition Education and Behaviour Change: This implies promoting nutrition education and behaviour change communication to improve household dietary practices.
- **Strengthening Health and Nutrition Services:** This refers to enhancing access to quality health and nutrition services, particularly for women, children, and vulnerable groups.
- **Policy and Governance:** This comprises developing and implementing policies and governance frameworks that prioritise food and nutrition security.
- Research and Innovation: It includes conducting research on climate-smart agriculture, nutrition-sensitive interventions, and sustainable food production Systems.

Food & Nutritional Security and Sustainable Development Goals (SDGs):

Achieving household food and nutrition security in India is crucial for meeting the Sustainable Development Goals (SDGs).

- **SDG 1: No Poverty** Household food and nutrition security play a vital role in poverty reduction. By ensuring access to sufficient, nutritious food, vulnerable households can break the cycle of poverty.
- **SDG 2: Zero Hunger** By ensuring that all individuals have access to nutritious food year-round, India can significantly reduce hunger and malnutrition.
- SDG 3: Good Health and Well-being Access to a diverse and nutritious diet is essential for improving health outcomes.



- SDG 5: Gender Equality Household food and nutrition security can help address gender inequalities.
- SDG 12: Responsible Consumption and Production —By encouraging the production and consumption of diverse and locally grown foods, India can reduce food waste, conserve biodiversity, promote sustainable farming methods, and minimise the environmental impact of agriculture.
- **SDG 13: Climate Action** Household food and nutrition security strategies should be aligned with climate action goals.
- SDG 17: Partnerships for the Goals Achieving household food and nutrition security requires strong multistakeholder partnerships.

Conclusion:

Promoting household food and nutrition security is a multifaceted endeavour that requires concerted efforts from various stakeholders. Through a range of governmental interventions such as food distribution, nutritional supplementation, agricultural support, and capacity building, these programmes strive to achieve sustainable development goals and ensure a healthier and more prosperous society.

2. Nutritional Management Framework for Rural India

Introduction: Food and nutrition constitute critical components for maintaining good health, enhancing productivity, and fostering socio-economic development. The Global Nutrition Report, published by the World Health Organization, states that nutrition holds a pivotal role within the 12 Sustainable Development Goals (SDGs) of the United Nations, underscoring its significance.

Why is Nutrition Important?

- Nutrition refers to the process of consuming food and converting it into sources of energy and other essentials required for life.
- Nutritional deficiency: A shift in consumption patterns towards processed and snack foods from traditional, healthy, homemade diets has led to an increased incidence of nutritional deficiencies.
- Lifestyle disease: Increased nutritional deficiencies along with chemical-based intensive agriculture, modern lifestyle
 and environmental pollution have contributed to a surge in lifestyle diseases such as obesity, high cholesterol, and
 diabetes.
- Socio-economic impact: Malnutrition and undernutrition are reported heavily in rural areas, tribal areas and urban slums and among people Below Poverty Line (BPL).
 - **Weakened** immune systems and compromised health have resulted in reduced work output and diminished productivity among adults, as well as elevated child mortality rates.

Government Initiatives:

- Integrated Child Development Services Common Application Software (ICDS-CAS): This system enabled the Anganwadi Workers (AWWs) to track health and nutritional services nationwide, enabling data-driven decisions at the grassroots level.
- **POSHAN Abhiyan:** Launched in 2018, POSHAN Abhiyan focuses on enhancing nutritional outcomes for children, adolescents, women, and lactating mothers, with a particular emphasis on rural areas.
 - POSHAN Tracker: Ministry of Women and Child Development (MWCD) has implemented POSHAN Tracker to track each beneficiary.
- **National Nutrition Mission:** A comprehensive nationwide programme to enhance the nutritional outcomes for pregnant women, lactating mothers and children by addressing undernutrition, malnutrition and low birth weight.
- National Institute of Nutrition:
 - It publishes the 'Nutrition Atlas' which provides comprehensive data on the nutrition level at the national and state level.
 - It developed the 'Nutrify India Now' mobile app for assessing nutrients from consumed foods.

Nutritional Management Framework for Rural India

- The nutritional management framework should include all relevant stakeholders and make use of available technologies in creating a data-driven, outcome-oriented nutritional ecosystem.
- The nutritional framework should address the four key categories; Children under 5 years, Pregnant and lactating women, Young women, and Adolescent women for holistically addressing nutrition issues.
- It should also ensure regular updation and monitoring of key nutritional targets, promote nutritional education programmes and capacity building of government functionaries.

Challenges in Managing Nutrition in India:



Figure: Challenges in Addressing Malnutrition

Way forward:

- A robust nutritional ecosystem can be established by engaging all stakeholders and building a robust digital
 infrastructure for effective implementation and monitoring of government initiatives.
- A continuous feedback loop should be created to make the policies data-driven and result-oriented to make government interventions meaningful.

3. Adequate Nutrition for Women and Children

Introduction:

Adequate nutrition is essential for women and children due to its direct impact on health, development, and overall
well-being. The article emphasizes the importance of proper nutrition for women and children, the consequences of
inadequate nutrition, the existing challenges, and the initiatives taken to address this issue.

