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# Outstanding performance by BYJU'S students in IAS 2021

Congratulations to our toppers

03

Ranks in  
Top 10

12

Ranks in  
Top 25

25

Ranks in  
Top 50



**RANK 01**

Shruti Sharma



**RANK 5**

Utkarsh Dwivedi



**RANK 6**

Yaksh Chaudhary



**RANK 12**

Yasharth Shekhar



**RANK 13**

Priyamvada  
Mhaddalkar



**RANK 14**

Abhinav Jain



**RANK 15**

Challapalle  
Yaswanthkumarreddy



**RANK 16**

Anshu Priya



**RANK 19**

Diksha Joshi



**RANK 20**

Arpit Chauhan



**RANK 21**

Dilip Kainikkara



**RANK 25**

Shruti Rajiakshmi



**RANK 29**

Bhavishya



**RANK 31**

Avinash V



**RANK 33**

Jaspinder Singh



**RANK 35**

Kartikeya Jaiswal



**RANK 37**

V Sanjana Simha



**RANK 40**

Kushal Jain



**RANK 44**

Anjali Shrotriya



**RANK 47**

Naman Kumar  
Singla



**RANK 50**

Abhijit Ray

# Outstanding performance by BYJU'S students in IAS 2020

Congratulations to our toppers

**02**

Ranks in  
Top 10

**18**

Ranks in  
Top 50

**36**

Ranks in  
Top 100



**RANK 02**

Jagrati Awasthi



**RANK 8**

Kartik Jivani



**RANK 13**

Gaurav Budania



**RANK 14**

Karishma Nair



**RANK 17**

Sarthak Agarwal



**RANK 25**

Vaibhav Rawat



**RANK 26**

Pulkit Singh



**RANK 28**

Divya Mishra



**RANK 30**

Divyanshu  
Choudhary



**RANK 31**

Megha Swaroop



**RANK 32**

Rallapalli Jagat Sai



**RANK 35**

Aparna Ramesh



**RANK 37**

Narwade Vinayak



**RANK 38**

Varuna Agarwal



**RANK 41**

Aswathy Jiji



**RANK 42**

Pooja Gupta



**RANK 46**

Jubin Mohapatra



**RANK 50**

Abhishek Shukla

# Incredible Results

## CSE 2019

4 Ranks  
in top 10

13 Ranks  
in top 50

22 Ranks  
in top 100



Rank 3  
Pratibha Verma



Rank 6  
Vishakha Yadav



Rank 8  
Abhishek Saraf



Rank 10  
Sanjita Mohapatra

## CSE 2018

11 Ranks  
in top 50

28 Ranks  
in top 100

183 Ranks  
in the final list



Rank 11  
Pujya Priyadarshni



Rank 16  
Dhodmise Trupti Ankush



Rank 21  
Rahul Jain



Rank 24  
Anuraj Jain



Rank 31  
Mainak Ghosh

## CSE 2017

5 Ranks  
in top 50

34 Ranks  
in top 100

236 Ranks  
in the final list



Rank 3  
Sachin Gupta



Rank 6  
Koya Sree Harsha



Rank 8  
Anubhav Singh



Rank 9  
Soumya Sharma



Rank 10  
Abhishek Surana

## CSE 2016

8 Ranks  
in top 50

18 Ranks  
in top 100

215 Ranks  
in the final list



Rank 2  
Anmol Sher Singh Bedi



Rank 5  
Abhilash Mishra



Rank 12  
Tejaswi Rana



Rank 30  
Prabhash Kumar



Rank 32  
Avdhesh Meena

## CSE 2015

5 Ranks  
in top 50

14 Ranks  
in top 100

162 Ranks  
in the final list



Rank 20  
Vipin Garg



Rank 24  
Khumanthem Diana Devi



Rank 25  
Chandra Mohan Garg



Rank 27  
Pulkit Garg



Rank 47  
Anshul Agarwal

## CSE 2014

6 Ranks  
in top 50

12 Ranks  
in top 100

83 Ranks  
overall selections



Rank 4  
Vandana Rao



Rank 5  
Suharsha Bhagat



Rank 16  
Ananya Das



Rank 23  
Anil Dhameliya



Rank 28  
Kushaal Yadav



Rank 39  
Vivekanand T.S



# TABLE OF CONTENTS

<b>1. POLITY ..... 13-31</b>	<ul style="list-style-type: none"> <li>● SC ruling on divorce</li> <li>● The SC ruling on Sena vs. Sena</li> <li>● SC's Delhi government ruling</li> <li>● Two judgments and the principle of accountability</li> <li>● Securing the migrant vote</li> <li>● Aim to lift AFSPA from Assam by 2023-end: Assam CM</li> <li>● Sedition and its roots in rudeness as an offence</li> <li>● The Telangana- A.P. water dispute</li> <li>● Why do judges recuse themselves?</li> <li>● Supreme Court on default bail</li> <li>● From Master of the Roster to Master of all Judges?</li> <li>● New Parliament Building</li> <li>● Enforcement Directorate (ED)</li> <li>● Central Bureau of Investigation (CBI)</li> <li>● Central Vigilance Commission</li> <li>● CAG voted in as WHO auditor for a second term</li> </ul>
<b>2. ECONOMY ..... 32-57</b>	<ul style="list-style-type: none"> <li>● India Leads 'Laundromat' Countries</li> <li>● WTO panel rules against India in ICT tariff dispute</li> <li>● Gig &amp; Platform workers and the Code on Social Security, 2020</li> <li>● What are the gaps in the AePS transaction model?</li> <li>● Will all overseas spends come under the tax net?</li> <li>● Tripping trade</li> <li>● De-dollarisation: the race to attain the status of global reserve currency</li> <li>● Why are financial regulators transitioning from LIBOR?</li> <li>● National Manufacturing Innovation Survey (NMIS)</li> <li>● NSE launches India's first REIT and InvITs index</li> <li>● What is the stalemate over the U.S. debt ceiling?</li> <li>● The nutritional value of millets</li> <li>● Go First Bankruptcy: Trouble in India's Aviation Sector</li> <li>● It's time to ensure safer skies</li> <li>● Clean energy funds rise, but mostly in China, Europe, U.S.</li> <li>● India's smart electricity future</li> <li>● Kiru hydro-electric power project</li> <li>● Logistic Performance Index 2023</li> <li>● India's First Water Metro</li> </ul>
<b>3. INTERNATIONAL RELATIONS ..... 58-79</b>	<ul style="list-style-type: none"> <li>● Nagorno-Karabakh tensions</li> <li>● Pakistan and China agree to extend CPEC to Afghanistan</li> <li>● China's global image</li> <li>● India's China strategy needs to be debated</li> <li>● SCO Foreign Ministers Meeting</li> <li>● The horizon for India beyond the G-20, SCO summits</li> <li>● PM Modi's visit to Japan &amp; Pacific islands and a long-drawn test for India's diplomatic skills</li> </ul>
	<ul style="list-style-type: none"> <li>● Hiroshima Summit</li> <li>● Indo-Pacific Economic Framework for Prosperity</li> <li>● North-South Transport Corridors (NSTC) - Connecting continents</li> <li>● Arab League readmits Syria after 11-year absence</li> <li>● Washington Declaration of US and South Korea</li> <li>● The shift in the U.S.'s approach to China</li> <li>● The 'right to health' goal and a role for Taiwan</li> <li>● The latest China-Canada kerfuffle</li> <li>● India, U.S. to hike technology cooperation</li> <li>● Ekatha Harbour</li> <li>● Yangon Port</li> <li>● Proud Boys</li> <li>● Uzbekistan's referendum to rewrite the constitution</li> <li>● Iraq unveils \$17-bn project linking Europe, West Asia</li> </ul>
<b>4. ART AND CULTURE ..... 80-84</b>	<ul style="list-style-type: none"> <li>● Using Buddhism as a tool of soft power</li> <li>● Santiniketan may be added to World Heritage List</li> <li>● Cham Lama</li> <li>● Kheer Bhawani mela</li> <li>● Trimbakeshwar Temple</li> <li>● 'Sufiyana Mausiki' &amp; 'Tchakri' folk songs</li> <li>● Kerala Souvenir Network</li> </ul>
<b>5. SCIENCE AND TECHNOLOGY ..... 85-107</b>	<ul style="list-style-type: none"> <li>● A ground view of the Indian Space Policy</li> <li>● India's National Quantum Mission</li> <li>● India as a Quad-led biomanufacturing hub</li> <li>● Solar maximum</li> <li>● Will AI tools help detect telecom fraud?</li> <li>● The EU's Artificial Intelligence Act</li> <li>● Explaining mitochondrial donation treatment: how a baby has three parents</li> <li>● On copyright infringement and AI</li> <li>● National Technology Day</li> <li>● India's Supercomputers</li> <li>● India's GSLV launches NVS-01 NavIC satellite</li> <li>● START Programme</li> <li>● New Jupiter-size exoplanet discovered</li> <li>● Tiangong space station</li> <li>● Monkeypox</li> <li>● FDA approves first vaccine for respiratory syncytial virus</li> <li>● Human pangenome map</li> <li>● Comb-jellies and their nervous system</li> <li>● Foucault pendulum swing</li> </ul>

<b>6. DEFENCE AND INTERNAL SECURITY ..... 108-120</b>	<b>11. EDUCATION ..... 159-162</b>
<ul style="list-style-type: none"> <li>● Manipur Issues</li> <li>● Minimising the threat from IEDs</li> <li>● Correlation between CCTV Cameras and crime</li> <li>● Safe City Project</li> <li>● Unified Security Force for all airports</li> <li>● Operation Kaveri: The world of special operations</li> <li>● Ajeya Warrior Exercise</li> <li>● ASEAN India Maritime Exercise</li> <li>● Operation Samudragupt</li> <li>● Defence Ministry's iDEX reaches milestone</li> <li>● Storm Shadow Missiles</li> <li>● Operation Dhvast</li> <li>● INS Sindhuratna</li> <li>● Automation projects by Army</li> </ul>	<ul style="list-style-type: none"> <li>● Poshan bhi, Padhai bhi</li> <li>● One in seven Indian primary schools run by a lone teacher</li> <li>● The lack of teachers in higher education</li> <li>● PARAKH</li> </ul>
<b>7. ENVIRONMENT AND ECOLOGY ..... 121-137</b>	<b>12. GOVERNANCE ..... 163-165</b>
<ul style="list-style-type: none"> <li>● Green deposits</li> <li>● India, its SDG pledge goal, and the strategy to apply</li> <li>● Tracking SDG progress the Bhopal way</li> <li>● Arsenic contamination</li> <li>● India-EU: Carbon Border Adjustment Mechanism</li> <li>● World Meteorological Organisation's Warning on global warming</li> <li>● Thawing Permafrost in Arctic</li> <li>● Gujarat: India's green hydrogen hub</li> <li>● The protests against the refinery project in Maharashtra</li> <li>● Why are cheetah cubs dying in Kuno reserve?</li> <li>● Central Asian Flyway</li> <li>● Study on butterflies' migration opens door for conservation</li> </ul>	<ul style="list-style-type: none"> <li>● Govt likely to ban sugar exports</li> <li>● Model Prisons Act</li> <li>● World Press Freedom Index 2023</li> </ul>
<b>8. HEALTH ISSUES ..... 138-148</b>	<b>13. DISASTER MANAGEMENT ..... 166-167</b>
<ul style="list-style-type: none"> <li>● National Medical Devices Policy 2023</li> <li>● National Health Account figures</li> <li>● AYUSH – ICMR collaboration</li> <li>● SAKSHAM- LMIS</li> <li>● UN Report on Maternal and Infant Health</li> <li>● Covid 19- is no longer an emergency</li> <li>● The lack of a drug recall law in India</li> <li>● Why spurious liquor kills</li> <li>● Palliative care model from Kerala</li> <li>● WHO's guideline on non-sugar sweeteners</li> </ul>	<ul style="list-style-type: none"> <li>● Groundwater exploitation and Land Subsidence</li> </ul>
<b>9. HISTORY ..... 149-152</b>	<b>14. GEOGRAPHY ..... 168-172</b>
<ul style="list-style-type: none"> <li>● Shilabhatarika</li> <li>● Sengol Sceptre</li> <li>● Excavations at Purana Qila</li> </ul>	<ul style="list-style-type: none"> <li>● India's first national water-body census</li> <li>● Recent rain likely to expand cotton farming in the north</li> <li>● Lake Kivu and African Great Lakes</li> <li>● Cyclone Mocha</li> </ul>
<b>10. SOCIAL JUSTICE ..... 153-158</b>	<b>15. INDIAN SOCIETY &amp; SOCIAL ISSUES ..... 173-175</b>
<ul style="list-style-type: none"> <li>● Prevention of Sexual Harassment at Workplace Act (PoSH Act)</li> <li>● Mahila Samman Saving Certificate Account</li> <li>● Eight Years of Jan Suraksha Schemes</li> <li>● Welfare spending has been getting a regular pruning</li> <li>● The erosion of hard-won labour rights</li> </ul>	<ul style="list-style-type: none"> <li>● Women Entrepreneurship in MSME Sector</li> <li>● Countering false narratives and propaganda</li> </ul>
	<b>16. MISCELLANEOUS ..... 176-178</b>
	<ul style="list-style-type: none"> <li>● Palme d'Or and Cannes Film Festival</li> <li>● 10 Indian languages to get technical-term dictionaries</li> <li>● Study on sludge finds high potential for use as fertilizer after treatment</li> <li>● One-stop centres for zero waste to be launched in cities</li> <li>● Police stations in Visakhapatnam likely to get e-Malkhana facility</li> <li>● Golden Globe Race</li> </ul>
	<b>17. YOJANA MAY 2023 - TECHADE ..... 179-187</b>
	<ul style="list-style-type: none"> <li>● Innovation in Space Technology</li> <li>● Startups-Revolutionising India's growth story</li> <li>● Potential of India's Edtech sector</li> <li>● Leveraging technology for transforming healthcare</li> <li>● Quantum Computing-Transforming Technology</li> <li>● AI Chatbots-Future and Challenges</li> <li>● 5G Cyber Security Challenges</li> <li>● Digital Publishing- Expanding the horizon</li> <li>● Use of Technology in Urban Planning</li> </ul>

**18. KURUKSHETRA MAY 2023 - RURAL CRAFTS .....  
..... 188-194**

- Potential of Rural Crafts
- Rural Crafts through Ritualistic and Indigenous Traditions
- Betting Big on Bamboo
- J&K Changing Dynamics of Handicrafts Sector
- Rural Crafts for Livelihood
- Fostering Rural Crafts through One District One Product
- Promotion and Development of Handloom and Handicraft Sector

**19. SCIENCE REPORTER - MAY 2023 ..... 195-201**

- Train Ticket to Tomorrow
- Killer Kitchens: Deleterious Impacts of Biomass Fuels
- Lithium: White Gold of Energy Storage
- Tardigrades

**20. DOWN TO EARTH - MAY 2023 ..... 202-209**

- A silent crisis
- Potent Emitter
- Rise of Fungus
- Will the Aral Sea ever come back?
- Homeless Hilsa
- Are we there yet?

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February (05, 06, 12, 13, 19, 20, 26 & 27) + March (05, 06 & 12)	Polity				
March (13, 19, 20, 26 & 27) + April (02, 03, 09, 10, 16 & 17)	Economics	Economics			
April (23, 24 & 30) + May (01, 07, 08, 14, 15, 21, 22 & 28)	Modern History + Post Independent	Modern History + Post Independent	Modern History + Post Independent		
May (29) + June (04, 05, 11, 12, 18, 19, 25 & 26) + July (02 & 03)	Geography	Geography	Geography	Geography	
July (10, 16, 17, 23, 24, 30 & 31) + August (06, 07, 13 & 14)	Ancient India + Medieval India + Art & Culture	Polity	Polity	Polity	Polity
August (20, 21, 27 & 28) + September (03, 04, 10, 11, 17, 18 & 24)	International Relations + World History	International Relations + World History	Economics	Economics	Economics
September (25) + October (01, 02, 08, 09, 15, 16, 22, 23, 29 & 30)	Environment & Ecology + Science & Technology + Disaster Management	Environment & Ecology + Science & Technology + Disaster Management	Environment & Ecology + Science & Technology + Disaster Management	Modern History + Post Independent	Modern History + Post Independent
November (05, 06, 12, 13, 19, 20, 26, 27) + December (03, 04 & 10)	Social Issues & Social Justice + Essay + Compulsory Language Paper	Social Issues & Social Justice + Essay + Compulsory Language Paper	Social Issues & Social Justice + Essay + Compulsory Language Paper	Social Issues & Social Justice + Essay + Compulsory Language Paper	Geography
December (11, 17, 18, 24 & 31) + January '23 (07, 08, 14, 15, 21 & 22)	Ethics + Governance	Internal Security + CSAT	Internal Security + CSAT	Internal Security + CSAT	Internal Security + CSAT
January '23 (28 & 29) + February '23 (04, 05, 11, 12, 18, 19, 25 & 26) + March '23 (04)	Internal Security + CSAT	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture
March '23 (05, 11, 12, 18, 19, 25 & 26) + April '23 (01, 02, 08 & 09)	Focus Prelims	Focus Prelims	International Relations + World History	International Relations + World History	International Relations + World History
April '23 (15, 16, 23, 29 & 30) + May '23 (06, 07, 13, 14, 20 & 21)		Focus Prelims	Focus Prelims	Environment & Ecology + Science & Technology + Disaster Management	Environment & Ecology + Science & Technology + Disaster Management
May '23 (27 & 28) + June '23 (17, 18, 24 & 25) + July (01, 02, 08, 09 & 15)		Ethics + Governance	Ethics + Governance	Ethics + Governance	Ethics + Governance
31st May to 11th June, 2023	PRELIMS 2023	PRELIMS 2023	PRELIMS 2023	PRELIMS 2023	PRELIMS 2023
July '23 (16, 22, 23, 29 & 30) + Aug '23 (05, 06, 12, 13, 19 & 20)					Social Issues & Social Justice + Essay + Compulsory Language Paper
1st September to 30th September, 2023	MAIN 2023	MAIN 2023	MAIN 2023	MAIN 2023	MAIN 2023

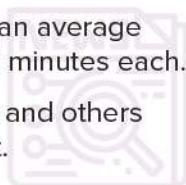


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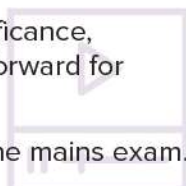
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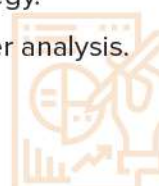
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# POLITY

## 1. SC ruling on divorce

**Syllabus:** Constitution of India - significant provisions and features

**Prelims:** About Article 142 of the Constitution

**Mains:** Supreme Court's Ruling on Divorce

**Context:** Under Article 142 of the Constitution, a five-judge Constitution Bench of the Supreme Court ruled that it might directly award divorce to spouses who have irretrievably broken up their marriage.

### What is the Supreme Court's Ruling?

- The Supreme Court held in *Shilpa Sailesh vs. Varun Sreenivasan* that it has the authority to dissolve a marriage if it is irretrievably broken down.
- Even if one of the parties is unwilling, the court can suspend the statutory six-month waiting time for divorce under the Hindu Marriage Act (HMA), 1955, and enable the marriage to be dissolved on the grounds of irretrievable collapse.
- To view dissolution of marriage as the correct answer and the only way ahead, the court must be entirely convinced and satisfied that marriage is "totally unworkable, emotionally dead, and beyond salvation."
- The court laid down the following factors to determine irretrievable breakdown of marriage:
  - The period of time that the parties had cohabited after marriage;
  - When the parties had last cohabited;
  - Nature of allegations made by the parties against each other and their family members;
  - Orders passed in the legal proceedings from time to time;
  - Cumulative impact on the personal relationship;
  - Whether, and how many attempts were made to settle the disputes by a court or through mediation, and when the last attempt was made.

### What is the current procedure for divorce under the Hindu Marriage Act?

- The Hindu Marriage Act of 1955 establishes divorce laws that apply to Hindus, Buddhists, Jains, and Sikhs.
- Section 13B of the Act allows for divorce with mutual consent.
- **Filing** - Both parties to the marriage must jointly submit a petition with the district court claiming that they have been living apart for a year or more and have mutually consented to divorce.
- The parties must file a second motion with the court between 6 and 18 months after the initial petition is filed.
- **Six-month waiting period** - The six-month waiting period is meant to allow the parties time to retract their plea.
- **Condition for mutual divorce** - A petition for mutual divorce can be filed only after a year of marriage.
- The petition can be moved sooner under Section 14 of the HMA if there is "exceptional hardship to the petitioner or exceptional depravity on the part of the respondent."
- A waiver of the six-month waiting time under Section 13B (2) can be requested in a family court exemption application.

### Why do we need direct decree of divorce under Article 142?

- Obtaining a divorce decree can be a time-consuming and lengthy process.
- A substantial number of comparable cases are currently ongoing in family courts.
- It underlined the importance of weighing the issues in light of the parties' economic and social standing.
- It takes into account the parties' dependents, if they have children, their age, and whether the spouse and children are dependents.

### How does SC grant decree of divorce under Article 142?

- The decision to grant divorce under Article 142(1) should be based on fundamental general and special public policy factors.
- **Fundamental general public policy** - Fundamental rights, secularism, federalism, and other fundamental constitutional elements.
- **Specific public policy** - Defined by the court as an express pre-eminent restriction in any substantive legislation, as opposed to stipulations and obligations to a specific legislative framework.

**What is Article 142 of the Constitution?**

- Article 142 of the Constitution, titled 'Enforcement of Supreme Court decisions and orders and orders as to discovery, etc.,' contains two clauses: Article 142 (1) and Article 142 (2).
- According to Article 142(1), the Supreme Court may pass such a decree or make such order as is required for doing complete justice in any cause or matter standing before it.
- Any such decree or order shall be enforceable across the territory of India in the manner stipulated by or under any law established by Parliament.
- Until Parliament makes such provision, it shall be enforceable in the manner prescribed by the President by order.
- The scope and extent of Article 142 have been defined by the Supreme Court in various decisions.
- Case of Prem Chand Garg (1962) - In order to provide complete justice, the fundamental rights and substantive provisions of the relevant statute laws must be respected.

**2. The SC ruling on Sena vs. Sena**

**Syllabus:** State legislatures—structure, functioning, conduct of business, powers & privileges and issues arising out of these.

**Prelims:** About Anti-Defection Law and Whip in India

**Mains:** Key highlights of the Supreme Court's judgement in the Sena v/s Sena Case

**Context:** The Supreme Court of India recently delivered its judgment in the Sena v/s Sena Case.

**Background:**

- In 2022, the Maha Vikas Aghadi (MVA) government in Maharashtra, consisting of Shiv Sena (led by Uddhav Thackeray), NCP, and Congress was toppled and replaced by another government, consisting of a faction of the Shiv Sena, BJP and other Independent MLAs.
- Eknath Shinde, who was the leader of the breakaway Sena faction, became Chief Minister of Maharashtra.
- Later, a petition was filed by Mr. Shinde after notices were issued by the then Deputy Speaker of the Maharashtra Assembly against 40 rebel MLAs under the 10th Schedule of the Constitution (Anti-Defection Law).
- Furthermore, petitions were also filed by the actual Shiv Sena group that challenged the decision of the then Maharashtra Governor to call for a trust vote and the swearing-in of a new Chief Minister. The election of the new Speaker was also contested.
- A Constitution Bench of the Supreme Court led by the Chief Justice of India (CJI) gave its judgement after hearing the petitions and arguments made by both parties.

**Supreme Court's Ruling**

- In a unanimous judgment, the Constitution Bench of the SC said that the then Maharashtra Governor's call for a trust vote, which resulted in the resignation of the MVA government, was "illegal".
- The bench pointed out that the Governor was "not justified" in calling the then Chief Minister to prove his majority on the floor of the House.
  - This is because the Governor did not have any reasons based on objective material before him, to reach a conclusion that Uddhav Thackeray had lost the trust of the House.
- However, the apex court said that "status quo ante cannot be restored" i.e. it could not reinstate Uddhav Thackeray as the Chief Minister, as he had resigned voluntarily instead of facing the floor test.
- On the questions over whose Whip is binding, i.e. the Whip appointed by the political party or the Whip acting on behalf of the legislature party, the apex court noted:
  - If a Whip appointed by a legislature party is considered binding then it would sever the figurative umbilical cord which connects a member of the House to the political party.
  - The court also held that the directions to vote in a specific manner or abstain from it are issued by the political party, and not the legislature party.
- Further, the court said that both the Whip and the Leader of the party are to be appointed only by the political party and regarded the Speaker's action of approving Eknath Shinde as the leader of Shiv Sena in the House as "contrary to law".



**Supreme Court's views on Anti-Defection Law (10th Schedule)**

- The Speaker is the authority to adjudicate petitions for disqualification under the 10th Schedule of the Constitution.
- The Supreme Court has stated that it cannot ordinarily adjudicate petitions for disqualification under the 10th Schedule.
  - The court also noted that there are no extraordinary circumstances in this case that require the exercise of jurisdiction by the Court to adjudicate disqualification petitions.
- The Court, however, said that the Speaker must decide disqualification petitions within a reasonable period."
- Additionally, the Court noted that a member has the right to participate in the proceedings of the House regardless of the pendency of any petitions for their disqualification.
- Further, the court also said that "the validity of the proceedings of the House in the interregnum (the period between a regime change) is not 'subject to' the outcome of the disqualification petitions."

**Nut graf:** The apex court in its ruling in Maharashtra's Sena vs Sena case has held that the then Maharashtra Governor's decision to call for a floor test that toppled the MVA government was not in accordance with the law. However, the court also said that the status quo ante cannot be restored as the former Chief Minister resigned the post voluntarily without facing a floor test.

**3. SC's Delhi government ruling**

**Syllabus:** Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure

**Prelims:** About Article 239AA and Lieutenant Governor (LG) of Delhi

**Mains:** The conflict between the government and the Lieutenant Governor (LG) of Delhi.

**Context:** On 11th of May 2023, the Supreme Court said that the National Capital Territory (NCT) of Delhi has legislative and executive power over administrative services in the National Capital, other than the matters relating to public order, police and land.



**Key details**

- The Supreme Court ruled unanimously in favour of the Delhi government on the issue of who controls the bureaucracy in the national capital.
- A Constitution Bench of the Supreme Court headed by the Chief Justice of India held that the Lieutenant-Governor (L-G) can exercise executive power on behalf of the Centre only in the three areas of public order, police and land in Delhi as mentioned in Article 239AA(3)(a).
- The Bench said that the L-G does not have sweeping executive powers over the national capital, and the Centre should be mindful of the unique "asymmetric federal model" of governance adopted for Delhi.
- SC held that the legislature has control over bureaucrats in administration of services, except in areas outside the legislative powers of the National Capital Territory (NCT).
- The court also noted that the sui generis (special status) granted to Delhi should align with "cooperative federalism".

**About Article 239AA:**

- Article 239AA was inserted in the Constitution by the 69th Amendment Act, 1991.
- It conferred Special Status upon Delhi following the recommendations of the S.Balakrishnan Committee that was set up in 1987 to look into Delhi's demands for statehood.
- According to the provisions of the Article, the NCT of Delhi will have an Administrator and a Legislative Assembly.
- As per the provisions of Article 239AA(3)(a) of the Constitution, the Legislative Assembly, "shall have the power to make laws for the whole or any part of the NCT with respect to any of the matters in the State List or Concurrent List in so far as any such matter is applicable to Union territories" except on the subjects of police, public order, and land.

**'DELHI HAS SUI GENERIS STATUS... UNLIKE OTHER UTs'**

<p><b>“</b> Article 239AA... was incorporated in the Constitution... with the aim that the residents of the capital city must have a voice in how they are to be governed. <b>It is the responsibility of the govt of NCTD to give expression to the will of the people of Delhi who elected it.</b> Therefore, the ideal conclusion would be that GNCTD ought to have control over services, subject to exclusion of subjects that are out of its legislative domain</p> <p><b>Legislative and executive power over services such as IAS, or joint cadre services... shall lie with NCTD...</b> Postings within the state cadre as well as joint cadre of a constituent state shall be made by the 'government of that state', that is, by the duly elected government</p> <p>...By virtue of Article 239AA, NCTD is accorded a "sui generis"</p>  <p>LG VK Saxena</p>	<p>status, setting it apart from other UTs... <b>The term 'administration' cannot be understood as the entire administration of GNCTD.</b> Otherwise, the purpose of giving powers to a constitutionally recognised and democratically elected govt would be diluted</p> <p>If the govt is not able to control and hold to account officers posted in its service, <b>its responsibility towards the legislature as well as the public is diluted...</b> If officers stop reporting to ministers or do not abide by their directions, the entire principle of collective responsibility is affected...</p> <p><b>An unaccountable and non-responsive civil service may pose a serious problem of governance in a democracy.</b> It creates a possibility that the permanent executive, consisting of unelected civil service officers... may act in ways that disregard the will of the electorate—SC Bench</p>  <p>CM Arvind Kejriwal</p>
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**Special provisions for Delhi:**

- The 69th Constitutional Amendment Act of 1991 conferred the UT of Delhi with a special status, and redesignated it the National Capital Territory of Delhi and designated the Delhi's administrator as the Lieutenant Governor (LG).
- The Act created a legislative assembly and a council of ministers for Delhi.
- The Assembly is empowered to make laws on all the matters of the State List (except public order, police and land) and the Concurrent List. However, the laws of Parliament prevail over those made by the Delhi Assembly.
- The council of ministers headed by the Delhi Chief Minister assists and advises the LG in the exercise of his or her functions except in the cases the LG has to act in his/her own discretion. If there is a difference of opinion between the ministers and the LG, the latter should refer the matter to the President of the country for a decision and act in accordance with that.
- The LG is authorised to promulgate ordinances during recess of the legislative assembly. An ordinance has the same force as an act of the assembly. Each such ordinance should be approved by the legislative assembly within 6 weeks from its reassembly. The LG may also withdraw an ordinance at any time. But, he or she cannot promulgate an ordinance when the assembly is dissolved or suspended. In addition, no such ordinance can be promulgated or withdrawn without the prior permission of the Indian President.

**4. Two judgments and the principle of accountability**

**Syllabus:** State Legislatures—structure, functioning, conduct of business, powers & privileges and issues arising out of these.

**Mains:** Issues associated with anti-defection law in India

**Context:** Two Constitution Benches of the Supreme Court of India delivered important judgments recently.

**Introduction:**

- In one case, the Supreme Court decided that the Delhi government headed by the Chief Minister — and not the Lieutenant Governor appointed by the central government — will control civil services working for the Delhi government.
- The second case involved the formation of the current government in Maharashtra following the “split” in the Shiv Sena party.

**Contradiction of a core principle:**

- Both the above unanimous judgments authored by the Chief Justice of India have contradictory positions.
- The Maharashtra judgement follows the Tenth Schedule (anti-defection law), which undermines parliamentary democracy.
- The Delhi case involved determining the accountability of civil services to the Delhi cabinet or the Union government.
- The Supreme Court ruled that parliamentary democracy requires a triple chain of command: civil service officers are accountable to Ministers, Ministers are accountable to the legislature, and the legislature is accountable to the electorate.
- The Maharashtra judgement dealt with conflicting whips issued by two factions of the Shiv Sena, and the Court determined the power to issue directions lies with the political party, not the legislature party.
- The Maharashtra judgement reinforces the power of party leadership over the legislature and undermines accountability to the electorate.
- The judgment contradicts the Delhi judgment's principle of daily assessment by the legislature, as party leaders control the votes of their legislators, ensuring the government's victory on every issue.

**Reasons behind this contradictory position:**

- The judges arrived at contradictory conclusions due to different interpretations based on the Constitution and the Tenth Schedule.
- The anti-defection law undermines the democratic principle of accountability between legislators and voters.
  - The law assumes that any vote against party direction is a betrayal of the electoral mandate, which is an incorrect interpretation of representative democracy.
- The Supreme Court has recognized the importance of factors beyond party affiliation in elections, such as candidates' criminal records, assets, liabilities, and educational qualifications.
- Election results in Karnataka and Madhya Pradesh, demonstrate that voters consider individual candidates rather than solely relying on party affiliation.
  - In Karnataka, by-elections were triggered due to the defection of several MLAs in 2019, just months after the general election; 13 of the defectors contested on a different party ticket, and 11 of them were re-elected.
  - Similarly, in Madhya Pradesh, 15 of the 22 MLAs who defected won the ensuing by-elections.
  - The electorate thus endorsed the candidate and not the original party that had won a couple of years earlier.

**Need for a relook:**

- The anti-defection law disrupts the accountability chain in a parliamentary democracy, undermining the core principle of government's accountability to the legislature and legislators' accountability to voters.
- Legislators are compelled to follow party orders, even at the expense of government accountability, leading to a violation of parliamentary democracy's central principle.
- A previous Supreme Court ruling in 1992 upheld the anti-defection law's constitutionality, but a re-evaluation of this issue would require a larger Bench.
- The Maharashtra judgement has referred a question on the Speaker's ability to decide on disqualification petitions while facing a removal notice to a seven-judge Bench.
- The seven-judge Bench should also explore whether the anti-defection law violates the basic structure of the Constitution, aiming to restore government accountability to the people.

**Nut Graf:** The Supreme Court's contradictory judgments on the Delhi government's control over civil services and the formation of the Maharashtra government highlight the conflict between party leadership and accountability to voters. The anti-defection law undermines parliamentary democracy and requires a re-examination by a larger Bench to restore government accountability.

## 5. Securing the migrant vote

**Syllabus:** Elections and Voting Rights.

**Prelims:** Remote Voting Machines.

**Mains:** Migrant Voting.

**Context:** Elections in Karnataka and Migrant Voters.

- Approximately 42.12% of the population of Greater Bengaluru is from different districts or states.

**Remote Voting Machines:**

### What is an RVM?

The machine allows migrant voters living outside their home constituencies to vote from their current residence

- The remote voter must register online/offline within a pre-notified time before the elections with their home constituency Returning Officer

- After successful verification at their home constituency, the voter will be approved for the remote voting facility

- Booths will be set up near their current homes



EVMs being sealed after an election

- In an RVM, a single ballot unit can cater to many constituencies at a single polling station by using dynamic ballot display instead of the usual printed paper ballot sheet

Source: The Hindu

- In order to extend voting facilities to domestic migrants, the Election Commission of India proposed to introduce Remote Voting Machines (RVMs).
- According to ECI, RVMs can handle multiple constituencies i.e. up to 72 multiple constituencies from a single remote polling booth.
- The existing laws and rules that would require amendments to implement RVMs include the Representation of the Peoples Act of 1950 and 1951, the Conduct of Election Rules, 1961 and the Registration of Electors Rules, 1960.
- RVM is similar to EVM in terms of security and voting experience and the ECI has maintained that RVMs, developed by the public sector undertaking Electronics Corporation of India Ltd, will be a standalone device not connected to the internet.
- The EC invited all recognised political parties which include eight national and 57 State parties to a demonstration of the prototype.
- However, various political parties objected to RVMs citing the pending complaints about the trustworthiness of Electronic Voting Machines (EVMs).
- Concerns are also raised about the lack of dialogue on the procedure and viability of RVMs.
- There needs to be more discussion and transparency for RVMs to materialize.

### Analysis of Migrant Voters in Bengaluru:

- Lokniti-Centre for the Study of Developing Societies carried out a study among migrant voters of Bengaluru.
- In regions of migrant workers from north and northeast India, about 99% are not registered as voters.
- They are registered as voters in their home constituencies. However, they are not able to vote in every election due to geographical constraints and difficulty in travelling back home during elections.
- There are apprehensions among migrants to register as voters in other states due to:
  - Fear of losing property in their home State.
  - Inability to bring their families with them.

- Though the majority of migrant workers were unaware of the ECI's proposal to introduce RVMs, 80% of them supported it.
  - However, some raised concerns about the mode of voting and its accuracy.
- The respondents of the survey greatly valued voting rights and supported RVMs.

**Nut Graf:** The Election Commission of India's proposal to introduce Remote Voting Machines (RVMs) provides a ray of hope for millions of migrant voters. However, two main prerequisites are spreading awareness and ensuring transparency of the procedure. This would further strengthen democracy.

## 6. Aim to lift AFSPA from Assam by 2023-end: Assam CM

**Syllabus:** Constitution of India - significant provisions and features

**Prelims:** About Armed Forces Special Powers Act (AFSPA)

**Mains:** Key provisions of Armed Forces Special Powers Act (AFSPA)

**Context:** The Chief Minister of Assam reiterated that there are plans to lift the Armed Forces Special Powers Act (AFSPA) from the State by the end of 2023.

### Details

- The Chief Minister of Assam has said that there are plans to lift AFSPA from the State by the end of 2023.
- The AFSPA, which empowers armed forces to arrest and search without warrants and use force without a magistrate's permission, has been lifted from most Assam districts except eight and one sub-division.
- The Chief Minister also said that the military personnel will be roped-in to train the police forces in the State.
- Plans are on to appoint retired Army personnel as Additional Superintendents of Police to impart training to the police force in Assam.
  - This will facilitate the replacement of central police with Assam police battalions.

### Armed Forces Special Powers Act (AFSPA)

- The AFSPA – like many other controversial laws – is of a colonial origin.
- The AFSPA was first enacted as an ordinance in the backdrop of the Quit India Movement launched by Mahatma Gandhi in 1942.
  - A day after its launch on August 8, 1942, the movement became leaderless and turned violent in many places across the country as leaders like Mahatma Gandhi, Jawaharlal Nehru, VB Patel and others had been put behind the bars.
  - Shaken by the massive scale of violence across the country, the then Viceroy Linlithgow promulgated the Armed Forces (Special Powers) Ordinance, 1942.
- On the lines of this ordinance, the Indian government promulgated four ordinances in 1947 to deal with internal security issues and unrest arising due to partition in four provinces Bengal, Assam, East Bengal and the United Provinces.
- It gives powers to the army, state and central police forces to shoot to kill, search houses and destroy any property that is “likely” to be used by insurgents in areas declared as “disturbed” by the home ministry.
- AFSPA is invoked when a case of militancy or insurgency takes place and the territorial integrity of India is at risk.



**The salient features of the AFSPA:**

- The Governor of a State and the Central Government are empowered to declare any part or full of any state as a disturbed area if according to their opinion that it has become necessary to disrupt the terrorist activity or any such activity that might impinge on the sovereignty of India or cause insult to the national flag, anthem or India's Constitution.
- Section (3) of AFSPA provides that, if the governor of a state issues an official notification in The Gazette of India then the Central government has the authority to deploy armed forces for assisting the civilian authorities. Once a region is declared 'disturbed' then it has to maintain the status quo for a minimum of three months, as per The Disturbed Areas Act of 1976.
- Section (4) of AFSPA gives special powers to army officers in disturbed areas to shoot (even if it kills) any individual who violates the law / or is suspected to violate the law (this includes assembly of five or more people, carrying of weapons) etc. The only condition is that the officer has to give a warning before opening fire.
- Security forces can arrest anybody even without a warrant, and carry out searches without consent.
- Once a person is taken into custody, he/she has to be handed over to the nearest police station as soon as possible.
- Prosecution of the officer on duty for alleged violation of human rights requires the prior permission of the Central Government.

**What is the Disturbed Areas Act (DAA)?**

- The Assam Disturbed Areas Act was initially promulgated for Nagaland in 1955 to suppress the Naga uprising. This act is called the mini AFSPA since it provides the same powers to the armed forces as in AFSPA.
- The state government has got the power to declare the whole or any part of the district by notification in the Official Gazette as a disturbed area.

**How different is DAA from AFSPA?**

- The DAA is the mini version of the AFSPA; it almost confers the same powers to the armed forces to take control of the state in order to curb the violence.
- The only difference is that the DAA is conferred as the power of the state but AFSPA can be invoked either by the Governor of the state or the Central Government.

**AFSPA in Assam**

- Assam was the first state to come under the AFSPA in 1958.
- AFSPA was first enacted to deal with the Naga insurgency in the Assam region.
- The entire state of Assam was under the Act since November 1990; this was necessitated due to the rise of ULFA's activities in the region which was at its peak during the 1990s.
- The Union Ministry of Home Affairs has recently expressed its readiness for a partial withdrawal of AFSPA from Assam and Arunachal Pradesh due to the improved security situation in these two states.
- According to data obtained from MHA through an RTI in July 2017, 31% of the complaints with regard to human rights violations were received from Assam.
- After the latest move of the government, now AFSPA will remain in the districts of Karbi Anglong, West Karbi Anglong, Dima Hasao, Dibrugarh, Tinsukia, Charaideo, Sivasagar, Golaghat, Jorhat and the Lakhimpur subdivision of Cachar.
- In the hill districts of Karbi Anglong and Dima Hasao, a peace treaty with Karbi groups has been signed. It is said that the moment a peace treaty with DLNA (Dimas National Liberation Army) is signed, AFSPA will be removed from the hill districts as well.

**7. Sedition and its roots in rudeness as an offence**

**Syllabus:** Constitution of India – evolution, features, and significant provisions.

**Prelims:** Sedition Laws in India

**Mains:** Issues associated with the Sedition laws in India.

**Background:**

- The offence of 'sedition' in the Pakistan Penal Code was declared invalid by Lahore High Court on 30th March 2023.
- However, in India, several complaints were registered under sedition during the same time.
- Several people were booked for criminal conspiracy to cause public mischief and to deface public property in Ahmedabad and Delhi.
- Similarly, some printing presses were alleged of breaching the Press and Registration of Books Act, 1867.

**Sedition Law in India**

- The IPC Section 124A provides for the punishment of those who by words (either spoken or written), or by signs, or by visible representation attempt to bring hatred or incite or attempt to incite disaffection towards the Government established by law in India.
- **Punishment for the Sedition Offence:**
  - It is a non-bailable offence.
  - Those convicted under the Section shall be punished with imprisonment for life to which fine may be added, or with imprisonment which may extend to three years, to which fine may be added.
  - The person found guilty of this offence is not eligible for any government job.
- The need for Sedition Law
  - The law keeps a check on anti-national, secessionist and terrorist elements that can hamper the public order and incite violence and induce enmity.
  - It helps in the stability of the elected government which could otherwise be attempted to be thrown out using illegal and violent means.
  - It is an alignment with contempt of court. Elected Government is an important part of the executive. Hence, contempt of the government can be checked.

**Issues associated with the misuse of Sedition Law:**

- Pakistan uses the law of blasphemy, specifically against poor citizens. Notably, India does not criminalize blasphemy, but has a similar provision under the clause of 'hurting of sentiments'.
- According to the National Crime Records Bureau (NCRB), 356 cases of sedition under Section 124A have been registered in India and 548 people have been arrested between 2015 and 2020 with only six convictions.
- As the seeds of sedition law were sown in colonial times, it is often described as a draconian law that can be used against what is otherwise constitutionally guaranteed freedom of speech and expression.
- It is argued that the logic behind sedition has leaped forward and transformed into other provisions of law that criminalise speech.
- The author argues that the state has stationed itself at the top of the social hierarchy. Thus the state functionary addresses the citizen in the most commanding voice.
- The unchecked use of laws like sedition against citizens often mirrors the social-political relations of power.
- It is found that the practice of prosecuting speech offences under 'offensive or disruptive speech' is often used on those who are:
  - Inferior in established social/political hierarchies
  - Outsiders to the reigning narrative of the time
  - Challenger of existing social or political order
- Moreover, prosecutors attack certain speech as grave and damaging to someone's reputation while tolerating other violent speech.
- India's ratification of the International Covenant on Civil and Political Rights (ICCPR) in 1979 should be seen as a right step towards acknowledging freedom of expression. Hence, with Sedition Law in activity, could lead to the wrong use of the law where people are charged with offence arbitrability for expressing their opinions.

**Supreme Court Stand in Sedition Law:**

- The apex court dismissed the Ministry of Information and Broadcasting's decision to ban the broadcast license for *Media One*.
- It further highlighted that "A homogenized view on issues that range from socio-economic policy to political ideologies can pose grave dangers to democracy".
- It said that the government should not use 'national security' as a catch phrase to censor speech.
- The judgment highlights its mutating stand on sedition law.

**Nut Graf:** *It is argued that the defining logic of sedition has already transplanted itself into several different provisions of law that criminalize speech. However, the courts are reviewing the validity of the law like the 'Media One case'.*

## 8. The Telangana- A.P. water dispute

**Syllabus:** Interstate Relations – Inter-State Water Disputes

**Prelims:** About Inter-State Water Disputes Tribunals

**Mains:** Krishna water dispute between Telangana and Andhra Pradesh

**Context:** The stalemate over sharing of Krishna water between Telangana and Andhra Pradesh continues as there is no resolution in sight.

### River Krishna

- The Krishna is an east-flowing river that originates in the Western Ghats near Mahabaleshwar in Maharashtra and merges with the Bay of Bengal.
- It flows through Maharashtra, Karnataka, Telangana and Andhra Pradesh.
- The Krishna River is the third-longest river in India, after the Ganga and the Godavari.
- The Krishna River is also the fourth-largest in terms of water inflows and river basin area in India, after the Ganga, Indus and Godavari.
- Together with its tributaries, it forms a vast basin that covers 33% of the total area of the four states.
- Ghataprabha, Malaprabha, Bhima, Tungabhadra and Musi are the most prominent tributaries of River Krishna.
- A dispute over the sharing of Krishna waters began with the erstwhile Hyderabad and Mysore states.
- Later it continued between successors Maharashtra, Karnataka and Andhra Pradesh.

### Krishna water dispute



Source: ThePrint

- The origins of the dispute over the sharing of Krishna water date back to the formation of Andhra Pradesh in November 1956.
- Before the formation of Andhra Pradesh, four leaders from different parts of the State which included the Rayalaseema Region and the Telangana region, entered into a Gentlemen's Agreement in February 1956.
  - One of the major provisions of this agreement was to safeguard the interests and acknowledge the needs of Telangana with respect to the utilisation of water resources and facilitate equitable distribution of water based on global treaties.
- The Andhra region already had a well-developed irrigation system as compared to the areas in Telangana which were drought-prone. This has led to the dispute over water sharing.
- In 1969, the Bachawat Tribunal or the Krishna Water Disputes Tribunal (KWDT-I) was set up to put an end to the dispute among the riparian States of Maharashtra, Karnataka and Andhra Pradesh (before bifurcation).
  - The KWDT-I allocated 811 tmcft of dependable water to Andhra Pradesh.
  - The A.P. government apportioned it in the ratio of 512:299 tmcft between Andhra (which also comprises Rayalaseema) and Telangana, respectively.
  - The KWDT-I also recommended taking the water from the Tungabhadra Dam to the drought-prone Mahabubnagar area of Telangana. However, this was not implemented which has led to discontent among the people of Telangana.
- Further, there is no mention of water sharing between the States in the Andhra Pradesh Reorganisation Act, 2014.

- Later in a meeting held by the then Ministry of Water Resources in 2015, the two States had agreed for sharing water in the ratio of 34:66 (Telangana: A.P.) as an ad hoc arrangement and it was specified that the ratio must be reviewed annually.
- The arrangement in the Act led to the establishment of the Krishna River Management Board (KRMB), which has continued the allocation of water in the same ratio of 34:66 year after year despite the opposition by Telangana.
- Telangana, in October 2020, protested for an equal share till water shares were finalised and reiterated its stand for an equal share and displeasure over the existing arrangement in a recent meeting.
- The KRMB after failing to convince the member States has now referred the matter to the Ministry of Jal Shakti (MoJS).

#### What does each State claim?

- **Telangana:** The Special Chief Secretary (Irrigation) of Telangana has held that “Telangana is entitled to 70% share in 811 tmc ft allocated to combined Andhra Pradesh by the KWDT-I Award, but the erstwhile A.P. had apportioned it in 512:299 tmc ft (A.P. : Telangana) ratio.
  - There have been claims that Andhra Pradesh is diverting about 300 tmc ft of water out of 512 tmc ft to the areas outside the Krishna Basin, which is a gross violation of the KWDT-I Award.
  - Telangana has thus urged the Centre to intervene and finalise a water-sharing agreement.
- **Andhra Pradesh:** A.P. has also been claiming a higher share of water in order to safeguard the interests of areas already developed.

#### Centre's Stand

- The Central Government has already convened two meetings in 2016 and 2020 which also involved the Chief Ministers of Telangana and A.P.
- In 2020, after a recommendation by the Ministry of Jal Shakti (MoJS), the Telangana government withdrew the petition it had filed in the Supreme Court over the issue as the Ministry assured to refer this issue to a Tribunal.
- Critics say that the Centre has been sitting over the issue for over two years and the two States are involved in constant tussle over the issue day in and day out.

**Nut graf:** Despite the completion of nine years since the bifurcation of the combined State of AP, the dispute over the sharing of water of the Krishna River between A.P. and Telangana has still remained unresolved. Experts feel that the Centre should come up with an impartial system for the allocation of water in order to put an end to this nagging issue.

## 9. Why do judges recuse themselves?

**Syllabus:** Structure, organization and functioning of the Judiciary

**Prelims:** About recusal of judges

**Mains:** Recusal of judges – Meaning, guiding principles, procedure, and various issues associated with it.

#### Context:

- Justice M.R. Shah, who is a Supreme Court judge, recently refused to recuse himself from hearing a plea by former Indian Police Service (IPS) officer Sanjiv Bhatt to submit additional evidence to back his Gujarat High Court appeal against his conviction in a 1990 custodial death case.
- The Chief Justice of India D.Y. Chandrachud also refused to recuse himself from hearing petitions seeking legal recognition of same-sex marriages.

#### Recusal of judges

- Recusal refers to the withdrawal of a judge from hearing a case in order to prevent the perception that the judge was biased while deciding a case or avoid a potential conflict of interest.
- There can be various reasons for the recusal of judges such as a judge could be holding shares in a litigant company or the judge might be having personal association with one of the parties of a case or if an appeal is filed in the Supreme Court against a High Court judgment delivered by the judge concerned before his elevation.

#### Guiding principles and legislation

- The practice of judicial recusal derives its origin from the fundamental principle of “**due process of law**”.
  - **Nemo judex in sua causa** is one of the key principles of due process of law.
  - Nemo judex in sua causa means “no person shall be a judge in his own case”.
- Further, the then Lord Chief Justice of England in his judgement in the Rex v/s Sussex Justices case (1924) had held that “**justice must not only be done but must also be seen to be done**”.

- Judges, while taking the oath of office, promise to perform their duties “without fear or favour, affection or ill-will” as per the **Third Schedule of the Constitution**.
- Additionally, the **Restatement of the Values of Judicial Life** adopted by the Supreme Court bars a judge from deciding a case that involves an entity where the judge holds pecuniary interest unless the parties concerned clarify that they have no objections.

#### Procedure for recusal

- There are mainly two types of recusals:
  - An automatic recusal is when a judge voluntarily recuses himself from a case.
  - A party involved in a case raises a plea for the recusal of a judge by highlighting the possibility of bias or conflict of interest of the judge.
- It is to be noted that a decision of recusal rests only on the conscience and discretion of the judge and no party can force or compel a judge to recuse himself from a case.
- There have been various instances in the past where judges have withdrawn themselves despite not seeing a conflict but only because such apprehension was cast.
  - However, there have also been several instances where judges have refused to withdraw from a case.
- Whenever a judge recuses himself from a case, that case would be listed before the Chief Justice for allotment to an alternate Bench.
- India has no codified rules governing recusals but various Supreme Court judgments have dealt with the issue in the past.
- As there are no statutory provisions that govern the process, it is left to the judges to record reasons for recusals. Judges have sometimes specified reasons orally in open court and sometimes have recorded reasons through written orders.
- In its recent ruling, the Delhi High Court has held that “no litigant or a third party has any right to intervene, comment or enquire regarding a judge’s recusal from a case”.