Importance of Women's Nutrition:

- Malnutrition leads to diseases, lower life expectancy, and maternal complications.
- Maternal health impacts childbearing, child-rearing, and overall family welfare.
- Inadequate nutrition in pregnancy leads to low birth weight, stillbirths, and maternal mortality.
- Undernourished women become undernourished mothers, perpetuating intergenerational malnutrition.
- Anaemia is prevalent among pregnant women, leading to higher maternal mortality.
- Poor health reduces productivity, earning capacity, and the ability to care for families.

Challenges in Solving Women's Nutrition Problem::

- Awareness Gap: Lack of awareness about the importance of women's nutrition and its impact on maternal and child health.
- Underweight or Obesity: Many Indian women are either underweight or obese, posing risks during pregnancy.
- Gender Bias: Intra-household food distribution often favours men, neglecting women's nutritional needs.
- Access to Services: Unequal access to basic nutrition, health services, and education facilities, especially in rural
 areas
- Nutrition Education: Inadequate dissemination of nutrition education across all age groups, genders, and social classes.
- Implementation Hurdles: Effective implementation of nutrition programs at the grassroots level faces obstacles.
- Monitoring and Evaluation: Difficulty in monitoring and evaluating the impact of nutrition interventions.

Initiatives for Solving Women's Nutrition Problem:

- **Poshan Abhiyan:** This flagship program by the Ministry of Women and Child Development aims to improve nutritional outcomes for children, pregnant women, and lactating mothers through various interventions.
- Maternal Health and Nutrition Programs: Initiatives like Pradhan Mantri Matru Vandana Yojana (PMMVY) and Janani Suraksha Yojana (JSY) provide cash incentives and cost-free antenatal care services to pregnant women.
- Prime Minister-Poshan Shakti Nirman (PM-POSHAN): Formerly known as the Mid-day Meal Scheme, it provides nutritional support to primary education students.
- **Poshan Tracker:** A governance tool by the Ministry of Women and Child Development for transparently tracking nutrition service delivery and identifying malnutrition in children.
- **NITI Aayog's "Nourishing India":** This document focuses on preventing undernutrition, particularly in the first 1000 days of a child's life.
- Integrated Child Development Services (ICDS): Aim to improve the nutritional status of children below six years of age.
- Scheme for Adolescent Girls (SAG): Provides nutritional support, health check-ups, and education for adolescent girls aged 14-18 years.



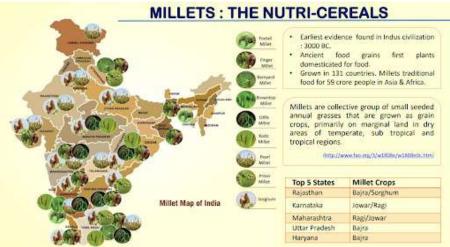
Way Forward:

- Impart comprehensive nutrition education to individuals regardless of age, gender, education, social class, or creed.
- Adopt a holistic approach focusing on the needs of girls and women throughout their life cycle, especially during pregnancy and lactation.
- Integrate weight monitoring, nutrition counselling, anaemia prevention/treatment, and mental health screening into routine antenatal check-ups.
- Empower women to prioritize their own nutritional needs, breaking the cycle of malnutrition.
- Focus on macro- and micronutrient intake during early childhood.

Conclusion: Addressing the nutritional needs of women and children through well-implemented programs is essential to break the cycle of malnutrition, ensuring healthier generations, and contributing to national development.

4. Millets – Future Food

Introduction: In a world grappling with pressing issues such as climate change, malnutrition, and poverty, an ancient yet highly resilient grain has emerged as a beacon of hope – millets. These small cereal grains, belonging to the **Poaceae family**, have garnered attention for their incredible nutritional value, environmental adaptability, and positive impact on various challenges. Often referred to as "**Nutri-Cereals**," millets are not just a food source; they are a solution to some of the most critical global issues.



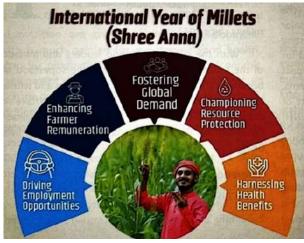
Source: agricoop.nic.in

A Resilient Crop with Climatic and Economic Significance: Millets, originally cultivated in Asia and Africa, have become a symbol of resilience in the face of climate variability.

- As the world grapples with unpredictable weather patterns and water scarcity, millets stand tall as a droughtresistant crop that requires minimal water and thrives even in poor soil conditions.
- Their ability to flourish in arid environments makes them a vital food source for millions of smallholder dryland farmers in these regions.

Economically, millets play a significant role by offering farmers a sustainable alternative to traditional crops.

- With their low water requirements and suitability for a range of soils and climates, millets serve as a smart risk management strategy for farmers.
- By embracing millet cultivation, these farmers reduce their carbon footprint and contribute to a more resilient agricultural system, ultimately improving their livelihoods.



Source: Kurukshetra



The Rise of Millets as Superfoods:

- Millets are not just staple crops; they are nutritional powerhouses that have earned the label of "superfoods."
- The term "Nutri-Cereals" aptly describes their high nutritional content. Varieties like sorghum, pearl millet, finger millet, and more offer impressive amounts of fibre, protein, vitamins, and minerals.
- Their unique nutritional composition, including high levels of iron and zinc, low glycemic index, and gluten-free nature, make them an ideal addition to a balanced diet.
- For instance, finger millet boasts three times the calcium content found in milk, making it a potent source of this
 essential mineral.

Millets have the potential to help us achieve SDGs like SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 12 (Sustainable Consumption and Production), and SDG 13 (Climate Action).



Source: PIB

Addressing Iron Deficiency:

• Recent research led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) highlighted that millet can significantly **improve hemoglobin and serum ferritin levels**, effectively reducing iron-deficiency anemia.

Government Efforts to Promote Millets:

- The Government of India has launched a mission to cultivate millets, aiming to achieve nutritional security while following recommendations by NITI Aayog. This initiative includes promoting biofortified millet varieties and integrating millets into various public delivery channels.
- Under the National Food Security Act, state governments are advised to procure millets at minimum support prices and distribute them through the public distribution system.
- Additionally, India's National Nutrition Mission, POSHAN Abhiyaan, has encouraged the inclusion of millets in programs like Integrated Child Development Services and Mid-Day Meals.

Conclusion:

The year 2023 has been declared the 'International Year of Millet' by the United Nations following India's proposal. India will be using its G-20 presidentship to bring these nutri-cereals back to the dining table.



SCIENCE REPORTER AUGUST 2023

. Chandrayaan: India's Quest for the Moon

Introduction: After the failure of the soft landing of the Lander of Chandrayaan-2 in 2019, within four years India has launched third lunar mission, Chandrayaan-3 which will shed light on a completely unexplored region of the Moon, it's South Polar.

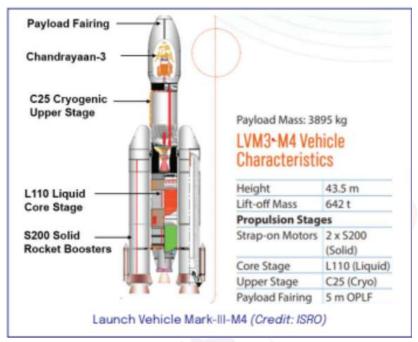


Figure: Chandrayan-3 Source: Science reporter

Looking back:

- Charalrayaan- 1 was India's first lunar and highly successful mission. It was launched by PSLV-I I in 2008 and was operational till 29 August 2009. It discovered traces of water on the Moon, a path-breaking discovery in space science.
- The second mission to the Moon, Chandrayaan-2 was launched on board GSLV Mk III on 22 July 2019.

Chandrayaan 3:

- Chandrayaan 3 is a follow-on mission to Chandrayaan.2 to demonstrate capability in safe landing and roving on the lunar surface. LVM III M4 was used for lifting off Chandrayaan-3. The total cost of the Chandrayaan 3 mission is over 615 crore rupees.
- Objectives:
 - o Safe, soft and precise landing of the lander on the lunar South Pole
 - To demonstrate the rover operations on the Monn surface
 - o To carry out scientific experiments on the lunar soil

Chandrayaan 2 Vs Chandrayaan 3:

The following are some of the major modifications in Chandrayaan-3 over Chandrayaan-2:

- 1. Reinforcement in Landing Leg Mechanism to withstand higher landing touchdown velocity from 2 m/s to 3 m/s.
- 2. Fuel margins on the Lander are increased to handle unplanned mission profiles, if any.
- 3. Laser Doppler Velocimeter (LDV) is added to provide crucial information about the terrain. LDV will measure the velocity and distance of the Lander from the lunar surface during descent.
- 4. Software upgrade to handle failures such as engine and thrust disruptions, and sensor failures.
- 5. Central engine from the Lander is removed for better operational efficiency.
- 6. Solar panel area on Lander is increased for higher power generation.
- 7. Increased battery capacity to mitigate weaker solar power generation.
- 8. Three additional TTC antennas are incorporated to provide higher data rate and improved redundancy.
- 9. Two Lander Hazard Detection and Avoidance Cameras (LHDAC) and Processing Algorithms are compared to one in Chandrayaan-2.



The Spacecraft: Chandrayaan-3

Chandrayaan-3 consists of two Modules — Propulsion and Lander (Lander + Rover). After landing, the Rover will roll
out to the Moon's surface.

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- Propulsion Module (PM): The PM will be used as a relay satellite; it will remain in lunar orbit to enable communications
 with Earth.
 - The main function of PM is to carry the Lander Module (Lander + Rover configuration) from launch injection to 100 km circular polar Lunar orbit.
 - The reflected light would enable us to probe a variety of Exo-planets
- Lander-Vikram Module: The Lander is box-shaped with four landing legs.
 - It is responsible for the precise soft landing on the lunar surface.