#### Famous instance of judicial recusals

- Five judges of the Bombay High Court had recused themselves from hearing the Bhima Koregaon case.
- Supreme Court judge Justice Bela M. Trivedi had recused herself from hearing Bilkis Bano’s plea.
- In the Novartis AG v/s Union of India case, Justice Markandey Katju had withdrawn his name from the case.
- Additional Sessions Judge Arul Varma recused himself from the Jamia Millia Islamia violence case (2019).

#### Supreme Court on judicial recusal

- The Supreme Court has listed several factors that need to be taken into account for deciding the impartiality of a judge.
- In **Ranjit Thakur v/s Union of India Judgement (1987)**, the apex court had said while determining if a judge should recuse himself from a case, the reasonableness of the apprehension of bias in the mind of the concerned party must be relevant.
  - The judge should not only think from his perspective but also look at the mind of the party before him.
- The Supreme Court in its **State of West Bengal v/s Shivananda Pathak Judgement (1998)**, defined judicial bias as a “preconceived opinion or predetermination to decide a case in a particular manner, so much so that such predisposition does not leave the mind open to conviction”.
  - This condition of preconceived opinion in the mind of the judge renders the judge incapable of impartiality in a case.
- In the **Supreme Court Advocates-on-Record Association v/s the Union of India Judgement (2015)**, the Court formulated a more definite rule by observing that where a judge has a pecuniary interest, no further inquiry is needed as to whether there was a ‘real danger’ or ‘reasonable suspicion’ of bias.
  - In order to ensure that the court is deciding in terms of possibility rather than the probability of bias, such cases require an inquiry, with the relevant test being the “real danger” test which investigates the real danger of bias.
- Furthermore, Justice Arun Mishra in the **Indore Development Authority v/s Manoharlal and Ors Judgement (2019)**, had noted that having a legal opinion alone does not invalidate a judge from being impartial.
  - Justice Arun Mishra had said that a judge who had rendered a decision in a smaller combination is not disqualified from being part of a larger Bench to which a reference is made.



## Practice of judicial recusals in foreign jurisdictions

- **The U.S.:** Unlike India, the U.S. has well-defined legislation on judicial recusals.
  - **Title 28 of the U.S. Code** mentions various grounds for disqualification of a judge.
  - Similar rules are also seen in the American Bar Association's Model Code of Judicial Conduct, which mentions three grounds for recusal namely financial/corporate interest, a case in which the judge was a material witness or a lawyer, and a relationship to a party.
  - Judges can also recuse themselves voluntarily which is known as "sua sponte recusals".
- **The U.K.:** The law on judicial recusals in the U.K. has evolved through various judicial pronouncements.
  - In the case of *R v/s Gough*, the 'real danger' test was adopted as a standard for passing recusal orders.
    - As per the test, the disqualification was made solely on substantive and tangible evidence which conclusively highlights the judicial bias or prejudice.
  - As the 'real danger' test was criticised heavily, a new test was formulated in the *Lawal v/s Northern Spirit Ltd* case.
    - The new standard laid down also looked into the likelihood of bias from the perspective of a fair-minded and reasonable observer.

**Nut graf:** Provisions for the recusal of a judge from a case play a crucial role in upholding the constitutional duty of the judges to be 'transparent and accountable' and also ensure due process of law. In order to deal with the increase in the frequency of recusal pleas, there is an urgent need for formulating procedural and substantive rules for recusal.

## 10. Supreme Court on default bail

**Syllabus:** Judiciary and Constitutional Rights

**Prelims:** Default bail

**Mains:** Supreme Court's judgement on Default Bail

**Context:** Supreme Court of India has recalled its decision on the *Ritu Chhabaria vs Union of India* case.

### Background:

- On 1st May 2023, the Supreme Court (SC) recalled its decision on the *Ritu Chhabaria vs Union of India* case.
- It was insisted by the Solicitor General of India that central investigation agencies were 'facing difficulties'.
- On 12th May 2023, SC issued an interim order clarifying that courts could grant default bail independent of and without relying on the *Ritu Chhabaria* judgment.
- It is argued that the Court's decision to suspend the rights of defendants in criminal cases might result in further erosion of the constitutional rights of the accused. It will also be against the fundamental principles of criminal procedure.

### Bail in India

- 'Bail' is derived from the old French verb 'baillier' meaning to 'give or deliver'.
- Bail refers to the provisional release of the accused in a criminal case in which the court is yet to announce the judgment.
  - The term 'bail' means the security that is deposited in order to secure the release of the accused.
- **Definition of Bail:** Wharton's Lexicon and Stroud's Judicial Dictionary defines Bail as "the setting free of the defendant by releasing him from the custody of law and entrusting him to the custody of his sureties who are liable to produce him to appear for his trial at a specific date and time."
- The position with respect to bail can be described as what was held in *Vaman Narain Ghiya v. State of Rajasthan*, "Bail" continues to be understood as a right for assertion of freedom against the State imposing restraints.
- Since the Universal Declaration of Human Rights of 1948, to which India is a signatory, the concept of bail has found a place within the scope of human rights.
- The term bail has not been defined in the Criminal Procedure Code, nevertheless, the word has been used in the Cr.P.C. several times and remains one of the most vital concepts of the criminal justice system in consonance with the fundamental principles enshrined in Parts III and IV of the Constitution along with the protection of human rights as prescribed under international treaties/covenants.

**Right to Default Bail:**

- The right to statutory bail, also called default bail, is available to the accused in instances when the investigating agency cannot complete its investigation within the time limit.
- According to Section 167(2) of the Code of Criminal Procedure (CrPC), the maximum time available to investigators is 60 or 90 days.
- If the investigation is not completed within this time period, the accused can apply for default bail under the first proviso to Section 167(2) of the CrPC.
- This provision is designed to prevent long-term detention of the accused.
- In multiple instances, the court has reiterated that it is an indefeasible right that flows from Article 21 of the Constitution. For example,
  - In the *Achpal vs State of Rajasthan (2018)* case, the court ruled that an investigation report by an unauthorized officer could not bar the accused from availing of this right.
  - Similarly, in *S. Kasi vs State (2020)*, it was ruled that the pandemic could not be used as the reason for the additional detention of the accused.

**Historical Background:**

- In the earlier version of CrPC, accused persons could be detained for a maximum of 15 days.
- The Law Commission in its 41st report recommended default bail due to abuse of the provision by the police that extended the custody of the accused.
- In 1978, CrPC was amended to add statutory bail and ensure that the accused is not detained for extended periods.

**Bail orders should not be too long or come too late as both violate personal liberty: SC**

- The Supreme Court in its recent ruling has held that bail orders should neither be too long and elaborate nor come too late as they violate the constitutional mandate of “personal liberty”.
- The SC Bench noted that, once a case for bail is reserved for orders, the pronouncement of the decision should not take too long as every day of waiting affects the personal liberty of an undertrial.
- The SC Bench highlighted the importance of brevity in bail orders and the need for the promptness in their pronouncement and criticised the practice of detailed elaboration of evidence in the orders granting/rejecting bail/anticipatory bail.
- The court also held that courts are expected to decide the matters pertaining to the liberty of citizens expeditiously.

**Associated Concerns:**

- The investigating authorities bypass the default bail provisions by filing incomplete or supplementary charge sheets within the 60/90-day period.
- In *Ritu Chhabaria's* case, SC delegitimized the incomplete charge sheets from applying for default bail.
- Moreover, the case did not lay down any additional hurdles in the investigation.
- The court's order to recall judgment has not only raised concerns but also deferred decisions on default bail for accused persons across the country.

**Nut Graf:** The court's order to recall its judgment in the *Ritu Chhabaria vs Union of India* case has raised concerns over the right to default bail and its implication on the constitutional rights of the accused. Moreover, it would cause deviation from fundamental principles of criminal procedure.

**11. From Master of the Roster to Master of all Judges?**

**Syllabus:** Structure, organization and functioning of the Judiciary

**Prelims:** Powers and functions of Chief Justice of India.

**Mains:** Issues related to functioning of the judiciary and the Chief Justice of India.

**Introduction:**

- In *Ritu Chhabria v. Union of India* case, the division bench of the Supreme Court (SC) affirmed the undertrial's right to be released on the default bail in case of incomplete investigation and proceedings beyond the statutory time limit.
  - It was held that an accused's right to seek default bail would be terminated only upon completion of the investigation within the statutory time limit.
- However, this decision was recalled in early May 2023.

**Other Details:**

- Consequently, the only recourse available now is the review petition.
  - However, it is highlighted that the review petition is also decided by the same bench that has stripped the decision of the *Ritu Chhabria* case.
- The only way through which CJI can enter the entire matter is through another Coordinate Bench on the same issue but different case. This will result in CJI referring the matter to a larger Bench.
- It is argued that in an intra-court appeal within the Supreme Court against an order passed by a Bench that did not include the CJI, the Court has effectively instituted a mechanism that is entirely devoid of legislative or constitutional backing.

**First Amongst Equals:**

- As per the constitution, all Supreme Court Judges are equal in terms of their judicial powers.
- However, CJI has some special administrative powers like constituting Benches and assigning tasks and references for reconsideration of a larger Bench. Thus, he is 'first amongst equals' and called the 'Master of the Roster.'
- It should be noted that in any Bench the vote or power given to CJI is the same as the other fellow judges. This is in contrast to the U.S. where all the judges collectively exercise power and render decisions, reflecting the collective strength of the court.

**Chief Justice of India as the Master of Roster**

- 'Master of Roster' refers to the privilege of the Chief Justice to constitute Benches to hear cases.
- Be it the Chief Justice of India or Chief Justice of any high court it is he or she who heads the administrative side. This includes allocation of matters before a judge as well.
  - So, no Judge can take up the matter on his/her own, unless allocated by the Chief Justice of India.
- According to the **Supreme Court (Handbook On Practice and Procedure and Office Procedure (Chapter VI – Roster)**, "Powers, Duties and Functions of the Registrar, Rule 29, expressly states that the Registrar shall prepare roster under the directions of the Chief Justice of India, and all such powers, duties and functions of the registrar are subject to any further special or general orders of the Chief Justice of India".
- In the judgment of **State of Rajasthan v/s Prakash Chand**, it clearly defines that regarding the matters of the High Court, the Chief Justice is the master of the roster.

**Associated Concerns:**

- It is argued that the decision of the *Ritu Chhabria vs Union of India* case was undone by a doubtful procedure that is not a part of the Constitution or Supreme Court Rules.
- There are many recorded instances of abuse of the 'Master of Roster' system. For example, serious infirmities were highlighted by the four seniormost judges of the Supreme Court four years ago.
- The recent order might enlarge the powers of the CJI on the judicial side and create an unprecedented intra-court appellate mechanism within the SC (disregarding the review petition).

**Way Ahead:**

- It is suggested that the practice of constituting Benches and allocating cases should be made computerized.
- The concept of 'Master of Roster' should be used only for the smooth administrative functioning of the court.
- CJI as the master of the roster has to exercise his powers reasonably, without giving scope for any justifiable criticism.
- A just and fair roster must be one that is divided subject-wise among judges according to their experience and expertise in those subjects. Politically sensitive matters should be before the five senior judges of the Supreme Court.

**Nut Graf:** *The Supreme Court's decision to recall its earlier judgment of default bail has raised various concerns like enlarging the powers of Chief Justice of India and bypassing the established procedure of review petition. These concerns should be addressed in a timely manner to ensure the trust of people in the Indian Judiciary.*

## 12. New Parliament Building

**Syllabus:** Parliament — structure, functioning, conduct of business, powers & privileges and issues arising out of these.

**Prelims:** New Parliament Building

**Mains:** New parliament house and its significance.

**Context:** The new Parliament House was inaugurated on 28 May 2023.

### Introduction:

- In its 75th year of independence, India will inaugurate its new parliament house on 28th May 2023.
- However, this is not the new Parliament setup. The new building will be an extension of the existing Parliament complex.
- It is highlighted that the old building gave direction to independent India. While the new one will witness the making of India as 'Aatmanirbhar Bharat'.

### Historical Background:

- In 1927, the main parliament building was inaugurated.
- In order to accommodate more staff and other offices, two more floors were added in 1956.
- It was further expanded in 1975.
- The parliament library was added to the complex in 2002.
- An extension of the Parliament Annexe was constructed in the year 2016.
- Notably, the foundation of a detailed plan for a new Parliament building was laid in December 2020 as a part of the Central Vista Project and in a span of two and a half years, the building is ready for use.

### The need for constructing new parliament building

- Lack of modern facilities.
- Shortage of space.
- Multiple retrofitting left little space for further improvements
- Electrical wires are squeezed under covers
- Multiple wirings gave a shabby look
- Many Presiding officers of the house (like Meira Kumar and Sumitra Mahajan) highlighted the poor state of the building

### Significance of the New Parliament House:

- The building is now more spacious, energy-efficient, and accessible.
- It houses updated technology.
- It will increase the efficiency of MPs and can modernize the work culture.
- Simultaneous interpretation in multiple languages would be possible due to better audio-video communication facilities.
- Better availability of records through e-library.
- It will house museum-grade galleries and a Constitution Hall to display India's age-old history of democracy.
- It will give the opportunity to introspect the efficiency and productivity of Parliament.
- Adequate functional space and modern facilities for the members will help in reducing friction and enabling better discussions and deliberations.
- In the future, each member will have a dedicated space for better interaction with the people of their constituency.

**Conclusion:** The world is changing fast and is on the verge of the emergence of machine learning and Artificial Intelligence. The new parliament building will prepare and equip India for new challenges.

**Nut Graf:** The inauguration of the new Parliament building is a significant step as it will equip policymakers with better technology and space efficiency. It is in line with the vision of Atmanirbhar Bharat. Moreover, it will prepare India for newer challenges.

### 13. Enforcement Directorate (ED)

**Syllabus:** Statutory, regulatory and various quasi-judicial bodies.

**Prelims:** About Enforcement Directorate (ED)

**Context:**

- The Union government informed the Supreme Court that Enforcement Directorate (ED) chief Sanjay Kumar Mishra's tenure will not continue in office beyond November 2023.
- In 2021, the apex court had directed the government to not give any further extension to Sanjay Kumar Mishra.
- However, the government made amendments to the Central Vigilance Commission (CVC) Act through an ordinance in November 2021 which paved the way for the government to stretch the tenure of the current ED chief by a year till November 2022.
- Further, the government once again gave a third extension in November 2022

#### Enforcement Directorate (ED)

- The Enforcement Directorate (ED) is a multi-disciplinary organization that is entrusted with the task of investigating economic crimes and violations of foreign exchange laws.
- An "Enforcement Unit" was set up under the Department of Economic Affairs for handling Exchange Control Laws violations under Foreign Exchange Regulation Act, 1947 in May 1956.
  - This unit was renamed "Enforcement Directorate" in 1957.
- Later in 1960, the administrative control of the ED was transferred from the Department of Economic Affairs to the Department of Revenue, Ministry of Finance.
- The statutory functions of the ED include enforcement of Acts such as the Foreign Exchange Regulation Act, 1973 (FERA), the Foreign Exchange Management Act, 1999 (FEMA), the Prevention of Money Laundering Act, 2002 (PMLA) and the Fugitive Economic Offenders Act, 2018 (FEOA).
- Headquarters: New Delhi
- Regional offices: Mumbai, Chennai, Chandigarh, Kolkata and Delhi which are headed by Special Directors of Enforcement.
- Special Court: For the trial of an offence punishable under section 4 of PMLA, the Central Government (in consultation with the Chief Justice of the High Court), designates one or more Sessions Court as Special Court(s). This court is also called "PMLA Court".
- The ED is headed by the Director of Enforcement, who is an Indian Revenue Service (IRS) officer.
  - According to the CVC Act, 2003, ED chiefs shall hold office for "not less than two years".
  - The government in 2021 brought in an ordinance that facilitated the extension of the tenure of ED and CBI directors by up to three years after the mandated term of two years.

### 14. Central Bureau of Investigation (CBI)

**Syllabus:** Statutory, regulatory and various quasi-judicial bodies.

**Prelims:** About Central Bureau of Investigation (CBI)

**Context:** The centre announced the appointment of Karnataka's Director-General of Police (DGP) Praveen Sood as the Director of the Central Bureau of Investigation (CBI).

#### Central Bureau of Investigation (CBI):

- The CBI was established as the Special Police Establishment in 1941, to investigate cases of corruption in the procurement during the Second World War.
- Later, the Santhanam Committee on Prevention of Corruption recommended the establishment of the CBI.
- The CBI was then formed by a resolution of the Home Affairs Ministry. The Ministry of Personnel, later on, took over the responsibility of the CBI and now it plays the role of an attached office.
- The CBI is the main investigating agency of the Government of India.
- It derives its powers from the Delhi Special Police Establishment Act, 1946. However, the CBI is not a statutory body.
- **Key functions:**
  - Its important role is to prevent corruption and maintain integrity in administration. It works under the supervision of the Central Vigilance Commission (CVC) in matters pertaining to the Prevention of Corruption Act, 1988.
  - Investigate cases connected to infringement of economic and fiscal laws.
  - Investigate crimes of a serious nature, that have national and international ramifications, and committed by



professional criminals or organised gangs.

- To coordinate the activities of the various state police forces and anti-corruption agencies.
- The CBI is India's representative for correspondence with the INTERPOL.
- CBI can suo-moto take up investigation of offenses only in the Union Territories.
  - The Central Government can authorize CBI to investigate a crime in a State but only with the consent of the concerned State Government.
- **Director of CBI:**
  - Director, CBI as Inspector General of Police, Delhi Special Police Establishment, is responsible for the administration of the organization.
  - Till 2014, the CBI Director was appointed on the basis of the DSPE Act, 1946. In 2014, the Lokpal Act provided a committee for the appointment of CBI Director, which includes:
    - The Prime Minister of India
    - The Chief Justice of India
    - The Leader of Opposition in the Lok Sabha
  - The Home Ministry sends a list of eligible candidates to DoPT. Then, the DoPT prepares the final list on the basis of seniority, integrity, and experience in the investigation of anti-corruption cases, and sends it to the committee.
  - The CBI Director has a fixed tenure of two years. However, the tenure can be extended up to five years.

## 15. Central Vigilance Commission

**Syllabus:** Statutory, regulatory and various quasi-judicial bodies.

**Prelims:** About Central Vigilance Commission (CVC) and the appointment of members

**Context:** Praveen Kumar Srivastava was recently sworn in by President Droupadi Murmu as the Central Vigilance Commissioner (CVC).

### Central Vigilance Commission

- The Indian government introduced the Central Vigilance Commission (CVC) in 1964.
- It was originally introduced through an executive resolution.
- The commission was set up on the recommendation of the K.Santhanam Committee on Prevention of Corruption.
- Central Vigilance Commission was established with the aim to exercise superintendence over the vigilance administration of the organisations in respect of which the executive powers of the Government of India extended.
- The Ordinance of 1998 conferred statutory status to the CVC.
  - It also extended the powers to exercise superintendence over the functioning of the Delhi Special Police Establishment, and also to review the progress of the investigations pertaining to alleged offences under the Prevention of Corruption Act, 1988 conducted by them.
- The Central Vigilance Act came into effect in the year 2003 after the CVC Bill was passed by both Lok Sabha and Rajya Sabha.
- The vision of CVC is to ensure a common and effective approach with the aim to eliminate corrupt and unethical practices in public administration and to bring about transparency, fair-play, objectivity, accountability and responsiveness to the aspirations of the citizen from administration.
- CVC works on the policy of 'Zero Tolerance Against Corruption.'
- To promote effective vigilance, CVC has adopted various preventive, punitive and participative vigilance tools.
- CVC, since 1998, is a three-member body that includes one Central Vigilance Commissioner and two Vigilance Commissioners.

### Appointment of CVC Members:

- The President of India appoints CVC members by warrant under his hand and seal
- As per the Central Vigilance Commission Act, 2003, the President's appointment comes after the recommendation by a three-member committee consisting of:
  - The Prime Minister
  - The Union Minister of Home Affairs
  - The Leader of Opposition in Lok Sabha
- **Term of Office:** Four years or if they attain 65 years of age (whichever is earlier)
- After they retire, they are not eligible for reappointment in any central or state government agency.
- First Chief Vigilance Commissioner of India was Nittoor Srinivasa Rau.

**16. CAG voted in as WHO auditor for a second term**

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

**Prelims:** About Comptroller and Auditor General (CAG) of India

**Context:** The Comptroller and Auditor General (CAG) of India, Girish Chandra Murmu has been re-elected as the External Auditor of the World Health Organisation (WHO) for a four-year term from 2024 to 2027.

**Details:**

- The CAG of India was already holding the position of External Auditor in the WHO for a four-year term from 2019 to 2023.
  - The re-election was held at the 76th World Health Assembly in Geneva and the CAG of India was re-elected with a majority of 114 out of 156 votes.
- The CAG of India was also selected for the post of External Auditor of the International Labour Organisation (ILO) in Geneva (2024-2027) in March 2023.
- Apart from WHO and ILO, the CAG of India is currently the External Auditor of:
  - The Food and Agriculture Organisation (2020-2025)
  - International Atomic Energy Agency (2022-2027)
  - Organization for Prohibition of Chemical Weapons (2021-2023)
  - Inter Parliamentary Union (2020-2022)
- Furthermore, the CAG of India is a Member of the United Nations Panel of External Auditors, the Governing Boards of the International Organisation of Supreme Audit Institutions and ASOSAI.
- The CAG also chairs the INTOSAI Knowledge Sharing Committee, its Working Group on IT Audit, and the Compliance Audit Sub-Committee.

**About the office of Comptroller and Auditor General (CAG) of India**

- Comptroller and Auditor General (CAG) of India is the apex authority responsible for external and internal audits of the expenses of the National and state governments.
- Article 148 of the Constitution of India establishes the authority of CAG and broadly deals with the CAG appointment, oath and conditions of service.
- Article 149 deals with Duties and Powers of the Comptroller and Auditor-General of India.
- The Comptroller and Auditor General is appointed by the President of India and can be removed from office only in the manner and on the grounds that a Judge of the Supreme Court is removed.
- The person appointed to this office should take an oath of office before the President or any other person appointed by the office of the President.
- According to **Article 148 (6)** of the Constitution, the administrative expenses of the office of the Comptroller and Auditor General, including all salaries, allowances and pensions payable to or in respect of persons serving in that office, shall be charged upon the **Consolidated Fund of India**.
- The reports of the Comptroller and Auditor-General of India relating to the accounts of the Union namely audit report on appropriation accounts, audit report on finance accounts, and audit report on public undertakings, are to be submitted to the President.
  - The President shall cause them to be laid before each House of Parliament.
- The incumbent is appointed for a period of 6 years or until attaining the age of 65 years whichever is earlier.
- The CAG is not eligible for any further office after the end of their tenure either in the Government of India or any State Government.

# ECONOMY

## 1. India Leads 'Laundromat' Countries

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

**Prelims:** Laundromat' Countries.

**Mains:** Price cap on Russia's Oil and its implications on global oil supply chain.

**Context:** A report titled "Laundromat: How the price cap coalition whitewashes Russian oil in third countries" published by the Helsinki-based Center for Research on Energy and Clean Air (CREA) has found that oil from Russia is getting backdoor entry into Europe via Laundromat countries.

### Laundromat Countries:

- "Laundromat" countries refer to those nations that are involved in purchasing cheap crude oil from Russia and converting it into refined petroleum products, which are "laundered" in Europe and other G7 countries.
  - India, China, Singapore, the U.A.E. and Turkey are named as laundromat countries.
- As per the latest CREA report, among the five laundromat countries, India has remained the highest global consumer of seaborne Russian crude and is exporting close to 3.8 million tonnes of processed oil products to "Price Cap Coalition" countries.
  - The "Price Cap Coalition" bars trade and insurance for any oil purchased above a certain price from Russia.
  - The Price Cap Coalition countries include the European Union (EU), G-7 countries, Australia and Japan.
- The report has highlighted that the Western countries have purchased about \$42 billion worth of laundered Russian crude in the form of various oil products from nations that are friendly towards Russia.
  - For instance, the exports of diesel from India tripled to about 1,60,000 barrels per day in March 2023 as compared to the period before the start of the Russia-Ukraine war.

### Key concerns:

- The report notes that the European countries are simply substituting oil products they previously bought directly from Russia, with the same products now "whitewashed" in other countries and bought from them at a premium.
- It highlights the fact that the back-door entry of Russian oil into European countries has blunted their efforts to restrict funding for Russia.
- The report has further accused Indian sellers and European buyers of circumventing sanctions imposed on Russia by the Western countries.

### Private Indian refiners:

- Most of the oil products from India were exported from two ports in Gujarat namely –
  - The **Sikka port** that services the Reliance-owned Jamnagar refinery.
    - The report claims that Sikka port is the largest importing port of seaborne crude oil from Russia in the world as well as the largest oil product export port to the price-cap coalition countries.
  - The **Vadinar port** that ships oil products from Nayara Energies, which is co-owned by a Russian oil company named Rosneft.
    - According to the report, the Vadinar port is of great value to Rosneft and the overall Russian oil industry.

### Conclusion:

- A recent report by the Center for Research on Energy and Clean Air (CREA) has found that European countries that have imposed a ban on Russian oil imports are instead importing huge amounts of refined oil commodities from countries that have become the largest importers of Russian crude.
- The report notes that this development is a major loophole that undermines the impact of the sanctions on Russia and recommends the use of "place of origin" certifications for the oil products sold to Europe.

**Nut Graf:** As per the report by CREA, despite banning or restricting Russian oil imports, European countries are indirectly obtaining oil from Russia through "laundromat countries." This has resulted in a substantial rise in Russian crude oil import volumes for these laundromat countries.

## 2. WTO panel rules against India in ICT tariff dispute

**Syllabus:** Global and Multilateral Groupings and Agreements.

**Prelims:** About World Trade Organisation (WTO), Information Technology Agreement (ITA) and WTO Appellate Body

**Mains:** WTO Panel and India's tariff on ICT goods.

**Context:** The World Trade Organization (WTO) panel ruled against India citing a violation of global trade rules in a dispute against the European Union, Japan and Taiwan.

### Details:

- The European Union (EU), Japan, and Taiwan have complained about India's tariffs on certain information and communication technology (ICT) products such as mobile phones.
- The three panels of the World Trade Organization (WTO) concluded that India has violated Article II of the General Agreement on Tariffs and Trade (GATT) as India's tariffs breach its Goods Schedule.
- It should be noted that WTO members are under a legal obligation not to impose tariff rates higher than their 'bound' or maximum tariff committed in their Goods Schedule.
  - The **Good Schedule** is based on the World Customs Organization's classification system.
  - It is called the **Harmonized System of Nomenclature (HSN)**. It categorizes traded products with specific names and numbers.
  - The HSN is regularly updated to accommodate new products. This is known as **transposition**.

### What is the dispute?

- In 2019 disputes arose due to the challenge by the European Union, Japan and Taiwan against the imposition of import duties on IT products.
- India introduced import duties between 7.5% and 20% for products such as mobile phones, mobile phone components and accessories, line telephone handsets, base stations, static converters or electric wires and cables.
- The imposition of import duties was challenged by the EU since it deemed these duties a direct breach of WTO rules.
- The EU argued that under the WTO commitments, India is obliged to apply a zero-duty rate to such products.
- Under the **1996 Information Technology Agreement (ITA)**, India is required to eliminate tariffs on a range of products, including mobile handsets since India is a signatory.
- However, in order to promote domestic manufacturing and curb the dumping of electronic products from China, India has been imposing tariffs on certain electronic items.
- Despite complaints by many countries about the violation of ITA principles by India due to the imposition of tariffs, India argues that smartphones did not exist during the time of signing of the agreement and hence it is not bound to eliminate tariffs.

### About World Trade Organisation (WTO):

- It is an international organization that was established in 1995 to promote free and fair trade between nations.
- The WTO provides a forum for member countries to negotiate and agree on trade rules, settle disputes related to trade, and monitor each other's trade policies.
- The WTO's mission is to facilitate international trade by promoting the elimination of barriers to trade, such as tariffs and other trade barriers, and by providing a forum for its members to negotiate trade agreements.

### Information Technology Agreement (ITA)

- ITA is a multilateral trade agreement that was negotiated under the WTO in 1996.
- It aims to promote free trade in information technology products among its signatory countries by eliminating tariffs and other trade barriers on a wide range of technology products, including computers, telecommunications equipment, semiconductors, and software.
- Under the ITA, signatory countries agreed to eliminate tariffs on a wide range of information technology products including advanced semiconductors, GPS navigation systems, and medical equipment.
- The agreement has been successful in promoting the growth of the global technology industry by lowering the cost of technology products and increasing access to technology across the world.

### WTO Panel Ruling

- The panel recommended India take measures to ensure conformity with its obligations under the General Agreement on Tariffs and Trade 1994.
- The WTO dispute settlement panel said that though it accepted India's argument of the non-existence of smartphones during the signing of the agreement in good faith, the panel found that India had failed to demonstrate that this assumption constituted an essential basis of India's consent to be bound by the certified Schedule.
- Since the WTO appellate body is absent, the EU has asked India to resolve the matter through a **multi-party interim appeal arbitration arrangement (MPIA)** which is an alternative system for resolving WTO disputes that are appealed by a member nation.
- The three panels have recommended India should reduce its tariff rates and make them compatible with its Goods Schedule.

### Impact of the issue:

- **Near-term and immediate impact:**
  - As the appellate mechanism is non-functional, the final order will take a long time. Hence the panel's ruling will not have an immediate or near-term impact on the industry.
- **Impact on FDI received:**
  - This ruling might create a small dent on the 'Make in India' initiative and foreign investors might become a bit cautious, thus leading to a slowing of FDI received in the information and communication technology sector.
- **Impact on current duty structure:**
  - If the ruling affects India's current duty structure, it could adversely impact the momentum of local value addition.
- **If India loses the appeal in future, it could lead to an even more severe impact.**

### India's stance on the issue:

- India denies these charges. India justified its stand by arguing that its binding tariff commitments on ICT products are based on the WTO Ministerial Declaration on Trade in Information Technology Products (ITA Agreement). India signed this declaration in 1996.
  - India argues that since smartphones were not in existence when the Information Technology Agreement (ITA) was signed, there is no basis for these charges.
- India is also against multi-party interim appeal arbitration arrangement (MPIA).
- India has decided to go to the WTO's appellate body against the panel's verdict. As the appellate body is not functional, it will buy India some more time.

### WTO Appellate Body:

- Formed in 1995, this body comprises seven individuals and serves as a permanent institution that reviews appeals arising from reports released by panels in disputes filed by members of the World Trade Organization.
- The Appellate Body has the authority to affirm, amend, or overturn the legal determinations and judgments made by a panel. In the event that all members do not object, the Dispute Settlement Body (DSB) endorses the Appellate Body Reports.
- The WTO Appellate body under the dispute settlement mechanism has been non-functional since 2019.
- It has been non-functional, due to the United States' refusal to appoint members to the Appellate Body, the majority of panel reports are being appealed without being resolved, leaving the dispute in a state of limbo.

**Nut Graf:** Many countries have complained that India's tariff rates on various Information and Communication Technology products are inconsistent with India's WTO obligations. Though sanctions cannot be imposed on India due to legal mechanisms, New Delhi should tread cautiously while dealing with the European Union.



### 3. Gig & Platform workers and the Code on Social Security, 2020

**Syllabus:** Indian Economy and issues relating to growth, development and employment.

**Prelims:** Code on Social Security, 2020 and Labour Codes

**Mains:** Various issues and concerns associated with the gig economy and gig workers

**Context:** The workers of Zomato-owned Blinkit company went on strike in parts of Delhi and the National Capital Region on April 11.

#### Background

- The Blinkit company recently introduced a new payout structure for delivery agents, as per which the minimum payout per delivery was reduced from ₹25 to ₹15.
- As a result of this new payout structure, the earnings of the delivery executives/agents working with Blinkit will now reduce to about ₹600 to 700 a day as compared to about ₹1,200 before.
- Unsure of the weekly payment they might draw after the introduction of the new payout system, the delivery executives went on strike.

#### Gig Economy

- The gig economy in general is defined as an arrangement between a service seeker and a service provider wherein a service seeker requires a certain task that will be fulfilled by the service provider.
- This agreement between the two is temporary and has a narrow scope limited to a specific requirement.
- The gig economy is a system that is based on flexible, short-term, or freelance work.
- The Code on Social Security, 2020 defines a gig worker as “a person who performs work or participates in a work arrangement and earns from such activities outside of traditional employer-employee relationships”.
- Freelancers, contingent workers, and independent contractors are examples of gig workers.

#### Gig workers

- Gig workers are a part of the workforce who are usually outside the ambit of the traditional employer-employee relationship.
- There are two groups of gig workers namely:
  - **Platform workers:** Gig workers who work on those jobs that use online algorithmic matching platforms or mobile applications to connect with their customers are called platform workers.
  - **Non-platform workers:** All those gig workers who do not use such online platforms are called non-platform workers. Non-platform workers include those working in construction and non-technology-based temporary works.
- In India, traditional employees are granted various benefits as per several laws and regulations such as the Minimum Wages Act, 1948, Employees' Provident Fund and Miscellaneous Provisions Act, 1952 (EPFA), and the Payment of Bonus Act, 1965.
  - Similarly, such benefits are also extended to contract employees under the Contract Labour (Regulation and Abolition) Act, 1970.
  - However, considering the unique nature of gig workers, they have limited recognition under the existing employment legislation and hence they fall outside the ambit of such statutory benefits.
- Since gig workers show characteristics of both employees and independent contractors, there have been questions over whether the gig workers be categorised as “employees” or as “independent contractors”.

#### Code on Social Security, 2020

- The Code on Social Security, 2020 introduced by the Ministry of Labour and Employment brings gig workers under the ambit of labour laws for the first time.
- **Section 2(35)** of the Code on Social Security, 2020 defines a gig worker as “a person who performs work or participates in a work arrangement and earns from such activities outside of a traditional employer-employee relationship”.
- According to the Code, platform work is defined as “a work arrangement outside of a traditional employer-employee relationship in which organisations or individuals use an online platform to access other organisations or individuals to solve specific problems or to provide specific services in exchange for payment”.
- While the Code recognises gig and platform workers, it still distinguishes between such workers and traditional employees.

- As per the Code, traditional employees are extended benefits such as insurance, provident fund, gratuity, employee compensation, and maternity benefits.
- The Code mandates the Union and State governments to come up with social security schemes for gig workers on matters such as provident funds, health, maternity benefits, accident benefits, etc.
- The Code further talks about compulsory registration of all gig and platform workers in order to avail of the benefits under the above-mentioned social security schemes.

### Key concerns

- Out of the four new Labour Codes introduced as part of labour reforms, the reference to gig and platform workers is made only in the Code on Social Security.
  - Thus, such workers continue to work without essential benefits and safeguards that are granted by other Codes such as minimum wage, occupational safety, etc.
- Although the Labour Codes received the President's assent in September 2020, they are yet to be implemented.
  - According to the Union government, the delay in the implementation is attributed to the delay in the framing of rules by the States.
- Such workers also remain excluded from accessing the various redressal mechanisms that are extended through the Industrial Disputes Act, 1947.
  - This denies gig and platform workers an effective mechanism to address their grievances and hold their employers accountable.
- Due to the non-traditional nature of their work, gig workers do not have the right to collective bargaining, a fundamental principle of modern labour law that plays a key role in protecting the rights of workers.
- Furthermore, gig and platform workers cannot create legally recognised unions.
- A report by Fairwork India published in 2022 highlighted the despicable working conditions of the various platform workers in the country and underlined the importance of framing legislation to safeguard the rights of gig workers.

### Interventions by the Judiciary

- The Indian Federation of App-based Transport Workers (IFAT) filed a public interest litigation (PIL) in September 2021, on behalf of gig workers before the Supreme Court.
- The PIL sought to declare the gig and platform workers as “unorganised workers” in order to bring them under the ambit of the Unorganised Workers’ Social Security Act, 2008.
  - Through the PIL, the IFAT had argued that the exclusion of gig workers from the category of “unorganised workers” under Sections 2(m) and 2(n) of the Unorganised Workers’ Social Security Act, 2008 violates their fundamental rights guaranteed under Articles 14 and 21 of the Constitution.
- Further, it is also argued that the denial of social benefits amounts to exploitation through forced labour, within the meaning of Article 23.
- The petition also demanded that such workers must be provided statutory protection in the form of social security benefits.
- The Supreme Court had asked for a response from the Central government on the petition in December 2021, but the Centre has still not responded.

### Rajasthan's Platform-based Gig Workers Welfare Board

- The Rajasthan government announced the establishment of the Rajasthan Platform-Based Gig Workers Social Security and Welfare Fund.
- This is the first-of-its-kind regulatory move to unburden the vulnerabilities of gig and platform workers since the introduction of the Code on Social Security (2020).
- The Rajasthan Platform-based Gig Workers Welfare Board is an institution to look after the well-being of the technology-mediated workforce.
- It is a tripartite institution with representatives from worker unions/associations, employers/clients, and bureaucracy.
- This tripartite relationship is required to:
  - Collectivize workers to raise concerns and demands
  - Force employers to acknowledge that their organization has informal workers
  - For the state to liaise and mediate the relationship between employers and workers
- The aim of the board is to deliver social security benefits to 3 to 4 lakh workers in the state.
- Rajasthan Government's move is a big win for platform workers, who are fighting for their rights. However, there are some issues that need to be addressed on a timely basis.

**Nut graf:** The recent protests by the delivery executives working for an online platform-based company have once again highlighted the issues plaguing the gig economy and gig workers in India. This indicates that there is an immediate need for the standardisation of regulations in the gig economy and extending social welfare benefits for such workers.

#### 4. What are the gaps in the AePS transaction model?

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

**Prelims:** AePS transaction model

**Mains:** Objectives and key services extended by the AePS model, existing loopholes in the model and possible remedies

**Context:** Several instances of scams have been reported in various parts of the country wherein cybercriminals have used silicone thumbs to replicate Aadhaar-linked fingerprints to drain users' bank accounts.

#### Aadhaar-enabled Payment System (AePS)

- The Aadhaar-enabled Payment System (AePS) is a bank-led model which facilitates online financial transactions at Point-of-Sale (PoS) devices (micro ATMs) of any bank with the help of Aadhaar authentication.
- The AePS allows an individual to withdraw money in their bank account from anywhere in the country using a local "Business Correspondent (BC)".
  - A Business Correspondent (BC) acts as an informal bank agent equipped with a biometric Point-of-Sale (PoS) machine which is a type of micro-ATM.
- According to the National Payments Corporation of India (NPCI), the AePS model helps transfer the funds using only the Bank Name, Aadhaar Number, and Fingerprint captured during Aadhaar enrolment.
  - Thus the AePS model negates the need for OTPs, bank accounts and other financial details.
- **Various banking services offered by AePS**, apart from cash withdrawal include cash deposit, balance enquiry, mini statement, Aadhaar to Aadhaar fund transfer, BHIM Aadhaar Pay, authentication, etc.
- **Key objectives:**
  - To empower individuals to use their Aadhaar as an identity to access their bank account and perform basic banking transactions.
  - Furthering Financial Inclusion.
  - In line with the Reserve Bank of India (RBI)'s goal of electronification of retail payments.
  - To facilitate interoperability across banks in a safe and secure manner.
- **Activation or enabling of AePS:** Unique Identification Authority of India (UIDAI) and NPCI have not clearly mentioned whether AePS is enabled by default.
  - According to Cashless India, which is a website managed and operated by the Ministry of Electronics and Information Technology (MeitY), AePS service does not require any activation and the only requirement is that the user's bank account must be linked with their Aadhaar number.
  - As per the UIDAI, individuals who wish to receive any benefit or subsidy under schemes notified under section 7 of the Aadhaar Act, must mandatorily submit their Aadhaar number to the banking service provider.

#### Loopholes in AePS model

- Scammers and cybercriminals have made use of the biometric information of the customers linked with Aadhaar to operate biometric POS devices and biometric ATMs.
- Aadhaar data breaches have been reported multiple times in the past, but the UIDAI has denied any breach of data.
  - The UIDAI has held that the Aadhaar information such as biometric data is fully safe and secure.
- Apart from the UIDAI's database, the biometric information linked with Aadhaar can be leaked from other sources where such crucial information is readily available in the form of photocopies, and soft copies.
- Criminals have also made use of silicone to trick devices into initiating transactions.
- Corrupt Business Correspondents (BC) have also manipulated users and have been involved in AePS frauds.

#### Way forward

- The UIDAI has proposed an amendment to the Aadhaar (Sharing of Information) Regulations, 2016, which mandates entities in possession of an Aadhaar number to not share details unless the Aadhaar numbers have been redacted or blacked out through appropriate means.
- The UIDAI has come up with a two-factor authentication mechanism developed with the help of a machine-learning-based security system that captures finger minutiae and finger images to analyse the 'liveness' of a fingerprint.
- Further, the users must ensure that they lock their Aadhaar information by visiting the UIDAI website or using the mobile app.
  - Locking of Aadhaar information will prevent the initiated financial transactions even if the biometric information is compromised.

- Users and customers are also urged to inform the banks and the concerned authorities as soon as possible in case of any suspicious activity in their bank accounts.
  - According to a circular issued by the RBI, a customer is entitled to zero liability if the customer informs the bank within three working days of receiving a communication from the bank regarding such an unauthorised transaction.
  - Thus, timely reporting can help in ensuring that the money transferred using fraudulent means is returned to the victim.

**Nut graf:** Recent instances of AePS-enabled frauds and scams have exposed the vulnerabilities of the AePS model and have put people in danger of being robbed of their hard-earned savings. A mechanism must be developed immediately to plug the loopholes in the system and prevent abuse by cybercriminals.

## 5. Will all overseas spends come under the tax net?

**Syllabus:** Indian Economy and issues relating to planning and mobilization of resources

**Mains:** Taxes and associated concerns.

**Context:** A notification was issued for the implementation of levying a higher tax on some types of remittances of funds abroad from 1 July 2023.

### Details:

- The Union Budget of 2023 proposed to levy a higher tax on some types of remittances of funds abroad. It also issued a notification in this direction in May 2023.
- After a huge outcry from the taxpayers, the Finance Ministry made a partial U-turn.

### Background Details:

- In Budget 2023, there was a proposal to raise the tax collection at source (TCS) on overseas tour packages and foreign remittances under the Liberalised Remittance Scheme (LRS).
  - The TCS rate is proposed to be increased from 5% to 20%.
  - The 20% tax is proposed on all LRS (as against 5% TCS on remittances over ₹7 lakh).
  - It excludes education or medical expenses abroad.
- On 16 May 2023, the Finance Ministry notified the Foreign Exchange Management (Current Account Transactions) (Amendment) Rules, 2023, to bring all credit card expenditures abroad under the remit of the LRS.
- It enabled the government to levy a higher TCS on credit card spending overseas from July 1.
- However, it was assured that purchases of foreign services like newspaper or streaming services subscriptions will not be impacted while being in India.

### Consequences of the Notification:

- The notification implies that additional funds of the taxpayer will be blocked which could have been adjusted against advance tax payments or refunds from their income tax returns.
- This was flagged as unnecessary harassment and blocking of funds for honest taxpayers.
- They also questioned the justification of tracking which could be done by even 2% or 5% TCS.
- Issues were also raised about employees using cards for overseas work trips and foreign holidays.
- Many experts have termed it “tax terrorism”.

### Government's Response:

- The Government clarified that business visits won't be impacted. It will regulate only the tour travel packages, gifts to non-residents, and domestic high-net-worth individuals investing in assets such as real estate, bonds, and stocks outside India.
- It emphasized that the 20% TCS rate is “not” high.
- The Ministry revised its stance and said that Payments abroad by an individual using their international credit cards up to ₹7 lakh per financial year were exempted from the TCS levy and the LRS calculations.
- However, there are still challenges for frequent business travellers.

**Nut Graf:** The Finance Ministry issued a notification on imposing a higher tax on some types of remittances of funds abroad. This has raised concerns for taxpayers. As a result, the government partially addressed these issues but a lot needs to be done, especially for frequent travellers.

## 6. Tripping trade

**Syllabus:** Indian Economy and issues relating to growth, development and employment.

**Mains:** India's declining export.

**Context:** The goods exports from India witnessed a steep fall in April 2023.

**Details:**

		April 2023 (USD Billion)	April 2022 (USD Billion)
Merchandise	Exports	34.66	39.70
	Imports	49.90	58.06
Services*	Exports	30.36	24.05
	Imports	16.50	14.06
Overall Trade (Merchandise + Services) *	Exports	65.02	63.75
	Imports	66.40	72.11
	Trade Balance	-1.38	-8.37

Source: PIB

- The goods export in April 2023 declined to \$34.6 billion (lowest since October 2022). This is the third successive decline in exports.
- Moreover, imports decreased by almost 14%, which is a 15-month low of under \$50 billion.
  - Petroleum exports reduced by 17.5%.
  - Jewellery shipment slipped to a 30% low.
- The reason behind the fall in exports for the second half of the financial year 2022-23 is the slowdown in the global economy.

### Associated Concerns:

- It should be noted that the Foreign Trade Policy targets a two trillion-dollar export in seven years.
- It is suggested by the experts that the healthy growth of 14.7% and total export of approximately \$776 billion cannot be replicated in 2023-24.
- The decline in imports indicates that the domestic demand is dwindling.
- Furthermore, the decline in exports of petroleum, gems, and jewellery impacts the exports of value-added end products.
- An official suggests that the prospect of any immediate respite likely from faltering global demand is very low.
  - The WTO forecasted an increase in global trade growth for the year 2023 due to China's opening up of the economy. However, Chinese growth is underwhelming.
  - The service export is also expected to experience the recent trade turmoil.

### Way Ahead:

- India should review its overall trade stance and reliance on a few large markets.
- It should look for greater integration with global value chains and multilateral trading arrangements.

**Nut Graf:** India witnessed the steepest fall in exports in the month of April indicating a global slowdown and dwindling domestic demand. It is suggested that India should review its trade policy and reliance on a few large markets to correct its course.



## 7. De-dollarisation: the race to attain the status of global reserve currency

**Syllabus:** Issues relating to planning and mobilization of resources.

**Prelims:** About De-dollarisation

**Mains:** The advantages of being a global reserve currency and the need for de-dollarisation

**Context:** In recent times, especially, post the start of the Russia-Ukraine war, the attempts to de-dollarise have gained momentum.

### De-dollarisation

- De-dollarisation refers to the replacement of the U.S. dollar with other currencies as the global reserve currency.
- A reserve currency is a currency that is used extensively in international transactions between countries and is commonly held as reserves by the central banks of various countries.
- Countries across the world have been looking to replace the U.S. dollar as the global reserve currency for several years for various reasons.
- However, the imposition of sanctions on Russia that limit the use of the dollar to buy oil and other goods from Russia has forced countries to ramp up their efforts to de-dollarize the global economy.
- Since the international transactions that are carried out in the form of the U.S. dollar must be cleared by American banks, countries opine that this accords the U.S. significant powers to oversee and control such transactions.

### The U.S. dollar as a global reserve currency

- Economists opine that the U.S. dollar was not forced upon any country to be used for cross-border transactions but instead, it was used because people actually preferred the U.S. dollar and is more widely accepted than the other currencies.
- Other currencies are not as popular as the U.S. dollar in order to be used for international transactions.
  - For instance, the efforts undertaken by India and Russia to carry out bilateral trade in the form of Indian rupees did not yield intended results as the value of India's imports from Russia is significantly more than its exports to Russia.
  - This trade balance meant that Russia had excess rupees which it was unwilling to spend on Indian goods. Hence Russia demanded the settlement of bilateral trade in U.S. dollars.
- The global acceptability of the U.S. dollar is mainly due to the popularity of U.S. assets among investors.
  - The U.S. has been experiencing a persistent trade deficit since 1975. This means that the value of the U.S. imports has been more than the value of its exports to other countries.
  - Therefore, the rest of the countries across the world have accumulated excess dollars due to the U.S.'s trade deficit and these excess dollars are being invested in U.S. assets like the debt securities issued by the U.S. government.
- Furthermore, the "rule of law" in the U.S., is said to be another key reason for the high level of trust the global investors have in the U.S. financial markets.
- The currencies of economic superpowers usually end up being used as the global reserve currency and currencies like the British pound and the French franc have enjoyed the status of the global reserve currency in the past.
  - However, with the economic decline of these countries, the currencies lost their popularity and status of being the global reserve currency.
  - The British pound which hitherto enjoyed the status was replaced by the U.S. dollar as Britain lost its status as a global economic superpower.

### Advantages enjoyed by global reserve currency

- A currency that enjoys the status of being a global reserve currency will enjoy an advantage over other countries.
- If the currency of a country enjoys the status of being a global reserve currency, the country will have the power to purchase goods and other assets from other countries by simply printing fresh currency.
- Countries, companies and individuals using U.S. dollars for their transactions ensure more liquidity of the currency.
  - Increased liquidity means that financial assets can be priced more easily and loans are more easily provided.
- If a country's currency is being used as a global reserve currency, then that country will have the leverage to impose financial sanctions and play a key role in shaping global geopolitics.

**Path ahead**

- Expansionary monetary policies adopted by the U.S. Federal Reserve in recent times threaten the status of the U.S. dollar as a global reserve currency.
- The U.S. Federal Reserve usually increases the supply of dollars in order to address economic downturns and fund the U.S. government's expenditures.
  - However, such expansion of the supply of dollars can lead to the debasement of the currency that threatens its status as a reserve currency.
- The recent instances of the imposition of unilateral sanctions on various countries by the U.S., have forced other countries, including the allies of the U.S. to develop an alternate and dollar-free system.
- Chinese yuan is currently being viewed as a possible alternative to the U.S. dollar on account of the rise and growth of China's economic might. However, the concerns over the "rule of law" in China have adversely impacted its prospects.

**Nut graf:** Critics believe that the dollar's status of being the primary reserve currency for the global economy has given the U.S. unfair privileges over other countries and have thus called for increased efforts to dethrone the dollar as the global reserve currency.

**8. Why are financial regulators transitioning from LIBOR?**

**Syllabus:** Issues relating to planning, mobilization of resources, growth, and development.

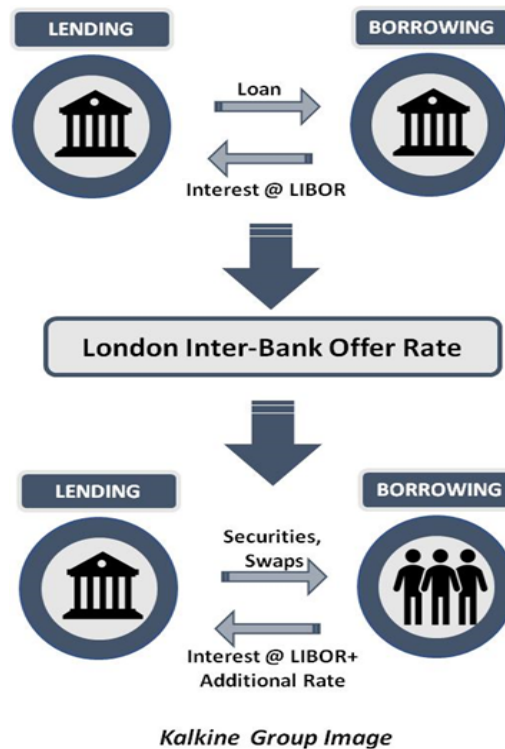
**Prelims:** About LIBOR and SOFR

**Mains:** Working of various benchmark interest rates, issues associated with LIBOR and the available alternatives

**Context:** The Reserve Bank of India (RBI) has asked the banks and financial institutions to facilitate a complete transition away from the London Interbank Offered Rate (LIBOR) by the 1st of July 2023.