Scientific payloads on Lander-Vikram Module:

- Radio Anatomy of Moon Bound Hypersensitive Ionosphere and Atmosphere (RAMBHA): RAMBHA will measure the near surface plasma (ions and electrons) density and its variation with time.
- Chandra's Surface Thermo-Physical Experiment (CHaSTE): ChaSTE consists of a thermal probe with sensors and a heater and measures the vertical temperature gradient and thermal conductivity into the lunar regolith.
- Instrument for Lunar Seismic Activity (ILSA): Its primary objective is to characterise the seismicity around the landing site.
- Laser Retroreflector Array (LRA): It is employed as a passive experiment to understand the dynamics of Earth's Moon system.

Rover-Pragyan:

• The Rover Pragyan is a mobile laboratory that will traverse the lunar surface, collect samples, and analyse the geological and chemical composition of the Moon.

Rover has two scientific instruments to determine the abundance of elements near the landing site:

- Laser-Induced Breakdown Spectroscope (LIBS): Its prime objective is to identify and determine the abundance of elements near the landing site.
- Alpha Particle X-ray Spectrometer (APXS): APXS will determine the elemental composition of the Moon's surface near the landing site by X-ray fluorescence spectroscopy.

Conclusion: The successful landing of Chandrayaan-3 Lander would make India only the fourth nation to accomplish landing and roving on the Moon's surface after Russia, the United States and China. Further, India is poised to reach the harshest but more resourceful south pole terrain of the Moon that no one has ever been able to succeed.

2. Plants That Cheat Animals

Introduction: The Botanists James Wandersee and Elisabeth Schussler coined the term "plant blindness' which means we tend to underappreciated the flora around us. Plants have a high capacity to adapt to weather changes, invading predators, and pests. Even though most plants remain fixed to the ground, they use the help of abiotic (wind, water) or biotic (animals) agents to pollinate their flowers and disperse their seeds to distant locations.

According to Penny Sarchet of New Scientist, plants use cheating as an effective pollination strategy where the animals are either deceived or do not receive any benefits.

Some interesting adaptations of plants:

 Goose grass and Enchanter's nightshade: They have seeds with spines or hooks that attach to the furry coats of animals, which helps distribute the seeds.



Figure: Goosegrass
Source: illinoiswildflowers.info

 Bee orchid (Ophrys apifera): The flower of the bee orchid (Ophrys apifera) bears a remarkable resemblance to a furry female bee. This attracts male bees and other bee species to the flower, resulting in pollination.



The bee orchid Ophrys apifera

Figure: Bee orchid Source: Science reporter

- Fly Orchid (Ophrys insectifera): They secrete allomones that attract male digger wasps, which helps with pollination.
- Moth orchids (Phalaenopsis): It is native to Indian and Southeast Asian countries. These orchids resemble a cluster
 of flying moths, which attracts real moths and pollen gets attached to them, which they inadvertently transfer to other
 areas.



Phalaenopsis philippines

Figure: Moth orchids (Phalaenopsis)
Source: Science reporter

• Hammer orchids: They have flowers that look and smell like female wasps and are pollinated by the thynnid wasp.



The hammer orchid Male thynnid wasp

Figure: Hammer orchid and Male thynnid wasp Source: Science reporter



- Tongue orchid (Bulbophyllum fletcherianum): They produce an overpowering aroma which attracts blowflies and carrion beetles that aid in pollination.
- Wood violet (Viola odorata): They have a mutualistic relationship with ants (myrmecochory) for the dispersal of their seeds. The seeds have lipid-rich appendages called elaiosomes, and ants harvest these elaiosomes and deposit the seeds underground in the midden. This enhances the germination potential of the seeds.



Ants feeding on an elaiosome-bearing seed

Figure: Elaiosome bearing seed Source: Science reporter

• **Pentadiplandra brazzeana:** Found in west central tropical Africa, the berries have a tiny amount of an intensely sweet-tasting protein, brazzein. Primates are attracted to the berries which help in the dispersal of seed.



Pentadiplandra brazzeana berries

Figure: Pentadiplandra brazzeana

Ceratocaryum argenteum: A South African grass species, shows an interesting adaptation called "fecal mimicry."
 The seeds of the grass resemble the droppings of antelopes and emit volatile chemicals. Dung beetles mistake the seeds for balls of dung, roll them away, and bury them. This helps in the germination of the seeds.



A dung beetle rolling the dung-like seed for burial

Figure: seeds of Ceratocaryum argenteum rolled by dung beetle

Conclusion: There are a class of carnivorous plants, such as Nepenthes and Drosophyllum, that have the ability to kill, digest, and assimilate insects and even small rodents. They trick the insects and turn them into their meals.



3. Biocomposites to Ensure Environmental Sustainability

Introduction: Composites are materials formed by combining dissimilar materials to form a novel material with superior properties compared to its constituent parts. This article covers composites, especially biocomposites, their composition, distinction from bioplastics, advantages over traditional composites, challenges, and applications across industries.

Composite Materials:

- Composite materials combine different materials for superior properties. For example, fiberglass.
- Composite materials have heterogeneous structures with varied compositions. This aids their application in aerospace, biomedical, automotive engineering, etc.
- Key advantages: high strength-to-weight ratio, fatigue resistance, corrosion resistance, impact resistance.

Biocomposites:

- Biocomposites as sustainable alternatives to traditional composites.
- Composition: natural fibers (reinforcement) + biopolymer matrix.
- Advantages: biodegradability, renewability, reduced environmental impact.
- Enhanced properties: lightweight, strength, stiffness.

Difference Between Bioplastics and Biocomposites

	Bioplastics	Biocomposites
About	Bioplastics are plastics made from renewable biomass sources like vegetable fats and oils, and cornstarch.	Biocomposites are materials combining natural fibers (reinforcement) with biopolymer matrices. Examples: bio-fibre,
Composition	Primarily consists of polymers derived from biomass, often mixed with additives.	Natural fibers serve as reinforcement while biopolymers act as the matrix.
Environmental Impact	While sourced from renewable materials, the manufacturing process can still produce emissions.	Aim to replace traditional materials in a range of applications.
Sustainability Focus	Bioplastics emphasize plastic waste reduction and substitution.	Biocomposites emphasize material enhancement and sustainable solutions for various industries.

Popular Types of Biocomposites

- Wood-Plastic Composites (WPCs): Blend wood fibers with thermoplastics for durable construction, decking, and furniture
- Natural Fiber Composites (NFCs): Combine plant fibers with resins for eco-friendly automotive, packaging, and construction materials.
- Biodegradable Polymer Composites: Pair biodegradable polymers with natural fibers for compostable, low-carbon-footprint packaging alternatives.
- **Biocomposites for Biomedical Applications:** Merge natural fibers with biodegradable polymers for tissue engineering, drug delivery, and wound healing.

Applications of Biocomposite Materials

- Data Storage: Cellulose-based biocomposites for eco-friendly data storage substrates, leveraging cellulose's abundance
- **Natural Biomaterials:** Many living organisms use natural biocomposites to construct structural elements. For instance, vertebrate bones consist of collagen fibers, providing strength and flexibility.
- **Enhanced Properties:** Hybrid biocomposites overcome limitations, offering tailored improvements in moisture resistance and strength.

Advantages of Biocomposites over Traditional Composites

- **Biodegradability:** Biocomposites stand out due to their ability to naturally decompose without causing harm, offering a clear advantage over conventional composites.
- Reduced Environmental Impact: Biocomposites contribute to a smaller carbon footprint and less harm to the environment.
- Lightweight Strength: Biocomposites excel in providing both strength and lightness.
- Customizability: Biocomposites have the ability to be customized to meet specific design and performance needs.



Challenges to Biocomposites

- Scarce Natural Fiber Supply: Acquiring ample natural fibers for biocomposites presents supply challenges.
- Higher Production Costs: Biocomposites' creation can exceed the costs of traditional materials due to fiber expense.
- Complex Disposal: Biocomposites need specific disposal conditions and improper disposal risks environmental consequences
- **Mechanical Limits:** Biocomposites may possess inferior mechanical properties, constraining specific applications.
- Testing Method Absence: Biocomposites lack standardized tests, hindering property and performance comparison.

Conclusion: Biocomposite manufacturing offers innovative solutions aligned with engineering and environmental needs. It bridges the gap between enhanced performance and eco-consciousness, promising a greener future.



DOWN TO EARTH AUGUST 2023

Futile deadlines

Introduction: Yet another project conceptualised to safeguard the Ganga is over without even nearing its target. A Right To Information (RTI)-based investigation finds that the first phase (2016-21) of the afforestation drive along the banks of the Ganga is over after managing to plant trees only in a little over 22 per cent of the target area.



Figure: Afforestation on banks of Ganga Source: The Print

Afforestation along the banks of the Ganga:

- The trajectory of the Himalayan rivers keeps changing. The Ganga, too, has shifted northward, which requires forestry to be done in the vacant catchment area, as per **National Mission for Clean Ganga (NMCG)**.
- Forests have the ability to hold water and release it slowly into rivers—an important component of ensuring uninterrupted flow in rivers and improving the overall hydrological cycle.

Project report for an afforestation drive along the Ganga:

- The Forest Research Institute (FRI), Dehradun prepared a detailed project report for an afforestation drive along the Ganga.
- It said that **afforestation was to be done on a stretch of 2,500 km** along the banks of the Ganga and its tributaries, covering five states— Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.
- Besides enhancing groundwater recharge and reducing erosion on both sides of the Ganga, the flow in the rivers was also to be corrected.
- Trees and shrubs were to be planted up to 5 km from both the banks of the mainstream and up to 2 km from the banks of the tributaries, except in the upper hilly region of Uttarakhand and the Sundarbans region of West Bengal.
- The Union government prepared a budget outlay of 2,293.73 crore rupees for the first phase of the drive, in 2016.
- The state forest departments were asked to carry out the afforestation.

Status and State wise performance:

- In 2023, an RTI query on the status of the project says that afforestation has been done **only 22.4 percent** between 2016-17 and 2021-22 at an expenditure of 347 crore rupees in the five states.
- Uttarakhand, which had the most area for forestation, has not completed even 10 per cent of the work.
- Similarly, **Bihar** completed work on only 7,000 ha against the target of 27,667 ha, and this area also includes other plantation work done by the state government.
- Jharkhand's share was the smallest, 1,939 ha, which was carried out in Sahibganj district.