**London Interbank Offered Rate (LIBOR)**

- LIBOR is a globally accepted benchmark interest rate at which major global banks may borrow from one another in the international (London) interbank market for short-term loans.
- LIBOR is used as a benchmark to settle trades in futures, options, swaps and other derivative financial instruments in over-the-counter markets and on exchanges.
- Furthermore, LIBOR is also used as a benchmark rate for consumer lending products such as credit cards, mortgages, student loans, corporate debt, etc.
- Every business day before 11 a.m. (London time), banks on the LIBOR panel make their submissions to Thomson Reuters, which is a news and financial data company.
  - This LIBOR panel comprises commercial bankers such as J.P. Morgan Chase (London branch), Lloyds Bank, Bank of America (London branch), Royal Bank of Canada, UBS AG, etc.
- The contributed rates are then ranked based on the LIBOR submission.
  - During the ranking process, extreme quartiles are excluded and the middle quartiles are averaged to derive the LIBOR.
  - This is in line with the idea of being as close to the median as possible.



### Controversy surrounding LIBOR

- The rate is calculated using the Waterfall Methodology, a standardized, transaction-based, data-driven, layered method.
- Investigations have revealed a long-lasting scheme among various banks to manipulate rates in order to acquire more profit.
  - In 2012, when an investigation into LIBOR started, it came into light that many banks, including Barclays, Deutsche Bank, Royal Bank of Scotland and UBS, manipulated the LIBOR rates for the bank's profit.
- Recently, there have been efforts to phase out LIBOR because of its role in worsening the Financial Crisis of 2008 and also due to the scandals involving LIBOR manipulation among rate-setting banks.
- Critics have pointed out that the mechanism adopted by LIBOR relied heavily on banks to be honest with their reporting disregarding their commercial interests.

### SOFR as an alternatives to LIBOR

- The U.S. Federal Reserve in 2017, announced the Secured Overnight Financing Rate (SOFR) as an alternative to LIBOR.
- Post the introduction of SOFR, new transactions in India were to be undertaken using the SOFR and the Modified Mumbai Interbank Forward Outright Rate (MMIFOR), replacing LIBOR and its corresponding domestic Mumbai Interbank Forward Outright Rate (MIFOR).
- SOFR is a rate produced by the U.S. Federal Reserve Bank based on transaction data (observable repo rates which are collateralised by U.S. Treasury securities) and is not based on estimates by experts as in LIBOR.
  - Thus, SOFR is considered to be more accurate and less prone to market manipulation.
- RBI had asked banks in India to assess their LIBOR exposures and initiate their preparations to adopt alternative reference rates.
- Contracts that were signed after December 31, 2021, were told not to use the LIBOR as a reference rate and the contracts that were entered before the date were to have fallback clauses for revised considerations when the LIBOR is completely phased out.

**Nut graf:** As both LIBOR and MIFOR would cease to be a representative benchmark from June 30 2023, the RBI has asked banks and financial institutions to develop their systems and processes to facilitate the complete transition to SOFR and MMIFOR from July 1st, 2023.

## 9. National Manufacturing Innovation Survey (NMIS)

**Syllabus:** Issues relating to growth, development and employment.

**Prelims:** About National Manufacturing Innovation Survey (NMIS) 2021-22

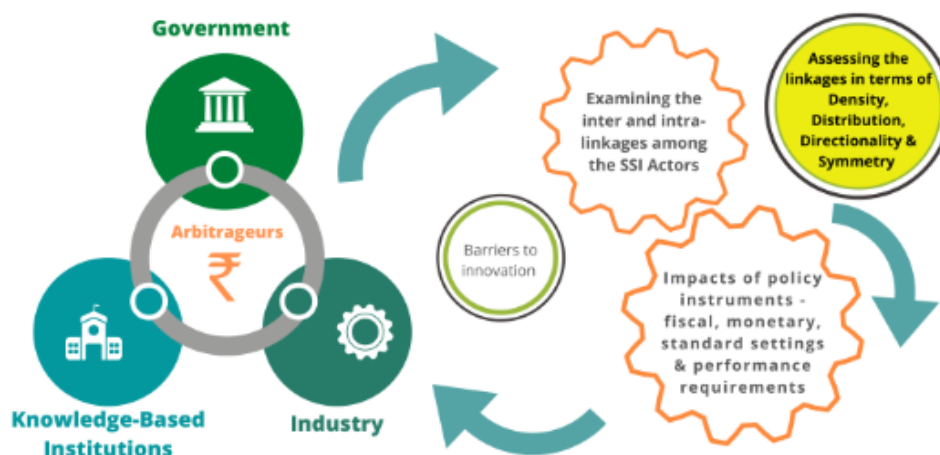
**Mains:** Key findings of National Manufacturing Innovation Survey (NMIS) 2020-21

**Context:** Karnataka ranked the most 'innovative' State as per the National Manufacturing Innovation Survey.

### National Manufacturing Innovation Survey (NMIS)

- The National Manufacturing Innovation Survey (NMIS) 2021-22 was a joint study by the Department of Science and Technology (DST) and the United Nations Industrial Development Organization (UNIDO).
- It was conducted to measure the innovation performance of manufacturing firms in India and.
- The National Manufacturing Innovation Survey (NMIS) 2021-22 analyzed the innovation processes, outcomes, and barriers in manufacturing firms and was conducted as a two-pronged survey.
- The NMIS survey 2021-22 also studied the innovation ecosystem that affects innovation outcomes in these firms.
- DST's first National Innovation Survey was held in 2011 and the NMIS Survey 2021-22 is a follow-up of it.

### Key findings of National Manufacturing Innovation Survey (NMIS) 2020-21



Source: [www.nstmis-dst.org](http://www.nstmis-dst.org)

- The survey was topped by Karnataka overall followed by Dadra and Nagar Haveli, Daman and Diu (DNH & DD), Telangana, and Tamil Nadu.
- States with the highest share of innovative firms are:
  - Telangana – 46.18%
  - Karnataka – 39.10%
  - Tamil Nadu – 31.90%
- States with the lowest share of innovative firms are:
  - Odisha – 12.78%
  - Bihar – 13.47%
  - Jharkhand – 13.71%
- Most of the surveyed industries belong to the micro, small, and medium enterprises (MSME) category and almost three-fourths of the 8,000 firms surveyed for the period of financial year 2017-20, neither made any innovative product nor business process innovation.
- However, nearly 80% of the firms reported significant gains such as expanding markets and reducing production costs.
- **The causes for barriers to innovation were lack of internal funds, lack of financing from external sources and high innovation costs.**
- Despite being among India's most industrialized States, Gujarat and Dadra and Nagar Haveli, Daman and Diu (DNH&DD) reported the highest frequencies of barriers to innovation.

- UNIDO representatives opined that findings of the survey show that innovation is yet to become common but is helping firms to turn profitable and there is a need to focus on manufacturing innovation along with capacity expansion.
- An official from DST also said that findings of the survey such as evidence of barriers and challenges to innovation and upgradation of industries will be used to devise policies, programs, and partnerships to strengthen innovation outcomes and benefits.

## 10. NSE launches India's first REIT and InvITs index

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

**Prelims:** REITs and InvITs Index

**Context:** NSE Indices have launched Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs) Index which is the first ever in India.

### REITs and InvITs Index:

- The aim of the new index is to track the performance of Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs) which are listed and traded on the NSE.
- REITs invest in real estate projects and InvITs invest in infrastructure projects with a long gestation period.
- The index will be reviewed and rebalanced on a quarterly basis and the weight of the index is based on free-float market capitalization. The base date is the first of July 2019 and has a base value of 1000.
- There is a security cap of 33% each and the total aggregate weight of the top 3 securities is capped at 72%.
- Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs) compose revenue-generating real estate and infrastructure assets respectively.
- The Reits and InvITs are good options for investors to diversify their portfolios to include revenue-generating real estate and infrastructure assets.
- The Reits and InvITs also help to diversify risk from regular asset classes like equity, debt and gold.
- REITs and Invits are famous among investors globally and are new to India which can be utilized by mutual funds.
- Mutual funds based on the REITs and InvITs index can be a good option for investors to diversify their portfolio rather than invest in single REITs and InvITs.
- The top constituents of the Nifty REITs and InvITs index are
  - Embassy office parks Reit (32.9% weight)
  - Powergrid Infrastructure Investment (20.2%)
  - Mindspace Business Parks Reit (15.3%)
  - India Grid Trust (15.3%)

## 11. What is the stalemate over the U.S. debt ceiling?

**Syllabus:** Government Budgeting

**Mains:** Details about the U.S. debt ceiling and issues associated with it

**Context:** The Secretary of Treasury informed the U.S. Congress that the country could default on its debt in the coming months if a consensus to raise or suspend the debt ceiling is not reached between the Republican-dominated House of Representatives and the President's White House.

### The U.S. debt ceiling

- A budget deficit occurs when any government spends more than it brings in. During such instances, the government has to borrow money to meet its financial obligations thereby accruing debt.
- In the case of the U.S., the federal government borrows money by creating and selling debt securities such as bonds to domestic or foreign investors, companies, banks, and other countries.
  - A majority portion of such debt instruments is owned by the federal government itself in order to fund various social security schemes, healthcare, federal pensions, etc.
- The taxation and spending aspects are decided by the administration and Congress, whereas the collection of taxes and the borrowing of funds is managed by the Treasury Department of the U.S.
- In 1917, Congress enacted the **Second Liberty Bond Act**, which permitted then-President Woodrow Wilson to make use of the money to fund the requirements that arose during the First World War without the approval of Congress lawmakers.



- However, Congress put in place a borrowing limit which created a debt ceiling that could only be raised by the approval of Congress (i.e. the House and Senate).

### Stalemate over the issue of debt ceiling

- The debt ceiling is not a “forward-looking” budgeting instrument, i.e. it does not reveal or mention the ideal levels of spending.
  - Congress usually approves various programmes or initiatives without having the entire funding and then a limit is placed on how much the Treasury can borrow to pay for these initiatives.
  - **Example:** If Congress approves \$100 of spending on a programme out of which \$70 comes from taxes but there is a ceiling on the government that it can borrow only \$15 to pay for the rest.
- Also, the move to raise or suspend such ceilings which must be approved by Congress has turned into a political issue in recent times.
  - The Opposition has used the debt ceiling to get budgetary and other legislative concessions.
  - **Example:** The U.S. almost defaulted on its debt in 2011 when there was a stalemate between the Republicans and the Obama administration on increasing the ceiling.

### The Demand of Republicans:

- The current impasse is said to be more severe than in 2011. The bill passed by Republicans combines a \$4.8 trillion in spending cuts with an increase in the current \$31.4 trillion debt ceiling.
- The Bill would cut a wide range of government spending back to last year's (2022) levels, leading to a decrease of \$4.8 trillion or about 9%.
- However, US President Biden wants a clean debt-ceiling hike and doesn't want to negotiate any kind of cuts, resulting in the current deadlock.

### Magnitude of the US Government Debt:

- Total government debt has risen from \$9.49 trillion in June 2008 to approximately \$31.4 trillion at present.
- The debt-to-GDP ratio has increased from 63.85% in June 2008 to over 120%.
- This indicates that US debt has nearly doubled over the past 15 years.

### Key concerns associated with debt ceiling

- Ever since the introduction of the debt ceiling, the U.S. government has reached or come close to reaching the debt ceiling several times.
  - As per the Treasury Department, since 1960, Congress has acted about 78 times to permanently raise, or temporarily extend, or revise the definition of the debt ceiling.
- While the government can receive taxation revenue even after reaching the debt ceiling, it cannot borrow any more to pay the existing bills which makes the U.S. unable to pay its debt-holders, ultimately leading to a default.
- Economists have cautioned the government about the possible catastrophic implications on the American as well as the global financial markets if the federal government defaults on the interest payments that it owes to domestic and foreign investors.
- The US government will be unable to pay military salary, pensions and interest on bonds
- Experts believe that a U.S. default can result in the downgrading of U.S. creditworthiness by interventional agencies, loss of confidence in the US economy, large-scale job losses, weakening of the dollar, stock sell-offs, and also increase the cost of borrowing for the U.S. government.

**Nut graf:** *There has been an impasse between the Republicans and the Biden administration over the issue of the debt ceiling and the economists have recommended removing such debt ceilings as they do not contribute to fiscal discipline anymore and lead to frequent political grandstanding which ultimately threatens national and global financial stability.*

## 12. The nutritional value of millets

**Syllabus:** Agriculture – Major crops and marketing of agricultural produce

**Prelims:** About Millets

**Mains:** Significance of Millets, high nutritional value of millets and challenges associated with grain processing

**Context:** Millets are gaining popularity across the world as the UN Food and Agriculture Organization (FAO) has declared 2023 to be the “International Year of Millets”

### Millets

- Millets are mainly grasses that are cultivated across the world as cereal crops, particularly in the tropical regions of Africa and Asia.
- The most famous varieties of millet include pearl millet, barnyard millet, finger millet, and foxtail millet.
- India is the largest producer of millets in the world.
  - Evidence indicates that millets were first cultivated in the Indian subcontinent about five millennia ago.
- According to reports, India In 2021-2022 accounted for about 40.51% of the world's pearl millet production and 8.09% of sorghum.
- In India, pearl millet accounts for about 60% of all the millet production which is followed by sorghum (27%), and ragi (11%).

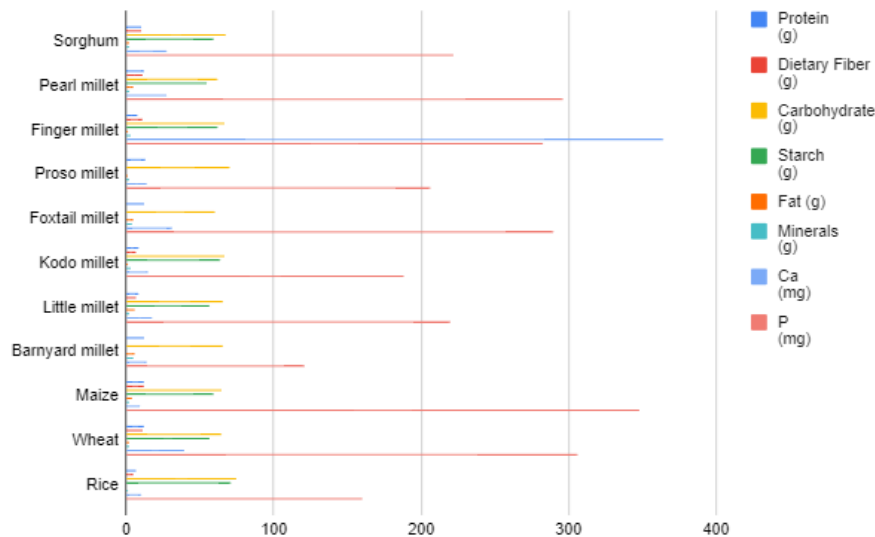
### Significance of Millet cultivation

- **High nutritional value:** The nutritional value associated with millets is very high compared to other major extant food crops.
  - The nutritional content of millets includes carbohydrates, proteins, fibre, amino acids, and minerals.
- **Drought resistant:** Millets have the ability to withstand and grow in harsh, resource-poor conditions.
  - Millets are drought-tolerant and can grow in warm weather, requiring less moisture and loamy soil.
- **Affordable nature:** Millets can grow on arid lands with minimal inputs. Thus cultivation of millet ensures that affordable foods can be produced that can contribute to healthy diets and a healthy environment.
- **Food security and economic viability:** Millets being climate-smart grains offer great opportunities for strengthening food security, nutrition security and bolstering economic growth.

### Nutritional content of millets

Millet	Ingredient/product	Nutritional significance
Sorghum	Flour, puffed	<ul style="list-style-type: none"> <li>• Rich in protein, fibre, thiamine, folic acid and riboflavin</li> <li>• Contains resistant starch</li> <li>• Possesses anti-diabetic, anti-cancerous and cardio protective constituents</li> <li>• Exhibits angiotensin I converting inhibitory activity</li> </ul>
Pearl Millet	Flour	<ul style="list-style-type: none"> <li>• Rich in unsaturated fatty acids such as oleic acid</li> <li>• Rich in dietary fiber with prebiotic potential</li> <li>• Ferulic acid and coumaric acid with anti-proliferative activity</li> <li>• Rich in iron and zinc</li> <li>• Ameliorate anemia</li> </ul>
Finger Millet	Flour	<ul style="list-style-type: none"> <li>• Rich source of calcium</li> <li>• Good amount of sulphur-containing amino acids</li> <li>• Rich in polyphenols – garlic, ferulic, p-hydroxy benzoic, procatechuic and p-coumaric acids</li> <li>• Hypoglycemic, hypocholesterolemic, and anti-ulcerative properties</li> <li>• Inhibits aldose reductase activity</li> </ul>
Little Millet	Dehusked, broken, rawa, puffed, poha	<ul style="list-style-type: none"> <li>• Rich in iron and fibre</li> <li>• Boosts immunity</li> </ul>
Foxtail Millet	Dehusked, broken, rawa, puffed, poha	<ul style="list-style-type: none"> <li>• Good source of tocopherol</li> <li>• Exhibits superior anti-oxidant activity</li> <li>• Rich in linoleic acid and gamma aminobutyric acid</li> <li>• Improves cholesterol metabolism</li> </ul>
Proso Millet	Dehusked, rawa, puffed,	<ul style="list-style-type: none"> <li>• Good source of vitamin A, B and E</li> <li>• Exhibits good antioxidant activity</li> <li>• Good source of manganese</li> <li>• Good for heart patients</li> </ul>
Kodo Millet	Dehusked, broken, rawa	<ul style="list-style-type: none"> <li>• High lysine</li> <li>• High antioxidant activity</li> <li>• Good for diabetic and heart patients</li> </ul>
Barnyard Millet	Dehusked, rawa,	<ul style="list-style-type: none"> <li>• Rich in crude fiber</li> <li>• Low phytate containing iron-rich millet</li> <li>• Protects against diabetes</li> </ul>
Browntop Millet	Dehusked, flour	<ul style="list-style-type: none"> <li>• Rich in protein and dietary fibre</li> <li>• Possesses anti-diabetic potential owing to gallic, caffeic and coumaric acids</li> <li>• Good source of calcium, phosphorus and zinc</li> </ul>

Source: Science Reporter



Source: The Hindu

### Processing of Millets and its impact on nutritional content

- The 'whole grain' consists of the endosperm, germ, and bran (pericarp + aleurone). However, the "refined grain" refers only to the endosperm.
  - The endosperm is the largest part of the millet kernel and is called the "storage centre". The endosperm also has a protein covering called the "aleurone".
  - The pericarp has an outer covering called the husk. The husk and the pericarp protect the kernel from harsh conditions, diseases, and damages.
- Processing of millets for consumption can affect nutrients in three different ways, namely enhancing them, suppressing them, and ignoring them.
- During processing, the husk is first removed from the grains as it is made of cellulosic matter that the human body cannot digest.
  - However, this results in the decline of the phytic acid and polyphenol contents in the millets.
- The next step in processing involves decortication of the grain, wherein the outer covering is removed in order to expose the seed. This is made to make the grain more edible and attractive.
  - Decortication of the grains adversely impacts the crude and dietary fibre content in the millet grains.
- The next steps involve milling, grinding (into flour), and sieving to remove large impurities such as bran.
  - Studies have revealed that sieving made the flour more digestible. However, it also reduced nutrient content due to the removal of bran.
- Polishing is typically the last step and it is a process wherein brown rice, for example, is changed to white rice by rubbing off the bran and the germ.
  - According to various studies, polishing removed 8-10% of grain weight and also removed important nutritional contents such as iron, magnesium, phosphorus, potassium, and manganese.

**Nut graf:** As millets are becoming popular worldwide because of their low input requirements and high nutritional density, which play a significant role in ensuring food as well as nutritional security, the time has now arrived to find solutions to the challenges associated with grain processing.

### 13. Go First Bankruptcy: Trouble in India's Aviation Sector

**Syllabus:** Infrastructure and Industries – aviation sector

**Mains:** Trends in the Indian aviation sector and key issues affecting the growth of the industry

**Context:** The Directorate General of Civil Aviation (DGCA) asked GoFirst Airlines to stop selling air tickets immediately as GoFirst Airlines filed for voluntary insolvency proceedings.

#### Background:

- Go Airlines (Go First) has filed for voluntary insolvency proceedings with the National Company Law Tribunal (NCLT).
- The airline has been struggling for some time now, with half its fleet of aircraft grounded due to snags in their Pratt & Whitney (P&W) engines, and other financial problems.
- Go First is the first Indian carrier since Jet Airways to go to the NCLT under the Insolvency and Bankruptcy Code (IBC), 2016.

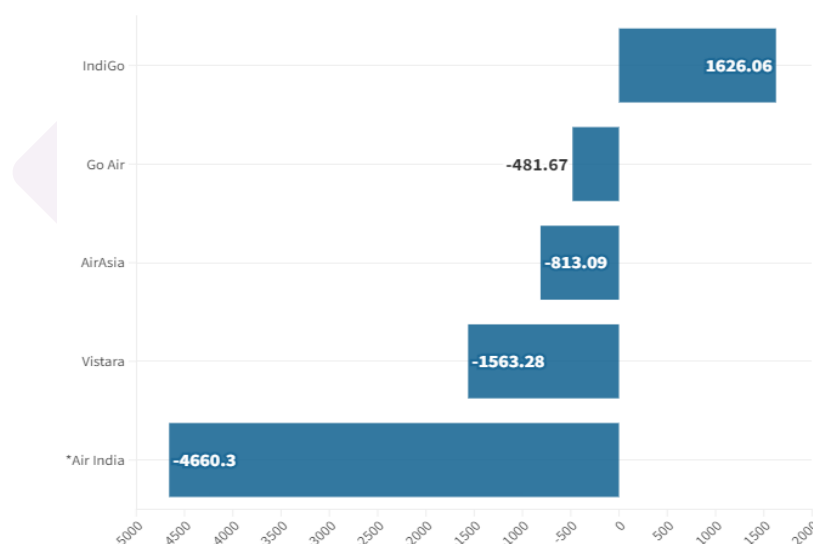
### Trends in the Indian aviation sector

- After being severely affected by the COVID pandemic, India's domestic air traffic has improved in recent times.
- In March 2023, domestic airlines carried about 1.3 crore passengers, which according to the DGCA was 11% more than the same month in the pre-pandemic years of 2018 and 2019.
- According to the Civil Aviation Ministry, India is expected to have over 14 crore passengers in FY 2023-24.
- It is said that the CAPA-Centre for Aviation projects in India would handle more than 130 crore passengers annually in the next 20 years.
- At present, there are 148 airports in India and India is the third-largest domestic market in the world in terms of seat capacity.
- As of March 2023, IndiGo has continued to dominate the domestic market with 56.8% of the market share which is followed by Vistara (8.9%) and Air India (8.8%), AirAsia (7.6%), GoFirst (6.9%), SpiceJet (6.4%) and Akasa Air (3.3%).

### Financial viability of the sector

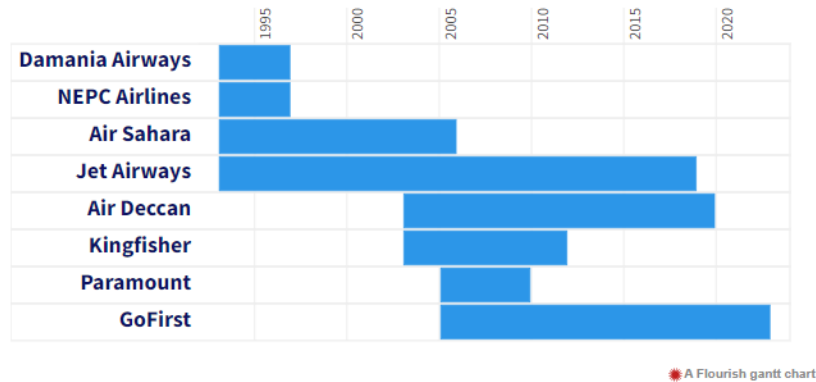
- Despite being regarded as the “fastest-growing aviation sector” in the world, airlines operating in India face difficulties to survive due to a highly competitive and unforgiving business environment.
- Furthermore, the travel restrictions imposed during the pandemic severely impacted all the carriers and India's airlines as a whole suffered huge losses of close to ₹15,000 crores in the financial year 2020-2021.
- However, even before the pandemic, the financials of various airlines were in the red.
  - During the financial year 2019-20, IndiGo was the only airline that made profits.
  - All other airlines experienced losses and losses posited by the then state-run Air India stood at ₹4,600 crores.
- It is important to note that financial trouble has caused the folding of major airlines in recent times.
  - About 17 airlines, domestic and regional, have already exited the market in the past few years.
  - Also, two full-service airlines namely Kingfisher and Jet Airways have exited the aviation industry owing to financial trouble.
- Additionally, the consolidation of four carriers which include Air India and Vistara under the umbrella of the Tatas is expected to make things even more difficult for smaller airlines to operate in the market, pointed out CAPA in its recent report.
  - While the state-owned version of Air India was a key impediment to competition, the latest consolidation effort would make sure that 75 to 80% of the market would be captured by Indigo and Air India combined.
  - This leaves only about 20% for other smaller airlines such as SpiceJet, GoFirst and AkasaAir.

In the pre-pandemic year 2019-20, IndiGo was the only Indian carrier to post a profit  
(In ₹ crores)



### The struggle for survival

The past decade saw two full-service airlines, Kingfisher and Jet Airways, exit the aviation industry after running into financial trouble



Source: The Hindu

### Analysis of the Civil Aviation Industry in India

- In India, the aviation policy is broad-based and is taken care of by the Ministry of Civil Aviation based on the legal framework of the Aircraft Act 1934, and Aircraft Rules 1937.
- The Directorate General of Civil Aviation (DGCA) is the statutory regulatory authority in India for civil aviation. It deals with issues such as safety, licensing, airworthiness, etc.
- Aviation experts opine that India is not at par with the advancements in modern technologies in aerospace and the increasing costs have affected passenger growth.
- The Indian aviation sector initially witnessed significant growth in the 1990s post-liberalisation reforms and the breaking of the monopoly created by Indian Airlines and Air India.
  - However, by the early 2000s, only two major airlines that were given licences namely Jet Airways and Sahara were able to survive.
- Low-cost carriers that came into the Indian market in 2003 were expected to provide impetus to the industry's growth owing to their diversification and lower fares.
  - However, the government's move to levy high taxes on Aviation Turbine Fuel (ATF) affected the profitability of these airlines.
- As per various reports, India's airfares are about 15% below the break-even point and heavily-taxed ATF which is close to 40-50% of operational expenses accounts for the single biggest expense for the carriers.
  - Further, a few of the Indian States also impose provincial taxes of close to 30% on jet fuel which makes shorter flight routes unsustainable for smaller airlines.
- Indian aviation policy has also posed various entry and growth barriers and it has also not affected players uniformly.
- Most of the airlines operating in India also do not own entire fleets as their finances do not allow them to invest huge amounts of money to buy aircraft.
  - Close to about 80% of the total commercial fleet in India is leased and leasing increases the costs of operations as these leases each are denominated in U.S dollars.
  - Airlines also are required to pay annual lease rents of about ₹10,000 crores to lessors which accounts for close to 15% of the revenues of Indian Airlines.
- Airlines must also bear costs in terms of airport fees that they pay in order to use airport facilities such as for aircraft landing and freight charges for the use of airport infrastructure like runways and passenger terminals.
  - For state-run airports, these charges are regulated by the Airports Economic Regulatory Authority (AERA) but there are concerns over the increase in such charges owing to the recent efforts to privatise airports.
  - While international airlines pass on most of such charges to the passengers, the carriers in India must pay these charges themselves to offer lower ticket fares.
- Safety and training are areas that suffer in Indian airlines, and the regulator is seen as a mere facilitator as long as the Ministry of Civil Aviation is involved.
- The aviation industry also requires skilled personnel, such as pilots, engineers, and air traffic controllers. However, there is a shortage of trained personnel in the country, which has hampered the growth of the industry.
- The aviation industry is highly sensitive to fluctuations in currency exchange rates. This can impact the profitability of airlines and affect the cost of air travel.

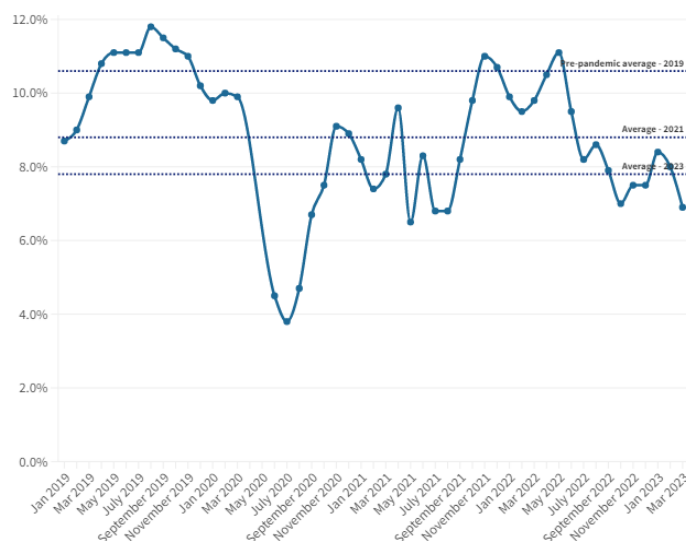


**Way Forward:**

- The Indian aviation industry needs transparency and accountability from airlines, the Ministry of Civil Aviation and DGCA with respect to operations and safety.
- The mismanagement of the Indian aviation industry hinders its potential for growth as a sector.
- A complete revamp of India's civil aviation policy is necessary to enforce stricter regulations on airline owners, promoters, and officials to prevent the mismanagement and failure of airlines.
  - The policy revamp should aim to prevent the recurrence of situations where employees and passengers are left stranded without compensation due to the sudden closure of airlines.
  - A revamped civil aviation policy should prioritize safety, training, and professionalism to ensure the long-term sustainability of the sector.
- Airlines should have a corpus fund to meet the dues of employees and passengers in case of airline closure.

**The Case study of GoFirst****GoFirst's attempt to capture the market**

Even before the pandemic, GoFirst struggled to capture a large part of the domestic market in the face of intense competition



Source: The Hindu

- The GoFirst airline filed for bankruptcy at the National Company Law Tribunal (NCLT) and grounded 28 of its 54 aircraft.
- GoFirst Airlines claimed that 50% of its fleet had to be grounded by December 2022 due to the failure of Pratt & Whitney engines.
- The airline company also said that it has continued to incur 100% of its operational costs which has led to a loss of over ₹10,000 crores.
- The airline owes a total of close to ₹11,463 crores to its various creditors.

**Nut graf:** With Go First, which is one of the oldest private airlines in India, filing for voluntary insolvency proceedings, various concerns regarding the health of the aviation industry in the country have come to the fore. In this context, industry experts have called for a review of the existing policy and infrastructural framework to improve the financial viability of the sector.

**14. It's time to ensure safer skies**

**Syllabus:** Infrastructure-Airports.

**Mains:** Aircraft accidents and associated concerns.

**Case Study of Mangalore Airport:**

- A Bangalore-based NGO (Environment Support Group) filed a Public Interest Litigation (PIL) in Karnataka High Court in 1997.
  - It reported that the second runway in Mangalore airport did not meet the standards of emergency landings and take-offs.
  - However, the PIL was dismissed.
- Another PIL was filed in the year 2002. It also got dismissed.
  - This was appealed in the Supreme Court. But, the apex court did not seem to 'interfere'.
- Consequently, on 22nd May 2010, AIE 812 crashed on landing in Mangalore. Almost 158 people died.
- The case was investigated and the pilot was blamed. It is argued that the inquiry team ignored the violations of laws or norms by government authorities.

**Other Examples of Accidents:**

- An Air Sahara 737 overshot the runway in 2005.
- A Kingfisher ATR went off the runway in 2009.
- Spicejet also met with a string of accidents.
- On August 2020, there was an accident in Calicut that resulted in the loss of 21 lives.

**Associated Concerns:**

- India has faced several incidents in the past that have resulted in huge loss of lives.
- Even the investigations by the Directorate General of Civil Aviation (DGCA) and Aircraft Accident Investigation Bureau (AAIB) have failed on multiple occasions.
- Indian authorities were not swift in learning the lessons from previous accidents.
- The incompetence of authorities is covered by blaming the pilot for accidents.
- Investigations had failed to prevent accidents from recurring thereby indicating a lack of accountability and transparency.
- There is a failure to identify serious errors in the report and take corrective actions.
- Immediate rescue by rescue and firefighting vehicles after accidents is also difficult due to narrow service roads like in Calicut.
- The commercial interest of the airlines bypasses the safety guidelines.
- There are deficiencies in training programmes, safety audits by DGCA, and adopting corrective measures.
- The pilots are fatigued due to commercial requirements.

**Way Ahead:**

- The judiciary should proactively take the case of the safety of Indian skies.
- Moreover, occupational safety and training should be given top priority.

**Nut Graf:** As a large number of aircraft are being inducted into Indian skies, it is important to ensure that accidents are reduced and corrective measures are taken for safeguarding the lives of travellers.

**15. Clean energy funds rise, but mostly in China, Europe, U.S.**

**Syllabus:** Infrastructure: Energy

**Prelims:** World Energy Investment report and International Energy Agency (IEA)

**Mains:** Trends in Renewable energy funding and the findings of World Energy Investment 2023

**Context:** According to 'World Energy Investment 2023,' investment in clean energy has increased in recent years.

### World Energy Investment Report

- The World Energy Investment is published by the International Energy Agency (IEA).
- The World Energy Investment report is published annually and World Energy Investment 2023 is the eight such report.
- The report provides the global benchmark for tracking capital flows in the energy sector.
- It also examines how investors are assessing risks and opportunities across all areas of fuel and electricity supply, critical minerals, efficiency, research and development and energy finance.
- This report is part of the IEA's support of the first global stocktake of the Paris Agreement, which will be finalised in the run up to COP28 to be held at the end of 2023.

### International Energy Agency (IEA)

- The International Energy Agency (IEA) is an intergovernmental autonomous organisation established in 1974 in order to ensure the security of oil supplies.
- The IEA was created in response to the 1973-1974 oil crisis.
- The IEA plays a major role in providing information related to the international oil market and taking action against any physical disruptions in the supply of oil.
- The key objective of the IEA is to coordinate the response of the participating states to the world energy crisis along with developing a mechanism for oil-sharing for use during supply difficulties.
- IEA mainly focuses on its energy policies which include economic development, energy security and environmental protection. These policies are also known as the 3 E'S of IEA.
- The IEA consists of 31 member countries, 11 association countries, and 4 accession countries.
- Important reports published by the IEA include: World Energy Outlook Report, World Energy Investment Report, World Energy Employment Report, Energy Efficiency Report, etc.

### India and IEA

- India became an associate member of IEA in March 2017
- However, India has engaged with the IEA even before as India was a party to the Declaration of Cooperation, signed in 1998.
- India had also signed three joint statements with IEA that covered various areas of mutual interest in the energy arena with major focus on gas and oil security.

### Findings of the report:

- The transition is mainly towards Electric Vehicles (EVs) and renewable power.

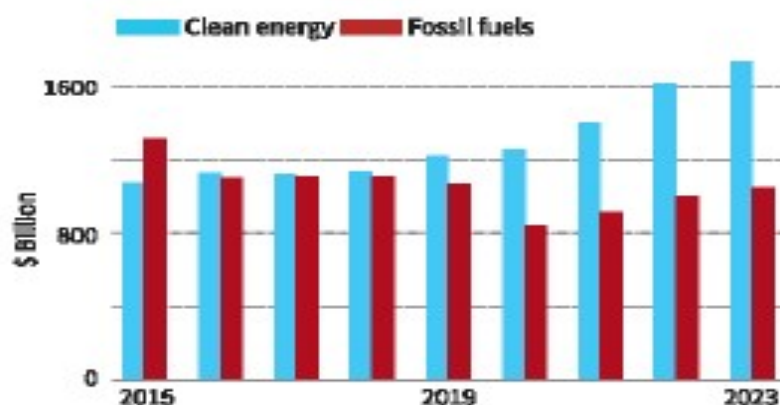
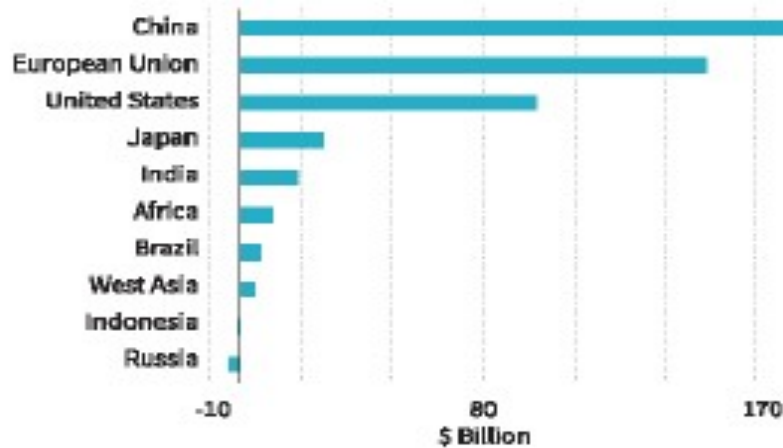


Figure: Global energy investment in clean energy and fossil fuels (in billion \$)

Source: The Hindu

- Investments in renewable energy are usually concentrated in advanced economies and China.



**Figure: Annual clean energy investments in select countries during 2019-2023**

**Source: The Hindu**

- However, the decline in the prices of clean energy technologies has reversed slightly in the past two years.
- It is shown that the post-pandemic recovery has significantly propelled investments in the renewable energy sector.
- It is found that annual investments in green energy have surpassed those in fossil fuels registering a growth of 24% against 15%.
- Moreover, the instability in the fossil fuel market due to Russia's invasion of Ukraine has accelerated the deployment of renewable energy technologies.
- Renewable energy in EV and power is complemented by battery technology, heat pumps, and nuclear power.
- It is estimated that in 2023, low-emission power will attract around 90% of the total investment in electricity generation.
  - Solar energy is projected to exceed \$1 billion per day in 2023, totaling \$380 billion for the year.
- India has exhibited robust investment in solar energy.
- Brazil is also on a consistent upward trajectory. Investments are also increasing in West Asian countries like Saudi Arabia, the UAE, and Oman.

#### Associated Challenges:

- The factors that are impeding investments in renewable energy are:
  - Higher interest rates
  - Ambiguous policies
  - Market designs
  - Financial constraints
  - High cost of capital
- The prices of several crucial clean energy technologies experienced an increase in 2021 and 2022. This rise can be attributed to increasing input prices for critical minerals, semiconductors, and bulk materials like steel and cement.

**Nut Graf:** *The World Energy Investment Report 2023 highlights that the push towards greener fuels is mainly driven by renewable power and electric vehicles. Moreover, it is usually concentrated in advanced economies and China.*

### 16. India's smart electricity future

**Syllabus:** Infrastructure - Energy

**Prelms:** Smart Electricity Transmission System

**Mains:** Implications of smart electricity initiative towards India's green-energy transition.

**Context:** This article discusses the potential and challenges of India's smart metering initiative.

#### Introduction:

- The smart metering initiative is a government-led program aimed at replacing traditional electricity metres with advanced smart metres.
- The program is part of the larger Smart Grid initiative, which aims to modernise the country's electricity infrastructure and improve the efficiency of the power sector.

- Under the smart metering initiative, the government plans to install 250 million smart metres in households and businesses across the country by 2025.
  - More than 5.5 million smart metres have been installed so far.
- The program is being implemented by state-owned power distribution companies, with support from the union government.
- India is supporting this initiative through a results-linked grant-cum-financing to help power distribution companies (discoms) become financially sound and efficient to deliver better services to consumers.

#### Smart Electricity Transmission System

- According to a statement released by the Power Ministry in March 2023, GOI, India will soon have a smart transmission system incorporating features that can improve efficiency, disaster preparedness, etc.
- The country will soon have a smart power transmission system with features such as:
  - Real-time monitoring and automated operation of grid
  - Better situational assessment
  - Increased share of renewable capacity
  - Improved utilisation of transmission capacity
  - Better resilience against cyber attacks and natural disasters
  - Centralised and data-driven decision-making,
  - Self-correcting systems etc.
- In 2021 an expert panel was set up by the Ministry of Power to recommend steps for the modernisation of the transmission sector and making it future-ready and smart.
- The panel recommended benchmarks for voltage control based on the performance of global transmission utilities and transmission network availability.
- The use of robots is expected to not only minimise human intervention and life risks/hazards but also save time while ensuring accuracy during construction and maintenance.
- The panel has recommended centralised remote monitoring, drones & robots, cyber security, process bus-based protection automation and control GIS/Hybrid substation, predictive maintenance technique using AI/ML algorithms, Hybrid AC/HVDC system, Dynamic Line Loading system (DLL), flexible AC transmission devices (FACTS), etc.
- The panel in its report has recommended technological and digital solutions, which can be adopted to make the electricity transmission grids future ready.

#### Advantages:

- Smart metres are digital devices that can measure and transmit electricity consumption data to utilities in real time.
- They offer several advantages over traditional metres, including more accurate billing, reduced theft and tampering, and better load management.
- Smart metres provide accurate and timely information about energy consumption, which can help to eliminate errors in billing.
- They can detect instances of energy theft or tampering. By identifying and addressing these issues, the initiative can help to reduce losses for utilities and improve the financial viability of the power sector.
- Real-time data on electricity consumption can help utilities to manage demand more effectively. This can lead to a more stable and reliable power supply and help to reduce blackouts and brownouts.
- Smart metres can help to integrate renewable energy sources, such as solar and wind, into the grid more effectively. By providing real-time data on energy consumption and production, utilities can balance supply and demand more efficiently and reduce reliance on fossil fuels.

#### Challenges:

- Smart metres are more expensive than traditional metres, and the cost of installation and maintenance is a significant challenge for utilities, particularly in rural and remote areas.
- They require reliable communication infrastructure, such as a robust and secure data network, to transmit data to utilities. This can be a challenge in areas with poor network coverage or limited connectivity.
- Some consumers may be reluctant to switch to smart metres due to concerns about privacy, data security, and the reliability of the technology.
- Smart metres can also face technical issues such as malfunctions, hacking attempts, and cyber-attacks.
- The implementation of smart metres requires coordination between multiple stakeholders, including utilities, regulators, and consumers.



**Way Forward:**

- In order to meet the increasing demand for electricity in India while also reducing carbon emissions from generation sources, it is essential for the smart metering initiative to adopt a philosophy centred around the needs and preferences of users.
- The Union Ministry of Power should drive a nationwide campaign to educate consumers about smart metre benefits and improve the uptake of smart metre apps.
  - The apps should be accessible to users from diverse socio-economic backgrounds and provide actionable tips and information.
- Discoms must co-own the program with Advanced Metering Infrastructure Service Providers (AMISPs), responsible for the installation and operation of the AMI system for the project lifetime (10 years).
- Discoms, system integrators, and technology providers should collaborate to devise innovative and scalable data solutions for the effective use of smart metre data.
- Policymakers and regulators must strengthen regulations to empower consumers to unlock new retail markets and simplify tariff design.
  - In a progressive step, the Union Ministry of Power in April 2023, proposed amendments to the Electricity Rules to enable time-variable tariffs for all smart metre users.
- Regulators must also enable simplification and innovation in tariff design and open the retail market to new business models and prosumers (producers, consumers, and storage users).

**Nut Graf:** India's Smart Metering initiative aims to replace traditional electricity meters with advanced smart meters, helping to modernize the country's electricity infrastructure and improve the efficiency of the power sector. Smart meters offer several advantages over traditional meters. However, the initiative also faces several challenges.

**17. Kiru hydro-electric power project**

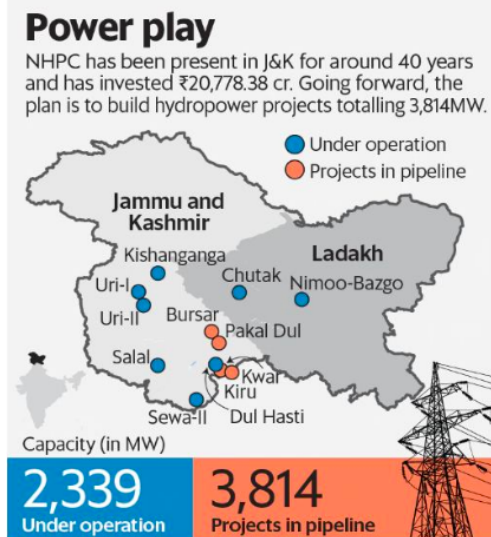
**Syllabus:** Infrastructure – Energy

**Prelims:** About Kiru hydro-electric power project

**Context:** The Central Bureau of Investigation (CBI) searched various locations in Delhi and Rajasthan in connection with a case alleging corruption in the award of ₹2,200 crore civil works related to the Kiru hydroelectric power project.

**Kiru hydro-electric power project**

- Kiru Hydro Electric Project is a 624 MW project being constructed in Kiru village located in the Kishtwar district of Jammu and Kashmir.
- The project is proposed on River Chenab.
  - The project is being built between Kirthai II (upstream) and Kwar (downstream) hydroelectric plants.
- The project is said to be a Run of River Scheme.
  - Run-of-the-river hydroelectric systems harvest the energy from flowing water to generate electricity in the absence of a large dam and reservoir.
- The project is being built by Chenab Valley Power Projects (CVPP), which is a joint venture between National Hydroelectric Power Corporation (NHPC), Jammu & Kashmir State Power Development Corporation (JKSPDC) and Power Trading Corporation (PTC).
- The project is expected to increase access to energy in the rural parts of northern India and will also improve the transportation, education, medical, and road transportation network in the region.



Source: Moneycontrol

## 18. Logistic Performance Index 2023

**Syllabus:** Infrastructure - Logistics

**Prelims:** About Logistic Performance Index

**Mains:** Important findings of the Logistic Performance Index 2023

**Context:** The World Bank's Logistic Performance Index (LPI) 2023 presently ranks India 38th out of 139 nations (up from 44 in 2018).

### What is the Logistic Performance Index (LPI)?

- The World Bank Group created the LPI as an interactive benchmarking tool.
  - It assists countries in identifying the obstacles and opportunities they face in their trade logistics performance, as well as what they can do to improve their performance.
- It assesses the simplicity with which dependable supply chain linkages may be established, as well as the structural elements that enable this. To evaluate logistics performance, the **LPI examines six parameters**:
  - Customs performance
  - Infrastructure quality
  - Ease of arranging shipments
  - Logistics services quality
  - Consignment tracking and tracing
  - Timeliness of shipments
- The World Bank published the LPI every two years from 2010 to 2018, with a delay in 2020 due to the COVID-19 pandemic and a revision of the index methodology. It was eventually published in 2023.
  - LPI 2023 compares 139 nations and, for the first time, assesses trade speed using metrics generated from large databases tracking exports.

### What Aspects Led to India's Improved Logistics Performance?

- **Policy Interventions:** The government announced the PM Gati Shakti programme, a National Master Plan for multimodal connectivity, in October 2021.
  - By 2024-25, this programme intends to minimise logistical costs while also boosting the economy.
- **National Logistics Policy (NLP):** In 2022, the Prime Minister (PM) announced the National Logistics Policy (NLP) to ensure speedy last-mile delivery, end transportation-related difficulties, save time and money for the industrial sector, and ensure desired speed in the logistics industry.
  - These policy measures are bearing fruit, as seen by India's increase in LPI and other indicators.
- **Infrastructure Improvements:** According to the LPI report, India's infrastructure score rose five places from 52nd in 2018 to 47th in 2023.
- The government has invested in trade-related soft and hard infrastructure, linking port entrances on both coasts to important economic centres in the country's interior.
- This investment has paid off, with India rising from 44th to 22nd in worldwide shipments in 2023.

**● The Role of Technology:**

- Technology has been a significant component of India's efforts to improve logistics performance.
- The government has built a supply chain visibility platform through a public-private collaboration, which has resulted in significant reductions in delays.
- NICDC Logistics Data Services Limited marks containers with radio frequency identification tags and provides end-to-end supply chain tracking to consignees.
- According to the survey, emerging economies such as India are outpacing advanced economies due to modernisation and digitalization.

**● Reduced Dwell Time:**

- Dwell time is the amount of time a vessel spends at a certain port or terminal. It may also refer to the period of time a container or cargo spends at a port or terminal before or after being loaded onto or unloaded from a vessel.
- One example of how India has improved its logistics performance is its relatively short dwell time (2.6 days).
- According to the analysis, the average stay time for containers in India and Singapore between May and October 2022 was three days, which was significantly lower than in certain industrialised countries.
- The dwell time in the United States was 7 days, whereas in Germany it was 10 days.
- With the implementation of cargo tracking, dwell time in Visakhapatnam's eastern port decreased from 32.4 days in 2015 to 5.3 days in 2019.

**19. India's First Water Metro**

**Syllabus:** Infrastructure

**Prelims:** India's First Water Metro

**Context:** Prime Minister inaugurated the Kochi water metro which is a first-of-its-kind public boat service integrated with a metro rail network.

**About India's First Water Metro:**



Source: [kochimetro.org](http://kochimetro.org)

- The total cost of the project is Rs 747 crores and is implemented by Kochi Metro Rail Corporation Limited (KMRL) with assistance from German funding agency Kreditanstalt für Wiederaufbau.
- The project is expected to boost the growth and development of Kochi and will connect 10 islands around Kochi.
- The water metro consists of two routes and will initially sail with 8 electric-hybrid boats.
- When the project becomes fully operational, the water metro will cover 76 km with 78 boats and 38 terminals which includes six panchayats and three municipalities.
- Cochin Shipyard Limited constructed all the boats which are hybrid and battery powered. They also have a backup of diesel-powered generators.

# INTERNATIONAL RELATIONS

## 1. Nagorno-Karabakh tensions

**Syllabus: Policies and politics of developed and developing countries**

**Mains: Nagorno-Karabakh issue**

**Context:** Azerbaijan announced the establishment of a roadblock at the opening of the Lachin corridor, the sole land route connecting Armenia and Nagorno-Karabakh, which was followed by reports of border gunfire by both Azeri and Armenian forces.

### What is Nagorno-Karabakh?

- Nagorno-Karabakh, often known as Artsakh by Armenians, is a hilly region in the South Caucasus.
- After the fall of the Russian Empire in 1917, it was claimed by both Azerbaijan and Armenia, and it has remained a source of contention ever since.
- The territory is internationally recognised as part of oil-rich Azerbaijan, but its inhabitants are mostly ethnic Armenians with their own government that has close ties to the government in neighbouring Armenia but is not officially recognised by it or other U.N. member states.
- Armenian Christians claim a lengthy history of supremacy in the region that dates back several centuries before Christ.
- Azerbaijan, whose people are primarily Muslim, also connects its historical identity to its territory. It accuses Armenians of forcibly displacing Azeris who resided nearby in the 1990s. It wants full control of the enclave and has suggested that ethnic Armenians obtain Azeri passports or leave.



Sources: Worldatlas.com

### How did the conflict over Nagorno-Karabakh begin?

- Nagorno-Karabakh was historically part of the Armenian Kingdom and has been ruled by several empires including the Ottomans, Persians, and Russians.
- Armenia, Azerbaijan, and Georgia later gained independence, with the Azeris absorbing Nagorno-Karabakh into their Republic.
- Despite its predominantly Armenian population, the Soviets designated Nagorno-Karabakh as an autonomous Oblast (administrative region) on Azerbaijan's territory.
- As Soviet power began to wane in the 1980s, the Armenian population of Nagorno-Karabakh expressed a desire to join Armenia, organising a referendum in 1988.
- Following the dissolution of the Soviet Union in 1991, Armenian insurgents in Nagorno-Karabakh declared it an independent territory, which was not recognised internationally.
- This resulted in an open war between Armenia and Azerbaijan, with Armenia controlling around 13% of Azerbaijan's land.
- The war ended in 1994, when both countries agreed to a cease-fire mediated by Russia, but this was insufficient to prevent further flare-ups in the region.
- A skirmish between the rebels and the Azerbaijani military in 2016 escalated into a four-day war that ended in a truce.
- In 2020, new hostilities erupted on the Armenia-Azerbaijan border, resulting in a six-week war in which Azeri forces reclaimed 40% of Nagorno-Karabakh.

### Concerns

- Without successful mediation attempts, ceasefire violations and increased tensions between Armenia and Azerbaijan threaten to rekindle a full-fledged conflict.
- A conflict of this magnitude would destabilise the South Caucasus area, potentially affecting oil and gas shipments from Azerbaijan, which produces approximately 800,000 barrels of oil per day, to Central Asia and Europe.
- By treaty, Russia has agreed to defend Armenia in the event of armed escalation, while Turkey has pledged to support Azerbaijan.
- The United States' public backing for Armenia in recent years, along with Russia's current involvement in the Ukraine conflict, might provide a pretext for escalation and hamper attempts to maintain regional peace.

### Where do the current peace talks stand?

- With the Minsk Group's efforts mostly failing, Baku saw a chance to present its own peace proposal, which demands for the acknowledgment of Nagorno-Karabakh within Azerbaijani territory.
- By facilitating meetings between the leaders of both countries, the European Union has emerged as a prospective peace broker.
- The Armenian President has faced social unrest and protesters calling for his ouster for agreeing to peace negotiations.
- Armenians are also urging Turkey, which has united with Azerbaijan, to recognise the Armenian genocide of 1915.

## 2. Pakistan and China agree to extend CPEC to Afghanistan

**Syllabus:** India and its neighbourhood- relations.

**Prelims:** About China-Pakistan Economic Corridor (CPEC) and One belt, one road initiative

**Mains:** Pakistan and China have agree to extend CPEC to Afghanistan

**Context:** Pakistan, China and Afghanistan have agreed to forge closer economic ties by extending the Beijing-backed China-Pakistan Economic Corridor (CPEC) to Afghanistan to fully harness the country's potential as a hub for regional connectivity.

### Details:

- The three countries reiterated their resolve to fully harness Afghanistan's potential as a hub for regional connectivity and reaffirmed "their commitment to further the trilateral cooperation under the Belt and Road Initiative (BRI), and to jointly extend the China-Pakistan Economic Corridor to Afghanistan."
- The USD 60 billion CPEC aims to connect Pakistan's Gwadar port in Balochistan with China's Xinjiang province. India has objected to the CPEC as it traverses through Pakistan-occupied Kashmir (PoK).
- The CPEC is officially regarded as the flagship project of China's multi-billion-dollar Belt and Road Initiative (BRI) – the pet project of President Xi Jinping.





### One belt, one road initiative

- It is a multi-billion-dollar initiative launched in 2013.
- It aims to link Southeast Asia, Central Asia, the Gulf region, Africa and Europe with a network of land and sea routes.
- It has been launched to undertake big infrastructure projects in the world which in turn would also enhance the global influence of China.
- They contain the following six economic corridors:
  - The New Eurasian Land Bridge, which connects Western China to Western Russia
  - The China-Mongolia-Russia Corridor, which connects North China to Eastern Russia via Mongolia
  - The China-Central Asia-West Asia Corridor, which connects Western China to Turkey via Central and West Asia
  - The China-Indochina Peninsula Corridor, which connects Southern China to Singapore via Indo-China
  - The China-Pakistan Corridor, which connects South Western China through Pakistan to Arabia Sea routes
  - The Bangladesh-China-India-Myanmar Corridor, which connects Southern China to India via Bangladesh and Myanmar
- Additionally, the maritime Silk Road connects coastal China to the Mediterranean via Singapore-Malaysia, the Indian Ocean, the Arabian Sea, and the Strait of Hormuz.



### 3. China's global image

**Syllabus:** Effect of Policies & Politics of Developed & Developing Countries on India's Interests

**Mains:** China's growing influence in central Asia and its implications for India

**Context:** China's position paper on its policy in Afghanistan.

#### Introduction:

- In April 2023, the Foreign Ministers of Afghanistan's neighbouring countries met in Samarkand, Uzbekistan, including China's Foreign Minister, who released an 11-point policy paper titled "China's position on the Afghan Issue."
- The paper outlines China's policy towards Afghanistan and its priorities in engaging with the Taliban.
- It also reflects China's recent efforts to reshape its image as a responsible mediator addressing international issues objectively.

#### China's policy choices:

- In the policy paper, China delineates its respect for the independence, sovereignty, and territorial integrity of Afghanistan and the Afghan people's choices and criticises the West's political policies, which it claims failed to fulfil commitments and impose democracy without considering Afghanistan's unique characteristics.
- China advocates using regional groupings that exclude the US and its allies to discuss the Afghan issue, such as the Shanghai Cooperation Organisation, the Moscow Format Dialogue, the Foreign Ministers' group, and the China-Afghanistan-Pakistan Trilateral Foreign Ministers' Dialogue.
  - China seeks to promote an alternative model and form a consensus among Afghanistan's neighbours.
- China frames its engagement in Afghanistan as being driven by humanitarian concerns, good neighbourly relations,

and mutual respect for neighbouring countries, while refraining from explicitly acknowledging its own interests in the region.

- China calls for a multilateral approach to respond to terrorism, extremism, and separatism, urging the Taliban, regional countries, and the international community to crack down on terror groups, specifically the East Turkestan Islamic Movement and boost Afghanistan's counterterrorism capabilities.
- The question of refugees and narcotics and their cross-border trafficking are also highlighted.

#### East Turkestan Islamic Movement (ETIM)

- The East Turkestan Islamic Movement (ETIM) is a militant separatist group based in China's Xinjiang region, which seeks to establish an independent state called East Turkestan.
- The Chinese government has accused ETIM of carrying out several terrorist attacks in Xinjiang and other parts of China. China has also claimed that the group has links with other terrorist organizations such as Al-Qaeda and the Taliban.
- The United Nations has designated ETIM as a terrorist organization, and several countries, including the United States and the European Union, have also listed the group as a terrorist organization.
- India has expressed concern about the activities of ETIM, particularly in the context of its growing ties with Pakistan-based militant groups.

#### Significance of this policy paper:

- Afghanistan borders China's Xinjiang region, which is home to a significant population of Uighur Muslims. As such, Afghanistan's stability and security directly affect China's national security interests.
- Afghanistan is rich in natural resources, including minerals such as lithium, copper, and rare earth elements, which are essential for China's high-tech industries. China is keen to develop these resources and has invested in several mining projects in Afghanistan.
- Afghanistan lies at the crossroads of China's Belt and Road Initiative.
- China has been seeking to expand its diplomatic influence in the region and sees Afghanistan as a key player in South Asia.
  - China has been engaging with the Taliban and other Afghan factions to promote peace and stability in the country and enhance its influence in the region.

#### China's effort to reshape its image:

- China has been making diplomatic efforts to project itself as a responsible mediator in resolving conflicts and promoting dialogue between different countries.
- It has been hosting and participating in various international forums and meetings to showcase its commitment to global governance.
- China highlights its achievements in bringing Iran and Saudi Arabia to negotiate and receiving visits from European leaders as evidence of its increasing influence.
- It also published the Global Security Initiative concept paper and the peace proposal for Ukraine.

#### Implications for India:

- China's continued engagement with Russia and Iran, as well as the Central Asian countries, is seen as a strategic move to enhance its influence and secure its energy needs.
- The strengthening of the China-Russia-Iran trilateral partnership has implications for India's strategic interests, as it could limit India's influence in the region.
- China's Belt and Road Initiative (BRI) has increased its engagement with Central Asian countries, which India views as a part of its extended neighbourhood.
- India has expressed concerns about the growing Chinese presence in the region, as it could lead to a potential encirclement of India by China and its allies.
- China's deepening ties with Iran have also been a cause for concern for India, as it could impact India's energy security and lead to a strategic shift in the region.
- However, India should continue to pursue its own strategic goals in the region, such as promoting stability, combating terrorism, and expanding economic opportunities, while also remaining mindful of China's growing presence and its potential impact on India's interests.

**Nut Graf:** China recently released an 11-point policy paper outlining China's position on the Afghan issue which emphasises respect for its sovereignty and criticises the West's failed policies. This policy paper reflects China's efforts to reshape its image as a responsible mediator.

#### 4. India's China strategy needs to be debated

**Syllabus:** India and its neighbourhood.

**Mains:** India-China relations.

**Context:** China's move to rename eleven places in Arunachal Pradesh.

**Introduction:**

- China has renamed eleven places in India's Arunachal Pradesh, which they consider to be "Zangnam" or "South Tibet" (in English).
- It is claimed that the move to "standardize" names in Zangnam "completely falls within China's sovereignty".

**Details:**

- India responded by outrightly rejecting the nomenclature.
- Notably, this is the third batch of "renaming" with reference to Arunachal Pradesh.

**Status of India-China Relations:**

- It is argued that there has been no serious attempt by China to resolve the Galwan issue. Moreover, further provocation has occurred from the Chinese side. For instance, there was a border skirmish in Tawang (December 2022).
- According to a research analysis by a senior police officer, India has lost access to 26 out of 65 Patrolling Points (PP) in eastern Ladakh.
- It is argued that India's approach of "playing safe" has resulted in the loss of pasture lands at Gogra hills, the North Bank of Pangong Tso, and the Kakjung areas.
- The author argues that India is not open to publicly denouncing China's move due to:
  - The growing power differential between India and China.
  - Uncertainty about the actions of major countries like the U.S.
  - Difference between the military capability of the two countries (India is not prepared for a major war with China).
  - Lack of consensus among various ministries in India.
  - Pressure from India's business groups who are willing to safeguard trade between the two neighbours.
  - Lack of political will.

**Associated Concerns:**

- It is highlighted by the author that India's approach is similar to its pre-1962 engagement with China and has the potential to hamper its national security.
- India is focusing on reinforcing its border defences and building roads and other infrastructure. This would only resist People's Liberation Army (PLA) but is not enough to deter it completely.
- There is an absence of a tough rhetorical response to Chinese actions in the public eye, which is considered a Chinese gain.

**Way Ahead:**

- The very first step is to acknowledge the problem.
- China has a constant fear of being isolated in global affairs due to its assertiveness. India should capitalize on this fear and exploit it for its own advantage.
- New Delhi should loudly and proudly raise matters of its vital importance and fracture China's image publicly.
- India should learn from its mistakes in the past and hold an urgent debate in the Parliament on India's China strategy.
- Moreover, the government should take Indian citizens in confidence.

**Conclusion:** It is important to remember Mark Twain's observation that history does not repeat itself, but it often rhymes. Though the period since Galwan (2020-2023) is not the same as 1949 to 1962, the pattern of appeasement and self-denial is quite similar.

**Nut Graf:** China has renamed eleven places in India's Arunachal Pradesh. India has only rejected these claims and has not taken any concrete steps to publicly challenge China. It is suggested that the Indian government should review its China strategy and not repeat the mistakes made in the pre-1962 period (India-China War).

## 5. SCO Foreign Ministers Meeting

**Syllabus:** Bilateral, Regional & Global Groupings & Agreements Involving India

**Prelims:** About Shanghai Cooperation Organisation (SCO)

**Mains:** Aim and goals of SCO and challenges.

**Context:** Foreign ministers of the Shanghai Cooperation Organisation (SCO) met in Goa on May 4-5, 2023.

### Background:

- India, the chair of SCO is hosting the foreign ministers' meeting in Goa from May 4-5 to prepare the agenda for the group's summit in July 2023 where 15 decisions or proposals will be signed off.
- The theme of India's chairmanship of SCO in 2023 is 'SECURE-SCO'.
- India attaches special importance to SCO in promoting multilateral, political, security, economic and people-to-people interactions in the region.
- The ongoing engagement with SCO has helped India promote its relations with the countries in the region with which India has shared civilizational linkages, and is considered India's extended neighbourhood.

### Shanghai Cooperation Organisation (SCO)

- SCO was initially started as the "Shanghai Five" in 2001 with Russia, China, Kazakhstan, Kyrgyzstan and Tajikistan as members.
  - With the induction of Uzbekistan as its member, "Shanghai Five" was renamed as Shanghai Cooperation Organisation (SCO) and came into force in 2003.
  - India and Pakistan joined SCO in 2017.
- **Observer status:** Afghanistan, Iran, Belarus and Mongolia
- **Aim:** Strengthening mutual trust among the member states; promoting their effective cooperation in politics, trade, economy, research and technology, and culture.
- **Focus areas:** Education, Energy, Transport, Tourism and Environmental conservation.
- The SCO's official languages are Russian and Chinese.
- Key objectives:
  - Strengthening mutual trust and neighbourliness among the member states
  - Promoting effective cooperation in politics, trade, the economy, research, technology, culture, education, energy, transport, tourism, environmental protection, and other areas
  - Making joint efforts to maintain and ensure peace, security and stability in the region
  - Working towards establishing a democratic, fair and rational new international political and economic order.

### Organisational structure of SCO

- SCO has two permanent bodies:
  - The SCO Secretariat is based in Beijing.
  - The Executive Committee of the Regional Anti-Terrorist Structure (RATS) based in Tashkent.
- SCO also consists of the Heads of State Council (HSC) which is the supreme decision-making body of the organisation.
  - HSC meets every year to adopt decisions and guidelines on important issues related to the grouping.
- The Heads of Government Council (HGC) of SCO includes the Prime Ministers and leaders of the countries which also meet annually to decide on SCO's priority areas and multilateral cooperation strategy.
  - The council also discusses various economic, cooperation issues and the annual budget of the group.
- The Foreign Ministers Council discusses issues related to the day-to-day activities of the grouping, charting HSC meetings and issuing statements on various international problems.

### Regional Anti-Terrorist Structure (RATS)

- Regional Anti-Terrorist Structure (RATS) is a permanent organ of the Shanghai Cooperation Organisation (SCO) which was formed in 2004.
- **Headquarters:** Tashkent, Uzbekistan
- **Aim:** to help member states combat extremism, terrorism and separatism.
- RATS is engaged in furthering cooperation and ties between member countries on concerns of terrorism, security, drug trafficking, crime and cyberwarfare.
- The Head of RATS is elected for a three-year term. All the member's states also have their own representatives at RATS.

**Highlights of the meeting:**

- Union External Affairs Minister S. Jaishankar held a “detailed” discussion with Chinese Foreign Minister Qin Gang.
  - India-China talks focused on resolving the military stand-off at the Line of Actual Control (LAC).
- Mr. Jaishankar also met with Russian Foreign Minister Sergey Lavrov and Uzbekistan counterpart Bakhtiyor Saidov.
  - Mr. Jaishankar held a “comprehensive review” of India-Russia bilateral, global and multilateral cooperation with the Russian Foreign Minister.
  - The two Ministers had a “trust-based exchange of views” on all issues, including their cooperation as part of the India-Russia Special and Privileged Strategic Partnership.
- Both meetings with the Russian and Chinese Ministers included discussions about upcoming events such as the SCO, G-20 and BRICS summits.
  - Russia and China have held up a consensus on the joint communique that India is hoping to release during the G-20 summit in September.
- Russia expressed its commitment to “build a fair multipolar system of interstate relations” and strengthen coordination within the framework of interaction at important international platforms such as the SCO, BRICS, the UN and the G20 with India.

**Nut Graf:** India, as the chair of SCO, is hosting a foreign ministers’ meeting to prepare the agenda for the group’s summit in July 2023. The meeting includes discussions on bilateral ties, unresolved military stand-off with China, and cooperation with Russia as part of the India-Russia Special and Privileged Strategic Partnership.

**6. The horizon for India beyond the G-20, SCO summits**

**Syllabus:** Bilateral, Regional & Global Groupings & Agreements Involving India and/or Affecting India’s Interests

**Mains:** India’s role in global politics as the president of G20 and SCO

**Context:** This article discusses the challenges that India faces during its presidency of the G-20 and the leadership of the Shanghai Cooperation Organisation (SCO).

**Introduction:**

- India faces multiple challenges despite holding the presidency of the G-20 and the leadership of the Shanghai Cooperation Organisation (SCO).
- Given the worsening global situation, there is a risk that India’s priorities as G20 president, such as climate change, clean energy, sustainable development programs, and multilateral institution reform, may be overshadowed by the deteriorating geopolitical climate and the possibility of impending conflict.
- It is necessary for India to carefully manage the competing demands of the G-20, SCO, and the Global South with a cautious approach.

**Concerns:**

- The lack of trust between the opposing camps headed by the United States and China/Russia respectively, leaves limited options for countries like India that have not pledged allegiance to either side.
  - The US and its allies are providing Ukraine with advanced weaponry and training, while Russia is also secretly receiving equipment from its allies. This arms race between the two sides poses a risk of a catastrophic conflict.
- India is facing threats from China at the Sino-Indian border, which is also displaying its naval power in East and Southeast Asia, and launching diplomatic-cum-strategic offensives across Asia.
  - China is attempting to widen the arc of conflict with India and is targeting India’s increasing closeness to the US and Western bloc, its participation in the Quad, and maritime surveillance exercises.
  - China is also trying to limit India’s influence in the extended neighbourhood, particularly in West Asia, where it is sidelining India and other nations with its initiatives.
- India is also facing challenges from its immediate neighbourhood, including Afghanistan, Pakistan, and Sri Lanka.
- India’s relationship with Russia is uncertain, particularly due to its growing defence cooperation with the US and strains in the Russia-China relationship.
  - The Tripartite Russia-India-China platform and BRICS, among other agreements with Russia, have also experienced a significant decline in their level of activity.



**Way Forward:**

- Despite India being recognized as a potential global power and having successfully emerged from the COVID-19 pandemic and economic crisis with minimal harm, there are still significant obstacles that need to be overcome before it can reach its ultimate goal.
- India needs to balance its domestic priorities with its international obligations.
  - While India has a strong desire to play a larger role in global politics, it also needs to address its domestic issues and focus on achieving its economic and social goals.
  - This balance is crucial to ensuring that India remains a stable and prosperous nation, capable of making meaningful contributions to the international community.
- India is aware of China's hostile intentions and therefore must exercise caution, given China's ability to engage in hybrid warfare, politics of water, and adapt the tactics of Sun Tzu to win wars without fighting.
- As a leader of the Global South, India has a unique role to play in promoting peace and stability in the world. India can use its position to encourage dialogue and diplomacy between key stakeholders in the Ukraine war and to urge both sides to respect international law and norms.

**Nut Graf:** India, as the G-20 President and SCO leader, faces numerous challenges, including the risk of its priorities being overshadowed by the geopolitical climate, border threats from China, and challenges from its immediate neighbourhood. By pursuing a balanced and pragmatic foreign policy, India can continue to advance its own interests while also contributing to global peace and stability.

**7. PM Modi's visit to Japan & Pacific islands and a long-drawn test for India's diplomatic skills**

**Syllabus:** Bilateral groupings and agreements involving India

**Prelims:** About Forum for India Pacific Islands Cooperation (FIPIC)

**Mains:** The significance of India's engagement with Japan and Pacific Island countries.

**Context:**

- Prime Minister Narendra Modi is on a three-nation visit to - Japan, Papua New Guinea and Australia, to attend multilateral summits, including that of the Group of Seven (G7).
- India was among the invitees to the G-7 summit, along with Australia, the Cook Islands, Brazil, Vietnam, Indonesia and others.

**News in details:**

- PM Modi visited Hiroshima in Japan from May 19 to 21 to participate in the annual summit of the G7 advanced economies under the Japanese Presidency.
  - The Prime Minister held bilateral meetings with some of the participating leaders on the sidelines of the Summit.
- He attended the summit at the invitation of Japanese Prime Minister Fumio Kishida.
- PM Modi's visit to Papua New Guinea will be the first visit by an Indian prime minister to the country.
- PM Modi will co-chair the third Summit of the Forum for India-Pacific Islands Cooperation (FIPIC) in Port Moresby, Papua New Guinea.

**India-Pacific Islands Cooperation (FIPIC)**

- The Forum for India–Pacific Islands Cooperation (FIPIC) was launched in November 2014 during the visit of Prime Minister Narendra Modi to Fiji.
- FIPIC was launched in line with India's Act East Policy.
- This initiative of India is also a part of South-South Cooperation.
- The FIPIC involves India and 14 Pacific Island countries namely, Fiji, Papua New Guinea, Tonga, Tuvalu, Kiribati, Samoa, Vanuatu, Niue, Federated States of Micronesia, Republic of the Marshall Islands, Cook Islands, Palau, Nauru and the Solomon Islands.
- The key objective of the initiative is to expand India's engagement in the Pacific region.
- India, through the FIPIC, has offered some major assistance projects which include setting up a special fund for adapting to climate change, setting up a trade office in India, efforts to improve digital connectivity, extending visas on arrival at Indian airports for all the 14 Pacific Island countries, cooperation in space technology, training the diplomats from these countries among others.
- Further, India has increased the annual "Grant-in-Aid" from USD 125,000 to 200,000 for each of these 14 Pacific Island countries.
- The first summit of FIPIC was held in Suva, Fiji in November 2014.
- The second summit of FIPIC was held in Jaipur in August 2015.

**Key highlights of the third summit of FIPIC**

- Highlighting the importance of the Pacific Islands nations, the Prime Minister of India noted that small island nations of the Pacific Ocean are in fact "large ocean states".
- The PM further highlighted the importance of a free and open Indo-Pacific region and also talked about India's commitment to assisting the development goals of the member countries.
- India has in the past supplied some of the most essential items such as vaccines, medicines, wheat and sugar to these nations during the time of crisis.
- The PM assured that India would continue to support Pacific island states in every possible way.
- The PM also acknowledges that new challenges with respect to supply chains of food, fuel, fertilizer and pharma are emerging in recent times apart from the already existing hurdles such as climate change, natural calamities, poverty and famine.
- The Prime Minister of Papua New Guinea pointed out that the members of the FIPIC are suffering on account of the high tariff on energy and food which has been a result of recent geopolitical tensions and power struggles between the big nations.
- During a special ceremony, the Governor General of Papua New Guinea conferred the **Grand Companion of the Order of Logohu (GCL)** to Prime Minister Narendra Modi.
  - It is the highest civilian award in Papua New Guinea.
- On the sidelines of the summit, Prime Minister Modi was also conferred with the **Companion of the Order of Fiji**, the highest honour of Fiji, by the Prime Minister of the Republic of Fiji.

**Multitude engagements:**

- Despite the cancellation of the Quad Summit in Sydney, the leaders of Australia, India, Japan, and the United States are meeting on the sidelines of the G-7, demonstrating their commitment to the Indo-Pacific "coalition of democracies".
- Mr. Modi is also visiting Washington in June 2023 for a state visit, a rare honour accorded by the U.S. President, that has been reserved for only two Indian leaders in the past, President Sarvepalli Radhakrishnan (1963) and Prime Minister Manmohan Singh (2009).
  - This visit will be marked by many strategic forays to bring India-U.S. ties closer.
- In July, India is hosting the Shanghai Cooperation Organisation (SCO) Summit, in which China's President Xi Jinping, Russia's President Vladimir Putin, Pakistan's Prime Minister Shehbaz Sharif and leaders of Central Asian states are expected to be present.
  - The membership of the SCO, including observer nations like Myanmar, creates an impression of it being predominantly aligned against the West, as it includes almost every country sanctioned by Western nations.
- The recent SCO Council for Foreign Ministers held in Goa witnessed India's bilateral relations with Pakistan, China, and Russia overshadowing significant multilateral outcomes.
  - This situation has been a source of frustration for Central Asian countries, as they have consistently emphasised the need to avoid discussing bilateral issues within the SCO, to prevent it from experiencing the same fate as the South Asian Association for Regional Cooperation (SAARC).
- In August, Mr. Modi will attend the BRICS summit in South Africa, engaging with leaders from Russia, China, Brazil, and South Africa to discuss alternative BRICS payment mechanisms and other ideas aimed at creating a counter-narrative to the dominance of the U.S.-European Union alliance.

- In September, as the host of the G-20 summit in Delhi, Mr. Modi will face a diplomatic challenge as leaders from all permanent members of the UN Security Council gather in Delhi, a unique occurrence since 2010.

#### Geography of the Indo-Pacific Islands



#### Striking a balance:

- India's strategic engagements and hosting of major summits in 2023 are in line with PM Modi's version of "multi-directional engagements" instead of traditional non-alignment.
- India's participation in reviving the Quad and joining the SCO as a full member in 2017 demonstrates its proactive approach to countering China's assertiveness and expanding its global influence.
- India, despite security challenges posed by its nuclear-armed neighbours, successfully maintains a delicate equilibrium and attracts the attention of countries from diverse global orientations.
- India has also successfully navigated India's position in the Ukraine war without taking extreme measures.
- India's efforts to serve as a "balancing force" are not only visible but also influential, inspiring other countries in Southeast Asia, the Global South to manage their ties with the West without fully aligning with its stance on Ukraine or sanctions.
- The success of India's autonomous strategy or multi-alignment is evident in the growing recognition and support it receives, including France's recent reiteration of "Strategic Autonomy" following French President Macron's visit to Beijing. This highlights the existence of divisions within the Western coalition itself on this matter.

#### Concerns:

- India's carefully balanced approach may face significant challenges if certain unexpected events, such as Ukraine's successful spring offensive or China's aggression along the Line of Actual Control, occur.
  - Such incidents would necessitate a reevaluation of India's policies and relationships, particularly with Russia.
- India's strategic considerations could also be influenced if Russia becomes more confrontational regarding payment issues or if it withholds defence supplies to India under Chinese pressure.
- Additionally, any attempt by the United States and Europe to impose unilateral sanctions on India for its increased oil imports from Russia or for acquiring Russian S-400 missile systems could prompt India to reconsider its position.
- These challenges will be intensified if India fails to secure Russia and China's consensus on a joint communique at the upcoming G-20 summit in September and during the SCO and BRICS summits in July and August, respectively.

**Nut Graf:** India's upcoming multilateral engagements in 2023 highlight India's strategic approach, maintaining a delicate balance while seeking recognition and support globally. Challenges may arise from unexpected events, potentially impacting India's policies and relationships. However, unless these scenarios occur, India is likely to continue navigating its interests between various global powers.

## 8. Hiroshima Summit

**Syllabus:** Bilateral, Regional & Global Groupings & Agreements Involving India and/or Affecting India's Interests

**Prelims:** About G7

**Mains:** Significance of G7 in addressing global challenges

**Context:** 47th G7 Summit hosted by Japan.

### About G-7

- The Group of Seven (G-7) is an informal bloc of industrialised democracies – France, Italy, Germany, the United Kingdom, Japan, the United States and Canada that meets annually to discuss issues of common interest like the global economy, international security and energy policy.
- France, Italy, Japan, the United Kingdom, the United States and West Germany formed the Group of Six (G-6) in 1975 so that the non-communist powers would come together to discuss economic concerns, which at that time included inflation and recession following an OPEC oil embargo.
- In 1976, Canada was also invited to join the group and the first meeting with all Group of 7 (G7) nations was hosted by the United States which was held in Puerto Rico in 1976.
- The European Union has participated fully in the G-7 since 1981 as a “non-enumerated” member.
- Russia joined in 1998 and its inclusion was meant as a signal of cooperation between East and West after the Soviet Union collapse in 1991. G-7 was known as G-8 for several years after Russia joined it.
- Russia was expelled out of the then G-8 in 2014 after it annexed Crimea from Ukraine which was seen as a ‘violation of Ukraine’s sovereignty and territorial integrity’. After the expulsion of Russia, the group was again called the Group of Seven (G-7).
- Summits are held annually and hosted on a rotation basis by the group’s members. The host country not only holds the G7 presidency but also sets the agenda for the year. In 2023, Japan assumed the G-7 Presidency and Italy will host it in 2024.
- The global GDP is moving from the trans-Atlantic region to the Indo-Pacific region. At present G-7 accounts for over 30% of the global GDP, reduced from about 50% four decades ago.

### Introduction:

- The 49th annual G7 Summit took place in Hiroshima, hosted by Japan as the current President of the group.
- The selection of Hiroshima as the host city highlights Prime Minister Kishida’s dedication to prioritise nuclear disarmament and non-proliferation during the meeting.
- Prime Minister Modi was invited by his Japanese counterpart and attended the G7 Summit, contributing to the discussions and deliberations alongside other world leaders.
- During the second day of the summit, the participating leaders issued a leaders’ communiqué, which was formally adopted on the 21st as the summit concluded. This communiqué serves as a collective statement outlining the shared agreements and commitments reached during the meeting.
- The G7 Summit in Hiroshima provided a crucial platform for leaders to address pressing global issues, ranging from nuclear disarmament to economic cooperation and climate action.
- The presence of world leaders, including Prime Minister Modi, reflects the significance of international cooperation in finding solutions to complex challenges.

### Significance of this summit for Japan:

- The agenda of the Hiroshima Summit held great importance for Japan due to the pressing issues it addressed.
  - These included Russia’s ongoing aggression in Ukraine, China’s assertive military and nuclear modernization plans, China’s increasing pressures on Taiwan, and North Korea’s volatile nuclear posturing and weapons program.
- Under the leadership of Prime Minister Fumio Kishida, Japan is actively continuing the legacy of his predecessor, Shinzo Abe, in advocating for Japan’s active role in global affairs and strengthening alliances with its partners.
- Kishida’s efforts have been focused on building a strong network of relationships and transforming them into meaningful partnerships, as demonstrated by the participation of countries like India, South Korea, Vietnam, Indonesia, Australia, and Brazil in the Hiroshima Summit.
- Japan saw the Summit as an opportunity to navigate the intricate geopolitical dynamics of the Indo-Pacific region, seeking functional collaborations and establishing strong partnerships to address security risks and great power competition.

- The Summit served as a crucial moment to reinforce partnerships in a region that carries significant security risks and plays a pivotal role in shaping the global trajectory.
- Collaboration in science and technology was also a key focus for Japan during the summit. Tokyo aimed to strengthen partnerships and revitalise its chip industry, recognizing the importance of technological advancements in addressing various challenges.

#### New Delhi-Tokyo partnership:

- In recent years, India and Japan have established a strong collaboration, engaging in joint military exercises and progressing agreements on economic cooperation.
- Japan's involvement in South Asia has been complemented by India's partnership, focusing on joint infrastructure projects in the Indo-Pacific region.
- Ongoing cooperation between India and Japan serves as a crucial example of the potential that sustained partnerships hold in addressing the challenges of the 21st century.
- The G7 2023 Summit provided an opportunity for Japan and India to further strengthen their partnership and broaden the scope of their shared interests.
- The Indo-Pacific strategies of both Japan and India are grounded in two key principles: upholding a rules-based order and opposing any unilateral attempts to alter the regional balance.
  - These principles were reiterated by both countries at the Hiroshima Summit, particularly in reference to Russia and China.
- The deepening ties between India and Japan carry significant implications for enhancing middle-power diplomacy in the Indo-Pacific region. The closer and stronger partnership between the two countries strengthens their collective influence and ability to shape regional dynamics.

**Nut Graf:** Recent G7 Summit in Hiroshima underscored Prime Minister Kishida's commitment to nuclear disarmament. The summit also provided an opportunity for Japan and India to strengthen their partnership, reinforcing the significance of sustained collaborations in addressing 21st-century challenges and enhancing middle-power diplomacy in the Indo-Pacific region.

## 9. Indo-Pacific Economic Framework for Prosperity

**Syllabus:** Regional and global groupings and agreements involving India and/or affecting India's interests.

**Prelims:** Indo-Pacific Economic Framework for Prosperity

**Mains:** Significance and concerns associated with Indo-Pacific Economic Framework for Prosperity

**Context:** Second round of negotiations for the Indo-Pacific Economic Framework for Prosperity (IPEF)

#### Introduction:

- An Indian delegation led by the Department of Commerce recently participated in the second round of negotiations for the Indo-Pacific Economic Framework for Prosperity (IPEF) in Bali, Indonesia.
- Representatives from 13 other countries also took part in the discussions covering all four pillars of the IPEF: Trade, Supply Chains, Clean Economy, and Fair Economy.
- India was involved in talks related to the latter three pillars.
- The IPEF is designed to promote economic growth and cooperation in the Indo-Pacific region.

#### Major differences between IPEFF and RCEP:

- In November 2019, India walked out from the trade pact called the Regional Comprehensive Economic Partnership (RCEP) involving China, Japan, South Korea, Australia, New Zealand and the 10-state Association of Southeast Asian Nations (ASEAN) grouping.
  - India's concerns with RCEP were related to the impact on its manufacturing sector due to cheap Chinese goods flooding Indian markets.
- IPEF is a broader concept that encompasses not only economic ties, but also strategic and security cooperation between the countries of the Indo-Pacific region, whereas the RCEP is a free trade agreement between 15 countries in the Asia-Pacific region.
- While both initiatives aim to enhance economic cooperation, the RCEP specifically focuses on trade and investment liberalisation, eliminating tariffs, and reducing non-tariff barriers to trade. The IPEF, on the other hand, emphasises the importance of infrastructure development, connectivity, and digital trade.
- The IPEF is seen as a way for the United States to compete with China's economic influence in the Indo-Pacific region while India prioritises developing a strategic partnership with the US over its deteriorating relationship with China.



- The U.S. is presenting a tariffs-free trade deal as a new type of partnership to get around countries' resistance to free trade agreements and overcome legislative roadblocks.

#### Concerns with IPEF:

- Trade deals used to be focused on tariffs, but now issues such as intellectual property, investment, regulation, digital, and labour and environmental standards are becoming more important.
  - The US's IPEF proposal removes tariffs from trade deals and focuses on these other areas, but it's vague language poses a risk of complete economic control for participating countries, primarily benefiting the US.
- The long-term consequences of the IPEF's systemic integration could limit the ability of member countries to pursue their own domestic policies aimed at promoting industrialization, due to the tight supply chain integration that many aspects of the IPEF facilitate.
- As the world becomes increasingly digitised, the structure of supply chains and the surrender of policy autonomy in areas such as digital, labour and environmental regulations, as well as export restrictions, could be viewed as technological traps that creates a permanent state of economic dependence.
- The IPEF will also have significant effects in agriculture, such as giving up control over regulating genetically modified seeds and food. It also involves surrendering the ability to regulate Big Tech and compromising manufacturing by accepting unfair labour and environmental standards.
- This will hinder India's ability to develop a thriving domestic ecosystem for emerging areas like the digital economy and green products.

**Nut Graf:** The IPEF which is designed to promote economic growth and cooperation in the Indo-Pacific region differs from RCEP as it encompasses strategic and security cooperation, as well as economic ties. However, IPEF could limit the ability of member countries to pursue their own domestic policies and surrender of policy autonomy in several areas.

### 10. North-South Transport Corridors (NSTC) - Connecting continents

**Syllabus:** Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests

**Prelims:** About North-South Transport Corridors (NSTC).

**Mains:** Significance of NSTC and associated concerns

**Context:** This article talks about the North-South Transport Corridors (NSTC).

#### North-South Transport Corridors (NSTC)



Source: The Hindu

- The idea of the International North-South Transport Corridor (INSTC) was first mooted in the year 2000.
- Initial agreements were signed between Russia, India, and Iran in 2002. Later 13 countries ratified the agreement.
- This trade route is 7200 Km long and the transport of freight is through a multi-mode network of roads, ships, and railways.
- It aims to link Russia's Baltic Sea coast to India's western ports in the Arabian Sea via Iran through a transport corridor.
- Which are the member states of the International North-South Transport Corridor?
- There are 13 member states of the INSTC project including India, Iran, Russia, Azerbaijan, Armenia, Kazakhstan, Belarus, Tajikistan, Kyrgyzstan, Oman, Turkey, Syria and Ukraine.
- Furthermore, Bulgaria is the Observer State and the Baltic countries like Latvia and Estonia have also expressed willingness to join the INSTC.

**Other Details about the Project:**

- There was little progress in the project over the years due to Western sanctions on Iran over its nuclear programme.
- However, Russia's invasion of Ukraine has given fresh impetus to NSTC.
- In February 2023, the Russian President stated that Russia would develop NSTC and open new routes of trade with India, Iran, Pakistan, and Gulf countries.
- In May 2023, Russia and Iran signed an agreement to develop a critical link in NSTC- Rasht-Astara railway(162 km).
- It is pointed out by the Federation of Freight Forwarders' Associations in India that the corridor would be 30% cheaper and 40% shorter than the current traditional route.

**Rasht-Astara link:**

- The Rasht-Astara railway would connect Iranian railways with Azerbaijan's railways. It would thus open a direct corridor from St. Petersburg to Bandar Abbas.
- Russia will invest nearly \$1.73 billion in its construction. Whereas Iran would invest around \$5 billion.
- It will have 22 tunnels and 15 special bridges.

**Significance of North-South Transport Corridor:**

- The earlier trade route connecting India and Russia was through the Suez Canal.
  - Hence the major objective of the INSTC corridor was to reduce the time taken, costs incurred, and increase connectivity between major cities like Mumbai, Moscow, Astrakhan(located in Russia), Baku (Azerbaijan), Tehran, Bandar Abbas and Bandar Anzail (All located in Iran).
- The corridor is aimed at reducing the carriage cost between India and Russia by about 30% and bringing down the transit time from 40 days by more than half.
- India depends on 80% of its energy requirements and thus it will significantly benefit India.
- It will boost trade between India and Central Asia.
- Russians and Iranians consider the project to be a potential game-changer for Eurasian economic integration.
- This corridor is expected to increase market access to the member nations who can also benefit through various backward and forward linkages.

**Associated Concerns:**

- Construction of the Rasht-Astara railway has been lagging for years due to financial reasons.
- There are geopolitical sanctions on both Russia and Iran, which would make it difficult for them to raise funds.
- Moreover, Iran's relationship with Azerbaijan is tense.

**Nut Graf:** The North-South Transport Corridor aims to link Russia's Baltic Sea Coast to India's western ports. It will boost trade in Eurasia and Central Asia. However, there are several associated concerns that resulted in the delay of the project.

**11. Arab League readmits Syria after 11-year absence**

**Syllabus:** Global and Multilateral Groupings and Agreements.

**Prelims:** About Arab League

**Mains:** India an Arab League

**Context:** The Arab League re-admitted the Syrian government ending a more than decade-long suspension and isolation.

- The Arab League in November 2011 had suspended Syria over its crackdown on peaceful protests that took the shape of a civil conflict that led to the killing of over 5,00,000 people.
- After a 12-year suspension, Arab government delegates voted to reinstate Syria in the Arab League (2023).

**About Arab League**

- Arab League is a regional organisation of Arab states in the Middle East.
- It was formed in Cairo in 1945 after a pact of the League was signed by six members namely Egypt, Iraq, Transjordan (renamed Jordan in 1949), Lebanon, Saudi Arabia, and Syria.
- According to Article 2 of the Pact, the key objectives of the League are:
  - To draw closer the relations between member-states and coordinate their political activities
  - Safeguard their independence and sovereignty; promote the interests of the Arab countries
  - Mediate in disputes between members or between members and a third party

- Promote cooperation in various matters such as trade, customs, currency, agriculture, industry, communications, navigation, cultural matters and matters connected with nationality among others.
- The Arab League has **22 member states** which include Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Authority, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.
- The League consists of the Council, the Special Ministerial Committees, the General-Secretariat and the Specialised Agencies.
  - The Council is the principal political organ, consisting of foreign ministers of all the member-countries.

### India and the Arab League

- India was conferred observer status in 2007.
- India also was the first member to enter the League without having an Arab community, or indigenous Arabic-speaking population.
- Trade between India and Arab League members was valued at US\$30 billion in 2007.
- India's major exports to Arab League countries: chemicals, automobiles, machinery, foodstuff and other fast-moving products,
  - India is also a large importer of oil and gas from these countries.
- India further has a large diaspora in the Arab League countries of about 5 million.

## 12. Washington Declaration of US and South Korea

**Syllabus:** Effect of Policies & Politics of Developed & Developing Countries on India's Interests

**Prelims:** Washington Declaration

**Mains:** US and South Korea relations and various challenges in Korean Peninsula

**Context:** U.S. President Joseph Biden and South Korean President Yoon Suk Yeol met on April 26, 2023, to mark the 70th anniversary of the U.S.-ROK Alliance.

### Introduction:

- The successful launch of North Korea's Hwasong-8 solid-fuel intercontinental ballistic missile has led to the South Korean President's visit to the US to advance the strategic partnership and draw up an extended nuclear deterrence plan against North Korea's regional aggression.
- Both countries signed the 'Washington Declaration' and have agreed to immediate bilateral presidential consultations in the event of a North Korean nuclear attack and promised a swift, overwhelming, and decisive response using the full force of the alliance, including the US's nuclear weapons.

### Washington Declaration:

- Both countries signed the "Washington Declaration" as a nuclear deterrence strategy during the visit.
- The Washington Declaration tries to establish a credible nuclear connection between them in response to North Korea's growing nuclear and missile provocations.
- The declaration allows for the establishment of a Nuclear Consultative Group (NCG), giving South Korea more control over nuclear response planning and coordination.
  - South Korea would receive Intel from the U.S. regarding nuclear advancements.
- It mentions the 'need for peace and stability' in the water around Taiwan and discusses issues such as the tension between China and Taiwan and Chinese military activities in the South China Sea.
- According to the declaration, an American nuclear ballistic submarine would be deployed on the Korean peninsula.
- It also mandates the U.S. President as the only 'sole authority' to use the nuclear arsenal of the U.S. in the event of a nuclear confrontation.

### Significance:

- The Washington Declaration aims to create a more overt and close coordination among US allies in the Indo-Pacific to deal with not only North Korea but also the moves of China and Russia.
- The attempt is based on the premise that China, Russia, and North Korea, along with a few other partnerships, are challenging the regional status quo.
- Under the declaration, the U.S. will strengthen South Korea's nuclear deterrence capabilities through joint military training programs and an annual intergovernmental simulation.

- The declaration reaffirmed the Non-Proliferation Treaty implying that South Korea would not venture into the creation of its own independent nuclear capabilities and would instead focus on deterrence measures through an alliance-based approach.

#### U.S. control over South Korea's nuclear power:

- The foreign policy objectives of South Korea are significantly influenced by the United States.
- The U.S. pressured South Korea to abandon its nuclear development program and withdrew nuclear weapons from the country in the 1990s.
- The U.S. wants to control global nuclear arms production, and allowing South Korea to develop its own nuclear arsenal would hinder this effort.
- The U.S. is more concerned about the nuclear capabilities of North Korea, and a potential crisis or conflict on the Korean Peninsula involving multiple nuclear-armed actors.
- The U.S. assures its allies that it will maintain stability in the region and protect them with its own nuclear weapons.

#### Global and Domestic Response:

- The Washington Declaration aims to balance power dynamics against North Korea with a nuclear deterrence policy in the region.
- Physical deployment of the arsenal can be seen as a direct threat by opposing actors and used as leverage to act aggressively.
- China criticised the agreement, stating that it undermines the nuclear non-proliferation regime and the strategic interests of other countries.
- North Korean leader Kim Jong-Un's sister warned that the declaration would only result in making peace and security in North-East Asia and the world exposed to more serious danger.
- 71% of South Koreans are sceptical about U.S. support and want to build their own nuclear weapons, according to a poll by the Chicago Council on Foreign Relations.

**Nut Graf:** The US and South Korea recently signed the "Washington Declaration" which is aimed at deterring North Korean aggression. The declaration allows for the establishment of a Nuclear Consultative Group, joint military training programs, and an annual intergovernmental simulation. However, some are sceptical of US support, and China and North Korea have criticized the agreement.

### 13. The shift in the U.S.'s approach to China

**Syllabus:** Effect of policies and politics of developed and developing countries

**Mains:** Trends in US-China bilateral relations and analysing the shift in the US's policy towards China.

**Context:** The US in recent times has expressed that its primary focus is towards shifting its policy on China from decoupling to de-risking. This policy was once again reiterated during the recently concluded G-7 summit at Hiroshima.

#### Overview of the US – China ties

- Post the establishment of diplomatic relations between the two countries in 1979, both countries undertook efforts to better their economic interdependence.
- Among the two, China benefited immensely due to the establishment of diplomatic ties, as the move also helped China to widen and deepen its diplomatic and economic ties with the rest of the world.
- With the increase in Chinese economic and military powers, the ambition to challenge the dominance and influence of the US in the international arena also grew bigger.
- The rise of China not only impacted the influence of the US in global geopolitics but also its domestic industry.
- At the time when Donald Trump became the President of the US, there was an urgent need to address the techno-economic challenges posed by China.
  - This forced the Trump administration to adopt a series of measures in order to reverse the trade imbalance that was favouring China.
  - The US administration undertook measures to increase tariffs on Chinese imports and kept the high technology sector of the U.S's out of China's reach.
  - This was regarded as the start of "the U.S.-China trade war" started and the bilateral ties were set on course for a "decoupling".
- The Biden administration which took over the reins of power continued with a similar policy towards China. However, over time, the current US administration has changed the label of "decoupling" to "de-risking".

### What is “de-risking”?

- In the words of the US National Security Advisor Jack Sullivan, “de-risking” mainly refers to having a resilient, effective supply chain and ensuring that the US is not subjected to coercion by any other country”.
- The key objective of “de-risking” is to limit such an effect in areas where it undercuts the national security and industrial competence of the U.S, while decoupling fundamentally aimed to reverse the 40 years old project that had enmeshed the two economies.
- This policy of “de-risking” has been reiterated by the US administration in recent landmark speeches by Treasury Secretary Janet Yellen on the “U.S.-China Economic Relationship” and US National Security Advisor Jack Sullivan on “Renewing American Economic Leadership”.
- Various laws passed by the US in recent times such as the Bipartisan Infrastructure Law, CHIPS and Science Act, and the Inflation Reduction Act also have highlighted this new approach.
  - Furthermore, the U.S.’s geo-economic initiatives such as the Partnership for Global Infrastructure and Investment and the Indo-Pacific Economic Framework for Prosperity (IPEF) also are in line with the spirit of “de-risking”.

### The rationale behind the change in US’s policy – the need for “de-risking”

- The change in the policy has been announced against the backdrop of several events of high geopolitical significance as the global economy is hoping for a rebound post the COVID pandemic.
- The tensions between the US and China have been rising in the wake of conflict across the Taiwan Strait and the spy balloon incident.
- Xi Jinping also began his second decade of rule over China as he was handed over an unprecedented third term as the President of the People’s Republic of China, General Secretary of the Communist Party of China and the Chairman of the Central Military Commission.
- The Russia-Ukraine war has also played a crucial role in enabling the US’s policy shift towards China as China has been backing Russia.
- Furthermore, the idea of “de-coupling” failed to appeal to the US allies and the European Union (EU) and the US administration felt that the policies of “de-risking” could better achieve the objective of getting its European allies on board to counter China.

### Geopolitical ramifications of “de-risking”

- The policies of “de-risking” are expected to help the US keep its allies closer in its geopolitical rivalry against China. This was witnessed during the recently concluded G-7 summit.
  - In the Leader’s Communique that was released post the summit, the leaders have also expressed the grouping’s consensus on de-risking and not de-coupling.
- The policies of “de-risking” have strengthened the West’s moves to counter China’s rise by facilitating a united stand among the allies.
- China has expressed concerns over the West’s de-risking approach.
  - China has also expressed displeasure over the allegations that China has been responsible for heightened geopolitical tensions.
  - According to China, the US is responsible for the current geopolitical tensions and has accused the US that it has created instability across the world by undertaking various political and military interventions with a Cold War mindset.
- However, the effectiveness and the outcomes of the “de-risking” policies have been questionable
- Countries such as India are expected to benefit from the “de-risking” strategies as such countries offer attractive supply chains and also provide the necessary might to confront China. However, such benefits could also come at a cost and are short term.
- Additionally, as the Russia-Ukraine conflict and the consolidation of the European alliance are the key reasons behind this shift, the idea of “de-risking” might also dilute the focus of the US over the Indo-Pacific region.

**Nut graf:** *in the wake of various events of high geopolitical significance, the US has announced the shift in its policy on China from “decoupling” to “de-risking”. This latest move by the US is expected to have significant ramifications on the global geopolitical.*



**14. The 'right to health' goal and a role for Taiwan**

**Syllabus:** Policies and Politics of Developed and Developing Countries.

**Mains:** Understanding Taiwan's Health Policy.

**Details:**

- Almost three years after the COVID-19 pandemic, border restrictions are lifted and global health governance is emphasizing a post-pandemic recovery.
- Taiwan favours health-related Sustainable Development Goals (SDGs) and World Health Organization's 'Triple Billion targets'.
- It is committed to providing a robust health infrastructure with an equitable and inclusive health service supply chain, universal health coverage, and a network of primary healthcare systems.
- It supports and shares experiences in creating a cross-sectoral, innovative, and people-centred health approach for the international community.

**Taiwan's response to COVID-19:**

- Notably, Taiwan ranks sixth-lowest in COVID-19 mortality and case-fatality rates among 38 OECD member countries and Singapore.
- Moreover, it ranks fourth-highest for coverage rates of at least one COVID-19 vaccine dose and third-highest in the administration of vaccine boosters.
- It effectively mitigated the spread of COVID-19 through its comprehensive public healthcare system, well-trained personnel, and efficient surveillance, investigation, and analysis systems.
- The citizens also played an important role by following government guidelines, adopting appropriate behaviour, and getting vaccinated.
- Taiwan issued 13 export licences for its herbal formula NRICM101 (Taiwan Chingguan Yihau) to assist neighbouring countries in combating COVID-19.

**Taiwan's Health Strategy:**

- A universal healthcare insurance system was established in Taiwan in 1995. It covered health care services like prenatal checkups, gestational diabetes screening, anaemia testing, etc.
- It also provides subsidized infertility treatment programmes to assist infertile couples.
- It intends to create a breastfeeding-friendly environment and facilitates preventive paediatric health care and health education.
- It also carries out various prevention and management programmes for non-communicable diseases.
- Taiwan supports WHO's goal of reducing cancer mortality by 25% by 2025. For instance, it has administered HPV (human papillomavirus) vaccines with a coverage rate of 92.1% by December 2022.
- It also promotes digital health and innovation. It accommodates Artificial Intelligence (AI) and other emerging technologies.

**Future Course of Action:**

- Despite its achievements in the health sector, Taiwan has not been invited to the World Health Assembly since 2017.
- The relevant stakeholders should support Taiwan and WHO should also include it as an observer in the World Health Assembly.
- Moreover, it should be given the opportunity of full participation in WHO meetings, mechanisms, and activities.

**Nut Graf:** Taiwan has made significant contributions to the public health domain, both nationally and globally. Thus it should not be left out, especially at this moment when countries across the world are engaging in dialogues on strengthening health systems.

## 15. The latest China-Canada kerfuffle

**Syllabus:** Effect of policies and politics of developed and developing countries

**Prelims:** Persona non grata

**Mains:** The state of Canada-China bilateral ties

**Context:** China and Canada expel each other's diplomats.

### Background:

- On the 8th of May 2023, the Canadian government declared a Chinese diplomat “persona non grata,” over allegations of intimidation of a Canadian lawmaker who had criticised China for its human rights abuses.
  - The Canadian lawmaker had initiated legislative efforts in Canada's House of Commons to declare China's treatment of Uyghurs and other minorities in Xinjiang as “genocide”.
  - A report from the Canadian Security Intelligence Service (CSIS) further revealed that the Chinese diplomat was gathering information about the Canadian lawmaker and his family in Hong Kong to target him over his anti-Chinese sentiments.
- On the 9th of May 2023, as a reciprocal countermeasure, China declared a Canadian diplomat in Shanghai as “persona non grata”.