Land Acquisition:

- Experts raise questions about the Ganga catchment area really being available for afforestation.
- According to a January 2015 order by the National Green Tribunal, the Delhi Development Authority has only 1,452 ha of the 9,700 ha Yamuna floodplain. The rest is under agriculture, on lease or encroached.
- There is no reason the same is not the case with Ganga, and the question was raised at the time the afforestation project was planned.
- Most farmland and private lands are along riverbanks, and, therefore, it was decided that the drive would be undertaken with the consent of farmers.



Conclusion:

It is the government's responsibility to acquire land for afforestation as it does for developmental works. Courts have passed orders for removing encroachments from floodplains, but governments carry them out halfheartedly.

2. Cementing Possibilities

Introduction: Cement is the second most used material after water and the second largest industrial emitter of carbon dioxide. Decarbonising the cement manufacturing sector is a priority target for meeting India's climate commitments.

Why decarbonising the cement sector is crucial?

- Second largest industrial emitter: According to the International Energy Agency (IEA), the cement sector is the second largest industrial contributor to carbon dioxide emissions globally, accounting for approximately 7% of the total emission.
- Addressing Climate Change: To achieve the targets of limiting global temperature rise to 1.5°C above the preindustrial levels.
- **Net-Zero Emissions by 2050:** As per the IEA, the global cement industry must annually reduce its CO2 emissions by 3% until 2030 to achieve the net-zero emissions target.
- Multiple sources of emission: Cement manufacturing causes carbon dioxide emissions during both calcination and combustion of fossil fuels like coal. Switching to low-carbon fuel or renewable energy alone is insufficient for fully decarbonising the cement sector.

Why decarbonising the cement sector is crucial for India?

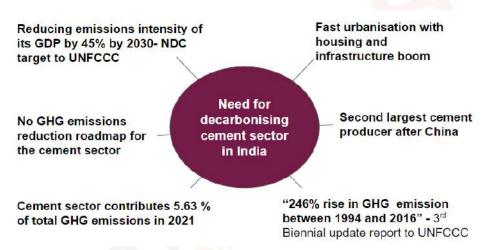


Figure: Need for decarbonising cement sector in India

Methods for making cement manufacturing cleaner:

- Substituting the limestone with alternative raw materials, such as fly ash, slag, or recycled materials, can reduce greenhouse gas emissions during the calcination process.
- Cement manufacturing companies can sign net-zero emission pledges to voluntarily reduce emissions by adopting science-based targets.
- The Centre for Science and Environment has suggested a three-pronged strategy for accelerated low-carbon pathways for the cement sector:
 - o Increase the share of blended cement production from the current 73 % to 90 %.
 - Increase the share of recycled materials in production: Increase the upper limit of the amount of fly ash (to 45%) and slag (75%) in cement production.
 - **Increase the use of non-fossil fuels:** Substituting 50% of the overall fuel requirement with alternative fuels like refuse-derived fuel (RDF), industrial waste and biomass by 2030.



Figure: Types of cement produced in India Source: Down to Earth

Way Forward:

- The cement sector is a "hard-to-abate" industrial sector, which means that it is difficult to reduce emissions without significantly changing the way the sector operates.
- Carbon capture, utilisation and storage (CCUS) should be made mandatory for large cement factories to control
 emissions.
- International cooperation: To accelerate the transition towards cleaner production access to technology and adequate financing is needed from developed countries.
- Policy interventions: Short-term and long-term emission reduction targets should be set and a clear decarbonisation
 pathway should be put out by the government to meet these targets.

Conclusion: With the Indian economy booming at exponential rates, the requirement for cement manufacturing is also set to grow. This makes India a crucial player in curbing greenhouse gas emissions from hard-to-abate sectors globally. Given the challenges of climate change and the existential threat it poses, we must move beyond the ordinary to the extraordinary to overcome the challenges faced by the hard-to-abate sectors.

3. Forests up for grabs?

Introduction: India's Forest Conservation Act has undergone amendment recently, raising concerns about the impact on forest conservation efforts. This article explores the changes that have sparked debate and their potential implications for biodiversity hotspots and forest resources.

Forest Conservation Act (1980):

- Enacted in 1980 to regulate non-forest activities on forestland.
- Aimed at balancing development and environmental conservation.
- Its primary objective was to protect forests by ensuring that forestlands were not diverted for non-forest activities.
- Since its inception, it has gone through eight amendments.

Godavarman verdict:

 The 1996 Godavarman Thirumulpad v Union of India case expanded the Act's reach to areas not explicitly designated as forests but recorded as green cover in government records. This widened the Act's application to sacred groves and community forests, bolstering protection.

Recent Amendment:

- On 4th August 2023. Parliament passed a major amendment to the Act, raising concerns among experts.
- The amendment process started with a consultation paper in October 2021, a draft in July 2022, and the amendment bill introduced in Lok Sabha in March 2023.