### Persona non grata

- Persona non grata in Latin means “an unwelcome person.”
- Persona non grata in foreign diplomacy refers to a diplomat or foreign individual whose entering or remaining in a certain country has been prohibited by that country.
- According to Article 9 of the Vienna Convention for Diplomatic Relations, 1961, “the host country can declare any member of the diplomatic staff of a mission persona non grata at any point in time and for any reason”.
  - Such a person must be recalled by the home country of the person within a stipulated time period, or else he stands to lose his diplomatic immunity.
  - The Article also says that an individual can be declared persona non grata even before arriving in a country.
  - However, the Article does not fix any rules regarding when a country can declare a foreign person persona non grata.
- **Important examples:**
  - India had declared a Pakistan High Commission staffer as persona non-grata for his involvement in espionage activities in 2016.
  - Further in 2020, the Indian government had declared two more Pakistani officials as persona non-grata for their involvement in espionage activities.
  - Famous Hollywood actor Brad Pitt was declared persona non grata by China after starring in the 1997 film titled “Seven Years in Tibet”.
  - Before becoming the President of the US, Donald Trump was also labelled persona non grata by Panama City's Municipal Council for his comments on the Panama Canal.

### Canada-China bilateral ties

- Diplomatic relations between China and Canada have been unsteady in recent times.
- The current state of ties started when the Canadian police arrested an executive of the Chinese tech company Huawei on charges of fraud in 2018.
- A few days after the incident, Chinese officials detained two Canadians on charges of spying and the move was then regarded as “hostage diplomacy”.
- During the same period, China banned the imports of canola from Canada, alleging pests in the shipment, which widened the tensions between the countries.
  - This ban was only lifted in 2022 amidst a global shortage of food due to the Russia-Ukraine war.
- Additionally, Canada had accused China of attempting to interfere in the Canadian federal elections conducted in 2019 and 2021.
- Both countries have also engaged in a technology battle as Canada has restricted the presence of Chinese companies in its communications infrastructure while China has said that the restrictions were imposed without any solid evidence.
- The tension between the two countries and their leaders was also seen at the 2022 G-20 summit held in Indonesia when the Chinese President and the Canadian Prime Minister argued over leaked details of their meeting about Chinese interference in domestic affairs.

**Nut graf:** The diplomatic ties between China and Canada have been strained for some time now, but the diplomatic tensions between the two countries have mounted with the latest spat which has led to the declaration of each other's diplomats as "persona non grata".

## 16. India, U.S. to hike technology cooperation

**Syllabus:** Bilateral groupings and agreements involving India

**Prelims:** About Initiative on Critical and Emerging Technologies (iCET), INDUS-X initiative and India-U.S. Defence Policy Group (DPG)

**Context:** India and the U.S. discuss the possibilities of co-producing jet engines, long-range artillery and infantry vehicles.

### Details

- Under the Initiative on Critical and Emerging Technologies (iCET), India and the U.S. are discussing possibilities of co-producing jet engines, long-range artillery and infantry.
- Ahead of the Prime Minister of India's visit to the U.S., INDUS-X initiative will be launched with an aim to promote partnerships between the two countries' defence innovation ecosystems.
- Significant focus has been given to the means to improve defence industrial cooperation which include technology partnership, long-term research and development, and improving supply chain security.
- Various proposals that are being discussed also include discussions to jointly manufacture a jet engine for India's future indigenous jets for which General Electric is competing with Safran of France and Rolls-Royce of the U.K.
- Ahead of the visit, such discussions were held at the 17th meeting of the India-U.S. Defence Policy Group (DPG).
  - The DPG is the apex official-level mechanism between the Ministry of Defence, India and the U.S. Department of Defence.
  - The DPG reviews and guides all aspects of bilateral defence cooperation.

## 17. Ekatha Harbour

**Syllabus:** India and its neighbourhood – relations

**Prelims:** About Ekatha Harbour

**Context:** The Indian Defence Minister and his Maldivian counterpart laid the foundation for "Ekatha Harbour".

### About Ekatha Harbour

- Ekatha Harbour is being constructed in the Maldives for the Maldives National Defence Forces Coast Guard.
- The Harbour is being constructed at Sifavaru in Uthuru Thila Falhu (UTF) atoll.
- India is assisting the construction of the naval dockyard and it is regarded as one of the biggest grant-in-aid projects of India.
- The Indian Defence Minister also Maldives National Defence Forces Coast Guard an additional Landing Craft in line with India's vision of Security and Growth for All in the Region (SAGAR).
- Maldives is said to be one of India's crucial maritime neighbours in the Indian Ocean Region (IOR) and the Indian government is looking to expand ties with Male in areas of defence and security amid China's efforts to expand its influence in the region.
- The Ministers further have agreed to explore additional avenues for cooperation, including in the areas of defence trade, capacity building and joint exercises.

## 18. Yangon Port

### Details:



Source: Britannica

- Adani Ports and Special Economic Zone Ltd (APSEZ) has sold its newly built container terminal in Yangon, Myanmar to Solar Energy Ltd for \$30 million.
- The sale was triggered by US sanctions on Myanmar Economic Corp. Ltd (MEC), which had leased the land to APSEZ for the project.
  - APSEZ is the ports and logistics division of the Adani Group.
  - Filings from May 2021 showed that the company invested \$127 million in the project, including a \$90 million upfront payment to lease land.
- The Port of Yangon is the largest city in Myanmar (formerly known as Burma), and it was the country's capital from 1948 to 2006.
- Located on the central coastline on the banks of the Yangon River, it is 40 kilometres upriver from the Gulf of Martaban off the Andaman Sea.
- Known internationally as Rangoon until 1989, Yangon reflects the Burmese pronunciation of the city's name.

## 19. Proud Boys

### Details:

- Former Proud Boys leader Enrique Tarrio was convicted of seditious conspiracy for orchestrating an attack on the U.S. Capitol to keep Donald Trump in power after the 2020 presidential election.
- The charge carries a prison sentence of up to 20 years, and Tarrio was a top target of the largest Justice Department investigation in American history.
- This is a significant milestone for the Justice Department, which has now secured seditious conspiracy convictions against the leaders of two major extremist groups who sought to keep Joe Biden out of the White House at all costs.

### About Proud Boys:

- The Proud Boys is a far-right, exclusively male, neo-fascist organisation in North America that promotes and engages in political violence in the United States.
- The group's leaders have been convicted of violently opposing the US government, including the constitutionally prescribed transfer of presidential power, and the group has been designated as a terrorist group in Canada and New Zealand.
- The Proud Boys are known for their opposition to left-wing and progressive groups and for their support for former US President Donald Trump, who has denounced such groups, including the Proud Boys.
- The group originated in 2016 under the leadership of Gavin McInnes, taking its name from the song "Proud of Your Boy" from the 2011 Disney musical Aladdin.
- The Proud Boys initially emerged as part of the alt-right but distanced itself from this movement in early 2017, and Donald Trump's comment "Proud Boys, stand back and stand by" during the October 2020 presidential debates is credited with greatly increasing interest and recruitment.

## 20. Uzbekistan's referendum to rewrite the constitution

### Details:

- Uzbekistan President Shavkat Mirziyoyev recently won voter approval (90%) in a referendum conducted to rewrite the Constitution.
- According to the President of Uzbekistan, the rewriting of the Constitution would help improve governance and quality of life in the former Soviet republic.
  - However, it could also allow him to extend his rule beyond his current term.
- Shavkat Mirziyoyev who was a former Prime Minister during the rule of dictator Islam Karimov, has gradually undertaken various social and economic reforms after becoming the President in 2016.
  - Shavkat Mirziyoyev freed up the forced labour working in cotton fields, released political prisoners, relaxed media censorship, promoted women's rights and encouraged entrepreneurship.
  - These efforts have attracted foreign investments, and Uzbekistan which was once a closed economy is now becoming the fastest-growing Central Asian country.
- The new charter describes Uzbekistan as “sovereign, democratic, legal, social and secular” and also promises a new media code and criminalisation of domestic abuse.
  - It further includes assurances such as banning the death penalty, guaranteeing prisoner rights and offering better social protection.

## 21. Iraq unveils \$17-bn project linking Europe, West Asia

**Syllabus:** Policies and politics of developed and developing countries

**Prelims:** Iraq project linking Europe and West Asia.

### Details:

- In order to transform itself into a regional transportation hub, Iraq presented an ambitious plan of developing road and rail infrastructure linking Europe with the Middle East.
- It is a \$17-billion project and is called “Route of Development”. It would stretch 1200 km from the northern border with Turkey to the Gulf in the south.
- The project will serve as a pillar of a sustainable non-oil economy.
- The estimated time of project completion is 3-5 years.
- The development has begun at the commercial port of Al-Faw, where its capacity is being expanded.
- The project will also comprise the construction of nearly 15 train stations along the route including the cities of Basra, Baghdad, and Mosul.



# ART AND CULTURE

## 1. Using Buddhism as a tool of soft power

**Syllabus:** Art and Culture - Buddhism.

**Prelims:** Buddhism

**Mains:** Buddhism as a soft power

### Details:

- It is argued that emerging superpowers like China and India are defining their own versions of the future of Buddhism and using it as a tool of soft power.
- The descendants of Shakya are not invited to Buddhist congregations like the Global Buddhist Summit.

### Background Details:

- Siddhartha Shakya who went on to become the Buddha belonged to the Shakya clan that ruled Kapilvatsu.
- The Shakyas did not have an army after Buddha's Parinirvana and many were massacred in Sagarahawa. The remaining members of the clan fled to different places like Magadha, Gandhara (modern-day Afghanistan), and Burma (Myanmar).
- Some also relocated to Kathmandu Valley. They were given a status similar to Vajracharya priests. However, they were not allowed to practice priesthood outside their families.
  - Thus, Shakyas are alternate temple caretakers in Hiranyavarna Mahavihara (Golden Temple).
  - It is highlighted that when Nepal accepted a grant from India to renovate portions of the Golden Temple complex, it resulted in a controversy.
  - It is believed that India was interested in the project because it is the most visited site of the Chinese (after Lumbini).

### India's Buddhism:

- Buddhism provided an identity of peace and tranquillity for India after Independence.
- Buddhist symbols like the Ashoka Pillar or the wheel in the flag were used to escape difficult times of partition and violence.
- India earlier claimed Buddhism to be its own. However, the Prime Minister of India in a speech in 2014 accepted the populist slogan of sovereignty in Nepal – 'Buddha is Born in Nepal'.
- The Indian Prime Minister laid the foundation stone of the India International Centre for Buddhist Culture and Heritage in Lumbini, Nepal (May 2022).
  - It is suggested that it is an attempt to counter the development of the Gautam Buddha International Airport in Bhairahawa, Nepal which is considered to be a Chinese project.
- Associated concerns:
  - It is argued that India uses Tibetan Buddhism and the Dalai Lama to provoke China.
  - Neither a patron nor a member of the Supreme Dhamma Council from Nepal was invited to the International Buddhist Confederation convened in India.
  - Moreover, nobody from Bhutan was invited, despite the fact that it is a Buddhist nation.

### Chinese Buddhism:

- China has approximately 245 million Buddhists, 28000 Buddhist monasteries, 16000 temples, and 2,40,000 Buddhist monks and nuns.
- Notably, China uses a flexible and multifaceted approach depending on the target country. It varies in Western, Buddhist majority, or Asian Countries.
- China favours Nepal over India as a source of Buddhism because of the use of Newa Ranjana scripts on the pillars or the association of these temples with Nepali artist Arniko, who is revered in China.
- China also used Buddhist narratives for infrastructure investments in Sri Lanka, Laos, and Cambodia.
- China prefers to use its own version of Buddhism as a tool of soft power.

**Nut Graf:** Emerging economies like India and China are using Buddhism as a tool for soft power. These geopolitical wranglings over Buddhism are making the Nepal Buddhists uneasy.

## 2. Santiniketan may be added to World Heritage List

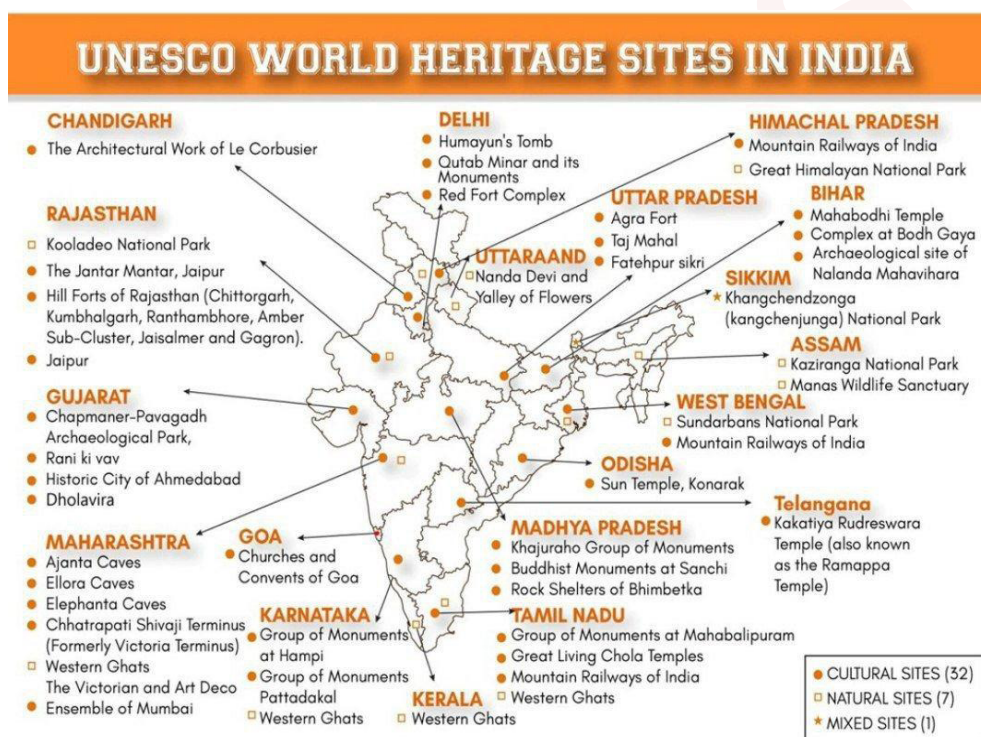
**Syllabus:** Art and Culture

**Prelims:** About Santiniketan and other UNESCO's World Heritage Sites in India

**Context:** Santiniketan, the home of Nobel laureate Rabindranath Tagore has been recommended for inclusion in UNESCO's World Heritage List. The quaint town in West Bengal's Birbhum district is also home to the Visva-Bharati University built by Tagore.

### Details:

- The recommendation was made by the International Council on Monuments and Sites (ICOMOS), which is the advisory body to the UNESCO World Heritage Centre, based on a file moved by the Indian government.
- ICOMOS is dedicated to the conservation and enhancement of global architectural and landscape heritage. May 9 was Tagore's 162nd birth anniversary.
- To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria mentioned in the UNESCO list.
- Santiniketan, if selected, would be the second cultural symbol from West Bengal, to make it to the UNESCO list. In 2021, UNESCO had included 'Durga Puja in Kolkata' in its list of Intangible Cultural Heritage of Humanity.



### UNESCO intangible heritage in India:

- Ramlila- 2008 -The traditional performance of Ramayana performed across North India during the festival of Dussehra. Most representative are those performed in Sattna, Vrindavan, Varanasi and Ramnagar.
- Vedic Chanting- 2008- Chanted during sacred rituals and recited daily by the Vedic communities known not only for the rich content of its oral literature but also for ingenious techniques employed by the priests.
- Kudiattom- 2008- A Sanskrit theatrical tradition practised in Kerala, traditionally performed in theatres called Kuttampalams, located in Hindu temples.
- Ramman- 2009- A religious festival in honour of the tutelary god, Bhumiya Devta, practised in the villages of Saloor-Dungra in Uttarakhand.
- Chhau dance- 2010- A tradition from Eastern India that enacts episodes from the Mahabharata and the Ramayana, local folklore and abstract themes.
- Kalbelia- 2010- A folk song and dance form of Rajasthan. The songs disseminate mythological knowledge through stories.
- Mudiattu- 2010- A ritual dance drama from Kerala based on the tale of the battle between Darika, a demon and Goddess Kali.
- Buddhist Chanting- 2012- Sacred texts chanted by the Buddhist priests of the Ladakh region.

- Sankirtana - 2013- Set of arts performed to mark religious occasions and various stages in the life of the Vaishnava people of the Manipur plains.
- Traditional Brass and Copper Craft of Utensil Making -2014- The craft of the Thathelias of Jandiala Guru constitutes the traditional technique of manufacturing brass and copper utensils in Punjab.
- Yoga - 2016- The art of unifying the mind with body and soul for greater physical and mental well-being. It consists of a series of poses, meditation, controlled breathing, word chanting, etc.
- Nowruz- 2016- The Persian new year is celebrated worldwide. It involves street performances of music and dance, public rituals involving water and fire, traditional sports and the making of handicrafts.
- Kumbh Mela- 2017- One of the largest human congregations in the world. It is a major pilgrimage and festival for Hindus.
- Durga Puja in Kolkata- 2021- The annual festival celebrated in September or October marking the ten-day worship of the Hindu mother-goddess Durga

### 3. Cham Lama

**Syllabus:** Salient aspects of Art Forms

**Prelims:** About Cham Lama Dance

**Context:** A Cham Lama performance was held during the celebration of Buddha Jayanti at Tupchiling Gompa in Lahaul in Himachal Pradesh.

#### Cham Lama Dance



Source: The Hindu

- The Cham dance is a form of dance that is performed during Buddhist festivals, such as Losar (the Tibetan New Year), and Buddha Jayanti.
- The traditional Cham Lama dance is usually performed at Tibetan monasteries during special Buddhist festivals.
- It is performed in the traditional Vajrayana or Tantric schools of Buddhism in India, Bhutan, Mongolia, Nepal, and Tibet.
- Cham dance was introduced in the eighth century by Padmasambhava to subjugate the local demons that were obstructing the building of the first monastery in Tibet.
- It is believed that the Cham dance is performed to exorcise evil spirits and demons.
- The performance involves monks in elaborate and colourful masks, headgear and costumes dancing slowly to the music played using traditional instruments such as drums and cymbals also performed by monks.

#### 4. Kheer Bhawani mela

**Syllabus:** Art and Culture; Various festivals

**Prelims:** About Kheer Bhawani mela

**Context:** Hundreds of Kashmiri Pandits celebrated the Kheer Bhawani mela at the famous Ragnya Devi temple in Ganderbal district and other shrines in Jammu and Kashmir

##### Kheer Bhawani mela

- Kheer Bhawani mela is an annual festival celebrated by the Kashmiri Pandits.
- Mata Kheer Bhawani is considered to be the deity of Kashmiri Pandits
- Kheer Bhawani Melas are held every year at five shrines across Kashmir. They are:
  - Ragnya Bagwati shrine at Tulmulla in Ganderbal,
  - Ragnya Bagwati shrine at Manzgam in Kulgam
  - Tripursundri shrine at Devsar in Kulgam
  - Ragnya Bagwati shrine at Logripora in Anantnag
  - Ragnya Bagwati temple complex at Tikkar in Kupwara.
- The festival is associated with Hindu Goddess Ragnya Devi.
- Kheer Bhavani Mela is usually organized coinciding with the Jyeshtha Ashtami.
- The Kheer Bhawani Mela represents a unique amalgamation of spirituality, culture, and communal harmony and is said to be a significant cultural event for Kashmiris across religious lines.
- During the festival, the devotees walk barefoot, carry rose petals and offer them as tribute to the goddess while the men take a dip in the stream close to the shrine.

#### 5. Trimbakeshwar temple

**Syllabus:** Architecture

**Prelims:** About Trimbakeshwar Temple and Temple Architecture in India

**Context:** The Maharashtra government has set up a special investigation team (SIT) to probe a recent incident in which a group of people from a minority community allegedly attempted to forcibly enter the Trimbakeshwar temple in Nashik.

##### Trimbakeshwar Temple



Source: indianexpress.com

- Trimbakeshwar in Nashik, Maharashtra is the abode of one of the twelve Jyotirlingas.
- Trimbakeshwar is located at the source of the Godavari River, which is the longest river in peninsular India.
- The city of Trimbakeshwar is situated at the foot of the Brahmagiri hill.
- Trimbakeshwar temple was constructed by the third Peshwa, Balaji Bajirao during the 18th century on the site of an old temple.
- Trimbakeshwar temple is an example of Nagara-style temple architecture and is constructed using black stone.



## 6. 'Sufiyana Mausiki' & 'Tchakri' folk songs

**Syllabus:** Salient aspects of Art Forms

**Prelims:** About Sufiyana Mausiki and Tchakri folk songs

**Context:** Sufiyana Mausiki and Tchakri folk songs were played during 'Dastaan-e-Bahaar' event in Baramulla to pay tributes to the master weavers of shawls and carpets, and prominent folk singers and celebrated the onset of summer.

### Details

- Sufiyana Mausiki and Tchakri are forms of devotional folk songs that have assumed centrality for carpet and shawl weavers of Kashmir for centuries.
- Sufiyana Mausiki and Tchakri songs are famous among the tribe of artisans from Kashmir.
- Sufiyana music has about 180 mukaams or stages. However, several stages are lost due to the decline in the tradition.
  - The Mukaam-e-Bahaar is sung at a low pitch and just before sunset.
- Sufiyana music has been granted classical status.
- Artisans feel that Sufiyana Mausiki and Tchakri songs help them engross themselves in the artwork.
  - They believe that it is a powerful tool to focus and maintain attention on meticulous details while weaving carpets and shawls.
  - It is also believed that sufiyana music helps to have peace at heart.
- Sufiyana Mausiki got prominence in Kashmir during the time of Sultan Ju Saaznawaz, a famous Sufiyana Musician from Iran who migrated to Kashmir.
  - Sultan Ju Saaznawaz is said to be the pioneer of Sufiyana Mausiki in Kashmir and was soon to be known as Ustaad Sultan Ju Saaznawaz i.e. a "magician with the strings".
- The instruments used while singing Sufiyana Mausiki and Tchakri songs include the harmonium, the rubab, the sarangi, the nout, the geger, the tumbaknaer and the chimta.

## 7. Kerala Souvenir Network

**Syllabus:** Art and Culture.

**Prelims:** Kerala Souvenir Network

### Details:

- The inexpensive Chinese imitation of artefacts is flooding the local market of Kerala, thereby neglecting the local market.
- It is a cause of concern that these souvenirs manufactured in China and North India offer no true link to Kerala's vibrant culture.
- The Kerala government is trying to intervene by launching the Kerala Souvenir Network.
  - The products under its ambit will be made available at government-authorized outlets at tourist destinations.
  - It will also be made available in the state tourism portal.
  - The mission comprises almost 5000 units across Kerala that will develop unique souvenirs.
  - A competition is also launched among units to foster innovation under specified themes.
  - The winning souvenirs will be selected on the basis of various factors like cost, aesthetics, function, material, etc.
  - Moreover, a group of 30 craftsmen will be trained to further train others.
- The branding will provide both reliability and authenticity.



# SCIENCE AND TECHNOLOGY

## 1. A ground view of the Indian Space Policy

**Syllabus:** Awareness in Different Fields – Space

**Prelims:** Indian Space Policy 2023

**Mains:** Critical Analysis of Indian Space Policy 2023

### Introduction:

- The Indian Space Research Organisation (ISRO) released the Indian Space Policy 2023 on April 20, 2023, which has been received positively by the industry.
- The Second Space Age began with the emergence of private TV channels, the Internet, mobile telephony, and smartphones, leading to India's space economy growing to over \$9.6 billion.
- India's space industry has vast potential, with the possibility of growing to \$60 billion by 2030 and creating more than two lakh jobs with the creation of an enabling environment.
- However, the lack of suitable legislation, clear rules, and regulations has hindered the growth of India's space industry, leading to the country spending nearly a billion dollars annually on procuring earth observation data and imagery from foreign sources.

### Indian Space Policy 2023

- The policy has been formulated as an overarching, dynamic and composite framework to implement the space reform vision of the Government of India.
- The government had brought out reforms in this sector in 2020 opening the doors for the private sector and offering them a level playing field.
- The reform also aims to make national space infrastructure developed over the years, available for use by the private industry through a business-friendly mechanism.
  - A mechanism has been created, where industries can approach IN-SPACe for utilizing the ISRO facilities.
- The Indian Space Policy-2023 also defined the functions and responsibilities of the Indian Space Research Organisation (ISRO), space sector PSU NewSpace India Limited (NSIL), and the Indian National Space Promotion and Authorization Centre (IN-SPACe).
- **IN-SPACe (Indian National Space Promotion and Authorisation Centre):** IN-SPACe is made a "single window" clearance and authorization agency for establishing launch pads, buying and selling satellites, disseminating high-resolution data, authorization agency for space launches, etc.
- **New Space India Limited (NSIL):** The operational portion of ISRO's missions will be transferred to NewSpace India Limited, a public-private partnership under the Department of Space.
  - NSIL will be responsible for commercializing space technologies.
  - It will manufacture, lease, and procure space components.
- **Indian Space Research Organization (ISRO):** It will develop standards for the space industry, work with academia to widen the space ecosystem, and maintain an edge in space infrastructure and transportation, human space-flight, etc.
  - It will focus on research in outer space.
  - The strategy also outlines the framework for the private sector to access ISRO facilities for a fee and encourages them to invest in new infrastructure for the industry.
- **Department of Space:** It is the nodal department for developing space technologies and ensuring coordination with different countries.
  - It will formulate overall policy guidelines.
- **Private Sector's Role:** The NGEs (including the private sector) are "allowed to engage in end-to-end space sector activities such as the establishment and operation of space objects, ground-based assets, and related services such as communication, remote sensing, navigation, and so on."

### Qualitative difference from previous efforts:

- The new policy focuses on enabling a flourishing commercial presence in space and defines its role in India's socio-economic development, protection of environment and lives, peaceful exploration of outer space, stimulation of public awareness, and scientific quest.
- The policy emphasises civilian and peaceful applications, and a separate policy document is expected to cover defence-oriented space security.
- The document lays out a strategy and defines the roles of different agencies, including ISRO, the Indian National Space Promotion and Authorisation Centre (IN-SPACe) and the NewSpace India Limited (NSIL).
- ISRO will no longer be involved in manufacturing operational space systems, and instead focus on R&D in advanced technology and realising space objects for meeting national prerogatives.
- ISRO will also share its technologies, products, processes, and best practices with non-government entities and government companies.
- NSIL will become the interface for interacting with the industry, undertaking commercial negotiations, and providing hand-holding support to ensure the efficient transfer of technologies.
- The NGEs (non-government entities) including the private sector are "allowed to undertake end-to-end activities in the space sector."
  - Satellites might be self-owned, bought, or leased; communication services could be provided over India or elsewhere; and remote sensing data could be distributed in India or elsewhere.
  - NGEs can design and operate space launch vehicles, as well as build their own infrastructure.
  - NGEs can now file with the International Telecommunication Union (ITU) and engage in commercial asteroid resource recovery.
  - In summary, the commercial sector can now participate in all aspects of space activities. Security agencies can entrust NGEs with sourcing customised solutions to meet specific needs.

### What is the need for the private sector in Space?

- **India Lags far behind in Space Economy:** The global space economy is currently valued at around USD 360 billion, with India lagging far behind. Despite being one of the world's few spacefaring nations, India accounts for only around 2% of the space economy.
- **Harnessing the Full Potential of India's Space Sector:** While ISRO's budget is now at USD1.6 billion, India's space economy is worth more than USD9.6 billion. Broadband, over-the-top (OTT), and 5G all promise double-digit yearly growth in satellite-based services.
  - With an enabling climate, it is anticipated that the Indian space sector might expand to USD 60 billion by 2030, directly creating more than two lakh employment.
- **The Private Sector has revolutionised the Space Sector:** Companies such as SpaceX, Blue Origin, and Virgin Galactic have changed the space business by lowering prices and turnaround time while increasing efficiency.
  - In India, however, commercial space sector participants have been limited to serving as vendors or suppliers to the government's space programme.
- **Improving Security:** Security and defence agencies spend roughly a billion dollars every year on foreign-sourced earth observation data and pictures. This level of reliance on foreign businesses may jeopardise India's security.
- **Bringing Aatmanirbharta to the Space Sector:** Currently, more than half of the transponders transmitting TV signals into Indian households are hosted on foreign satellites, resulting in an annual outflow of more than \$500 million.
- **Promoting Entrepreneurship in the Space Sector:** To fully unlock the potential of India's youth and entrepreneurs, there is a need to support private sector participation in all high technology domains, including space.
  - To realise this ambition, commercial organisations in the Indian space industry must be able to establish themselves as independent participants capable of end-to-end space activities.
- **Making the Space Industry Competitive:** By promoting the private sector, the Indian space programme will be able to remain cost competitive in the global space market, creating countless jobs in the space and other related areas.

### Advantages of the Indian space policy:

- Promoting the private sector will enable the Indian space program to remain cost competitive within the global space market, and thus create several jobs in space and other related sectors.
- The space sector has the potential to **incubate a vibrant ecosystem of startups and private industries**. By becoming a leading contributor to India's economic growth story, the space sector is replicating the success seen in the IT sector today.
- This would also increase India's share in the global space market significantly.
- The current policy would enable India to gain a strategic advantage in the field of space technologies which is emerging as a new area of economic activity.
- It will also enable India to provide safeguards to its space-based assets and protect them against any harmful attack.
- The new policy also provides a thrust in the field of generating white-collar employment opportunities for our population.

- Enhanced opportunities **in this field and a rise in investment would prevent a brain drain from our country.**
- It will also lead to a rise in investment in the field of Research and Development and thus pave the way for the emergence of new technologies.

#### Gaps in the policy:

- The new policy lacks a clear timeline for ISRO's transition and IN-SPACe's regulatory framework creation.
- The policy framework envisaged requires clear rules and regulations concerning FDI and licensing, government procurement to support new space start-ups, liability in case of violations, and an appellate framework for dispute settlement.
- IN-SPACe is expected to authorise space activities for both government and non-government entities and needs legislative authority to function as a regulatory body.
  - Currently, IN-SPACe operates under the Department of Space, and its role is ambiguous as the Secretary (Space) also serves as the Chairman of ISRO, the government entity to be regulated by IN-SPACe.
  - IN-SPACe is a regulatory agency with no legislative jurisdiction.
- The strategy establishes an ambitious role for IN-SPACe but does not specify a timeline for taking the necessary steps.
  - A timeline is urgently needed to establish the necessary legal framework and turn the vision of the Indian Space Policy 2023 into reality, launching India into the Second Space Age.

**Nut Graf:** *The New Space Policy 2023 has clearly laid out the roles and responsibilities of all the associated entities. It aims to enhance the private sector participation in space technologies. However, it lacks a clear timeline for ISRO's transition and IN-SPACe's regulatory framework creation.*

## 2. India's National Quantum Mission

**Syllabus:** Awareness in Different Fields of IT, computers and robotics.

**Prelims:** National Quantum Mission

**Mains:** Details and Salient features of National Quantum Mission. Quantum Technology - applications, applications and associated issues.

**Context:** National Quantum Mission received cabinet approval at a total cost of Rs. 6003.65 crores, to scale up scientific and industrial R&D, for accelerating Quantum Technology-led economic growth and to leverage India into a leading nation in the area.

#### What is the National Quantum Mission?

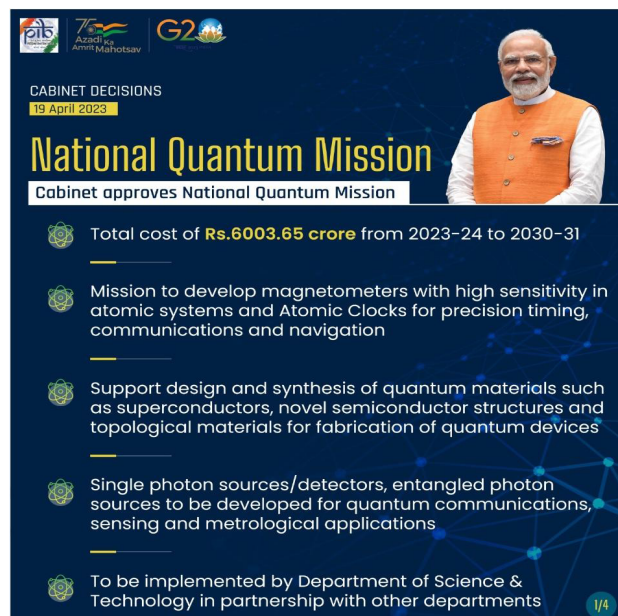
- India will be the seventh country to have a dedicated quantum mission after the US, Austria, Finland, France, Canada and China.
- Quantum materials are a class of matter or systems that allow us to exploit some of the unique properties of quantum physics and accomplish tasks that classical technology is incapable of.
- The concept of "quantum materials" was originally introduced to identify some of the exotic quantum systems, including unconventional superconductors, heavy-fermion systems, and multifunctional oxides.
- R&D in quantum materials today embraces traditional semiconductors, superconductors, and non-linear optical crystals directly relevant to computing, communication, and sensing.

#### Salient features of NQM:

- It intends to produce intermediate scale quantum computers with 50-100 physical qubits in five years and 50-1000 physical qubits in eight years.
- 'Qubits' or 'quantum bits' are the units of process used by quantum computers, much as bits (1 and 0) are the basic units by which computers process information.
- The expedition will aid in the development of high-sensitivity magnetometers for precision timing (atomic clocks), communications, and navigation.
- It will also aid in the design and synthesis of quantum materials for quantum device production, such as superconductors, innovative semiconductor architectures, and topological materials.
- The mission will also help developing:
  - Satellite based secure quantum communications between ground stations over a range of 2000 km within India.
  - Long distance secure quantum communications with other countries
  - Inter-city quantum key distribution over 2000 km
  - Multi-node Quantum network with quantum memories

- Four Thematic Hubs (T-Hubs) would be set up in top academic and National R&D institutes on the domains of Quantum Technology:
  - Quantum computation
  - Quantum communication
  - Quantum Sensing & Metrology
  - Quantum Materials & Devices

### Targets - Communication



- Satellite-based secure quantum communications between ground stations over a range of 2000 kilometres within India,
- Long-distance secure quantum communications with other countries,
- Inter-city quantum key distribution over 2000 km.
- Multi-node Quantum network with quantum memories.
- Setting up **four Thematic Hubs (T-Hubs)** in top academic and National R&D institutes in the domains:
- Quantum Computing, Quantum Communication, Quantum Sensing & Metrology, and Quantum Materials & Devices.

### Applications

- **Financial Services:** Quantum computers have the ability to shed light on larger challenges if limitations are eased and additional possibilities are possible.
- **Cybersecurity:** According to the World Economic Forum, “quantum computing could make today’s cybersecurity obsolete.” This is due to the fact that current encryption is based on combinatorics.
- **Chemical engineering:** Because there are so many different atom combinations and ways for them to connect, developing new functional compounds involves combinatorics.
- **Advanced manufacturing:** Artificial intelligence aids in the efficiency of manufacturing by identifying the source of rare faults in their manufacturing processes.
- These are challenging combinatorial issues relating to locating a single flaw in systems with numerous potential sequences.
- **Machine learning:** Improved machine learning through faster structured prediction. Boltzmann machines, quantum Boltzmann machines, semi-supervised learning, unsupervised learning, and deep learning are some examples.
- **Healthcare:** DNA gene sequencing, for example, radiotherapy treatment optimization/brain tumour identification, might be done in seconds rather than hours or weeks.

### What are the Advantages of Quantum Technology?

- **Increased Computing Power:** Quantum computers are substantially quicker than today’s computers. They are also capable of solving complex challenges that are currently out of our reach.
- **Improved Security:** Because quantum encryption systems rely on quantum physics principles, they are far more secure than regular encryption approaches.
- **Quicker Communication:** Quantum communication networks may carry information quicker and more securely than traditional networks, and they have the potential to be fully unhackable.

- **Enhanced AI:** Quantum machine learning methods have the potential to make AI model training more efficient and accurate.
- **Better Sensing and Measuring:** Because quantum sensors can detect extremely small changes in the environment, they can be used in medical diagnostics, environmental monitoring, and geological research.

#### Associated concerns or Issues

- **Expensive freezers:** Due to their sensitivity to environmental disturbances, quantum computers are currently exceedingly unstable and must be stored in costly refrigerators cooled to near-absolute zero temperatures.
- **Threat to National Security:** Quantum AI techniques, for example, can equip autonomous weapons and mobile platforms, such as drones, with enhanced sensing, navigation, and positioning capabilities in GPS-denied environments. Equipped with quantum AI technologies, such systems may also change course independently to evade adversary countermeasures.
- **Cyberattacks:** Quantum has the potential to greatly improve internet connectivity, security, and speed. This quantum cryptography-based architecture might usher in a super-secure communications infrastructure that protects internet-connected objects, especially vital infrastructure, from cyberattacks.
- **Error correction during the computing stage hasn't been perfected:** Because error correction during the computing stage has not been perfected, computations may be unreliable. Because qubits are not digital data bits, they cannot benefit from traditional error correction procedures employed by traditional computers.
- **Retrieving computational results can corrupt the data:** Data corruption can occur when retrieving computational results: Developments like a specific database search algorithm that assures the act of measurement causes the quantum state to decohere into the correct response and hold promise.

### 3. India as a Quad-led biomanufacturing hub

**Syllabus:** Indigenization of technology and developing new technology

**Prelims:** Biomanufacturing.

**Mains:** Quad-led biomanufacturing hub.

#### Details:

- A Critical and Emerging Technology Working Group was established by Quad in March 2021.
- It was formed to ensure cooperation, monitor trends, and look out for opportunities in emerging technologies including biotechnology.
- It is argued that cooperation in the field of biotechnology remains insufficient.

#### Biomanufacturing and its Significance:

- Biomanufacturing refers to using living systems, specifically microorganisms and cell cultures, to produce materials (and molecules) on a commercial scale.
- Biomanufacturing can transform industrial systems as 60% of physical inputs to the global economy can be produced using the technology.
- It is suggested that the establishment of a Quad-led biomanufacturing hub in India can enhance cooperation.
- Countries like the U.S. and China have designed specific policies to develop bio-economies.

#### Establishment of Biomanufacturing in India:

- The Quad should develop a Biomanufacturing hub in India as India's National Biotechnology Development Strategy envisions the country as a Global hub by 2025.
  - It sets a target of \$100 billion for the hub.
  - However, it will also require external support from the Quad members for initial development.
- Its development will benefit the economic potential of the country and address supply chain vulnerabilities.
- Quad members' role in Biomanufacturing hub:
  - The U.S. can provide funds.
  - Australia, Japan, and the U.S. have advanced biotechnology innovation ecosystems and intellectual property.
  - While India has a skilled workforce and can provide affordable scale.
- India is the right choice for the hub as:
  - It has existing infrastructure, pharmaceutical manufacturing expertise, and the required workforce.
  - As per the Australian Strategic Policy Institute, India is a top performer both in terms of the quality of research output and in research publications.
  - It will provide low-cost manufacturing, especially in the production of enzymes, reagents, etc.
  - It is found that the cost of manufacturing in India is almost 33% lower than that in the U.S.



- China is also willing to capture this market on the lines of small-molecule active pharmaceutical ingredients (APIs).
- Concerns about China's dominance in the field forced India to launch the Production-Linked Incentive (PLI) scheme for biopharmaceuticals and associated products.
- Establishing a hub in India will help in technology transfer, connecting investors, and establishing a fund. This will further reduce dependence on China.
- India is aiming to enhance its fermentation capacity tenfold to 10 million litres in the next 3-5 years and become a leader in the field.

**Way Ahead:**

- India should improve its workforce quality. In this context, permanent training facilities should be developed in universities.
- There should be more focus on commercializing research and development.
- The hub should harmonize language, regulations, and data-sharing. This would secure supply chains for Quad nations and facilitate international collaboration.

**Nut Graf:** *The proposed biomanufacturing hub in India will not only capitalize on the economic potential of the industry but also address existing vulnerabilities in global supply chains and help the Quad countries in the key area.*

**4. Solar maximum**

**Syllabus:** Awareness in the field of Space

**Prelims:** About Solar maximum

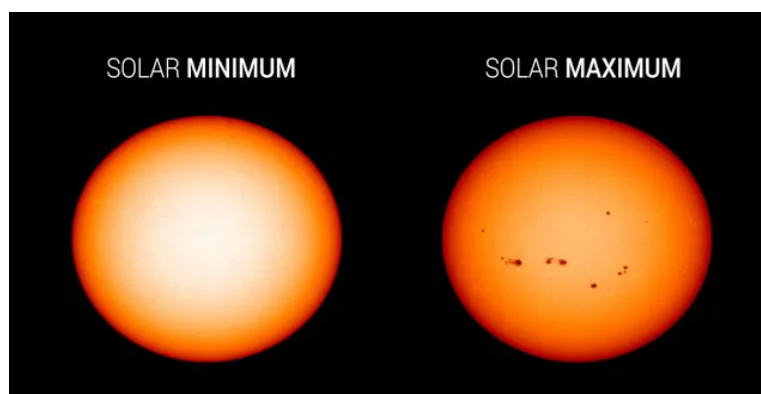
**Mains:** Effects of Solar maximum and details about Solar cycle

**Context:** Solar maximum might arrive in 2024, a year earlier than expected. The sun will reach the peak of its current solar cycle. It can lead to large-scale blackouts and disrupt radio communications across the world.

- The increased radiation activity can have serious health consequences for astronauts.
- The next solar maximum was predicted to begin in 2025. But now new research shows that the sun may reach the peak of its current cycle in 2024, a year ahead.

**What is solar maximum?**

- The sun goes through a natural solar cycle approximately every 11 years.
- The cycle is marked by the increase and decrease of sunspots, visible as dark blemishes on the sun's surface.
- A magnetic field is generated by the movement of charged particles in the sun's interior.
- This extends beyond the surface, creating a heliosphere, a vast region of space that is influenced by the solar wind.
- As the sun rotates, the magnetic field lines are tangled, leading to the formation of sunspots, which are dark, cooler regions on its surface.
- The greatest number of sunspots in any given solar cycle is designated as "solar maximum". The lowest number is "solar minimum".
- But there is more to the solar cycle than just increased sunspots.
- In the sun's atmosphere or corona, bright active regions appear, which are rooted in the lower sunspots.
- Scientists track these regions since they are often the origin of eruptions on the sun such as solar flares or coronal mass ejections.



Source: firstpost

**What do we know about the latest solar cycle?**

- The current solar cycle is the 25th since the records began in 1755 and started in 2019.
- Now the cycle is nearing its peak.
- In April, the sun exploded with three major solar flares.
- There were 23 coronal mass ejections and a massive geomagnetic storm that struck Earth and raged for over two days.
- Solar physicists also found 96 sunspots on its surface.
- While official predictions by NASA and National Oceanic and Atmospheric Administration (NOAA) say that the sun will reach the peak of its activity in 2025, new research led by NASA research scientist Robert Leamon and Scott McIntosh, the deputy director at US National Center for Atmospheric Research (NCAR), suggests this might happen next year.
- According to the finalised forecast, the current cycle is expected to reach its peak in 2024.
- The cycle, the team of researchers thinks, will reach about 185 monthly sunspots during its maximum and thus be somewhat milder than what the team originally forecasted.
- This peak intensity will place this cycle at about the average compared to the historical record.
- The cycles vary in activity. The weakest on record has produced less than 100 sunspots and the strongest nearly 300.

**How will solar maximum affect the Earth?**

- Increased solar activity can disrupt radio communications and the power grid and have serious health consequences for astronauts.
- The increased solar activity leads to solar flares, which consist of high-energy photons like X-rays. This can increase the ionisation in the Earth's upper atmosphere and disrupt radio communications, the professor says.
- Geomagnetic storms cause disturbances to the Earth's magnetic field and can damage the power grid distribution. Notable blackouts caused by geomagnetic storms are the 1989 blackout across the entire province of Quebec, Canada and the 2003 blackout across the eastern United States and parts of Canada.
- The hazards are primarily to large-scale infrastructure. On an individual level, people on Earth are unlikely to directly see the effects of solar maximum.
- High-energy particles travel toward Earth during the solar maximum. The particles are radiation and pose a major health risk to astronauts and passengers and crew on high-latitude and high-altitude aircraft. They can also damage space hardware and lead to satellite loss.
- Astronauts on the International Space Station may be asked to seek shelter and all extravehicular activities are paused.
- But not all is unknown and scary. According to a report on Space.com, one spectacular side-effect of increased solar activity during the solar cycle is increased opportunities to see auroras: the aurora borealis (Northern Lights) and its southern counterpart, the aurora australis. When the energetic particles from the sun slam into and interact with Earth's upper atmosphere, dazzling light shows illuminate the sky.



**Figure: Auroras, caused by a coronal mass ejection on the sun, illuminate the skies over Lapland in Rovaniemi, Finland on 15 March 2023.**

**Does the sun's activity affect other planets?**

- During the solar cycle, when the sun's magnetic poles flip, the effects ripple through the solar system.
- Planets without a protective magnetosphere such as Venus feel the full impact. In 2006, the sun ejected a small coronal mass ejection (CME), a release of plasma and magnetic field which hit Venus and stripped the planet's atmosphere of vast amounts of oxygen.

## 5. Will AI tools help detect telecom fraud?

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

**Prelims:** Facial Recognition Technology (FRT) and ASTR.

**Mains:** Significance of AI tools in detecting fraud

**Context:** The Department of Telecommunications (DoT) has started using 'Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification' or ASTR.

### Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification (ASTR):

- It is an artificial intelligence-based facial recognition tool.
- The DoT, in 2012 asked all TSPs to share their subscriber database including pictures of users. ASTR analyzes this data and categorizes them into similar-looking images using facial recognition technology (FRT).
- It aims to weed out incidents of fraudulently procured SIM cards being used across the country for financial and other cyber scams.
- A face comparison is carried out for each face against all faces in the database, and similar faces are grouped under one directory.
  - Two faces are concluded to be identical by ASTR if they match to the extent of at least 97.5 per cent. As per Jakhar's paper:
  - ASTR is capable of detecting all SIMs against a suspected face in less than 10 seconds from a database of 1 crore images.
- Once the faces are matched, ASTR's algorithm uses what it describes as "fuzzy logic" to find similarities or approximate matches for the subscriber names.
- The DoT allows an individual to take nine legitimate mobile phone connections using a single identity proof.
- The ASTR looks up if there are more than nine connections against a single individual's photograph.
  - It runs a search through the database to see if the same person has taken SIMs under different names.

### Significance of Artificial Intelligence in Telecom Frauds:

- India's telecom ecosystem is the second-largest in the world with around 117 crore subscribers.
- Manually identifying and verifying the documents will be a massive exercise for a large number of subscribers.
- Moreover, the existing text-based analysis is limited to finding similarities between the proof of identities and verifying the accuracy of such information. However, it cannot analyze photographic data to detect similar faces.
- ASTR had detected as many as 6,800 connections against the same image of the subscriber, that is, the same face, but different names. In another case, 5,300 connections were found to have been taken against a single image.
- ASTR can detect and map nearly 68 facial features. It characterizes two faces as similar if there is a 97.5% match.

### Associated Concerns:

- There is a challenge of misidentification due to the inaccuracy of the technology.
- There can be an underrepresentation of certain groups of people in FRT.
- Technical errors like bad lighting, facial expression, ageing, etc. can hamper its accuracy.
- Concerns are also associated with privacy, consent, and mass surveillance.
- FRT will consume a large amount of data to both train and operate.
- Moreover, in many incidents, an individual might not be aware of or in control of the processing of their data.
- It is also argued that no public notification was issued about the use of ASTR on user data.
- In India, there is no data protection law or an FRT-specific regulation.

### Way Ahead:

- A paper published by NITI Aayog on India's national strategy towards harnessing the potential of AI talks about due consent and voluntary use of FRT. This approach should be followed in letter and spirit.
- Many countries use FRT adhering to the local personal data protection regimes. This strategy can be emulated in India as well.
- Moreover, FRT should be limited to instances where both public interest and constitutional morality can be in sync.

**Nut Graf:** The Department of Telecom is using a facial recognition technology called ASTR to detect SIM cards acquired fraudulently. However, there are several concerns associated with its use that need to be addressed on an urgent basis as it might compromise the privacy of citizens.

## 6. The EU's Artificial Intelligence Act

**Syllabus:** Awareness in the fields of IT, Computers, and Robotics.

**Prelims:** About European Union's Artificial Intelligence Act

**Mains:** Regulating Artificial Intelligence (AI) systems and tools

**Context:** The members of the European Parliament reached a consensus to draft a new version of the European Union's Artificial Intelligence Act.

### The need for regulating Artificial Intelligence

- As artificial intelligence (AI) are technologies now being used extensively, their algorithms are becoming more advanced and are capable of undertaking a wide range of complex tasks such as driving cars, voice assistance, detecting cancer, recommending music, etc.
  - With such advancements, there has been an increase in the potential risks and uncertainties associated with them.
- Further, several AI tools are regarded as “black boxes” i.e. even the ones who designed the tools cannot actually explain what process takes place within the tools to generate a specific output.
- There has been an increase in instances wherein complex and unexplainable AI tools such as AI-enabled facial recognition tools have led to wrongful arrests.
- More recently, there have been concerns over “Deepfakes” that are generated using complex large language models (LLMs) like Generative Pretrained Transformer-3 (GPT-3) and 4.
- Industry stakeholders including Twitter CEO Elon Musk and Apple co-founder Steve Wozniak recently urged the AI labs to stop the training of AI models more powerful than GPT-4 for six months in order to mitigate the potential risks to society and humanity.
  - In their letter, the industry stakeholders stated that “powerful AI systems must be developed only once we are confident that their effects will be positive and their risks will be manageable”.

### Artificial Intelligence Act

- The Artificial Intelligence Act or the AI Act was first drafted in 2021.
- The Act aims to ensure transparency, trust, and accountability to AI and put in place a framework to mitigate the risks associated with safety, health, fundamental rights, and democratic values of the European Union (EU).
- The Act was further envisioned to address various ethical issues and implementation challenges in sectors such as healthcare, education, finance and energy.
- The AI Act also aims to ensure that AI in Europe respects the 27-country bloc's values and rules.
- The key objective of the AI Act was to establish a balance between the promotion of the uptake of AI and mitigating the risks associated with the use of technology.
- Similar to the EU's General Data Protection Regulation (GDPR) of 2018 which was regarded as an industry leader in the global data protection regime, the AI law also aims to make Europe a global hub of excellence in the field of AI.

### Salient features of the Draft AI Act

- The draft AI Act defines AI as “software that is developed with one or more of the techniques that can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with”.
- It also identifies AI tools based on machine learning (ML), deep learning, knowledge, logic-based and statistical approaches.
- The Act employs an approach to categorise AI tech based on the level of risk associated with the health and safety or fundamental rights of an individual. The Act mentions four risk categories namely unacceptable, high, limited and minimal.
  - The Act bans the use of technologies that fall under the category of unacceptable risk with little exception.
  - Such technologies include the use of real-time facial and biometric identification systems in public spaces, systems of social scoring of citizens by governments that result in “unjustified and detrimental treatment”, techniques that distort an individual's behaviour and technologies that have the ability to exploit vulnerable classes of society.
  - AI systems that fall under the limited and minimal risk category are permitted to use with very few requirements like transparency obligations.
- The draft version of the Act also prescribes various pre-and post-market requirements for developers and users of systems such as biometric identification and categorisation tools, AI tools used in healthcare, education, law enforcement systems, and tools that provide access to crucial private and public services.
  - Since AI algorithms evolve over time, post-market monitoring obligations also play a significant role.

- The Act envisages creating a framework that sets various parameters and undertakes a strict review of high-risk AI systems which are called “conformity assessments”.

### Recent proposals for the Draft AI Act

- The AI Act that was drafted two years back only included one mention of the term “chatbot”. However, the advancement in the use of general-purpose AI tools and chatbots such as the ChatGPT has mandated a need to update the rules in order to catch up with the significant rise in interest in generative AI tools.
- Legislators also have shifted their focus towards the use of copyrighted material by companies using generative AI tools such as ChatGPT or Midjourney image generator, because such tools have the ability to train themselves using the data available on the internet.
  - Companies using such tools will be mandated to disclose the copyrighted material used to develop their systems.
- Furthermore, discussions are underway on whether all forms of general-purpose artificial intelligence systems (GPAIS) be categorised as high-risk.

### AI regulations across the world

- **The U.S.** – At present the U.S. does not have a holistic AI regulation.
  - The government has however notified a blueprint for an AI Bill of Rights (AIBoR) which has been formulated by the White House Office of Science and Technology Policy (OSTP).
  - The AIBoR highlights the risks associated with the AI tools to economic and civil rights and mentions five principles to mitigate such risks.
  - The AIBoR blueprint employs a sector-specific approach to AI governance instead of a horizontal approach like that of the EU.
  - AIBoR is similar to a handbook and is not binding legislation.
- **China** – China has come up with the world’s first nationally binding regulations that focus on specific types of algorithms and AI.
  - China has passed a law to regulate recommendation algorithms with a focus on how they disseminate information.
  - China has also enacted legislation that targets deep synthesis technology like those employed in generating “Deepfakes”.
  - To ensure transparency and analyse how the algorithms work, China’s AI regulation authority has also developed a database of algorithms where developers have to register their algorithms and provide information.
- **India** – India has undertaken steps to ensure that AI technologies are developed and used in a responsible and ethical manner, including the development of the Personal Data Protection Bill.
  - The NITI Aayog came up with the National Strategy on Artificial Intelligence (NSAI) in 2018 with an aim to establish the country as an “AI Garage”.
  - The Union IT and Telecom Minister recently said that the government is not considering bringing a law or regulating the growth of artificial intelligence in the country.

**Nut graf:** The rapidly evolving pace of AI tools and advancements in general-purpose artificial intelligence systems (GPAIS) such as ChatGPT require policymakers across the globe to accelerate their efforts to develop a robust AI governance regime to mitigate and prevent the potential risks associated with such technologies.

## 7. Explaining mitochondrial donation treatment: how a baby has three parents

**Syllabus:** Awareness in the field of bio-technology

**Prelims:** About mitochondrial replacement therapy (MRT)

**Mains:** Mitochondrial Replacement Therapy (MRT): procedure involved, significance and its associated legal aspects

**Context:** Recently, it was announced that a baby was born using three persons’ DNA in the U. K.

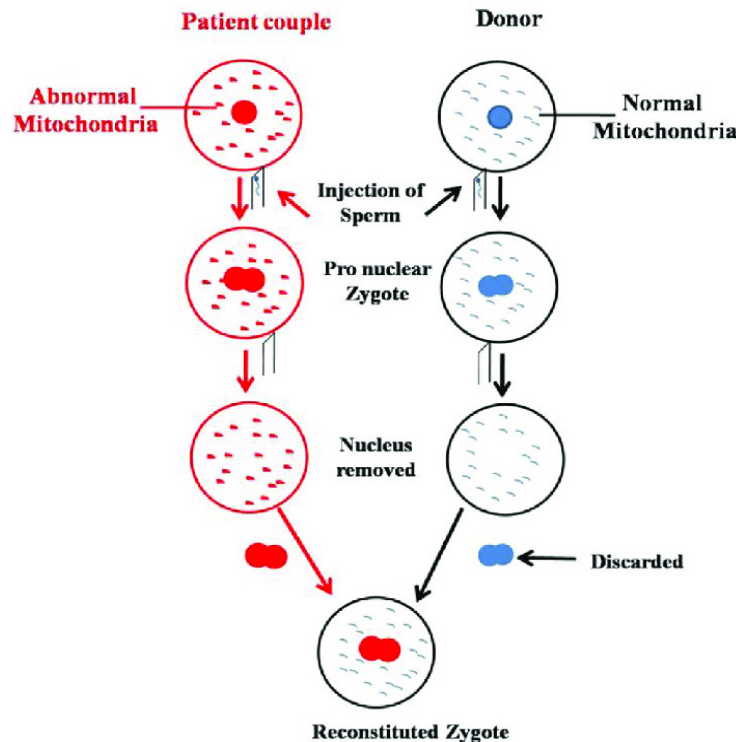
### Details:

- The baby born using mitochondrial replacement therapy (MRT), technically, has three parents as the baby carried most of its genetic material such as DNA from its parents, and the mitochondria from the donor were used while fertilising the egg.
- This mitochondrial replacement therapy (MRT) was employed in order to prevent the child from inheriting the mother’s mitochondrial disease.
- Mitochondria are regarded as the “powerhouses of the cells” as they generate the energy required for the functioning of cells in the human body.



- Defects in the mitochondrial can impact the functioning of cells which can have adverse effects on various 'energy-hungry' tissues of the brain, nerves, muscles, kidneys, heart, liver and can affect the functioning of these organs.
- Such diseases that occur due to mitochondrial defects are known as mitochondrial diseases.
- Mitochondrial diseases are only passed on by the mother, and various studies are underway to find a solution for protecting the infant from inheriting the disease.

### Mitochondrial Replacement Therapy (MRT)



Source: ResearchGate

- Using advanced in vitro fertilisation techniques the biological father's sperm would be used to fertilise the eggs from the biological mother, who suffers from a mitochondrial disease and another female donor with normal mitochondria, separately.
- Later, the nuclear genetic material from the donor's egg is removed and replaced with the genetic material from the biological parents.
- The "egg" now produced will have the genetic material i.e. DNA from the parents and healthy mitochondria from the female donor.
- This egg is then implanted in the uterus and carried to full term to yield a baby which does not inherit the biological mother's mitochondrial disease.

### Legislations to facilitate MRT

- MRT was pioneered in the U. K. by doctors at the Newcastle Fertility Centre and the U.K. government in 2015 had amended the law to facilitate the procedure.
- The Newcastle Clinic later became the first centre to get a licence to perform MRT, and the first few cases were approved in 2018.
- The U. K.'s Human Fertilisation and Embryology Authority (HFEA) provides the required approval on a case-by-case basis.
- Australia in 2022 became the second country after the U.K. to legalize the use of MRT.

**Nut graf:** A pioneering technology called "Mitochondrial Replacement Therapy (MRT)" was recently used to facilitate the birth of a baby which technically has three parents. This technology has the capability to prevent the child from inheriting mitochondrial disease.

## 8. On copyright infringement and AI

**Syllabus:** Issues relating to intellectual property rights

**Prelims:** About Copyright and various types of intellectual property rights

**Mains:** Copyright infringement, exemptions from liabilities, observations made by the U.S. courts in AWF Case and its implications

**Context:** The U.S. Supreme Court's ruling in the Andy Warhol Foundation for the Visual Arts Inc. v/s Goldsmith et al. Case.

### Copyrights

- Copyright is a collection of legal rights extended by law to an intellectual property owner.
- It provides a set of exclusive rights for artists over their creative output.
- Copyright law protects the work of diverse artists which include creators of literary, dramatic, artistic works, and musicals, photographers and the producers of cinematographic films and sound recordings.
- The extent of rights includes control over the manner in which others reproduce or modify the work of copyright holders.

### Exemptions from infringement liability

- The copyrights are usually balanced with the rights of the users with the help of exceptions mentioned under the copyright laws and different jurisdictions follow different approaches to exceptions.
- **European Nations:** These nations, particularly the countries in continental Europe, have followed an “**enumerated exceptions approach**”.
  - As per this approach, an instance of copyright infringement in question must be specifically covered under the law in order to be considered an exception.
- **The U.S.:** Various other countries, including the U.S., have adopted an “**open-ended approach**”.
  - There is no need to specify exemptions beforehand. However, guidelines are in place that mention the types of uses that can be exempted.
  - The courts in the U.S. usually take into account four key factors while determining a copyright infringement case, they are:
    - **Purpose and character of the use** (courts have usually given the highest priority)
    - **Nature of the copyrighted work**
    - **Amount and substantiality of the portion taken by the defendant**
    - **Effect of the use on the potential market of the plaintiff's work**
  - The open-ended approach ensures that there is a considerable amount of flexibility to deal with challenges that arise due to emerging technologies.
  - However, a major limitation is that it is hard to predict whether an activity will be exempted from copyright infringement liabilities until it undergoes a litigation procedure.

### Andy Warhol Foundation for the Visual Arts Inc. v/s Goldsmith et al. Case (AWF case)

- Lynn Goldsmith, who is well known for her concert and portrait shots, had photographed the famous musician Prince in 1981 and one of these photographs was licensed by the Vanity Fair magazine for use as an “artist reference” in 1984.
  - Lynn Goldsmith was paid \$400 for the licence by Vanity Fair.
- The licence had particularly mentioned that the illustration could appear once as a full-page element and once as a one-quarter-page element, in their November issue of 1984.
- The magazine then hired Andy Warhol, a famous visual artist to work on the illustration.
  - Andy Warhol came up with a silkscreen portrait of Prince using Goldsmith's photograph.
- This silkscreen portrait, then, appeared in the magazine with appropriate credits to Lynn Goldsmith. However, Andy Warhol created 13 such screen prints and two pencil sketches, while the licence had authorised only one illustration.
- In 2016, a media conglomerate that publishes Vanity Fair, approached the Andy Warhol Foundation (AWF) to reuse the 1984 illustration and upon realising that there were more portraits available, they opted to publish one of them and they paid \$10,000 to AWF as part of the license and nothing to Lynn Goldsmith.
- Realising that Lynn Goldsmith might file a copyright infringement suit, AWF filed a suit to declare that it had not committed infringement.
  - Lynn Goldsmith later filed a countersuit accusing AWF of copyright infringement.

### Observation of various courts in the AWF case

- A district court had ruled in favour of the AWF and it observed that Andy Warhol's use of Lynn Goldsmith's photo constituted fair use.
  - According to the court, Andy Warhol's work was "transformative" as it had a different character, gave Goldsmith's photograph a new expression, and used new aesthetics with creative and communicative results distinct from that of Goldsmith's.
  - The court also noted that Warhol's work added something new to the world of art and the public would be deprived of this contribution if the works could not be distributed.
- The Court of Appeals, however, reversed these observations and said that Warhol's use of the photograph did not constitute fair use.
- The case ultimately ended up in the Supreme Court of the U.S. and it gave its final verdict on May 18, 2023.
  - The majority of judges opined that if an original work and secondary work have similar purposes and if the secondary work is of a commercial nature, then the factor of "Purpose and character of the use" would not favour a fair-use interpretation unless there are other justifications.
  - The majority of the judges, in this case, felt that both Goldsmith's photos, as well as Warhol's adaptations, had more or less the same purpose.
  - They held that while copying may have helped convey a new meaning or message, that in itself did not suffice to grant exemptions from copyright infringement liabilities.

### Implications of the Judgment

- The U.S. Supreme Court's judgement is bound to create ripples across the field of visual arts.
- This decision is also expected to impact the manner in which regenerative artificial intelligence (AI) tools, such as ChatGPT have been conceived.
  - Such regenerative AI tools are trained in a manner to use various texts, photos, and videos from the internet without considering whether they are copyrighted or not.
- The observations made on the issue of the commercial nature of the use might also lead to a deviation from the established view.

### Implications for Indian copyright law

- Experts feel that there might not be any direct impact on Indian copyright law, as the framework for granting exceptions is different in India.
- India has adopted a hybrid model of exception, according to which, a copyrighted work is exempted for specific purposes mentioned under Section 52(1)(a) of the Copyright Act of 1957.
- India has a long list of exceptions mentioned and the decision of the U.S. Supreme Court could influence the courts while determining the "fairness" of litigation.

**Nut graf:** The latest ruling by the U.S. Supreme Court in the AWF Case is expected to have far-reaching implications over the established copyright regulations as it adds unpredictability to the process of exempting copyright infringement from liabilities.

## 9. National Technology Day

**Syllabus:** Achievements of Indians in science & technology

**Prelims:** About National Technology Day and Operation Shakti

**Context:** National Technology Day in India is observed on May 11th each year to commemorate India's successful nuclear test at Pokhran, Rajasthan, in 1998.

### Details:

- The day, which was first observed on 11th May, 1999, aims to commemorate the scientific and technological achievements of Indian scientists, engineers. The day was named by the former Prime Minister Atal Bihari Vajpayee.
- Every year, the Technology Development Board of India (a statutory body under the Ministry of Science and Technology) celebrates the day by awarding individuals with the National Award for their contribution to science and technology in India.

**Significance:**

- It is the day India successfully tested nuclear bombs in Pokhran on 11th May, 1998.
- India successfully test-fired its Shakti-1 nuclear missile in operation called Pokhran-II, also codenamed as Operation Shakti.
- The nuclear missile was tested at the Indian Army's Pokhran Test Range in Rajasthan. This was the second test which was conducted after Pokhran-I codenamed Operation Smiling Buddha, in May 1974.
- On the same day, India performed a successful test firing of the Trishul Missile (surface to air short range missile) and had test flown the first indigenous aircraft – 'Hansa – 3'.

**Immediate consequences:**

- The tests were strongly condemned by the international community, and the United States responded by imposing sanctions against India under the Glenn Amendment, which restricted certain forms of aid and military technology transfers.
- Pakistan responded to the tests by conducting its own series of nuclear tests on May 28 and 30, which further escalated tensions in the region.
- China also strongly criticised India for what it saw as a violation of international norms and an affront to the authority of the United Nations and the global community.
- Domestically, the decision to conduct the tests was met with criticism from both the Congress and the Left parties, who argued that it was unnecessary and provocative, and could have serious consequences for India's security and global standing.

**Pillars of India's Nuclear Doctrine**

- No-first-use
- Credible minimum deterrence
- Nuclear command authority (NCA)

**Nuclear Command Authority**

- On 4th January 2003, India unveiled a 3-tier Nuclear Command Authority (NCA) to manage its nuclear weapons. This board framework was approved on the nuclear doctrine prepared by the National Security Board.
- The NCA comprises of the following:
  - **Political council:** The political council is headed by the Prime Minister.
    - It is the body which authorizes the use of nuclear weapons.
  - **Executive council:** The executive council is headed by the National Security Adviser to the prime minister.
    - Its function is to offer inputs for decision-making by the NCA and to implement the directives it gets from the political council.
  - **Strategic forces command:** The strategic forces command (SFC) is responsible for the administration of the nuclear forces and will be actually tasked with the firing of nuclear weapons.
    - SFC is the second tri-service command in India.

**10. India's Supercomputers**

**Syllabus:** Achievements of Indians in science & technology; indigenization of technology and developing new technology.

**Prelims:** India's Supercomputers

**Context:** The Union Earth Sciences Minister has noted that India is set to scale up its supercomputing prowess significantly and will also install an 18-petaflop system.

- Flops or floating point operations per second indicate the processing speed of computers and one petaflop refers to 1,000 trillion flops.

**Background:**

- India will have an upgraded 'high-performance computing (HPC)' by the end of 2023. It is suggested that this will be the fastest supercomputer in India.
- According to the Minister, the processing power to such a degree would help solve complex mathematical calculations and also help in weather forecasting.
- The new supercomputers, which are yet to be named, are imported from French corporation, ATOS (an information technology service and consulting company).
  - The Indian government had signed an agreement in December 2018 with France to procure high-performance computers worth ₹4,500 crores by 2025.

- The new MoES computers are likely to cost ₹900 crores.
- The HPC system will be installed at the Indian Institute of Tropical Meteorology, Pune, and the National Centre for Medium-Range Weather Forecasting, Noida.
- The Atos machines will be utilized in running sophisticated weather models to predict daily, fortnightly, and long-term weather changes.
  - Powerful machines are needed for weather forecasting as it is premised on the ability to simulate the state of the atmosphere and oceans.

**Significance of High-Performance Computing:**

- Several fields like protein biology, aerospace-modelling applications, AI-linked applications, etc are dependent on efficient computing.
- The possession of HPC is also considered a symbol of technological prowess.
- It provides a reassurance that Indian scientists can tap the potential of the supercomputers for important research.
- It also helps in mitigating the harmful impacts of weather-related disasters like cyclones. India has tremendously improved its short-term weather forecasts.

**Supercomputers**

- It is a computer with a high level of performance as compared to general-purpose computers.
- It is used to solve complex problems that either require more time or are not solvable by regular computers.
- The performance of a supercomputer is usually measured in floating-point operations per second (FLOPS).
- They are used to solve computationally intensive tasks in areas like quantum mechanics, weather forecasting, climate research, oil and gas exploration, molecular modeling, physical simulations, etc.
- The Top500 project maintains a list of the 500 most powerful HPC machines in the world. It updates the list twice a year.

**Supercomputers in India**

- India's first supercomputer was PARAM 8000.
- At present, Pratyush and Mihir, which are India's most powerful civilian supercomputers, are placed at the Indian Institute of Tropical Meteorology in Pune, and the National Centre for Medium Range Weather Forecasting (NCM-RWF) in Noida, respectively.
  - They have a combined capacity of 6.8 petaflops.
  - They were made operational in 2018 at an investment of ₹438 crores.
- Only one machine (in Pune's Centre for Development of Advanced Computing) is in the top 100 list in the world.
  - It has a top speed of 13 petaflops.
  - 1 petaflop is equal to 1,000 trillion flops.
- The fastest high-performance computing system in the world is currently housed in the Frontier-Cray system at Oakridge National Laboratory, in the US.
  - This supercomputer has a peak speed of one exa-flop (about 1,000 petaflops).

**Nut Graf:** Supercomputers have great potential in various fields like weather forecasting, advanced data handling, artificial intelligence, etc. India should upscale its technological process through the use of supercomputing technology and move beyond just weather forecasting.



## 11. India's GSLV launches NVS-01 NavIC satellite

**Syllabus:** Awareness in the field of Space

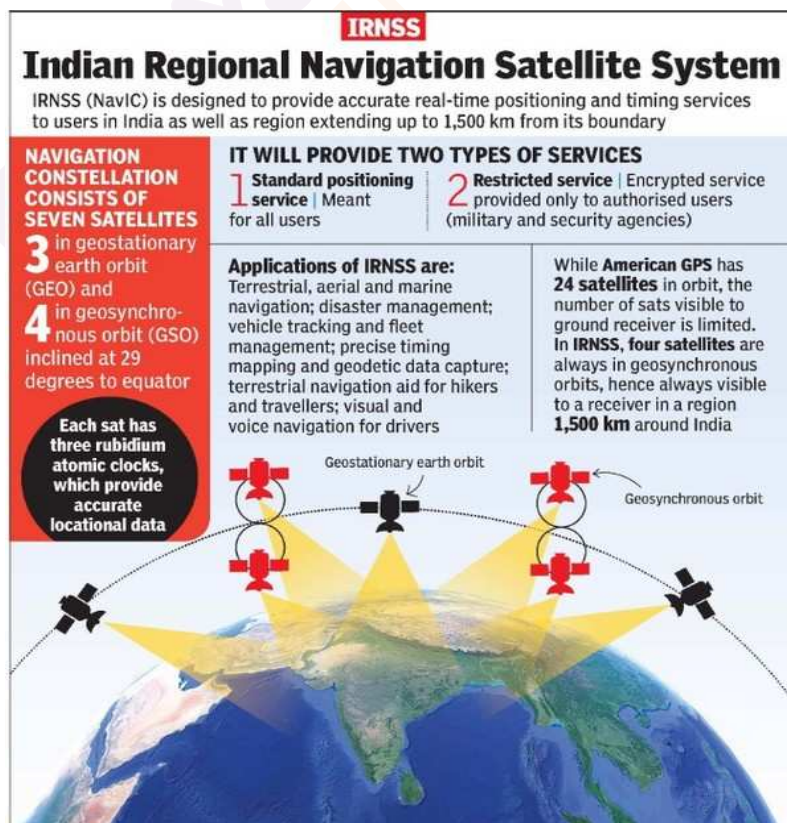
**Prelims:** About Navigation by Indian Constellation (NavIC), NVS-01 Satellite and Geosynchronous Satellite Launch Vehicle (GSLV)

**Context:** The Indian Space Research Organisation (ISRO) successfully placed the NVS-01 navigation satellite into Geosynchronous Transfer Orbit (GTO).

### NVS-01 navigation satellite

- ISRO, using its Geosynchronous Satellite Launch Vehicle (GSLV), successfully placed the NVS-01 navigation satellite into the GTO.
  - The latest mission was carried out using GSLV-F12 which is the 15th flight of India's GSLV and the 9th flight with indigenous cryo stage.
  - The latest mission was also the 6th operational flight of a GSLV with an indigenous cryogenic stage.
- NVS-01 navigation satellite is the first in the series of five second-generation satellites for Navigation by Indian Constellation (NavIC)
- The NVS-01 navigation satellite weighs about 2,232 kg and carries navigation payloads for L1, L5 and S bands.
- For the first time ever an indigenous atomic clock was flown in NVS-01.
- The NVS-01 navigation satellite will enhance India's regional navigation system by providing accurate and real-time navigation.
- The signals from NavIC are designed to provide user position to better than 20 metres and timing accuracy of better than 50 nanoseconds.
- The NVS-01 satellite has a mission life of over 12 years, which is longer than the 10-year life of the first-generation satellites in the NavIC system.
- The NavIC system has been hindered by failing atomic clocks and satellites nearing the end of their mission life. Thus efforts are underway to replace the ageing satellites and make the NavIC system fully functional and operational.
- The second-generation NavIC satellites are equipped with enhanced features for terrestrial, aerial and maritime navigation, precision agriculture, location-based services in mobile devices and marine fisheries.

### About Navigation by Indian Constellation (NavIC):



Source: Times of India

- NavIC is an independent regional navigational satellite system developed by India.
- NavIC was earlier known as Indian Regional Navigation Satellite System (IRNSS).
- ISRO has developed NavIC.
- The NavIC covers an area that includes India and a region up to 1500 km beyond the Indian boundary.
- NavIC is designed with a constellation of 7 satellites and a network of ground stations operating 24 x 7.
- The NavIC constellation consists of three satellites that are placed in geostationary orbit and four other satellites that are placed in inclined geosynchronous orbit.
- The two kinds of services provided by NavIC include:
  - **Standard Position Service (SPS)** for civilian uses
  - **Restricted Service (RS)** for strategic purposes

**The following countries have their own navigation satellite system.**

- **The United States:** GPS – World's most used GPS system, operational from 1978. Constellation of 32 satellites.
- **Russia:** GLONASS – Constellation of 24 satellites.
- **European Union:** Galileo – Became operational in 2016, with a constellation of 30 satellites.
- **China:** BeiDou – Currently it provides regional coverage of the Asia-Pacific region, plans to provide global coverage by 2020.
- **Japan:** Quasi-Zenith Satellite System (QZSS) – It is a regional satellite system covering Japan and Asia-Oceania region.
- **India:** NAVIC or The Indian Regional Navigation Satellite System.

## 12. START Programme

**Syllabus:** Awareness in the field of space

**Prelims:** About START Programme

**Context:** The Indian Space Research Organisation (ISRO) has announced a new training programme named space science and technology awareness training (START).

### START Programme

- Space Science and Technology Awareness Training (START) is an introductory-level online training programme launched by the ISRO.
- This programme is designed in such a way that it covers various aspects of space science, such as Astronomy, Astrophysics, Aeronomy, Heliophysics, Sun-Earth interaction and Instrumentation.
  - The programme is also expected to cover topics on the Indian Space Science exploration programme and research opportunities in Space Science.
- The programme is aimed at post-graduate and final-year undergraduate students of physical sciences and technology and will be delivered by scientists from Indian academia and ISRO.
- The main aim of the programme is to provide introductory-level training for students in space science and technology and also educate them about different facets of the field, research opportunities, and career options.
- The START programme is in line with ISRO's efforts to enable Indian students to become professionals in space science and technology, as the organization's space exploration programmes continue to expand into new domains.

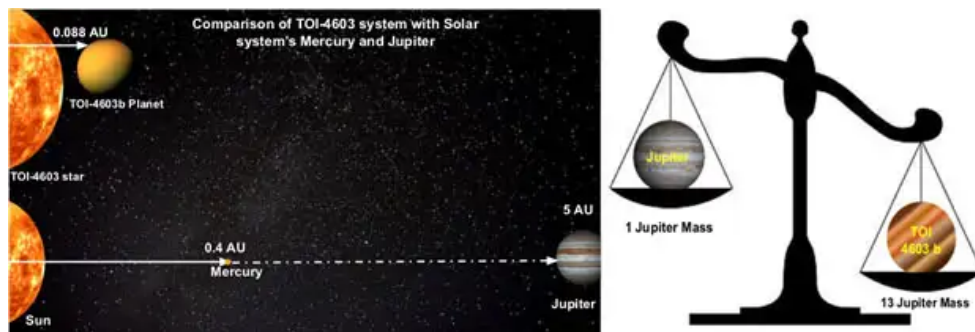
**13. New Jupiter-size exoplanet discovered**

**Syllabus:** Awareness in the field of Space

**Prelims:** About the discovery of new exoplanet

**Context:** An international team of scientists led by Prof. Abhijit Chakraborty at the Exoplanet Research Group of the Physical Research Laboratory (PRL), Ahmedabad has discovered a new Jupiter-sized exoplanet.

**Details**



Source: ISRO

- A new Jupiter-sized exoplanet with the highest density of  $\sim 14 \text{ g/cm}^3$  known to date has been discovered.
- The new exoplanet discovered has a mass that is 13 times that of Jupiter.
- This discovery was made using the indigenously developed **PRL Advanced Radial-velocity Abu-sky Search spectrograph (PARAS)** and PRL 1.2m telescope at Gurushikhar Observatory located in Mt. Abu.
- The team of scientists involved in the discovery includes researchers from India, Germany, Switzerland and the US.
- The new exoplanet discovered was found around the star called TOI4603 or HD 245134.
- This newly discovered exoplanet "TOI 4603b" is regarded as one of the most massive and densest giant planets that orbits very close to its host star at a distance less than 1/10th the distance between our Sun and Earth.
- This newly discovered planet falls into the transition mass range of massive giant planets and low-mass brown dwarfs.
  - Massive giant exoplanets are those having mass greater than four times that of Jupiter.
  - Low-mass brown dwarfs are those having mass equal to 13 times the mass of Jupiter.
- The exoplanet with a surface temperature of 1670 K is said to be undergoing high-eccentricity tidal migration with an eccentricity value of approximately 0.3.
- The discovery also marks the third exoplanet discovery by India, and by the PRL scientists using PARAS spectrograph and the PRL 1.2m telescope, following the discoveries of K2-236b (in 2018) and TOI-1789b (in 2021).
- The finding of such exoplanets provides valuable information about the formation, migration, and evolution mechanisms of massive exoplanets.

**14. Tiangong space station**

**Syllabus:** Awareness in the field of Space

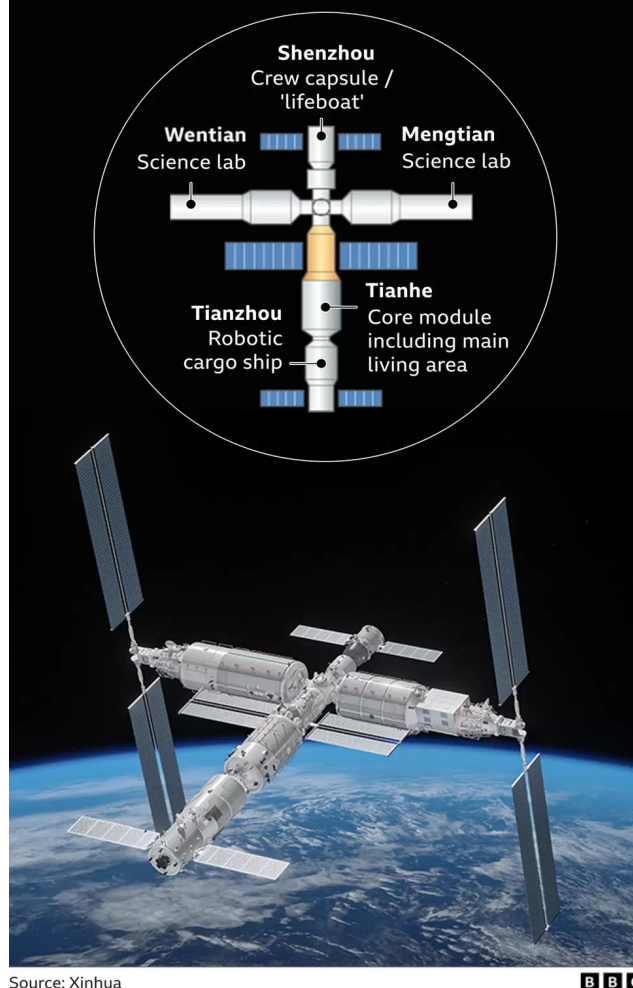
**Prelims:** About Tiangong space station

**Context:** China has recently sent three astronauts to its Tiangong space station and has put a civilian into orbit for the first time amidst plans to send a crewed mission to the Moon by 2030.

**Tiangong space station**

## China's space station

How it will look when fully assembled



Source: Xinhua

BBC

Source: The BBC

- Tiangong space station which translates as “Heavenly Palace” is China’s permanent space station.
- China had previously launched two temporary trial space stations, named as Tiangong-1 and Tiangong-2.
- The Tiangong space station has three modules namely:
  - **Tianhe**: the core module launched in 2021
  - **Wentian**: science module 1, launched in 2022
  - **Mengtian**: science module 2, also launched in 2022
- Tiangong space station is planned in such a way that it shares its orbit with the Xuntian space telescope in order to facilitate astronauts to repair and upgrade the telescope easily.
- China became only the third country in history to have put both astronauts into space and to build a space station, after the Soviet Union and the US.
- China believes that Tiangong will replace the International Space Station (ISS), which is due to be decommissioned in 2031.

**15. Monkeypox**

**Syllabus:** Awareness about various diseases

**Prelims:** About Monkeypox

**Context:** The World Health Organization (WHO) has declared that Monkeypox (mpox) no longer constitutes a global health emergency.

**Monkeypox disease**

- Monkeypox disease is caused due to the Monkeypox virus.
- The virus belongs to the poxvirus family and was first identified in monkeys in 1958.
- The first human case was reported in 1970 from the Democratic Republic of Congo and many sporadic outbreaks of animal-to-human as well as human-to-human transmission have been reported in Central and West Africa with significant mortality.
- Since the eradication of smallpox, monkeypox is said to be one of the dominant poxviruses in humans, with cases increasing over the years.
- As the transmission happens only due to close contact, the outbreaks are self-limiting.
- The incubation period is found to be between five to 21 days in the majority of affected people and is often mild or self-limiting.
- The outbreaks in Central Africa are considered to be due to their close contact with animals in the region.
- While monkeys are said to be the only hosts, the reservoir is not known and it is believed that rodents and non-human primates could be potential reservoirs.

**Does the virus mutate?**

- Monkeypox virus is a DNA virus with a large genome of around 2,00,000 nucleotide bases and since it is a DNA virus, the rate of mutations in the monkeypox virus is significantly lower compared to RNA viruses such as SARS-CoV-2.
- The low rate of mutation does not require large-scale genomic surveillance to provide details about the transmission of monkeypox.

**What does the genome sequence reveal?**

- The genome sequences conducted in Africa and other parts of the world reveal that there are two distinct subfamilies of the virus;
  - The Congo Basin/Central African subfamilies
  - The West African subfamilies
- The Central African/Congo basin subfamilies are believed to have a higher transmission and virulence rate as compared to the West African clade.
- According to recent genome studies, the sequences found across the world are identical and almost all genomes are reported to be of the West African subfamily which has lesser fatality compared to the Central African one.
- The virus genomes also show similarities with those from the outbreak in Nigeria during the 2017-2019 period suggesting that the present outbreak is not driven by a particular new variant, but possibly related to unique transmission networks.

**Presence of vaccine**

- As there is enough data about the virus and its transmission patterns there is enough information about effective means to prevent the spread, including a vaccine.
- Smallpox/vaccinia vaccine provides protection.
  - The vaccine was discontinued in 1980 following the eradication of smallpox, but the emergency stockpiles of the vaccines are maintained by many countries.
  - Since the younger generation of individuals is unlikely to have received the vaccine, the disease is seen more in younger individuals.
- Also, there is enough knowledge on the disease from African countries which have effectively managed the outbreaks in the past.
- With a vaccine available, efforts are to be focused on bridging the divide in health, knowledge, experience and infrastructure thereby helping in preventing and managing future outbreaks contributing to an equitable and global public health.



## 16. FDA approves first vaccine for respiratory syncytial virus

**Syllabus:** Awareness about various diseases

**Prelims:** Respiratory Syncytial Virus(RSV) Vaccine.

**Context:** FDA approved the first vaccine for respiratory syncytial virus on 3rd May 2023.

### Details

- The first vaccine for respiratory syncytial virus (RSV) was approved by the Food and Drug Administration (FDA). The name of the vaccine is Arexvy.
- It aims to lower respiratory tract disease in people older than 60 years.
- The vaccine is manufactured by a company named GSK.
- The FDA approved the vaccine on the basis of a phase-3 trial conducted on approximately 25000 participants.
- It was found that a single dose of vaccine reduced the risk of developing lower respiratory tract disease caused by the RSV virus by almost 82.6% (people with ages above 60 years). Moreover, it reduced the risk of severe disease by 94.1%.

### Respiratory Syncytial Virus (RSV) and Comorbidities:

- As per the U.S. Centres for Disease Control and Prevention, lower respiratory tract disease caused by the RSV virus leads to around 60000 to 120000 hospitalizations and nearly 6000 to 10000 deaths among people with age 65 or more.
- The RSV virus considerably impacts adults with comorbidities. For instance, the common cold with mild symptoms can become deadly for older people with RSV.
- According to the Atlanta-based CDC, RSV is also a cause of concern for infants. Approximately 58000 to 80000 children (below 5 years) in the U.S. are hospitalized and about 100 to 300 die due to RSV.

### Vaccines for RSV:

- Arexvy will be available for older adults in the U.S. ahead of winter 2023-24.
- It is highlighted that two more RSV vaccines by Pfizer and Moderna have completed clinical trials and might be approved by FDA in the coming months.
  - The vaccine developed by Pfizer is a protein-based vaccine whereas the vaccine by Moderna is a mRNA vaccine.
- Trials are also underway by GSK for people aged between 50 to 59 (including people with comorbidities).

**Nut Graf:** The Food and Drug Administration has approved the first vaccine for respiratory syncytial virus. It has the potential to considerably reduce respiratory tract-related disease in persons aged above 60 years.

## 17. Human pangenome map

**Syllabus:** Science and Technology – Developments and their applications and effects in everyday life.

**Prelims:** About Pangenome reference map

**Context:** A new study published in the Nature Journal describes a pangenome reference map.

### Pangenome reference map

- The genome represents the complete hereditary information of an organism encoded in its DNA.
- The genome is regarded as the blueprint of life as it is a collection of all the genes and the regions between the genes contained in the 23 pairs of chromosomes.
- The process involved in decoding the order of these base pairs and the genetic fingerprint of a human being is known as “genome sequencing”.
  - When the genomes are sequenced, they are usually compared with another reference map called a reference genome.
  - This helps in understanding the regions of differences between the newly sequenced genome and the reference genome.
- The pangenome reference map comes in the form of a graph, unlike the other reference genomes which are all linear sequences.
- The pangenome reference map was developed by the International Human Pangenome Reference Consortium,

which is a group funded by the National Human Genome Research Institute (NHGRI) as a part of the National Institutes of Health.

- This new reference map consists of the genome sequences of 47 people.
- In the pangenome reference map, the graph of each chromosome is similar to that of a bamboo stem with nodes where a stretch of sequences of all 47 individuals converge.
  - These internodes of varying lengths demonstrate genetic variations among individuals from different ancestries.
- In order to develop complete and contiguous chromosome maps, scientists have made use of long-read DNA sequencing technologies.
  - This negates the changes of errors and also simplifies the map.
- A complete and error-free human pangenome map will play a key role in understanding the differences between any two individuals and explain human diversity better.
- It further helps in understanding genetic variants in a few populations, which have caused certain adverse health conditions.

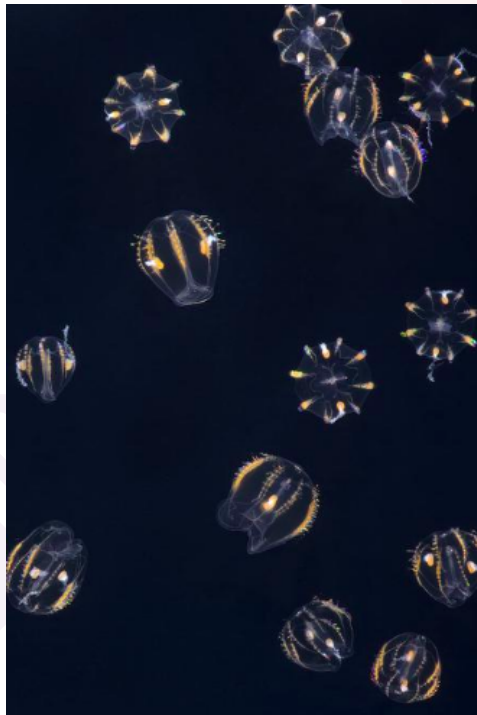
## 18. Comb-jellies and their nervous system

**Syllabus:** Science and Technology

**Prelims:** About comb-jellies and their nervous system

**Context:** A recent study published has taken a close look at the nervous system of the comb-jelly.

**Comb-jellies**



**Source: The Hindu**

- Comb jellies (ctenophores) belong to a phylum of marine invertebrates named Ctenophora.
- Comb jelly is a marine animal with a jelly-like body surrounded by iridescent combs.
- Comb jellies are one of the oldest animal lineages with a defined nervous system.
- Ctenophores are hermaphroditic, i.e. they possess both male and female reproductive organs.
- Ctenophores have also been at the centre of a debate over the identity of the first animal.

### Findings of the study

- The nerve net is a diffuse nervous system made up of interconnected neurons and is commonly found in simple marine animals such as comb jellies and jellyfish.
- With the help of a recent study, researchers have found that nerve-net neurons in Comb-jellies are continuously connected by a single plasma membrane, instead of being connected by synapses (junctions between neurons in all other animals, including humans).
- It was seen that the neurites, which are branches from the neuron that form synapses, were all interconnected by a single plasma membrane.

**19. Foucault pendulum swing**

**Syllabus:** Science and Technology; Applications and effects of Science and Technology developments

**Prelims:** About Foucault pendulum swings

**Context:** A Foucault pendulum suspended from its “Constitutional Gallery” area is one of the main features of the new Parliament building inaugurated recently.

**Foucault pendulum swing**

**Source:** The Hindu

- The Foucault pendulum swing placed in the new Parliament building has been designed and installed by the National Council of Science Museums (NCSM) of Kolkata.
- The Foucault pendulum is named after a French physicist named Léon Foucault who is known to have devised the apparatus in the 19th century.
- A Foucault pendulum swing is a simple device that is mainly used to illustrate the Earth's rotation.
- The pendulum consists of a bob suspended at the end of a long, strong wire from a fixed point in the ceiling and the imaginary surface across which the wire and the bob swing is known as the “plane of the swing”.
- If this pendulum is placed at the North Pole, it will basically be swinging as the Earth rotates ‘below’ and the plane of the swing to the person standing on the Earth's surface will seem to rotate by a full circle as the earth completes one rotation
  - If the pendulum is placed over the equator, the plane won't appear to shift at all as it will be rotating along with the Earth.
  - If the pendulum is placed at any other latitude, the plane will shift through 360 degrees in “one sidereal day divided by the sine of the latitude of its location”.

# DEFENCE AND INTERNAL SECURITY

## 1. Manipur Issues

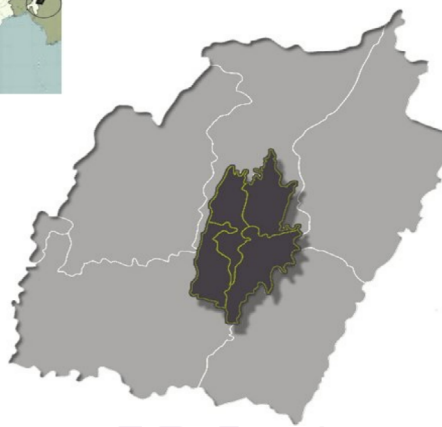
**Syllabus:** Challenges to internal security

**Prelims:** Shoot at sight orders

**Mains:** Riots in Manipur.

**Context:** Violent protests and clashes erupted in Manipur as the Manipur High Court directed the State Government to grant Scheduled Tribe (ST) status to the Meitei community based on a 10-year-old recommendation.

**Background:**



- Geographical features and the location of the State have a significant influence on the problems faced by Manipur.
  - There are 16 districts in Manipur and the State is said to be divided into “valley” and “hill” districts.
  - The Imphal Valley lies at the centre of the State and is surrounded by hills.
- The valley accounts for about 10% of Manipur’s landmass and is dominated by the non-tribal Meitei.
- People belonging to the Meitei community account for over 64% of the State population and yield 40 out of the 60 Members of the Legislative Assembly (MLAs) of the State.
- Meanwhile, the hills that account for close to 90% of the geographical area of the State are inhabited by about 35% recognised tribes but are represented by only 20 MLAs.

### Meitei Community’s Demands for ST Status

- Since 2012, there has been a constant demand led by the Scheduled Tribes Demand Committee of Manipur (STDCM) for granting the Scheduled Tribe (ST) status to the Meitei community.
- The Meitei (Meitei) Tribe Union had filed a petition before the Manipur High Court and had argued that the Meitei community was once recognised as a “tribe” before the merger of the princely state of Manipur with the Union of India in 1949 and that it lost its identity as a tribe after the merger.
- Petitioners had further argued that the ST status must be extended to the community in order to preserve the community and save their ancestral land, tradition, culture and language. According to STDCM:
  - The Meitei community has been victimised without any constitutional protection.
  - They have been gradually marginalised in their ancestral land.
  - And the population of the Meitei community has reduced from 59% of the total population of Manipur in 1951 to 44% as per 2011 Census data.

### Manipur High Court’s Judgement

- The Manipur High Court on April 19, 2023, asked the Manipur government to submit a 10-year-old recommendation to the Union Tribal Affairs Ministry for the inclusion of the Meitei community in the ST list within four weeks.
- The High Court referred to the Union Tribal Ministry’s letter to the State government in May 2013 which had sought recommendations along with the latest socio-economic survey and ethnographic report.

**Opposition by other tribal groups**

- The demand for ST status for the Meitei community has been opposed by the other tribal groups of the state.
- These tribal groups opine that the individuals of the Meitei community already have a demographic as well as a political advantage.
  - They further argue that the Meitei community is more advanced than the tribal groups academically and in other aspects.
- According to the various tribal organisations, granting ST status to the Meiteis would result in the loss of employment opportunities and would also allow Meiteis to acquire land in the hills which would ultimately push the tribals out.
- Additionally, groups like the All Tribal Students' Union of Manipur also argue that the Manipuri language of the Meiteis is included in the Eighth Schedule of the Constitution and that various sections of the community are already enjoying various benefits associated with the Scheduled Castes (SC) or Other Backward Classes (OBC) status.

**Recent Unrest in Manipur**

- Following the April 19th directives of the Manipur High Court, the All Tribal Students' Union of Manipur (ATSUM) called for a "Tribal Solidarity March".
- The March was organised in protest against the demand for the inclusion of the Meitei community in the ST category. However, violent clashes broke out at various places during the march.
- The situation in Manipur turned extreme and violent which saw the deployment of the Indian Army and other central police forces.
- The Manipur government also authorised all District Magistrates to issue "shoot at sight orders" in "extreme cases" in order to control the situation.

**Shoot-at-Sight Order**

- A Shoot-at-sight order authorizes the police or other security forces to shoot anyone who violates the order, without any warning or attempt to arrest them.
- Shoot-at-sight is a controversial order that is used only in extremely rare circumstances.
  - This is used only if authorities feel there is a grave public threat to peace and security and if they deem lethal force absolutely necessary.
- The provisions of law that allow the issuance of "shoot-at-sight" orders include:
  - Sections 41-60 and Sections 149-152 of the Code of Criminal Procedure (CrPC), 1973
  - Section 3(a) of the Armed Forces Special Powers Act (AFSPA), 1958
  - Section 81 of the Indian Penal Code (IPC), 1860
- In the famous Jayantilal case, the Gujarat High Court declared the shoot-at-sight orders imposed for breaking a curfew "void".
  - It held that the law and order forces of the State of Gujarat have no authority to shoot at anyone for a mere breach of the curfew order.

**Supreme Court's Views and the Centre's stand**

- The Supreme Court has regarded the Manipur crisis as a "humanitarian problem" and expressed concerns about the loss of life and property.
- The apex court had further noted that it is the President who has the power to designate a community as Scheduled Caste or Scheduled Tribe and not the High Court.
- The Chief Justice of India (CJI) has urged the Centre and the Manipur government to undertake efforts to protect the people.
- The Union Home Minister said that the order passed by the Manipur High Court will be studied and discussed with all stakeholders and appropriate decisions will be taken after consultation.
- The Indian Army has deployed Heron Unmanned Aerial Vehicles (UAV) and helicopters to increase surveillance on the situation in Manipur and along the Indo-Myanmar Border.

**Way Ahead:**

- It is important to confess and confront the truth about riots and their cause. The government should proactively take responsibility.
- A judicial commission under the supervision of the Supreme Court should urgently fix accountability.
- It is suggested that there should be more genuine accommodation of tribal rights and identities under the Sixth Schedule.
- Moreover, Article 371C where 'scheduled matters' on the hill areas are made inviolable by the legislative majority should be made more robust.



- The existence of multiple tribal communities in Imphal and its valley implies that the state's integrationist and majoritarian projects should contend with the asymmetrical regime of land rights, where tribals can also own land in both hills and valleys.
- It is advised that the State should withdraw all its notifications on reserved forests, protected forests, and wildlife sanctuaries. It should also stop targeting communities as 'foreigners', 'encroachers', and 'illegal immigrants'.
- The communities of the region should be engaged in reasoned dialogues as equals.
- Inter-community reconciliation efforts should be initiated.

**Nut Graf:** *The riots in Manipur highlight that the existence of diverse communities in Manipur is extremely challenging for accommodating distinctive community rights and building an inclusive state. It is suggested that the government needs to modify its stance and all the stakeholders should come together to resolve the internal differences.*

## 2. Minimising the threat from IEDs

**Syllabus:** Challenges to internal security

**Prelims:** Improvised Explosive Device (IED)

**Mains:** Challenges associated with landmine or IEDs ambushes and possible ways to address them.

### Context

- On the 26th of April 2023, an improvised explosive device (IED) blast led to the death of about 10 security personnel in the Dantewada region in Chhattisgarh while they were on an anti-Maoist mission.
- Again on the 5th of May, five soldiers were killed in a gunfight with militants in the Rajouri-Poonch sector of the Jammu division and before the gunfight broke out an explosive device was triggered.

#### Improvised Explosive Device (IED):

- IEDs are homemade or non-standard explosive devices made from commonly available materials such as fertiliser, propane tanks, and cell phones.
- There are several types of IEDs such as roadside bombs, suicide bombs, vehicle-borne IEDs, and command-detonated IEDs.
  - Roadside bombs are the most common type of IED and are typically placed on or near a roadway to target vehicles passing by.
- IEDs are cheap, easy to make, and can be concealed in ordinary objects. They are also highly adaptable, making them a preferred weapon for insurgents and terrorists. IEDs can cause significant damage and casualties with minimal risk to the attacker.
- The use of IEDs is prohibited under international law. The Convention on Certain Conventional Weapons (CCW) prohibits the use of IEDs in armed conflicts, and the International Mine Action Standards (IMAS) provide guidelines for the safe disposal of explosive remnants of war, including IEDs.

#### Challenges associated with such attacks

- Dealing with such faceless and unidentifiable enemies who are hidden among the common people is one of the major challenges security forces face.
- As security personnel are committed to upholding the law of the land as well as protecting the people, they can open fire only in self-defence, not in apprehension.
- Thus, militants, such as the Lashkar-e-Taiba in Kashmir or the Maoists in central India, have the "first mover advantage", in triggering an IED on a mobile Army vehicle or initiating open firing on static CRPF posts.
- In such situations, especially with respect to a landmine or IED ambushes, the reaction or the response time available for personnel to resort to "Immediate Action (IA) or Counter Ambush drill" is only a few seconds.
- Therefore, there are various standard operating systems and procedures, technological measures, etc. employed to identify and detect IEDs/landmines.

**Key recommendations:**

- **Avoiding travel by vehicle:** Experts believe that in such areas where extremism is active, the safest mode of travel is on foot and travelling in vehicles must be avoided.
  - Various studies reveal that more than 60% of casualties in Maoist territories are because of vehicles ambushed in landmines/IEDs.
  - Thus routine exercises such as cordon-and-search, area domination, long-range patrolling, ambush-cum-patrolling, etc. are to be undertaken on foot.
- **Onward and return journeys should never be the same:** If in case vehicle travel is absolutely necessary then the onward and return journeys should never be by the same route and must be avoided during the daytime.
  - Studies show that Maoists usually do not trigger IEDs during night time in order to avoid the risk of civilian casualties and further the exact timing of triggering IEDs becomes difficult during night time.
  - Furthermore, the security forces must always travel in a convoy of at least two or three vehicles maintaining appropriate distances.
- **Use of civilian or public modes of transportation:** Stealth, camouflage and concealment are integral to anti-terrorist operations. However, such vehicles used by security personnel are easily identifiable from long distances.
  - In order to avoid easy identification, security personnel must travel using civilian or public modes of transportation in mufti with weapons hidden carefully.
- **Advanced protective gear and armoured vehicles:** Security personnel deployed in such areas must be equipped with appropriate protective gear which includes blast-resistant clothing, helmets, and eye protection.
  - The security vehicles must also have a V-shaped and armour-plated hull along with blast-resistant technology and proper sandbagging to minimise damage in the event of an explosion.
  - Advanced guns and other weapons must be mounted on top of the vehicles with outward-facing rotatory seats which facilitates 360-degree visibility.
- **Thorough detection systems and protocols must be in place:** Various detection procedures and methods such as metal detectors, ground-penetrating radar, and trained sniffer dogs must be implemented regularly and rigorously.
  - Aerial surveillance can also be undertaken with the help of drones, Unmanned aerial vehicles (UAVs) and on-ground surveillance can be done using Unmanned Ground Vehicles (UGVs).
- **Intelligence inputs:** Gathering and collecting actionable intelligence plays a crucial role in defence and security management.
  - Efforts must be made to build cordial relationships with the locals and this requires patience, commitment, empathy and integrity on the part of security forces.

**Other key measures:**

- IED ambushes or attacks must not be seen as standalone events as an entire ecosystem consisting of financiers, suppliers, transporters, builders and triggermen are behind it.
  - In the year 2008-09, the U.S. forensic investigation agency collected over 5,000 fingerprints from the remnants of IEDs and explosives recovered from the bomb blasts in Afghanistan.
    - This helped in the identification and detection of suspects and accomplices involved in such attacks.
  - Thus diligent and scientific investigation coupled with the meticulous collection of evidence helps frame chargesheets that enable speedy trials and conviction.
- Measures such as collaboration with international organisations, civil societies, NGOs, and other countries to share information on the resources and best practices help in the detection and prevention of such attacks.
- National and international regulations and legislations must be implemented that limit the manufacturing, use, supply and trade of landmines or IEDs, other explosives and detonators.
- Continuous investment in research and development is crucial for improving the technical equipment used for IED detection.
  - The government could fund research to develop new sensors and detection technologies that can detect IEDs with low metal content or those concealed under the road.
- Legislative actions are necessary to enforce the mandatory addition of odoriferous chemicals and/or biosensors to explosives used in industry and mining, etc. for their easy detection during transport.
- An agency must be constituted under the Union Ministry of Home Affairs to coordinate the efforts and measures undertaken by Central and State governments.

**Nut graf:** Acknowledging the fact that landmine or IED attacks have been major setbacks to fighting militants in India, immediate actions must be undertaken to provide legislative, technological and procedural support to our law enforcement agencies.