Changes Brought About by the Recent Amendment:

- Redefined Scope and Name Change:
 - o The Forest Conservation Act was renamed Van (Sanrakshan Evam Samvardhan) Adhiniyam.
 - o Concerns were raised over the exclusion of non-Hindi speakers and the term "samvardhan" for augmentation.
- Narrowing the Definition of Forests:
 - The amendment narrows the scope of the Act by redefining what constitutes a forest.
 - o Prior to the amendment, all areas covered under the dictionary definition of forests were subject to the Act.
 - The amendment limits applicability to lands recorded as forests on or after October 25, 1980.



Easing Exemptions and Development Activities:

- Development activities are allowed in existing forests.
- Exemptions from forest clearances for security-related infrastructure projects near international borders.
- Concerns raised by border states and experts about the increased vulnerability of biodiversity-rich areas.

Implications for Conservation and Biodiversity:

- The narrowing of forest definition raises concerns about the conservation of sacred groves and community forests
- Analysis of biodiversity hotspots shows increased vulnerability due to the amendment.

Impact on Indigenous and Forest-Dwelling Communities:

- Forest Rights Act, 2006, mandated consent of gram sabhas for environmental clearances in recognized forestlands.
- The amendment might compromise the rights of indigenous communities.
- Uncertainty surrounding the application of Article 371 A in Nagaland for protecting customary practices and land ownership.

Contradiction with Carbon Goals:

- o The amendment introduces goals related to carbon sink creation and net-zero emissions by 2070.
- o Experts criticize the amendment's provisions for undermining in-situ conservation and biodiversity protection.

Way Forward:

- **Balanced Approach:** Promote development while safeguarding forests and indigenous rights through a balanced approach.
- Scientific Approach: Base decisions on research to ensure sustainable forest management.
- Strengthen Safeguards: Ensure strict measures to protect forest integrity during development projects.
- Public Discourse: Encourage open discussions to include diverse views on critical amendments.

Conclusion: As the country strives for sustainable development, it is essential to strike a balance between economic growth and ecological preservation. Recognizing the voices of all stakeholders (like environmentalists, experts, and local communities) while framing policies will be crucial in shaping policies that safeguard India's precious forest resources for generations to come.

4. On the precipice

Introduction: A major ocean current system that helps regulate climate and weather patterns around the world may come to a halt this century, much sooner than earlier believed.

• The Atlantic Meridional Overturning Circulation (amoc), which moves warm ocean water from the tropics to the northern Atlantic Ocean basin, could collapse between 2025 and 2095 due to the impact of anthropogenic emissions, says a July 25, 2023 paper by scientists from the University of Copenhagen, Denmark.

What is The Atlantic Meridional Overturning Circulation (AMOC)?

- AMOC is a significant ocean current system that plays a crucial role in regulating climate and weather patterns globally.
- It moves warm ocean water from the tropics to the northern Atlantic Ocean basin, impacting the climate of Europe, North America, and other regions.
- The Atlantic Meridional Overturning Circulation (AMOC) is considered one of the climate tipping elements.
- If AMOC collapses or significantly slows down, it could act as a trigger for larger climate shifts, **affecting regional and global weather patterns, sea levels, and ecosystems.**

Climate Tipping element:

Tipping elements are critical planetary systems impacted by warming and greenhouse gases. If they surpass temperature thresholds, their changes become irreversible, affecting climate and ecology.

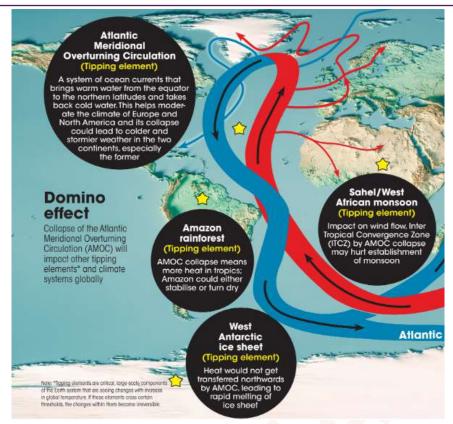


Figure: Tipping element Source: DTE

Slowing Down of AMOC:

- The AMOC transports warm, salty waters from the tropics northward.
- These waters cool, become denser, and sink in the North Atlantic through downwelling or overturning.
- Additional **cold**, **fresh water from melting Arctic ice is integrated into the cooler ocean moving southwards.** This cycle acts as a **heat conveyor belt**, regulating northern warmth and southern cooling.
- However, increased precipitation and rapid Greenland ice sheet melting have added more cold water, reducing salinity and density. This causes the colder layer to expand, the warmer layer to contract, slowing AMOC and driving its potential collapse.
- Recent scientific research suggests that AMOC could collapse sooner than expected, potentially between 2025 and 2095.
- This collapse is attributed to the impact of anthropogenic emissions, primarily greenhouse gases.

Dwelling/overturning refers to the sinking of cooled, denser water in the North Atlantic and its subsequent movement southward, a key process in the Atlantic Meridional Overturning Circulation (AMOC).