### 3. Correlation between CCTV Cameras and crime

**Syllabus:** Security challenges and their management

**Mains:** Pros and Cons of CCTV Cameras in India.

**Context:** This article discusses the significance and concerns regarding the use of CCTV cameras by the government.

#### Introduction:

- India's CCTV camera coverage has grown rapidly over the years. Today, Delhi and Chennai have more cameras per square mile than cities in China.
- States argue that CCTV cameras reduce crime, and the public finds the presence of these cameras reassuring.
- In a survey conducted by Lokniti-Centre for the Study of Developing Societies in August 2022 in 12 States, more than three-fourths of the respondents supported installing CCTV cameras at the entrance of their homes.
- However, surveillance using CCTV by the government in India is a topic of concern for various reasons.

#### Role of CCTV Cameras in Fighting Crime:

- The presence of CCTV cameras can act as a deterrent to potential criminals by making them aware that they are being watched and recorded.
- CCTV footage can be used as valuable evidence in criminal investigations and trials, providing clear and irrefutable proof of criminal activity.
- They can help prevent crimes from occurring in the first place by allowing law enforcement to monitor high-risk areas and respond quickly to any suspicious activity.
- In crowded public places like markets, malls and railway stations, CCTV cameras can help authorities manage and control crowds, ensuring public safety.
- They can be used to monitor traffic flow and identify any congestion or accidents, helping to improve traffic management and reduce accidents.
- CCTV cameras can help emergency services respond more quickly and efficiently to incidents such as fires, natural disasters and terrorist attacks.
- They can be used to monitor public transport, ensuring the safety of passengers and identifying any criminal activity on board.

#### Concerns:

- The use of CCTV cameras by the government raises concerns about privacy violations of citizens. It is important to strike a balance between the need for security and the right to privacy.
- The widespread use of this technology could lead to a culture of surveillance, in which citizens feel constantly monitored and their privacy is compromised.
- There are also concerns about the accuracy of facial recognition technology and the potential for false positives, which could result in innocent people being mistakenly identified as criminals.
- The government may not be transparent about the use of CCTV cameras, and citizens may not be aware of their rights or the extent to which they are being monitored.
- There is a possibility that the use of CCTV cameras could lead to bias and discrimination, especially against marginalized communities.
- The installation and maintenance of CCTV cameras can be expensive, and there is a risk that taxpayers' money may be wasted if the cameras are not used effectively.
- The effectiveness of CCTV cameras in reducing crime is still a matter of debate. There are multiple studies in the U.K. which show that there is no connection between CCTV cameras and the reduction of crime.
- CCTV cameras can be vulnerable to cyberattacks, and if they are not secured properly, the footage could be compromised.

#### Poor regulation:

- Societal demands drove the implementation of surveillance systems, with CCTVs being primarily pushed from a women's safety angle and the Mumbai attacks serving as a catalyst.
- The experimentation with technology was part of the modernization of policing infrastructure in India.
- However, there is no law in India regulating the collection, processing, storage, or sharing of surveillance data.
- There is no specific law or standard operating procedure governing the use of facial recognition technology by police departments in India.

- There is no oversight committee or mechanism for citizens to file complaints against the police in case of civil rights violations related to the use of surveillance technologies.
- While laws are in place to protect citizens, national security is often cited as an excuse for not regulating state surveillance.

*Nut Graf: India's use of CCTV cameras has rapidly grown in recent years. The cameras are believed to deter crime and provide valuable evidence, but there are concerns about privacy violations, accuracy, bias, and transparency. Poor regulation and the lack of laws governing surveillance data collection and sharing have raised concerns about civil rights violations and misuse.*

#### 4. Safe City Project

**Syllabus:** Security challenges and their management

**Prelims:** About Safe City Project

**Mains:** Significance of Safe City Project

**Context:** Delhi is all set to implement the Safe City Project, which aims to provide better security for citizens, particularly women.

##### About Safe City Project:

- The Safe City Project is an initiative of the Ministry of Home Affairs, in collaboration with the Ministry of Women and Child Development under the Nirbhaya Fund, aimed at creating a safe, secure, and empowering environment for women and girls in public spaces.
- The project is being implemented in eight metro cities, including Delhi, Mumbai, Chennai, Kolkata, Hyderabad, Ahmedabad, Lucknow, and Bengaluru.
- Under the project, CCTV cameras will be installed, along with a command-and-control center with facilities for video analytics, AI, machine learning, and facial recognition.
- The cost of the projects is shared in a 60:40 ratio between the Central government

##### Significance:

- It will enable citizens and especially women to pursue all opportunities without the threat of gender-based violence and/or harassment.
- It will make the police capable of meeting modern-day security challenges.
- It will also make the personnel and system adapt to technology to better manage evading detection of criminals.
- Similarly, the Centre for Internet Security had come up in Bengaluru in 2017 for dealing with the evolving security challenges.

**Conclusion:** Evolving security challenges such as in the cyber and internet domains need the up to date personnel and cutting edge technological solutions. The Safe city project will prove to be a milestone in tackling security challenges, if implemented in true sense. Moreover, generating public awareness will be crucial to get the maximum benefit out of any such endeavors.

#### 5. Unified Security Force for all airports.

**Syllabus:** Various Security forces and agencies and their mandate

**Mains:** Unified Security Force for all airports in India

**Context:** The government is thinking about creating a "Unified Security Force" for all airports in India, similar to the Transportation Security Administration (TSA) in the United States.

- Then gradually expand the scope of the Unified Security Force to sea ports, metro, railways and roadways.

##### Current status:

- The Bureau of Civil Aviation Security (BCAS), which is responsible for overseeing security in civil aviation, operates under the purview of the Ministry of Civil Aviation.
- The Central Industrial Security Force (CISF), responsible for airport security, falls under the jurisdiction of the Ministry of Home Affairs, as does the Bureau of Immigration.
- The Customs Department is overseen by the Ministry of Finance.

### Need for a unified security force:

- Airports serve as critical nodes in the transportation network of a country. In a rapidly expanding aviation industry, a sturdy system is essential.
  - India is pegged to be the third-largest aviation market in the world by 2024 and is already the third-largest domestic aviation market after the U.S. and China.
  - The total number of airports in the country is also targeted to grow from the current 148 to 220 by 2025, and airlines have more than 1,000 aircraft on order.
- In the United States, the Transportation Security Administration (TSA) serves as a unified security force for all airports in the country. However, in India, airport security is the responsibility of several different agencies, resulting in a lack of coordination and a fragmented security apparatus.
  - The TSA was formed in the aftermath of the 9/11 attack in the U.S. to oversee security for all modes of transportation, such as air travel, passenger rail and intercity bus travel.
  - While the Central Industrial Security Force (CISF) is deployed at 66 out of the current 148 airports to carry out security functions, State police oversee security at the remaining airports.
- This move would also help in integrating policy, regulations and implementation by bringing them under one body. Today, for instance, if the BCAS frames regulations for aviation, the implementation body is either the CISF or the airports.

## 6. Operation Kaveri: The world of special operations

**Syllabus:** Various Security Forces & Agencies & Their Mandate

**Mains:** Role of Indian Air Force in special operations

**Context:** The Indian Air Force intensifies 'Operation Kaveri' to rescue stranded citizens from Sudan.

### Introduction:

- Close to 3,000 Indians were stuck in various parts of Sudan such as the national capital, Khartoum and other provinces like Darfur.
- Operation Kaveri has been initiated to bring back such stranded Indian citizens from Sudan.
- India has deployed two C-130J heavy-lift aircraft in Jeddah (Saudi Arabia) and has sent INS Sumedha to Port Said (Egypt) for the operation.



Source: Geology.com

### Role of Indian Air Force:

- Approximately 1,400 Indian nationals who were affected by the conflict in Sudan have been rescued solely by the Indian Air Force (IAF) under 'Operation Kaveri'.
- According to the IAF, two C-130 J aircraft were utilized to transport 260 individuals, including elderly individuals who were over the age of 90, with one passenger even being over the age of 102.



- In a daring operation, a C-130J heavy-lift aircraft of the Indian Air Force rescued 121 people from a small airstrip at Wadi Sayyidna, which is about 40 km north of the violence-hit Sudanese capital city of Khartoum.
  - The airstrip in question had a degraded surface with no navigational aid or fuel, and most critically no landing lights which are required to guide an aircraft landing at night.

**The essence of special ops:**

- The development of India's special operations capabilities has been a priority for the country's military in recent years.
- One of the key components of this effort has been the acquisition and deployment of the C-130J Super Hercules aircraft, which has significantly enhanced India's ability to conduct special operations.
  - The IAF's C-130J special ops squadrons call themselves the 'Veiled Vipers' and the 'Raiding Raptors.'
- The C-130J is a versatile aircraft that is capable of carrying out a wide range of missions, including airlift, air-to-air refuelling, and special operations.
- It is particularly well-suited for special operations missions due to its ability to operate from short and unimproved runways, as well as its advanced avionics and communication systems.
- In addition to acquiring the C-130J, India has also focused on training aircrew to operate the aircraft in special operations missions. This includes specialized training in areas such as low-level flying, aerial delivery of personnel and equipment, and tactics and procedures for operating in hostile environments.
- As India continues to face security challenges both within its borders and in the region, these capabilities will play an important role in ensuring the country's security and defending its interests.
- Special operations require a non-military intangible element, which means that young officers and corporals must accomplish more than just their assigned tasks. Therefore, it is important not to dilute the ethos and training of the IAF's special operations crew by using versatile C-130s for routine tasks and VIP carriage.

**Nut Graf:** Indian citizens stranded in Sudan are being brought back to India under 'Operation Kaveri', with the Indian Air Force playing a crucial role in the rescue mission. The IAF's special ops capabilities and their deployment of the C-130J aircraft have been instrumental in conducting these daring operations.

**7. Ajeya Warrior Exercise**

**Syllabus:** Various Security forces and agencies and their mandate

**Prelims:** Ajeya Warrior Exercise

**Context:** The seventh round of the joint military exercise "AJEYA WARRIOR-23" between India and the United Kingdom was held in England.

**Ajeya Warrior Exercise**

- Ajeya Warrior is a bilateral military exercise between India and the UK.
- Ajeya Warrior is a biannual training exercise that is held alternately in the UK and India.
- The first military training took place in 2013.
  - The second and third editions of the Ajeya Warrior exercise took place in 2015 and 2017 respectively.
- **Objectives:**
  - To cultivate healthy military ties, acquire knowledge from one another's best practices, and promote the ability to work together.
  - To build mutual trust, friendship, and cooperation between the two militaries.
  - Train the soldiers of each army in counter-terrorism and counter-insurgency operations.

**Other Exercises Between India & the UK****1. Konkan Exercise**

- It is a joint military exercise between the navies of India and the UK.
- It was introduced in 2004.
- The latest Konkan Exercise took place in 2021.
  - It took place on the English Channel.
  - INS Tabar participated from the Indian side.

**2. Indradhanush Exercise**

- It is a joint military exercise between the air forces of India and the UK.
- Two nations held the fifth edition of the Indradhanush exercise on 24th February 2020. It took place at Air Force Station, Hindan (Ghaziabad, Uttar Pradesh).
- The theme of Indradhanush-2020 was Base Defence and Force Protection.

**8. ASEAN India Maritime Exercise**

**Syllabus:** Various Security forces and agencies and their mandate

**Prelims:** ASEAN India Maritime Exercise (AIME-2023)

**Context:** INS Satpura and INS Delhi participated in the Inaugural ASEAN India Maritime Exercise (AIME-2023) in May 2023.



Source: PIB

**ASEAN India Maritime Exercise (AIME-2023)**

- On May 2 2023, the first-ever ASEAN-India Maritime Exercise (AIME) commenced with simulated military operations.
- **Location:** Singapore and the South China Sea
- The exercise was held in two phases:
  - **Harbour Phase:** Was held at Changi Naval Base from 2nd to 4th May 2023.
  - **Sea Phase:** Was held in the South China Sea from the 7th to 8th of May 2023.
- **Vessel:** **INS Delhi**, India's first indigenously-built guided missile destroyer and **INS Satpura**, an indigenously-built guided missile stealth frigate will take part in the exercise.
- **Benefits:** AIME 2023 will provide an opportunity for Indian Navy and ASEAN navies to work together closely and conduct seamless operations in the maritime domain.

## 9. Operation Samudragupt

**Syllabus:** Various Security forces and agencies and their mandate.

**Prelims:** Operation Samudragupt

**Context:** Drug bust in Kochi coast.

### Key Details:

- The Narcotics Control Bureau and the Indian Navy conducted a joint operation off the Kochi coast, Kerala and seized approximately 2,500 kg of methamphetamine valued at around ₹15,000 crore.
- This is claimed to be the biggest drug seizure ever in terms of monetary value by any anti-drug enforcement agency in India, and it is also the first interception of a mother ship carrying drugs by an Indian agency.
- The drugs had its origin in Pakistan and were loaded onto the mother ship from the Makran coast, Pakistan.
- The operation is part of Operation Samudragupt, targeting maritime trafficking of drugs, aimed at making the Indian Ocean region free of narcotics, and more arrests in the case are likely.

### Operation Samudragupt:

- Operation Samudragupt is a joint operation by the Narcotics Control Bureau (NCB) and the Indian Navy.
- The operation was launched in January 2022 to target maritime trafficking of drugs originating in Afghanistan and Pakistan.
- The operation has been successful in seizing a large quantity of drugs and arresting several drug traffickers.
- It is a significant success in the fight against drug trafficking in India.
- The operation is named after Samudragupta, of Gupta empire who is known for his military conquests and his patronage of art and culture.
- The operation is being carried out in the Indian Ocean region, which is a major transit route for drugs.

## 10. Defence Ministry's iDEX reaches milestone

**Syllabus:** Various Security forces and agencies and their mandate.

**Prelims:** Innovations for Defence Excellence (iDEX) and Mission DefSpace

**Context:** The Innovations for Defence Excellence (iDEX), which is a flagship initiative of the Ministry of Defence has reached a milestone with the signing of the 250th contract.

### Details:

- The latest contract is the first one under the Mission DefSpace, and the 100th SPRINT (Navy) contract.
- The first iDEX contract of Mission DefSpace was exchanged between the Additional Secretary (Defence Production), the CEO of the Defence Innovation Organisation (DIO) and the CEO of InspeCity.
  - InspeCity is developing a gas-based (compact micropropulsion system) system. The technology can be integrated with other satellites such as the cubesat swarm being developed under Mission DefSpace.
  - Mission DefSpace, with 75 Defence Space Challenges to be addressed by the private sector, was launched during DefExpo at Gandhinagar in October 2022.
- The 100th SPRINT (Navy) contract was exchanged with Siliconia Technologies Private Limited.
  - A prototype of a lightweight ASIC (Application-Specific Integrated Circuit) based communication system using software-defined antenna for Low Earth Orbit, Medium Earth Orbit and Geostationary satellite communication will be developed.
  - As part of the SPRINT initiative, 75 challenge statements for the Indian industry were revealed in July 2022, and the initiative aims at inducting 75 technologies and products into the Navy by August 2023.

### About Innovations for Defence Excellence (iDEX)

- The iDEX is an initiative by the Government of India to modernize the nation's Defense industry.
- Government launched iDEX in April 2018.
- iDEX aims at creation of an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups, individual innovators, R&D institutes & academia.
  - India is the world's largest defence equipment importer and is expected to spend around USD 220 Billion in the coming decade to modernize its armed forces.

- iDEX will provide the engaging industries with grants, fundings and other support to carry out Research & Development.
- iDEX will be funded and managed by the Defence Innovation Organization (DIO).
  - DIO has been formed as a 'not for profit' company as per Section 8 of the Companies Act 2013 for this purpose, by the two founder members i.e. Defence Public Sector Undertakings (DPSUs) – HAL & BEL which are Navratna companies. Check out the list of Navratna Companies in India on the given link.
- DEX will function as the executive arm of DIO, carrying out all the required activities while DIO will provide high level policy guidance to iDEX.
- The DIO with its iDEX team will enable creation of channels for innovators to engage and interact with the Indian defence production industry.
- **Key functions:**
  - Receive periodic reports from iDEX team on the projects.
  - Provide high level policy guidance regarding the effort's direction and execution.
- This iDEX team consists of Tech experts, Tech deployment experts and Innovation stakeholders.

#### Mission DefSpace

- It is an ambitious effort to develop innovative solutions for the three Services (Indian airforce, Navy and Army) in the space domain through the Indian industry and start-ups.
- 75 challenges are being opened to get innovative solutions, based on the defence requirements in the space domain.
- Startups, innovators and the private sector will be invited to find solutions for the problems that will include both offensive and defensive capabilities.
- It aims to develop a range of military applications for space warfare and to enable the private industries to offer solutions to the armed forces for future offensive and defensive requirements.
- Defence applications in space will not only help the Indian armed forces but can also be extended to friendly foreign nations.

### 11. Storm Shadow Missiles

**Syllabus:** Various Security forces and agencies and their mandate.

**Prelims:** Storm Shadow Missiles

**Context:** Recently, the Defense Ministry of Russia reported that two industrial locations in the Russian-controlled city of Luhansk in eastern Ukraine were attacked by using Storm Shadow long-range cruise missiles provided by Britain.

#### Key Details:

- The latest event marks the first instance of Britain supplying Ukraine with long-range cruise missiles, enabling them to strike Russian troops and supply depots well beyond the front lines in preparation for a significant counter-attack.
- According to the British Defense Minister, Ukraine has given assurance that these missiles will not be employed to attack targets situated inside Russia's recognized international borders.
- Storm Shadow is an Anglo-French low-observable, long-range(over 400 km), air-launched cruise missile developed since 1994 by Matra and British Aerospace, and now manufactured by MBDA, an European multinational developer and manufacturer of missiles.
- It can be launched from aircraft or ground-based launchers and is capable of hitting targets deep inside enemy territory.
- Storm Shadow is a highly accurate missile, designed to hit targets with pinpoint precision. It uses GPS and inertial navigation systems to guide it to its target, and has a circular error probable (CEP) of less than 3 metres, making it an extremely effective weapon for destroying high-value targets.
- Storm Shadow is currently in service with several countries, including the United Kingdom, France, Italy, and Saudi Arabia.
- It has been used in several other conflicts, including the Gulf War, the Kosovo War, and the Iraq War, and has proven to be an effective weapon for destroying high-value targets at long range.

## 12. Operation Dhvast

**Syllabus:** Various Security forces and agencies and their mandate.

**Prelims:** About Operation Dhvast and National Investigation Agency (NIA)

**Context:** Three persons were arrested for their involvement in terrorist-gangster-drug smugglers network cases as part of “Operation Dhvast”.

### Operation Dhvast

- Operation Dhvast is a nationwide drive conducted by the National Investigation Agency (NIA).
- The NIA as part of the operation conducted searches at 324 locations in six states and two Union Territories (UTs).
- The operation was undertaken as part of NIA's crackdown on the alleged nexus between gangsters, drug smugglers and terrorist groups based in foreign countries.

### About National Investigation Agency (NIA)

- The National Investigation Agency (NIA) is a central counter-terrorism agency in India.
- It was established in 2008 after the Mumbai terror attacks with the enactment of the National Investigation Agency (NIA) Act.
- NIA functions under the Ministry of Home Affairs, Government of India.
- The NIA can investigate terror cases across the country without having to get permission from the states.
- The agency investigates terror offences, waging war against the country, offences on nuclear facilities, etc.
- The agency's aim is to become a professional investigating agency matching global standards.
- It also aims at being a deterrent for existing and potential terrorists, apart from being a storehouse of information on terrorism.
- The NIA maintains the 'NIA Most Wanted List'.
- The agency is headquartered in New Delhi and has 8 regional offices across India.
- It is headed by a Director-General (an IPS officer).

## 13. INS Sindhuratna

**Syllabus:** Various Security forces and agencies and their mandate.

**Prelims:** About INS Sindhuratna

**Context:** INS Sindhuratna which underwent a major upgrade in Russia reached Mumbai after sailing for 97 days and close to 10,000 miles.

### INS Sindhuratna

- INS Sindhuratna is a Sindhughosh/Kilo-class diesel-electric submarine of the Indian Navy.
  - The Sindhughosh or Kilo-class submarines were designed under Project 877.
  - They were built under a contract between Rosvooruzhenie and the Ministry of Defence (India).
- INS Sindhuratna was commissioned into the Navy in December 1988.
- In February 2014, a major accident took place involving INS Sindhuratna which led to the death of two officers.
- Post the incident, INS Sindhuratna was sent for an upgrade and Medium Refit Life Certification (MRLC) process in Russia.
- The submarine with its modernised weapon and sensor suite will enhance the force level in the Western Seaboard, opening a new & exciting chapter in submarine operations in the Indian Ocean Region.



**14. Automation projects by Army**

**Syllabus:** Various Security forces and agencies and their mandate.

**Prelims:** Automation projects undertaken by the Indian Army

**Details:**

- The Indian Army is undertaking several secure automation projects aimed at enhancing operational efficiency and human resource management, logistics, inventory management, medical services, and other administrative functions.
- One of these projects is the Battlefield Surveillance System (BSS) under Project Sanjay.
  - BSS aims to provide a real-time, integrated surveillance picture to commanders at all levels by December 2025.
  - BSS integrates data from various sensors, satellites, UAVs, and patrols on the movements of India's adversaries.
- Bharat Electronics Ltd. (BEL) is the project's system integrator and has shown a success rate of more than 95% after hundreds of trials.
  - A few surveillance centres were set up under two corps of the Army during the trials, and the full project will be implemented by the end of 2025.
- The secure Network for Spectrum will provide abundant bandwidth to enable these projects.
- The Army is setting up captive data centres across the country, which will be fully operational this year.
- Complementing the BSS are the upgraded Army Information and Decision Support System and the Situational Awareness Module for the Army (SAMA).
  - SAMA has been developed in conjunction with BISAG-N.
- Another key project is the Situational Reporting Over Enterprise-Class GIS Platform (E-Sitrep) which will handle all operational correspondences in the Army.
- The Computerised Inventory Control Project (CICP) is an Enterprise Resource Planning solution for managing the Army's stores, munition, aviation, and vehicles.



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# ENVIRONMENT AND ECOLOGY

## 1. Green deposits

**Syllabus:** Conservation, environmental pollution and degradation

**Prelims:** About Green Deposits

**Mains:** RBI's regulatory framework on green deposits, its significance and associated challenges

**Context:** The Reserve Bank of India (RBI) in April 2023 issued a regulatory framework for banks to accept green deposits from customers.

### Green Deposits

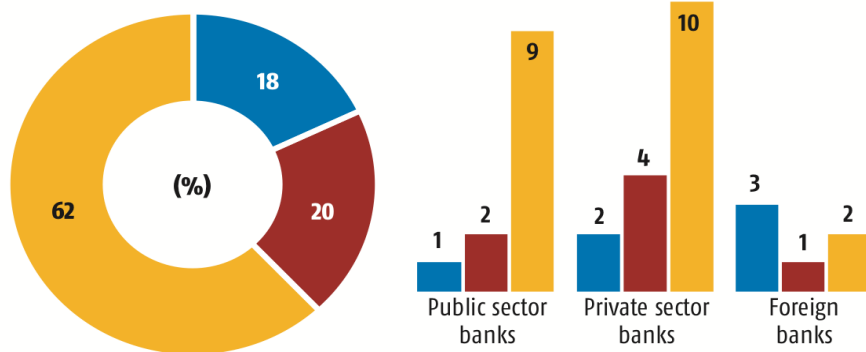
- Green deposits are similar to the regular deposits that the banks accept from their users.
- The key difference between regular and green deposits is that banks assure to earmark the money they receive as green deposits towards environment-friendly projects.
  - **Example:** A bank that receives green deposits might promise to use such amounts to finance renewable energy projects.
  - Such a bank might also avoid using green deposits to fund fossil fuel projects.
- A green deposit is said to be another product among the wide array of other financial products that help finance environmentally sustainable projects such as green bonds, green shares, etc.
- A green finance ecosystem aims to create a low-carbon, resource-efficient, and sustainable economy, while also addressing the risks and opportunities associated with environmental issues such as climate change, pollution, and biodiversity loss.

### RBI's Regulatory Framework on Green Deposits

- The framework will be effective from June 1, 2023.
- It will cover Scheduled Commercial Banks, including SFBs but excluding Regional Rural Banks (RRBs).
- It will also cover Local Area Banks, Payments Banks, and all deposit-taking Non-Banking Financial Companies (NBFCs), including Housing Finance Companies.
- Banks are required to formulate a set of rules/policies which are to be adhered to while investing in green deposits. Such rules must be approved by their respective Boards.
- The set of rules/policies must be made public on the banks' websites and banks are also mandated to disclose regular information about the number of green deposits received, the allocation of such deposits towards various projects, and the impact of such investments on the environment.
- A third party must verify the information made public by the banks and also verify the sustainability credentials of such business projects.
- The RBI has further compiled a list of sectors that can be classified as sustainable and are eligible to receive green deposits.
  - The list of the sectors includes afforestation, biodiversity conservation, climate change adaptation, energy efficiency, clean transportation, management of living natural resources, renewable energy, sustainable water, and waste management.
- Banks are not allowed to fund projects involving fossil fuels, gambling, hydropower generation, nuclear power, palm oil, and tobacco using green deposits.

## Introduction of green deposits by surveyed banks

- Have introduced
- Have not yet introduced, but intend to do so soon
- Have neither introduced green deposits, nor intend to do so in the short term



Source: Survey on Climate Risk and Sustainable Finance, RBI, July 2022

## Sectors outside the green zone

- New or existing extraction, production and distribution of fossil fuels, including improvements and upgrades; or where the core energy source is fossil fuel-based
- Nuclear power
- Direct waste incineration
- Alcohol, weapons, tobacco, gaming, or palm oil industries
- Renewable energy projects generating energy from biomass using feedstock originating from protected areas
- Landfill projects
- Hydropower plants larger than 25 Mw

Source: Business Standard

## Significance of green deposits and RBI's regulatory framework

- The green deposits help encourage individuals or depositors who are interested in investing their money in environmentally sustainable investment products.
- According to green investing enthusiasts, funding various green projects is one of the best methods with respect to environmental conservation.
- The regulatory framework issued by the RBI helps prevent greenwashing.
  - Greenwashing involves making misleading claims about the positive environmental impact of an activity.
  - **Example:** A bank may claim that their green deposits have had significant positive impacts on the environment, while in reality, such impact has been very minimal.
  - A bank might also use the green deposits to fund projects that are not environment-friendly to get higher returns, under the guise of green investing.

## Associated challenges

- Critics feel that investors may be less interested as interest rates are lower and with higher inflation rates the real returns will be much lower.
- The issuers will have to incur higher costs which may disincentivise such issuances.
- Experts opine that the range of projects in which green funds can be invested by the bank is limited by design.
- Critics argue that such green investment products are to only satisfy the investors or make them feel good about themselves as such investments hardly bring about any significant positive change in the environment.
- A few finance experts regard green investing as "a feel-good scam that enriches only consultants".
- Furthermore, in reality, it is difficult to determine if a project is really environmentally sustainable as most of the projects have second-order effects which are hard to predict during the initial stages.

**Nut graf:** Acknowledging the potential of green deposits and the green economy as a whole, the RBI has come up with a framework that regulates the acceptance and use of green deposits. This framework, apart from ensuring transparency and accountability, also plays a significant role in preventing greenwashing.

## 2. India, its SDG pledge goal, and the strategy to apply

**Syllabus:** Conservation, environmental pollution and degradation

**Mains:** Sustainable Development Goals and its progress in India.

### Details:

- Prime Minister Shri Narendra Modi during the first meeting of Finance Ministers and Central Bank Governors under India's G20 Presidency raised concern about the slow progress on Sustainable Development Goals (SDGs).
- Due to the vast population of India, realizing SDGs at the global level is tied to the success of India.

### Sustainable Development Goals:

- The Sustainable Development Goals agenda was accepted by all members of the United Nations in 2012 at the Rio De Janeiro Council Meet with an aim to promote a healthy and developed future of the planet and its people.
- It was in 2015 when the Sustainable Development Goals were implemented after a successful fifteen-year plan of development called the Millennium Development Goals.
- The Sustainable Development Goals are a set of 17 pointer targets that all the countries which are members of the UN agreed to work upon for the better future of the country.



### Status of India with respect to Sustainable Development Goal:

- The framework of SDG has set targets for 231 indicators across 17 goals that should be achieved by 2030.
- A study that analyzed India's progress on 33 welfare indicators spanning over nine SDGs has shown a mixed picture with positive and negative trends.
- India is 'On-Target' to achieve 14 of the 33 SDGs. Some of the indicators that have substantially improved in the last five years are:
  - Neonatal and Under-Five Mortality
  - Full vaccination
  - Sanitation
  - Electricity accessibility
  - Eliminating adolescent pregnancy
  - Reducing multidimensional poverty
  - Women with bank accounts
- However, the national 'On-Target' does not equally apply to all districts. For instance,
  - 286 and 208 districts (out of 707) are not on track for achieving neonatal and under-five mortality respectively.
  - Similarly, the improved sanitation indicator excludes 129 districts.
- The current pace of improvement in 19 of the 33 SDG goals is very poor. For instance,
  - Around 479 (two-thirds) districts are 'Off-Target' in the context of clean fuel for cooking.
  - Nearly 415 and 278 districts are 'Off-Target' for improved water and handwashing facilities respectively.
  - No district in the country has eliminated child marriage. Around 539 (three-fourths) districts will not be able to reduce the prevalence of girl-child marriage by 2030.
  - Despite huge improvements in mobile phone accessibility (93% of households), only 56% of women own mobile phones.

**Lessons learned from the COVID-19 approach:**

- It should be noted that designing and implementing policy is best considered as an “optimization problem” that relies on adequate resources, political will, data, and responsive administration.
- The approach adopted by India during the COVID-19 pandemic provides some important lessons.
  - Strong and sustained political leadership along with responsive administration at all levels (district, state, and national) helped India achieve success in vaccination coverage and the rollout of a comprehensive relief package.
    - Moreover, course correction was also undertaken in real time.
    - Such a mission-oriented approach is urgently required for achieving SDGs at the district level.
  - India's success during the pandemic can also be attributed to digital infrastructure, the Co-WIN data platform, and the Aarogya Setu application.
    - On the basis of this approach, India should consolidate its several siloed platforms into an integrated digital resource.
  - The timelines were prescribed by the government of India for various schemes like Pradhan Mantri Garib Kalyan Anna Yojana during the pandemic.
    - It provided a mix of both in-kind and economic support, which helped in reducing the negative impact of the pandemic (specifically for vulnerable and socio-economically disadvantaged groups).

**Conclusion:**

- India should innovate a new policy path that is both healthy and sustainable to achieve the targets of SDGs in districts.
- India has showcased its ability to deliver a real-time response in tackling the COVID-19 pandemic

**Nut Graf:** *Nationwide efforts are required to meet Sustainable Development Goals at all levels, beginning at the district level. India can also learn from its efficient strategy that was deployed while dealing with the COVID-19 pandemic.*

**3. Tracking SDG progress the Bhopal way**

**Syllabus:** Conservation, environmental pollution and degradation

**Prelims:** Voluntary Local Review and Sustainable Development Goal.

**Mains:** Voluntary Local Review.

**Context:** Bhopal released its Voluntary Local Review.

**Details:**

- The United Nations members (193) adopted the 2030 Agenda for Sustainable Development in 2015.
  - The Agenda consists of 17 Sustainable Development Goals (SDGs) and 169 targets as a plan of action for ‘people’, ‘the planet’, and ‘prosperity’.
  - The member states are mandated to submit a Voluntary National Review (VNR) to the UN's High-Level Political Forum (HLPF).
  - Voluntary Local Reviews (VLRs) are recently introduced for reporting local implementation of SDGs at the sub-national and city levels.
- There is an increasing global movement on the localization of SDGs. In this context, Bhopal became the first city to join the movement after releasing its VLR.

**India's Progress in SDGs:**

- India's second VNR was presented by NITI Aayog in the HLPF of 2020.
- Ministry of Statistics and Program Implementation (MoSPI) published a National Indicator Framework (NIF) to review and monitor India's progress.
  - NIF contextualizes the UN's Global Indicator Framework.
- Moreover, nearly 23 states and UTs prepared a vision document based on SDGs.

**Significance of Voluntary Local Review:**

- It should be noted that cities are the most important stakeholders as 65% of the 169 targets cannot be successfully achieved without the involvement of local urban stakeholders.
- VLR demonstrates local actions and encourages sustainable and equitable transformation of people.
- It aligns the city's action with the State-level action plan and the country's VNR.
- Cities will have the freedom to choose their VLR approach as per their priority and logistical comfort.



**Case Study of Bhopal:**

- The Bhopal Municipal Corporation, UN-Habitat, and a collective of over 23 local stakeholders have collaborated in Bhopal for its VLR.
- It has mapped 56 developmental projects to the SDGs on three pillars:
  - *People*: SDGs 1,3,4,5.
  - *Planet*: SDGs 6,13,15.
  - *Prosperity*: SDGs 7,8,11.
- The quantitative assessment of city indicators under **Sustainable Cities and Communities** (SDG 11).
  - It analyzes the status of solid waste management practices, public transportation, and open spaces per capita.
  - It also analyzes the areas that need to be improved like shelter, pollution, city planning, etc.
- Efforts are also made to engage people in the process.

**Other Examples of Voluntary Local Review:**

- In the city of Canterbury in the United Kingdom, instead of the local government, residents and local groups came together to form a coalition that conducted a VLR.
  - It also petitioned the local government to work with city-level groups to advance SDGs.
- The local governments of Dhulikhel (Nepal), Singra (Bangladesh), and Amman (Jordan) published their VLRs in 2022.

**Conclusion:** Other cities should follow Bhopal's example and showcase their innovations and emerging collaborations in this direction.

**Nut Graf:** *The localization of the Sustainable Development Goals through Voluntary Local Review is a great step for monitoring and achieving Agenda 2030. In this direction, Bhopal has chalked out an approach suited to itself. It should be emulated both nationally and internationally.*

**4. Arsenic contamination**

**Syllabus:** Conservation, environmental pollution and degradation

**Prelims:** About Arsenic contamination

**Mains:** Issues associated with Arsenic contamination and the way forward

**Context:** A recent study reflects that arsenic contamination can seriously hamper the cognitive capability of the person.

**Details:**

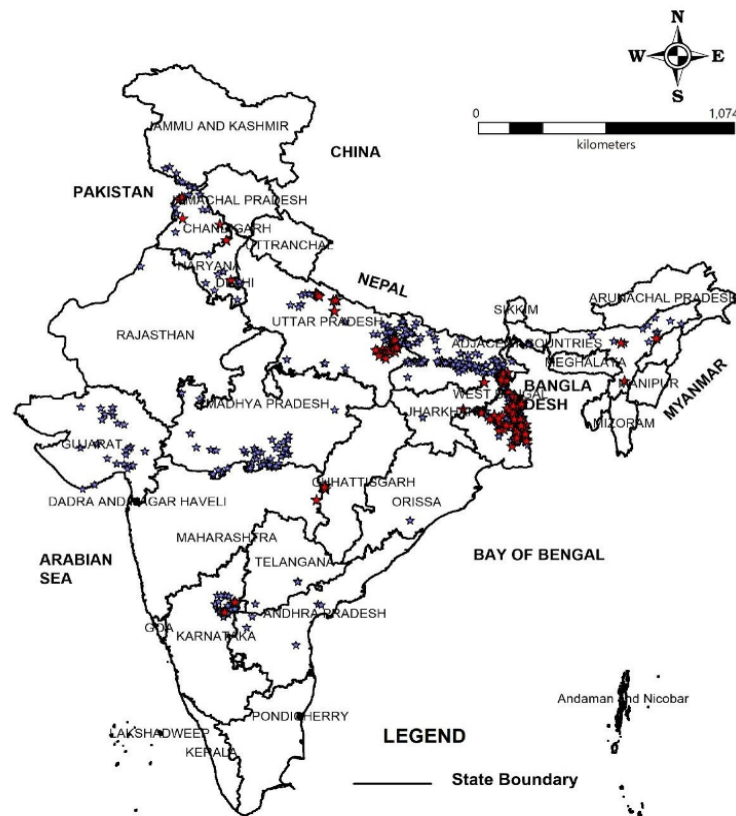
- Recent research indicates that even low levels of arsenic consumption can impact cognitive function in children, adolescents, and young adults, in addition to known higher-level health risks.
- The study found that arsenic exposure resulted in reduced grey matter and weaker connections in key brain regions.
- The study also suggests that chronic arsenic exposure may constitute a global "silent pandemic" affecting a significant portion of the population.
- While individual impacts on cognition were limited, the collective effect of arsenic exposure was more pronounced.
- Arsenic exposure has been shown to disproportionately affect impoverished communities, according to previous studies.
- Further investigations are necessary to find the relationship between arsenic and brain function, along with exploring other environmental factors like air pollution.
- Efforts have been made by governments in Bihar and West Bengal to address arsenic contamination through piped water access and arsenic removal plants.

**What is Arsenic contamination?**

- Arsenic is a natural component of the earth's crust and is widely distributed throughout the environment in the air, water and land. It is highly toxic in its inorganic form.
- Arsenic is introduced into soil and groundwater during weathering of rocks and minerals followed by subsequent leaching and runoff.
- Arsenic is emitted into the atmosphere by high-temperature processes such as coal-fired power plants, burning vegetation and volcanism.
- Arsenic has found its way into the food chain – mainly rice, wheat and potato.
- Arsenic contamination in groundwater has been a growing concern in several parts of the country.

- Arsenic is present in the groundwater as it is used on a large scale for irrigation by farmers. That is how it finds its way into the food chain as well.
- In India, West Bengal, Jharkhand, Bihar, Uttar Pradesh, Assam, Manipur and Chhattisgarh are reported to be most affected by arsenic contamination of groundwater above the permissible level.
- People are exposed to elevated levels of inorganic arsenic through drinking contaminated water, **using contaminated water in food preparation and irrigation of food crops, industrial processes, eating contaminated food and smoking tobacco.**
- Arsenic intake from food was most commonly correlated with rice intake, which is more commonly consumed in south India and where the highest mean arsenic levels were observed.

#### LOCATIONS OF ARSENIC IN GROUND WATER



#### Effects of Arsenic Contamination

- Chronic exposure to arsenic could be creating a **'silent pandemic'** affecting large portions of the global population.
- Arsenic exposure, previous studies have shown, is particularly harmful to the poor.
  - The **economic and nutritionally poor face greater cognitive impairment** from arsenic exposure.
- Arsenic can occur in an organic form. Inorganic arsenic compounds (such as those found in water) are highly toxic while organic arsenic compounds (such as those found in seafood) are less harmful to health.
- The immediate symptoms of acute arsenic poisoning include vomiting, abdominal pain and diarrhoea. These are followed by numbness and tingling of the extremities, muscle cramping and death, in extreme cases.
- The first symptoms of long-term exposure to high levels of inorganic arsenic (for example, through drinking water and food) are usually observed in the skin and include pigmentation changes, skin lesions and hard patches on the palms and soles of the feet (hyperkeratosis).
- These occur after a minimum exposure of approximately five years and may be a precursor to skin cancer.
- In addition to skin cancer, long-term exposure to arsenic may also cause cancers of the bladder and lungs.
- Other adverse health effects that may be associated with long-term ingestion of inorganic arsenic include developmental effects, diabetes, pulmonary disease, and cardiovascular disease.
- Arsenic-induced myocardial infarction, in particular, can be a significant cause of excess mortality.
- In Taiwan, arsenic exposure has been linked to "Blackfoot disease", which is a severe disease of blood vessels leading to gangrene.
- This disease has not been observed in other parts of the world, however, and it is possible that malnutrition contributes to its development.
- Arsenic is also associated with adverse pregnancy outcomes and infant mortality, with impacts on child health, and exposure in utero and in early childhood has been linked to increases in mortality in young adults due to multiple cancers, lung disease, heart attacks, and kidney failure.

**Way forward**

- Importantly, arsenic exposure may be an easily modifiable risk factor.
- While treatment of water is possible but complicated and costly, cooking rice in a certain way removes the naturally occurring arsenic in brown rice by over 50% and in white rice by 74%, while not reducing micronutrients in the rice.
- A common strategy employed is to encourage piped water access rather than groundwater extraction, install arsenic removal plants and – if groundwater extraction is inevitable – encourage extraction from aquifers that are deeper than 100 m, instead of shallow aquifers, which generally contain higher amounts of arsenic.

**5. India-EU: Carbon Border Adjustment Mechanism**

**Syllabus:** Conservation, environmental pollution and degradation

**Prelims:** India-EU: Carbon Border Adjustment Mechanism

**Mains:** Impact of CBAM on India

**Context:** The European Union is about to implement the carbon border adjustment mechanism from October 1st, 2023 and it is expected to impact India's metal export to the EU countries.

**Carbon Border Adjustment Mechanism (CBAM):**

- It is a mechanism to be introduced by the European Union (EU) to put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries.
- The EU plans a gradual introduction of CBAM from 1st October 2023 and this will translate into a 20-35% tax on selected imports to the EU nations by 1st January 2026.
- From 1st January 2026, the EU will start levying the carbon tax on multiple products exported to the EU.
- The products included in the CBAM list will be expanded over a period of time and by 2034, it will cover all products entering the EU.

**EU's Stand:**

- The CBAM will ensure that climate objectives are not overlooked by carbon-intensive imports.
- It will spur cleaner production in other exporting countries.

**Impact of CBAM on India**

- CBAM will hurt the global trade of developing countries, especially India.
- In 2022, India's 27% of the total export in iron, steel, and aluminium products (valuing USD 8.2 billion) went to the EU.
- Under this mechanism, from 1st October 2023, India's export of Iron and aluminum to EU nations, will attract extra scrutiny.
- The tariffs for iron, steel, and aluminum products will be raised to 20-35 percent, exceeding the EU's agreed-upon bound tariff rate of 2.2 percent for its manufacturers at the World Trade Organization (WTO). This will increase costs resulting in the loss of billions of dollars of exports.
- Though fertilizer, cement and electrical energy are the other affected products, India's export on these products to the EU is very negligible and hence won't impact India that much.
- As the EU adds more items to the CBAM list after 1st January 2026, the impact will be more on Indian exporters.

**Way Forward**

- Setting up of a task force to prepare the ministries and the industry to meet the challenges of CBAM.
- All the industry players involved in the steel and aluminum sector need to be educated to meet the deadline of 1st October.
- A carbon market needs to be set up in India.
- India should use the opportunity of G20's presidency to galvanize other nations on the EU's tax framework and become the voice for the global south.

**Nut Graf:** The European Union's stand to impose a carbon tax on imports can have serious repercussions for developing and least-developed countries. It will also bypass the concept of 'common but differentiated responsibilities'. India should raise concerns at international organizations and become the voice of the global south.

## 6. World Meteorological Organisation's Warning on global warming

**Syllabus:** Climate change, environmental pollution and degradation

**Mains:** World Meteorological Organisation's Warning on global warming

**Context:** The World Meteorological Organization (WMO) predicts a more than 50% chance of global temperatures surpassing 1.5°C within five years, highlighting insufficient progress in reducing greenhouse gas emissions and the influence of El Niño. Global Warming Likely to Breach 1.5°C

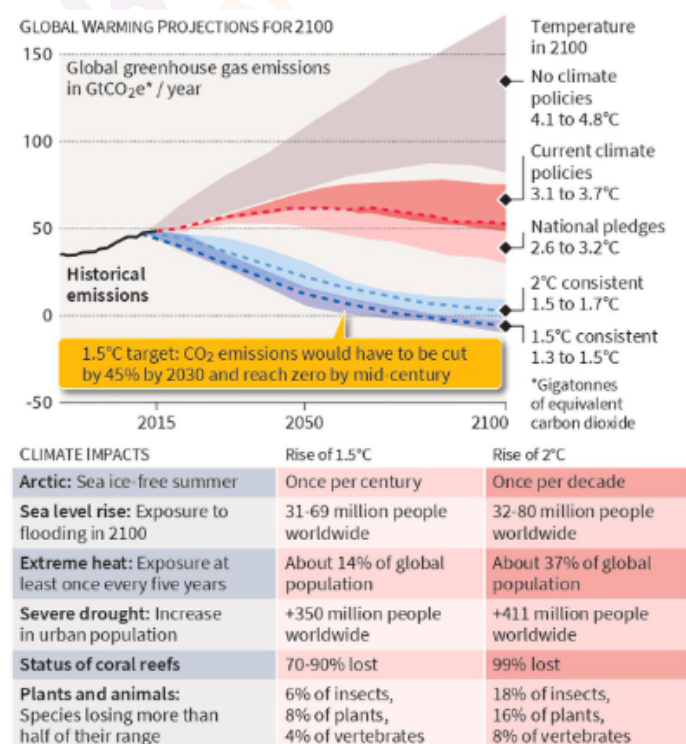
### World Meteorological Organization (WMO)

- World Meteorological Organization (WMO) is a specialized agency of the United Nations established in 1950 as an intergovernmental body.
- The UN Economic and Social Council is the parent organization of the WMO.
- The World Meteorological Organisation (WMO) has 193 Member States and 6 Member Territories.
- The World Meteorological Congress is the supreme body of the WMO.
- It is headed by its Secretary-General.
- The reports published by the World Meteorological Organisation are annual reports on the status of the World Climate and Greenhouse Gas Bulletin.
- India has been a member of the WMO since 1950.
- India's permanent representative to the organization is the head (DGM – Director-General of Meteorology) of the IMD.

### What is the 1.5°C target?

- The 1.5 °C target was established as a part of the Paris Agreement, which calls for countries to undertake collaborative climate actions to mitigate greenhouse gas emissions to limit global warming.
- One of the main goals of the Paris Agreement was to limit global warming to well below 2° C and preferably limit it to 1.5° C, compared to pre-industrial levels.
- The 1.5 °C target mainly aims to limit global warming to said level by 2100, to prevent the planet from slipping into further climate crises.
- The 1.5 °C target was also endorsed by the Intergovernmental Panel on Climate Change (IPCC) as a global target in 2018 and has been pursued in most of the climate dialogues.

### Highlights of the WMO Report:



Source: The Hindu

- Global temperatures are now more likely than not to exceed 1.5 degrees Celsius within the next five years.
- This does not mean crossing the long-term warming threshold of 1.5°C set in the Paris Agreement.
- A year with temperatures at 1.5°C would provide insights into the potential impact of crossing the long-term threshold.
- The probability of temporarily exceeding 1.5°C has increased over time.
- The world has not made sufficient progress in reducing greenhouse gas emissions.
- The development of an El Niño weather pattern is partially responsible for the increased likelihood of reaching 1.5°C.
- El Niño, combined with human-induced climate change, is expected to push global temperatures into uncharted territory.
- Concerns are raised over the impact of El Niño, including extreme weather events and risks to regions like North America and South America.
- The WMO report provides a prediction-based long-range weather forecast, distinguishing it from climate projections.
- There is a 98% chance that one of the next five years will be the hottest on record.
- The report emphasizes the need for intensified global efforts to address the climate crisis.

#### **Role of El Niño in Increasing Global Temperatures:**

- El Niño is a weather pattern characterized by warmer-than-average sea surface temperatures in the tropical Pacific Ocean.
- During El Niño, warmer waters in the tropical Pacific heat the atmosphere above, leading to a rise in global temperatures.
- El Niño can result in extreme weather events, such as heatwaves, droughts, and increased risk of wildfires.
- The current prediction of an El Niño development is raising concerns among scientists worldwide.
- El Niño's influence on global temperatures underscores the complexity and interconnectedness of natural climate variability and human-induced climate change.

#### **What Happens if the Earth Warms 1.5 Degrees? - Consequences of Increased Global Temperature of More than 1.5 Degrees Celsius:**

- Increased frequency and intensity of heat waves, leading to heat-related illnesses and deaths.
- Accelerated melting of glaciers and polar ice caps, contributing to sea-level rise and increased coastal flooding.
- Worsening drought conditions in certain regions lead to water scarcity and agricultural challenges.
- More frequent and intense extreme weather events, including hurricanes, cyclones, and storms.
- As per the data available with the WMO, extreme weather events have resulted in the deaths of over two million people and incurred \$4.3 trillion in economic damages in the last 50 years. In 2020-2021, close to about 22,608 disaster deaths were recorded worldwide.
  - Recent floods in Pakistan impacted major croplands and displaced over 80 lakh people within the country.
  - Countries in the Horn of Africa have been experiencing extreme drought conditions since 2020.
  - Countries in the western parts are witnessing severe floods and heavy rainfall.
  - People in Syria and Yemen have also been displaced on account of severe floods, storms, and heavy snowfall.
- Climate change has induced crop failure and also increased the risks of agricultural pest attacks and diseases.
  - The rapid rate of warming has also exacerbated food insecurity causing deaths and displacements.
  - Countries such as Afghanistan, Ethiopia, Nigeria, South Sudan, Yemen and Somalia are witnessing acute food shortages.
- Adverse effects on human health include the spread of infectious diseases and the exacerbation of respiratory illnesses.
- Disruption of marine ecosystems, including coral bleaching and damage to marine life.
- Socioeconomic impacts include displacement of populations due to rising sea levels and increased vulnerability in low-lying coastal areas.
- Potential damage to infrastructure, including roads, buildings, and utilities, due to extreme weather events.
- Challenges for global economies include disruptions to industries such as tourism, agriculture, and insurance.
- Compounded social and environmental inequalities, with disadvantaged communities often bearing the brunt of the consequences.

#### **Impact of global warming on India**

- India has been increasingly facing the brunt of climate change.
- Various instances of heatwaves in India in 2022 led to a decline in crop yield.
- Further, in 2022, India experienced extreme weather events for 80% of the days.
- February 2023 was seen to be the hottest month since 1901.
- There have been significant changes in the rainfall patterns and Indian monsoons which has caused wildfires and acute food shortages.



### Various efforts undertaken by India to mitigate climate change

- India was ranked eighth and referred to as a “high-performer” in the recent Climate Change Performance Index (CCPI) 2023.
- India has played an active role in attempting to balance both the development needs along with ongoing climate actions.
- Policymakers have come up with initiatives such as the Green Hydrogen Mission and the introduction of green bonds.
- Even in the international arena, India has been playing an active role by introducing programmes such as International Solar Alliance (ISA) and Coalition for Disaster Resilient Infrastructure (CDRI).

**Nut graf:** The WMO, through its recent report, has cautioned that the annual global surface temperatures will exceed 1.5°C above pre-industrial levels for at least one of the years between 2023 to 2027. This has highlighted the need for bringing about a balance in the development needs with ongoing climate action both at the domestic as well as international levels.