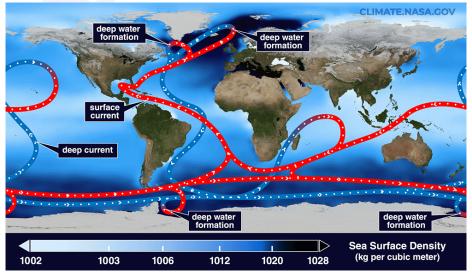


Figure: Sea Surface Density
Source: NASA



Impact of Slowing Down AMOC:

Climate Changes:

- A collapsed AMOC would result in widespread cooling across the northern hemisphere and altered precipitation patterns.
- Regions like Europe, North America, China, and parts of Russia could experience cooling temperatures and reduced rainfall. Europe's climate, which currently benefits from warm water flow, could suddenly shift to a much cooler state due to expanding polar water.
- This could impact agriculture and food production.

Cascading Effects:

- The collapse of AMOC could trigger a **domino effect**, influencing other climate systems globally.
- Excess heat retained in the tropics could impact elements like the Amazon rainforest, West Antarctic ice sheet, and monsoons in various regions.

Amazon Rainforest:

 A collapsed AMOC might lead to less rainfall over the Amazon rainforest, potentially transforming it into a savannah-like environment due to altered hydrological cycles.

• West Antarctic Ice Sheet:

Increased ocean heat in the southern hemisphere could affect the stability and melting of the West Antarctic ice sheet, with potential consequences for sea level rise.

Monsoons:

- The weakening of AMOC could hinder monsoon formation and rainfall patterns in regions like the Sahel,
 South Asia, and India.
- Changes in temperature gradients and atmospheric moisture could impact monsoon circulation.

Conclusion:

In summary, the AMOC, a vital ocean current system, faces the risk of collapsing sooner than expected due to human-induced climate change. Such a collapse could lead to significant disruptions in global climate patterns, affecting regions' temperatures, precipitation, and ecosystems, with potential cascading impacts on other climate systems.

5. ROAD TO CITY COOL

Introduction:

The escalating episodes of scorching heat waves in Indian cities are sounding alarm bells for urban planners and residents alike. With the dual threats of climate change-induced temperature spikes and the ongoing expansion of urban areas, the livability of cities is at stake. Addressing these challenges calls for innovative strategies that transform the urban landscape while promoting sustainability and comfort.

Twin Threats of Urban Heat:

- Climate Adaptation for Big Cities: Large urban centers struggle to acclimatize to changing weather patterns, necessitating significant upgrades to enhance livability.
- 2. **Heat-Resilient Development for Small Cities:** Smaller cities, experiencing explosive growth, must focus on developing heat-resilient infrastructure to prevent exacerbating heat-related issues.

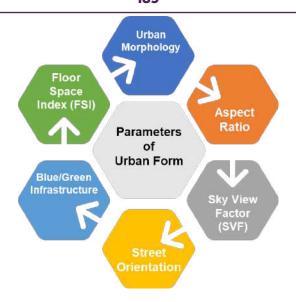
Urban Form: The Crucial Factor:

- Central to addressing both threats is the concept of "urban form," a blend of natural and human-made elements that define a city's physical layout and activity patterns.
- The configuration of buildings, green spaces, water bodies, and roads collectively shapes the urban form, influencing heat resilience and livability.
- In this regard, a study conducted by the Centre for Science and Environment (CSE) in 2022 has unearthed valuable
 insights that offer guidance for battling heat-related challenges.

Parameters of Urban Form

Several parameters intricately contribute to a city's urban form and its potential to combat heat:





Urban Morphology:

- The study identifies **open highrise**, **open midrise**, **and compact midrise morphologies** as more **heat-resilient** due to their **lower land surface temperatures (LST)**.
- Neighborhoods with low rise buildings fare worse, especially those employing heat-trapping roofing materials.
- Aspect Ratio
 - o The relationship between **building height and street width, known as aspect ratio,** affects heat accumulation.
 - A narrower street width reduces heat gain as buildings cast shade on one another.
- Sky View Factor (SVF):
 - The sky view factor, representing the visible sky area from ground level, plays a role in heat trapping.
 - Higher SVF locations, like highways and intersections, experience elevated temperatures due to less shade.
- Blue/Green Infrastructure:
 - Green spaces—trees, grass, and shrubs—positively influence the urban microclimate.
 - Effective vegetation cover, particularly trees with dense foliage, significantly reduces LST.
- Floor Space Index (FSI):
 - High FSI corresponds to higher heat absorption, emphasizing the importance of regulating construction density to mitigate temperature rise.
- Street Orientation: The orientation of streets impacts heat gain, with north-south oriented streets experiencing higher temperatures due to intense east and west sun exposure.

Neighborhood Plan

- The study's findings underscore the significance of implementing urban form-based codes, tailored to each city's unique characteristics.
- Such codes can accommodate contextual cooling solutions that account for diverse urban forms.
- By optimizing zoning regulations, different neighborhoods could prioritize shading walkways, cool roofs, or high vegetation coverage based on their specific requirements.

Conclusion

The roadmap to cooler cities involves a multifaceted approach, **blending scientific insights with strategic urban planning.** It's imperative that cities adopt progressive by-laws and master plans, enabling the integration of key urban form parameters. **The correlation between urban form and heat resilience is undeniable**, with solutions ranging from structural design improvements to enhanced green spaces. As cities heed these lessons, they pave the way for **more livable**, **sustainable**, **and cooler urban environments**.

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Study Material

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