## 7. Thawing Permafrost in Arctic

**Syllabus:** Environmental pollution and degradation

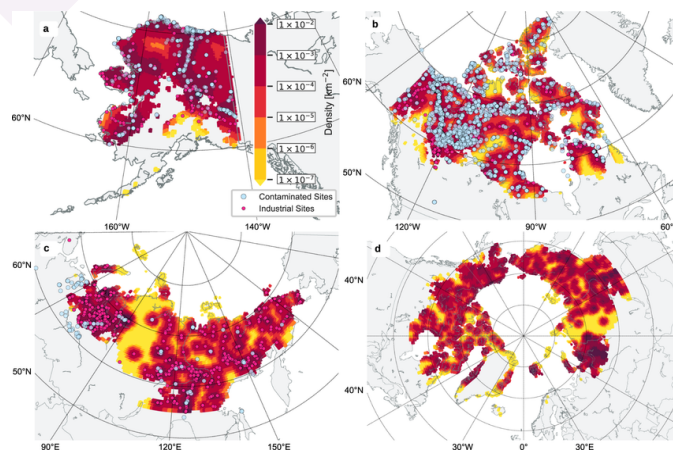
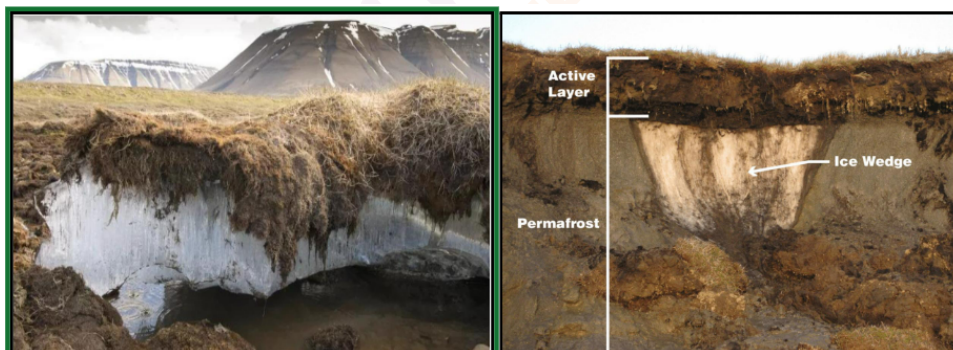
**Prelims:** Permafrost

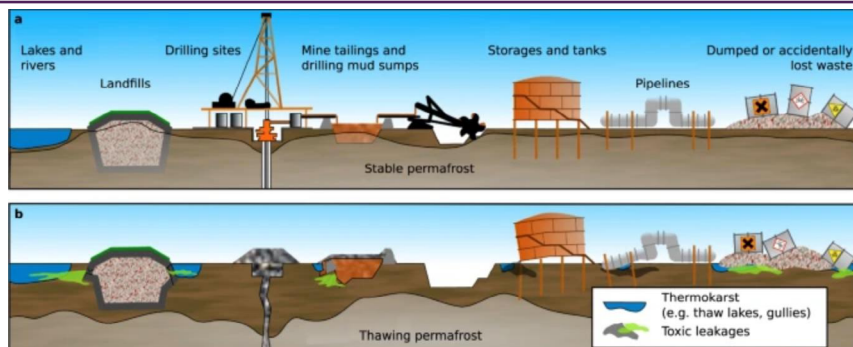
**Mains:** Findings of a study on permafrost in Arctic and the Implications of thawing of permafrost

**Context:** With rising global temperatures, thawing permafrost is likely to destabilize thousands of industrial sites and linked contaminated areas in the Arctic, which could result in the spread of toxic substances across the region, according to a new study.

### What is a permafrost?

- Permafrost is essentially any ground that stays frozen — 0 degree Celsius or lower — for at least two years straight.
- These permanently frozen grounds are often found in Arctic regions such as Greenland, Alaska (the United States), Canada, Russia and Eastern Europe.





### Findings of the study

- **Contaminated Areas In the region:** Around 4,500 industrial units in permafrost zones are expected to have produced between 13,000 and 20,000 polluted sites.
  - As of now, approximately 1,000 known industrial sites and 2,200 to 4,800 recognised contaminated sites are at risk of destabilisation due to thawing permafrost.
- **Industrial waste in the arctic region:** Drilling and mining wastes, toxic chemicals such as drilling muds and fluids, mine waste piles, heavy metals, spilled fuels, and radioactive waste are all known industrial waste forms in the Arctic.
- **Rapid Thawing and Destabilising Industrial Sites:** Because the Arctic is warming approximately four times faster than the rest of the world as a result of climate change, permafrost is thawing quickly, potentially destabilising not only industrial sites but also polluted areas.
  - By the end of the century, over 2,100 industrial sites and between 5,600 and 10,000 polluted sites face destabilisation.
- **Reasons for building such sites include:** The Arctic, once thought to be perpetually stable and reliable, is far from an empty and undisturbed environment.
  - It's densely packed with industrial facilities including oilfields and pipelines, mines, and military outposts.
  - All of this infrastructure is built atop permafrost, and the hazardous waste from these industrial sites has been buried in it, with the expectation that it will remain locked away indefinitely.
  - However, danger looms as the earth continues to warm.
  - During the Cold War, the Arctic region saw significant growth, becoming a focus for resource extraction and military operations.
  - As a result, industrial and toxic waste accumulated on or within the permafrost, and no measures to remove it were done.

### Implications of thawing of permafrost:

- The release of Greenhouse Gases (GHG) into the atmosphere is one of its most harmful consequences.
- According to a NASA report dated 2022, "Arctic permafrost alone contains an estimated 1,700 billion metric tonnes of carbon, including methane and carbon dioxide." That is nearly 51 times the amount of carbon emitted by the world as a result of fossil fuel emissions in 2019.
- Plant stuff frozen in permafrost does not degrade; but, as the permafrost thaws, bacteria within the dead plant material begin to break it down, releasing carbon into the atmosphere.
- According to a 2022 Columbia University study, warming permafrost would release thousands of dormant viruses and germs.
- Some of them "could be new viruses or ancient ones for which humans lack immunity and cures, or diseases that society has eliminated, such as smallpox or Bubonic plague."

## 8. Gujarat: India's green hydrogen hub

**Syllabus:** Environmental Pollution & Degradation

**Mains:** Potential benefits and challenges of implementing green hydrogen production

**Context:** Gujarat's efforts to promote green hydrogen manufacturing and its policy framework.

### Introduction:

- Gujarat is taking significant strides towards becoming the country's leading green hydrogen manufacturing hub.
- With the signing of memoranda of understanding (MoUs) with major corporations like Reliance, Adani, ArcelorMittal, and Torrent, Gujarat is attracting substantial investments in green energy projects.
- The state aims to establish a production capacity of 8 metric tonnes per annum (MTPA) of green hydrogen by 2035.

**Green Hydrogen Manufacturing Policy in Gujarat:**

- Gujarat is in the process of formulating a new policy that will prioritise the development of green hydrogen manufacturing.
- This policy will provide the necessary framework and guidelines for the industry's growth in the state.
- By designating green hydrogen as a "priority sector," Gujarat is signalling its commitment to fostering a favourable environment for investment and innovation in this field.

**Land Allotment and Incentives:**

- To facilitate the establishment of green hydrogen projects, the Gujarat State Cabinet has approved the allocation of 1.99 lakh hectares of land in the Kutch-Banaskantha border areas.
- This move accommodates the proposals of the corporates that have signed MoUs, covering a total area of 3.26 lakh hectares. Initially, the land parcels will be leased for a period of 40 years.
- The state government also plans to incentivize industries investing in green hydrogen projects through a range of incentives. These incentives will aim to attract and support the growth of the industry in Gujarat.
- Additionally, the land allotment policy stipulates that companies must achieve 50% of their green hydrogen production capacity within five years of plant commissioning and 100% within eight years.

**Opportunities and Corporate Commitments:**

- Several major corporations, including Reliance and Adani, have pledged significant investments in Gujarat's green hydrogen sector.
- The Reliance group plans to invest ₹5.6 lakh crore in setting up a renewable energy park and a green hydrogen park.
- The Adani group has committed to investing over ₹4.13 lakh crore in green hydrogen and associated ecosystems, with a goal to produce up to 3 million tonnes of green hydrogen annually.
- These investments encompass the establishment of solar photovoltaic module factories, electrolyzers, energy storage batteries, fuel cells, and wind and solar projects.

**India's Net-Zero Emission Goals:**

- Aligned with the Nationally Determined Contributions (NDC), India has set an ambitious target of becoming a net-zero emission country by 2070.
- To achieve this goal, India aims to reduce its carbon emissions by 45% by 2030, with a plan to source 50% of its energy from renewable sources.
- To further support the development of green hydrogen, the Indian government allocated ₹19,744 crore in the recent Union Budget for the National Green Hydrogen Mission.
  - This mission aims to promote the establishment of a green hydrogen production capacity of at least 5 MMT per annum and a renewable energy capacity addition of approximately 125 GW by 2030. The policy also seeks to attract investments exceeding ₹8 lakh crore and generate over 6 lakh jobs by 2030.
- Gujarat, with its favourable policy regime and robust infrastructure, intends to be a key player in India's green energy ecosystem, expecting investments worth around ₹10 lakh crore over the next 15 years.

**Nut Graf:** Gujarat government through its new policy framework, land allocation, and incentives has laid a solid foundation to attract investments and foster innovation in the green hydrogen sector. The commitments made by major corporations and the support of the National Green Hydrogen Mission further validate the immense potential of Gujarat's green hydrogen industry.

## 9. The protests against the refinery project in Maharashtra

**Syllabus:** Environmental Pollution & Degradation

**Mains:** Need for careful planning and consideration of environmental and social impacts when undertaking large-scale industrial projects.

**Context:** Local protests against soil-testing surveys for Ratnagiri super refinery project along the coastal Konkan coast of Maharashtra.

### Introduction:

- Thousands of people have been protesting against the Ratnagiri super refinery project for the past two years as they are concerned about the potential impact on the environment and the livelihoods of local communities.
- On April 24, 2023, soil testing began in Barsu village in the coastal Ratnagiri district of Maharashtra to determine the site's suitability for the proposed Ratnagiri Refinery and Petrochemicals Limited project.
- An intense protest was organised against this from Barsu village, where the police resorted to mild caning and firing tear gas shells to disperse the crowd.

### About Ratnagiri Project:

- Ratnagiri Refinery and Petrochemicals Limited (RRPCL) is a joint venture company, formed on 22nd September 2017, by Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL) and Hindustan Petroleum Corporation Limited (HPCL) with equity participation of 50:25:25.
  - It proposes to implement an integrated refinery and petrochemicals complex in the West Coast of Maharashtra. It is considered to be the largest refinery complex in the world.
- A memorandum of understanding (MoU) was signed between Saudi Aramco, IOCL, BPCL and HPCL for developing the oil refinery in April 2018.
- Abu Dhabi National Oil Company (ADNOC) signed a framework agreement with the joint venture for the project's development.
- IOCL, BPCL and HPCL, along with Saudi Aramco and ADNOC will develop the refinery in a 50:50 partnership.
- The \$44bn project will have a processing output of 60 million metric tonnes per year (Mtpa) and is expected to be commissioned by 2023.
- Besides fuels, the Project will also develop various downstream petrochemicals to meet India's fast-growing fuels and petrochemicals demand.
- As of April 2022, India's oil refining capacity stood at 251.2 million metric tonnes per annum, making it the second-largest refiner in Asia and the fourth largest in the world.

### Concerns raised by the locals:

- The project site is in a region that is ecologically sensitive, with several species of flora and fauna endemic to the area.
  - The Konkan region has large mango orchids as well as jack fruit and cashew plantations.
- The villagers also expressed concern about the potential health hazards posed by the refinery and petrochemical unit, which is expected to emit a large amount of pollutants.
  - Konkan coast is home to a number of industries, including power plants, refineries, and chemical factories. These industries are known to emit high levels of pollutants such as sulphur dioxide, nitrogen oxides, and particulate matter into the air, which can have serious impacts on human health and the environment.
- Many farmers expressed concern that they would lose their source of livelihood if their land was acquired for the project.

### Government's stand:

- In November 2022, Maharashtra government started issuing land acquisition notices to residents of six villages to acquire the initial 2,220 acres of land.
- It has been a strong supporter of the project and argued that it would help reduce India's dependence on crude oil imports and provide a boost to the economy, apart from generating employment for over one lakh people, both direct and indirect.
- Further, Saudi Aramco has been expressing concern about the delay in the project due to the unavailability of land which has become a cause of concern for both the Centre and State governments.
- Recently, the Chief Minister stated that the project would not go ahead without the agreement of the local population.

**Nut Graf:** Ratnagiri super refinery project is facing a number of challenges and controversies, and there are concerns about its potential impact on the environment and local communities. The project highlights the need for careful planning and consideration of environmental and social impacts when undertaking large-scale industrial projects.

**10. Why are cheetah cubs dying in Kuno reserve?**

**Syllabus:** Biodiversity Conservation.

**Prelims:** About Rajesh Gopal Committee

**Mains:** Details about Project Cheetah

**Context:** Death of three Cheetah Cubs in Kuno National Park, Madhya Pradesh.

**Details:**

- The ambitious Project Cheetah has suffered a setback as three out of four cubs born in Kuno National Park in Madhya Pradesh have died.
- These cubs were born to a translocated Namibian cheetah at the Kuno National Park in Madhya Pradesh in March 2023.
- Experts believe that the extreme heat and the lack of adequate nutrition might have contributed to the death.
- Furthermore, three adult cheetahs have also died to date since 20 of the animals were relocated from Namibia and South Africa to Kuno National Park.

**Rajesh Gopal Committee:**

- An 11-member committee, headed by Dr. Rajesh Gopal, secretary-general of Global Tiger Forum and former India Forest Service officer closely associated with Project Tiger, has been formed to oversee the implementation of Project Cheetah.
- This committee also comprises other national and international experts.
- The key mandate of the committee is:
  - To monitor the progress of the cheetah reintroduction programme.
  - Advise the Madhya Pradesh Forest Department and the National Tiger Conservation Authority to decide on opening up the cheetah habitat for eco-tourism.
  - Recommend regulations in this regard and ways to involve the local community in the project activities.
- The Cheetah Project Steering Committee will be in force for two years.
- The Committee is required to convene at least one meeting every month and conduct field visits to the Kuno National Park.

**Key reasons for the death of Cheetah cubs:**

- It is suggested that all the cubs were underweight and the major reason cited for their death is “extreme heat, weakness and malnutrition”.
- Furthermore, ‘inexperience’ on the mother’s part in tending to her cub is also partly responsible for their death.
- According to experts, cheetah cubs in the wild have a very high mortality rate in comparison to tigers and lions.
  - They have a survival rate of only 10% and roughly the same fraction makes it to adulthood.
  - Moreover, according to a study conducted in 1994, 66% of cheetahs die due to predation, and nearly 16% due to “abandonment by the mother”.



## Cheetah deaths at Kuno

Three adult cheetahs and three cubs died since 20 of the big cats were relocated from Namibia and South Africa to the Kuno National Park



Cheetah	Date of death	Reason
Sasha	March 27	Kidney ailment
Uday	April 23	Cardiopulmonary failure
Daksha	May 9	Injury from a violent interaction
Three cubs born to Jwala	May 23	Weakness/ extreme weather

Source: The Hindu

### Status of Project Cheetah:

- In September 2023, one year of cheetah reintroduction from Namibia will be complete.
- The official Cheetah Action Plan highlights that the survival of even half the cheetah would be an “indicator of success”.
- However, independent critics argue that there are some flaws in Project Cheetah. For instance,
  - The space and prey base in Kuno is very little for all 20 cheetahs.
  - Raising cheetahs in fenced reserves in Africa can’t be replicated in India as the cultural values in India promote coexistence with beasts like the tiger and lion conservation programmes.

### Research Analysis on India’s Project Cheetah:

According to research in Berlin, Germany, there were multiple shortcomings in the reintroduction plan. Some of them are:

- The Kuno National Park is surrounded by villages with livestock farmers.
- On the basis of prey density, the carrying capacity for cheetahs was calculated to be 21, which implies three cheetahs per 100 sq km.
- According to the socio-spatial organization, adult male cheetahs can be territory holders or floaters. And thus territories are distributed in the landscape with a separation distance of 20-23 km.
- It is predicted that only three males will occupy the entire national park leaving limited space for floaters or females. It will further force other males to settle outside the Kuno National Park.

**Nut Graf:** The death of cheetahs in Kuno National Park has highlighted the issues in the Project Cheetah. It is suggested by various experts that the Project needs to be reviewed to make it a success in real terms and ensure proper conservation of biodiversity.

## 11. Central Asian Flyway

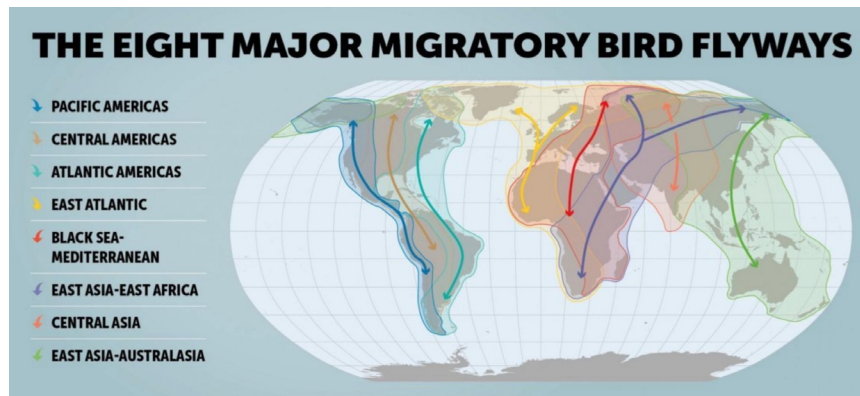
**Syllabus:** Biodiversity conservation

**Prelims:** Central Asian Flyway

**Mains:** Significance of Central Asian Flyway and various issues associated with it

**Context:** The Ministry of Environment, Forest and Climate Change in collaboration with the United Nations Environment Programme/Convention on Migratory Species (UNEP/CMS) had organized a meeting of Range Countries to strengthen conservation efforts for migratory birds and their habitats in the Central Asian Flyway (CAF)

**Central Asian Flyway:**



- The Central Asian Flyway is a major migratory route for birds, covering 30 countries from the **Arctic Ocean to the Indian Ocean**.
- It is home to more than 400 species of migratory birds, including threatened and endangered species such as the **Siberian crane** and the **lesser white-fronted goose**.
- 11 have come on-board for coordinated efforts to save migratory birds within the Central Asian flyway. These eleven countries are **India, Armenia, Bangladesh, Kazakhstan, Kyrgyzstan, Kuwait, Mongolia, Oman, Saudi Arabia, Tajikistan and Uzbekistan**.

### Species to benefit

- Asiatic Dowitcher (*Limnodromus semipalmatus*),
- Black-necked Crane (*Grus nigricollis*),
- Indian Skimmer (*Rynchops albicollis*),
- Ibisbill (*Ibidorhyncha struthersii*),
- Brown-headed Gull (*Larus brunnicephalus*),
- Siberian Crane (*Leucogeranus leucogeranus*),
- Sociable lapwing (*Vanellus gregarius*),
- Spot-billed Pelican (*Pelecanus philippensis*),
- Relict Gull (*Larus relictus*),
- Black-winged Pratincole (*Glareola nordmannii*)
- Caspian Plover (*Charadrius asiaticus*).

### India's involvement

- Once agreed upon by all the countries, India may serve as secretariat of the Central Asian Flyway in due course.

**National Action Plan:** India has launched the National Action Plan for the Conservation of Migratory Birds (2018-2023) along the central Asian flyway to reduce population decline of migratory birds and secure their habitat.

- The plan has set the national goal of halting and reversing the decline of the migratory bird population by 2027.

**Issues**

- Unfortunately, many migratory birds around the world are in decline.
- Many traits of migrants make them especially exposed to a wide range of hazards.
- Birds' stamina is tested when they do such dramatic movements. They rely on ideal weather conditions and must obtain adequate food supplies at several locations during their migratory trek.
- Anthropogenic threats are gradually degrading crucial migratory bird habitats along the whole length of the flyway.
- Larger migrants are also endangered by collisions with man-made infrastructure like powerlines. Furthermore, poorly engineered medium-voltage lines put large perching species like raptors at risk of electrocution.
- Migratory bird conservation relies on international collaboration and a coordinated response along whole flyways in the face of such a varied variety of hazards.
- The Important Bird Areas (IBAs) initiative of BirdLife International lays the groundwork for effective conservation activity.

**12. Study on butterflies' migration opens door for conservation**

**Syllabus:** Biodiversity conservation

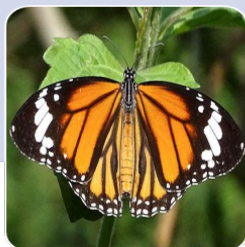
**Prelims:** Butterfly migration.

**Mains:** Butterflies migration between Eastern and Western Ghats.

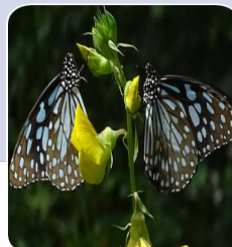
**Context:** Research on migration patterns of milkweed butterflies in southern India.

**Details**

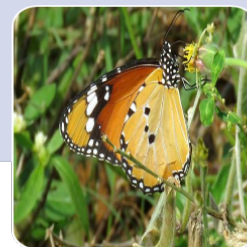
- The milkweed butterflies migrate between the Eastern and the Western Ghats in order to seek refuge from harsh summers.
- A group of researchers has recently analyzed their migration pattern and the impact of land use change, habitat degradation, and climate warming on migration.
- It is observed that after the southwest monsoon, milkweed butterflies migrate westward from the Eastern Ghats and plains to the Western Ghats. They become active for almost two months.
- These butterflies congregate in specific sites of the Western Ghats in large numbers during winter and dry seasons (between October and April).
- After summer rains, they migrate to the Eastern Ghats and the plains.
- It was found that the wings of the butterflies batter during their eastward journey (in comparison to their westward journey).
- It was also found that the dominant species(in migration) namely the Dark blue tiger and Double-branded crow do not breed in the mid and high-altitude evergreen and semi-evergreen forests of the Western Ghats.
- The migration of butterflies also plays an important ecological role in pollination and the entire ecosystem.
- The analysis of migration patterns and their feeding habits have the potential to unravel various mysteries of nature and the interconnectedness of plant and animal life.



Striped Tiger



Plain Tiger



Blue Tiger

**Source:** The Hindu

**Nut Graf:** A research on the migration pattern of milkweed butterflies will not only help in further analysis of the environment but also help in its conservation.

# HEALTH ISSUES

## 1. National Medical Devices Policy 2023

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Mains:** Details about National Medical Devices Policy 2023 and its significance

**Context:** Recently, the Union Cabinet has approved the National Medical Devices (NMD) Policy, 2023.

### About National Medical Devices Policy, 2023

- The policy aims to accelerate the growth of the medical device sector in India and make it self-reliant.
- The vision is to become a global leader in the manufacturing and innovation of medical devices and hence achieve a 10-12% share in the global market over the next 25 years.
- The mission of the policy is to provide access and universality, affordability, quality, patient-centred and quality care, preventive and promotive health, security, research and innovation, and skilled manpower.

### Strategies to Promote the Medical Devices Sector

The policy outlines six broad areas of policy interventions to promote the medical device sector:

- **Regulatory Streamlining:** The policy aims to improve the ease of doing business and research while balancing patient safety with product innovation. It proposes measures such as the creation of a single window clearance system for the licensing of medical devices, enhancing the role of Indian standards like BIS, and designing coherent pricing regulations.
- **Enabling Infrastructure:** The policy envisages the establishment and strengthening of large medical device parks and clusters equipped with world-class common infrastructure facilities in proximity to economic zones. It will be pursued with state governments and industry for better convergence and backward integration with the medical device industry.
- **Facilitating R&D and Innovation:** The policy aims to promote research and development in India and establish centres of excellence in academic and research institutions. It also proposes innovation hubs, plug-and-play infrastructures, and support for start-ups.
- **Attracting Investments in the Sector:** The policy proposes measures to attract investments in the sector, including schemes like the PLI scheme for medical devices. The policy also aims to facilitate domestic manufacturing of medical devices to complement the government's "Atmanirbhar Bharat" and "Make in India" programs.
- **Skilling and Trade Promotion:** The policy proposes measures to provide support in training and capacity-building programs and promote higher education to foster talent and skilled resources in line with the industry requirements. This will help in developing a skilled workforce for the medical device sector.
- **Promotion of Domestic Manufacturing:** The policy gives a push for domestic investments and production of medical devices to complement the government's "Atmanirbhar Bharat" and "Make in India" programs. This will help in reducing the dependency on imports and promoting the domestic manufacturing of medical devices.

### National Medical Devices Policy – Expected Outcomes

- Increased investment in R&D and innovation, leading to the development of new and improved medical devices.
- Streamlined regulatory processes, reducing barriers to entry and facilitating faster approvals for new medical devices.
- Boosted local manufacturing, creating jobs and reducing the country's reliance on imports.
- Improved access to medical devices, particularly in rural and remote areas of the country.
- Increased exports of medical devices, generating revenue and boosting India's reputation as a leading medical device manufacturer.
- With the new policy in place, the Centre aims to reduce India's import dependence to nearly 30% in the next couple of years; and become one of the top five global manufacturing hubs.
- Policy is expected to help the Medical Devices Sector grow from present USD 11 Bn to USD 50 Bn by 2030.

## 2. National Health Account figures

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About National Health Account

**Mains:** Key findings of National Health Accounts (NHA) Estimates for India (2019-20),

**Context:** Recently, the Ministry of Health and Family Welfare has released the 7th National Health Accounts (NHA) Estimates for India (2019-20), which was produced by the National Health Systems Resource Centre.

- The NHA estimates are prepared by using an accounting framework based on the internationally accepted System of Health Accounts 2011, provided by the World Health Organization (WHO).

### Highlights:

Health Indicators	Definitions	Data of Growth Trends
Out of Pocket Expenditure (OOPE)	OOPE is the money paid directly by households, at the point of receiving health care. This occurs when services are neither provided free of cost through a government health facility, nor is the individual covered under any public or private insurance or social protection scheme.	The share of OOPE in total health expenditure has declined from 62.6% in 2014-15 to 47.1% in 2019-20.
Government Health Expenditure (GHE)	GHE constitutes spending under all schemes funded and managed by Union, State, and Local Governments including quasi-Governmental organizations and donors in case funds are channeled through Government organizations. health system as a low Government.	GHE's share in the country's total GDP increased from 1.13% (2014-15) to 1.35% (2019-20).
General Government Expenditure (GGE)	This is a proportion of the share of Government expenditures towards healthcare in the General Government Expenditures and indicates Government's priority towards healthcare.	In GGE the share of health sector spending has steadily increased from 3.94% to 5.02% between 2014-15 and 2019-20.
Total Health Expenditure (THE)	THE constitutes current and capital expenditures incurred by Government and Private Sources including External funds.	In the Total Health Expenditure (THE) of the country between 2014-15 and 2019-20, the share of GHE has increased from 29% to 41.4%.
Social Security Expenditure (SSE)	It includes government-funded health insurance, medical reimbursement to government employees, and social health insurance programs.	The share of SSE on health has increased from 5.7% in 2014-15 to 9.3% in 2019-20.
Private Health Insurance Expenditures (PHIE)	PHIE constitute spending through health insurance companies where households or employers pay a premium to be covered under a specific health plan.	PHIE has increased from 3.4 % in 2013-14 to 7 % in 2019-20 estimates out of total Health Expenditure.
External/ Donor Funding for health	This constitutes all funding available to the country by assistance from donors.	It has increased from 0.3 % in 2013-14 to 0.5 % in 2019-20 out of total health expenditure.



**The way ahead:**

- The state governments should move ahead in healthcare spending as percentage of their total budget to about 8% which is currently 4-5% for many states, adding that “this spending must be in line with the bigger picture of benefiting the citizens”.
- It is important to persist with this trend of expenditure on primary healthcare so that promotive and preventive health, which mostly take place at primary level, can be focused upon.
- The Fifteenth Finance Commission recommends that the public health expenditure of the Union and States should be increased together to reach 2.5% of GDP (Growth Domestic Product) by 2025.
- Currently, 20% of the population has social and private health insurance, while the remaining 30%, known as the “missing middle,” have no health insurance.

**National Health Systems resource centre:**

- It was established in 2006-07 under the National Rural Health Mission (NRHM) of Government of India to serve as an apex body for technical assistance.
- Its mandate is to assist in policy and strategy development in the provision and mobilization of technical assistance to the states and in capacity building for the Ministry of Health and Family Welfare (MoHFW).

**3. AYUSH – ICMR collaboration**

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Mains:** Details about the collaboration between AYUSH and ICMR

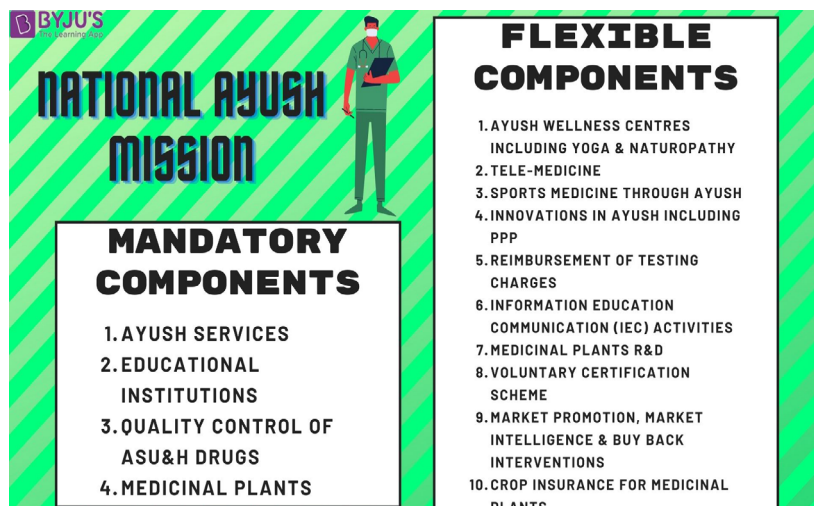
**Context:** Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy (AYUSH) and the **Indian Council of Medical Research (ICMR)** have joined hands to undertake quality human clinical trials to generate evidence on the benefits of using ayurveda along with modern medicine (evidence-based medicine) in treating certain disease conditions of national importance.

**Details:**

- To begin with, the collaboration will be restricted to ayurveda. The other systems of AYUSH — yoga, unani, siddha and homoeopathy — may be included, and each system will be tested together with modern medicine when the central councils of the respective AYUSH systems are ready to work with the ICMR.
- Initially, clinical trials for each disease may have two arms — modern medicine as the standard of care as well as a combination of modern medicine and ayurveda. The arm that uses both ayurveda and modern medicine will, if at all, only be able to validate the superiority of combining the two for better outcomes.

**AYUSH Ministry – Year End Review**

- **WHO - Global Center for Traditional Medicine (WHO - GCTM)**, the first and only center of its kind is taking shape in Jamnagar, Gujarat. Director General-WHO had announced the establishment of WHO - GCTM in India with a vision of “Traditional Medicine for improving global health and achieving Universal Health Coverage” on 13th November 2020.
- The first **Global Ayush Investment and Innovation Summit (GAIIS) 2022** held in Gandhinagar, Gujarat in April witnessed letter of intents worth more than Rs. 9000 crore in major categories like FMCG, Medical Value Travel (Heal in India), Pharma, Technology & Diagnostic and Farmers & Agriculture.
- A new category named ‘Ayush Aahar’ was announced which will facilitate the producers of Ayurvedic nutritional supplements.
- Three **National Ayush Institutes of eminence in Ayurveda, Unani and Homoeopathy were inaugurated by the Prime Minister** - All India Institute of Ayurveda in Goa, National Institute of Unani Medicine in Ghaziabad, and National Institute of Homoeopathy at Delhi.
- A significant step to achieve cooperation and facilitation of “One Herb, One Standard” was taken with the signing of MoU between the Pharmacopoeia Commission for Indian Medicine and Homoeopathy (PCIM&H) and Indian Pharmacopoeia Commission (IPC).
- Another MoU was signed with the Ministry of Electronics and Information Technology for providing technical support to the Ministry of Ayush for digitalisation of Ayush Sector under the Ayush Grid project.
- Ministry of Ayush and FSSAI, India’s apex body for food regulation formulated regulations of safety & quality standards for food products under ‘**Ayurveda Aahara**’ category.
- This year saw many new initiatives, the ‘**Guardian Ring**’ program, which was a collaborative exercise between 79 countries and United Nations organisations along with Indian Missions abroad to illustrate Yoga’s unifying power that surpasses national boundaries.
- Similarly, the 7th Ayurveda Day was celebrated on a magnificent scale in India and at international level. It was celebrated with the theme “Har Din Har Ghar Ayurveda” so as to propagate benefits of Ayurveda to larger and grass root communities.



### Recent AYUSH related initiatives

- This Ministry along with Directorate General of Health Services (DGHS) is implementing NPCDCS (National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke) for health promotion, prevention and management of Non-communicable diseases or Lifestyle related disorders
- It has been decided that 10% of the Sub-centres are to be upgraded as Health and Wellness Centres (HWCs) under Ayushman Bharat which will be developed by the Ministry of AYUSH to provide comprehensive Health care to the needy community.
- **Central Council for Research in Homoeopathy (CCRH)** has developed a public health program on 'Homoeopathy for Healthy Child' which has been integrated with Rashtriya Bal Swasthya Karyakram (RBSK).
- **Morarji Desai National Institute of Yoga (MDNIY)**, an autonomous organization under Ministry of AYUSH has established 19 Preventive Health Care Units of Yoga in CGHS Wellness Centres in Delhi and NCR. Regular Yoga training programmes are being held in these Units.
- **e-AUSHADHI Portal** - The portal has been launched by the Ministry of AYUSH for online licensing of Ayurveda, Siddha, Unani and Homoeopathy drugs and related matters. The portal is intended for increased transparency, improved information management facility, improved data usability and increased accountability.

## 4. SAKSHAM- LMIS

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About SAKSHAM- LMIS and National Institute of Health & Family Welfare (NIHFW)

**Context:** The Union Health Ministry has introduced the SAKSHAM (Stimulating Advanced Knowledge for Sustainable Health Management), a Learning Management Information System (LMIS) of the Ministry of Health and Family Welfare.

- SAKSHAM serves as a comprehensive digital learning platform for offering online training and medical education to all healthcare professionals across the country. It has been developed by the National Institute of Health & Family Welfare (NIHFW).

### Objectives:

- The platform aims to ensure inclusive capacity building among health professionals, ranging from those working in rural and remote primary health centers to those in metropolitan cities' tertiary care and corporate hospitals.
- **Currently, SAKSHAM:** LMIS hosts over 200 public health and 100 clinical courses, accessible through online mode.
- Saksham will be developed as a centralized resource repository for training and teaching material. It will also act as a central database of trained healthcare professionals in the country.

### National Institute of Health & Family Welfare (NIHFW)

- NIHFW was established on 9th March 1977, under the autonomous Ministry of Health and Family Welfare, Government of India.
- NIHFW's primary mandate is to act as a think tank for the promotion of health and family welfare programs in the country.
- It is also the premier organization for capacity building through training of health professionals, frontline health workers such as Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwife (ANMs) and other central and state officers & healthcare staff.

## 5. UN Report on Maternal and Infant Health

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Mains:** Important findings of UN Report on Maternal and Infant Health and recommendations

**Context:** A new report from the United Nations (UN) has found that progress in reducing the number of women and babies who die every year during pregnancy, childbirth, or the first weeks after birth has stopped since 2015.

### Key Findings of the Report:

- **Global Maternal and Neonatal Health Challenges:** The report highlights that India is at the forefront of the global burden of maternal deaths, stillbirths, and newborn deaths, representing 17% of the total.
- **Maternal Mortality Ratio (MMR):** MMR observed an annual reduction rate of 2.8% between 2000 and 2009, which decreased to 1.3% between 2010 and 2020. An improvement of reducing this indicator by 11.9% is required in the next decade to meet global targets of an MMR equivalent to 70 deaths per 1,000 live births.
- **Stillbirth Rate (SBR):** Between 2000 and 2009, the SBR was reduced by 2.3% and by 1.8% between 2010 and 2021. The SBR is defined as the number of babies born with no signs of life at 28 weeks or more of gestation, per 1,000 total births.
- **Neonatal Mortality Rate (NMR):** NMR records a similar trend; a 3.2% reduction between 2000 and 2009, 2.2% reduction between 2010 and 2021.

### Suggested measures:

- Maternal and infant health can be improved by increasing essential health services. Three measures are used to assess availability: at least four antenatal care contacts, skilled attendants at birth, and postnatal care within the first two days after birth.
- Antenatal care coverage has improved from 61% in 2010 to 68% in 2022, with a projected increase to only 69% by 2025.
- Skilled attendant at birth coverage has increased from 75% to 86% between 2010 and 2022, and is expected to reach 88% by 2025.
- Postnatal care coverage has shown the highest improvement, from 54% to 66% between 2010 and 2022, projected to reach 69% by 2025.

### Maternal death - key causes:

- **Severe Bleeding (hemorrhage):** This is the leading cause of maternal mortality, often occurring during childbirth or in the immediate postpartum period.
- **High Blood Pressure Disorders (pre-eclampsia and eclampsia):** These conditions can result in complications such as organ failure, seizures, and even lead to maternal death.
- **Unsafe Abortions:** In areas where access to safe and legal abortions is limited, women may resort to unsafe procedures, leading to complications and maternal deaths.
- **Other Factors:** Roughly a third of women do not have even four of a recommended eight antenatal checks or receive essential postnatal care, while some 270 million women lack access to modern family planning methods.

### Infant death - key causes:

- **Prematurity and Low Birth Weight:** Babies born too early (preterm) or with a low birth weight are more vulnerable to various health complications and have a higher risk of mortality.
- **Birth Asphyxia:** When a baby does not receive enough oxygen during childbirth, it can result in birth asphyxia, leading to brain damage or death if resuscitation is not performed promptly.
- **Sudden Infant Death Syndrome (SIDS):** SIDS refers to the sudden, unexplained death of an infant under one year of age, usually during sleep.

### Various Government initiatives:

- **Janani Shishu Suraksha Karyakram(JSSK):** Government of India has launched this scheme on 1st June, 2011, which entitles all pregnant women delivering in public health institutions to absolutely free and no expense delivery including Cesarean section.
- **Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA):** It was launched in 2016 to ensure quality antenatal care and high risk pregnancy detection in pregnant women on 9th of every month.
- **LaQshya:** In order to further accelerate the decline in MMR in the coming years, the government has launched 'LaQshya - Labour room Quality improvement Initiative'.
  - LaQshya program is a focused and targeted approach to strengthen key processes related to the labour rooms and maternity operation theatres which aims at improving quality of care around birth and ensuring Respectful Maternity Care.

## 6. Covid 19- is no longer an emergency

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Mains:** Public health emergencies of international concern

**Context:** The World Health Organization (WHO) has declared that Covid-19 no longer represents a “global health emergency”.

### Introduction:

- The World Health Organisation (WHO) said that Covid-19 was no longer a Public Health Emergency of International Concern, and that the focus would now be on the long-term management of the infection.
- WHO acknowledges at least seven million deaths caused by the pandemic.
- WHO first declared Covid-19 to be a public health emergency of international concern (PHEIC) in January 2020 before characterising it as a pandemic.
- This signalled the need for coordinated global action to protect people from the new virus.

### What is a public health emergency of international concern?

- As per WHO, it is “an extraordinary event” that constitutes a “public health risk to other States through the international spread of disease” and “to potentially require a coordinated international response.” Previous emergencies have included Ebola, Zika and H1N1.
  - Most recently, the Monkeypox outbreak has been declared a Public Health Emergency of International Concern by WHO.
- The responsibility of declaring an event as an emergency lies with the Director-General of the WHO and requires the convening of a committee of members.
- A PHEIC prompts a collective commitment from nations to comply with WHO’s guidelines for handling the emergency.
- Subsequently, each country announces its own public health emergency, which holds legal significance. These declarations enable countries to allocate resources and suspend regulations to alleviate the situation.

**Nut Graf:** The WHO declared that Covid-19 is no longer a public health emergency of international concern, shifting focus to long-term management. WHO officials have stated that although Covid-19 is still spreading and evolving, it remains a global health threat, but at a reduced level of concern.

## 7. The lack of a drug recall law in India

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About Central Drugs Standard Control Organisation (CDSCO)

**Mains:** The issues associated with the lack of a drug recall law and authority in India and the way forward

**Context:** Abbot, a multinational pharmaceutical company, recently issued a public notice to caution people about a mislabelled batch of medicine that it had inadvertently shipped to the market. This incident has brought back the focus on the lack of drug recall law in the country.

### Is there a drug recall law in India?

- Drug recalls can be seen often in countries like the U.S. but domestic or foreign pharmaceutical companies have never recalled their substandard or mislabelled drugs in India.
  - This is because there exists a law in the U.S. that mandates pharmaceutical firms to recall such drugs from the market that fail to meet quality parameters.
  - However, in India, despite the efforts to formulate legislation ever since 1976, there is still no law passed that requires mandatory recall of such drugs.
- In 1976, the Drugs Consultative Committee discussed the issue of drug recalls.
  - The Drugs Consultative Committee consists of all the state drug controllers, senior bureaucrats from the Ministry of Health and the Central Drugs Standard Control Organisation (CDSCO).
- In the meeting, the committee resolved to improve cooperation between various state drug controllers to facilitate better coordination. However, this decision did not translate into passing an amendment to the law to put in place a legally binding structure to enforce drug recalls.

- Furthermore, the issue was taken up for discussion repeatedly in regulatory meetings that were held after 1976 but none of them led to the enactment of amendments to the Drugs and Cosmetics Act to create a mandatory recall mechanism.
- The Central Drugs Standard Control Organisation (CDSCO), in 2012, notified certain recall guidelines but even these guidelines lack backing and the force of law.

#### Possible reasons for the lack of drug recall law in India

- The Drug Regulation Section of the Union Health Ministry does not have the necessary expertise to take up the task of tackling complex drug regulatory issues.
- There has been a greater interest in establishing an environment for the growth of the pharmaceutical industry than in protecting public health.
- The regulatory structure in India is highly fragmented, with each State having its own drug regulator.
  - Despite this level of fragmentation, drugs manufactured in one State can seamlessly cross borders across the country.
- Another possible reason for a lack of drug recall law in India is that drug regulators are worried that the creation of a drug recall system would bring the public attention to the sorry state of affairs in India's pharmaceutical industry.
  - Experts believe that if the drugs are recalled in a transparent manner, with the people being informed of the failures, then such instances would take place almost every day which in turn would increase the pressure on drug regulators.

#### Path ahead

- Substandard drugs if not removed swiftly from the market can create health events and could severely impact vulnerable classes, especially, children.
- In order to develop an effective recall mechanism, the responsibility of recalling drugs has to be centralised, with one specialised authority being empowered to hold firms liable for failures to recall drugs from across the country.
  - Since India is a single market for drugs and the incompetence of a regulator in one State can lead to adverse effects for patients in other States, there should be only one regulator.
  - However, both the pharmaceutical industry as well as the state drug regulators have expressed displeasure over greater centralisation of regulatory powers.

#### Central Drugs Standard Control Organization (CDSCO)

- The Central Drugs Standard Control Organization (CDSCO) is the Central Drug Authority for discharging functions assigned to the Central Government under the Drugs and Cosmetics Act, 1940.
- CDSCO works under the Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India.
- CDSCO has six zonal offices, four sub-zonal offices, 13 port offices and seven laboratories under its control.
- Drugs Controller General of India (DCGI) is the head of the department of the CDSCO.
- **Major functions of CDSCO:**
  - Regulatory control over the import of drugs
  - Approval of new drugs and clinical trials
  - Meetings of Drugs Consultative Committee (DCC) and Drugs Technical Advisory Board (DTAB)
  - Approval of licenses

**Nut graf:** Despite there being resistance from the pharmaceutical firms and the state drug regulators, the establishment of a centralised drug recall authority must be considered as the circulation of substandard drugs in the market has dangerous consequences for the consumers.



## 8. Why spurious liquor kills

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About spurious liquor

**Mains:** Ill effects associated with the consumption of spurious liquor, the available treatment and efforts undertaken by the government.

### Context

- Recently, about 22 people have died and more than 30 others were still being treated in hospitals after consuming spurious liquor in the Chengalpattu and Villupuram districts of Tamil Nadu.
- This event has come as a surprise as the liquor sales in Tamil Nadu are wholly controlled by the State.

### What is the alcohol in liquor?

- Liquor is differentiated by its alcohol content. For example, beer contains 5% of alcohol content by volume, wine contains about 12% and other distilled spirits contain about 40%.
- Usually, the alcohol used in those beverages consumed for recreational purposes is ethanol (ethyl alcohol).
- Ethanol ( $C_2H_5OH$ ) molecule is one carbon atom bonded to three hydrogen atoms and one more carbon atom. The second carbon atom is bonded to two hydrogen atoms and the hydroxyl group known as the ion "OH-".
- Ethanol is a psychoactive drug that causes intoxicating effects by reducing the level of neurotransmission in the body.
- Ethanol is metabolised inside the human body by the liver and the stomach by alcohol dehydrogenase (ADH) enzymes into acetaldehyde.
  - Later the aldehyde dehydrogenase (ALDH) enzymes convert the acetaldehyde into acetate.
- According to the World Health Organization (WHO), "no level of its consumption is safe for human health".
  - Long-term addiction to alcohol might result in dependence, and increased risk of some cancers and heart diseases.
- The adverse health effects such as hangovers and a few types of cancers, are mainly due to acetaldehyde.

### Spurious liquor

- Spurious liquors are those which contain methanol (methyl alcohol) which is also known as wood alcohol.
- The arrack (Spurious liquor) sellers usually purchase industrial-grade methanol from factories and utilise it to make low-grade, country-made liquor.
- In such cases, methanol is usually added to strengthen the intoxicating effects and/or to increase the volume of the liquor made.

#### Methanol

- Methanol ( $CH_3OH$ ) molecule consists of one carbon atom bonded with three hydrogen atoms and one hydroxyl group.
- Methanol has numerous industrial applications.
  - It is used as a precursor to acetic acid, formaldehyde, and aromatic hydrocarbons.
  - It is also used as a solvent and as an antifreeze.
- Methanol is commonly produced by combining carbon monoxide and hydrogen in the presence of copper and zinc oxides as catalysts at 50-100 atm of pressure and  $250^\circ C$ .
- During the pre-industrial era, in ancient Egypt, people used to produce methanol by heating wood to a very high temperature.

### Ill effects of the consumption of spurious liquor

- Methanol is the main reason for the deadliness of spurious liquor.
- The human body usually contains minute quantities of methanol because of the consumption of certain fruits. However, even more than 0.1 ml of pure methanol per kilogram of body weight can have serious health implications for humans.
- When consumed, methanol is metabolised in the liver by ADH enzymes into formaldehyde ( $H-CHO$ ).
  - Later, the ALDH enzymes transform formaldehyde into formic acid ( $HCOOH$ ).
  - The accumulation of formic acid causes metabolic acidosis which can further lead to acidemia, a condition wherein the blood's pH drops below its normal value of 7.35, becoming increasingly acidic.
  - Formic acid can also affect the functioning of the enzyme called cytochrome oxidase, which affects the ability of the cells to use oxygen and results in the build-up of lactic acid, contributing to acidosis.

- According to various reports, methanol consumption also causes “methanol-induced optic neuropathy”.
  - This condition may further lead to long-term or irreversible visual impairment or even blindness.
  - Ophthalmic effects have been seen in more than 50% of those individuals who have consumed methanol.
- Methanol poisoning can also cause cerebral oedema, haemorrhage, and death.
- However, if a person has consumed ethanol along with the methanol, the health implication may not be evident until after a few days thereby delaying treatment and increasing the chance of mortality.

#### Available treatment

- As methanol is ingested, the human body requires some time to completely eliminate it.
  - As per certain estimates about 33% of methanol still remains in the body even after 48 hours.
  - Methanol is completely absorbed through the gastrointestinal tract and the blood-methanol level can reach its maximum value within just 90 minutes.
- There are two immediate treatment procedures to address methanol poisoning, which include:
  - Administering ethanol which competes with methanol for the ADH enzymes. Administering ethanol ensures that methanol is not metabolised into formaldehyde.
  - Administering an antidote named “fomepizole”. This antidote slows down the action of the ADH enzymes to produce formaldehyde at a slower rate such that the body can excrete it.
- Fomepizole is expensive compared to pharmaceutical-grade ethanol. However, administering ethanol requires the supervision of healthcare workers.
- Individuals might also have to undergo a dialysis procedure to remove methanol and formic acid salts from the blood in order to reduce kidney and retina damage.
- Folinic acid might also be administered to break up the formic acid into carbon dioxide and water.
  - Fomepizole as well as folinic acid are listed under the WHO’s list of essential medicines.
- The formic acid would have begun accumulating in dangerous amounts around 18-24 hours after ingestion, affecting the optic nerve, kidneys, heart, and brain.

#### Efforts undertaken by the government

- The Food Safety and Standards (Alcoholic Beverages) Regulations, 2018, mentions the maximum permissible amount of methanol in various liquors.
  - For example, methanol must be “absent” in coconut fenny, 50 grams per 100 litres in country liquor, and 300 grams per 100 litres in pot-distilled spirits.
- Methanol is also included under Schedule I of the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989.
- The Indian Standard IS 517 mentions ways to determine the quality of methanol.
- The Indian Standards along with the Tamil Nadu Denatured Spirit, Methyl Alcohol, and Varnish (French Polish) Rules, 1959, mentions the signage that a methanol packaging should carry.
- The manufacturing, export, import, storage, and sale of methanol in Tamil Nadu requires licences under the 1959 Rules.
- Taking suo motu cognisance of reports of people dying after consuming spurious liquor in Villupuram and Chengalpattu districts, the National Human Rights Commission (NHRC) has issued notices to the Tamil Nadu Chief Secretary and the Director-General of Police, seeking a detailed response from them within four weeks.

**Nut graf:** According to experts, the poison has been methanol in every hooch tragedy in the history of India and of the world since 1945. In this context, there exists a need to formulate a National Alcohol Control Policy as prescribed by the WHO to limit the manufacturing and sale of spurious liquor made using methanol.

## 9. Palliative care model from Kerala

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Mains:** Need for the integration of palliative care into the health care system of the country.

**Context:** This article discusses various dimensions of Kerala's successful palliative care model.

### Introduction:

- Palliative care is a specialised approach to healthcare that focuses on improving the quality of life for individuals facing serious illnesses or conditions.
- It aims to provide relief from pain, symptoms, and psychological distress, while also addressing the emotional, social, and spiritual needs of patients and their families.
- Palliative care is not limited to end-of-life situations and can be provided alongside curative treatments. It is appropriate for individuals with chronic illnesses, such as cancer, heart disease, or neurological disorders, as well as those with life-threatening conditions.
- Palliative care can be provided in various settings, including hospitals, hospices, long-term care facilities, and even in a person's own home.
- More than 80% of individuals who experienced serious health-related suffering in 2015 were from low- and middle-income countries.
- India's capacity to address significant health-related suffering on a large scale is inadequate due to limited coverage of palliative care, which stands at approximately 4% and is concentrated primarily in major cities.
  - This poses a challenge considering the country's middle-income status, ageing population, and increasing burden of non-communicable diseases.

### Kerala Model:

- Kerala stands out as a global example of a comprehensive and inclusive palliative care model. The model's success extends beyond healthcare, demonstrating broader social and public innovations.
- Kerala boasts one of the largest palliative care networks in the world, with over 841 palliative care sites out of India's total of 908, as reported by The Lancet in 2018.
- The state has established a network of palliative care centres, community-based clinics, and home care services that work in coordination with hospitals and healthcare professionals.
- Kerala's model emphasises community involvement and participation in palliative care. Local volunteers, known as palliative care workers, play a crucial role in identifying patients, providing basic care, and supporting families.
  - For example, the Pain and Palliative Care Society in Calicut has been instrumental in delivering palliative care services to patients in need, reaching over 7,000 patients in 2020 alone.
- The volunteers went beyond traditional boundaries by extending their support to patients with unconventional conditions like spinal injuries, HIV/AIDS, and geriatric cases. They also recognized the social challenges faced by families in their communities when dealing with these conditions.
- Recognizing that a significant portion of a patient's suffering is non-medical, the community-based model in Kerala emphasised holistic care.
  - This approach involved community ownership and provided comprehensive support, including medical, social, financial, bereavement, and rehabilitative assistance to patients and their families.
  - Kerala's model differed greatly from hospital-based approaches prevalent elsewhere in the world.
- The need for the State's involvement in palliative care was recognized by community organisers in Kerala by 2004. This led to the initiation of the Pariraksha project in Malappuram panchayats, which eventually paved the way for a landmark palliative care policy in 2008.
  - This policy mandated palliative care provision at primary, community, and tertiary levels across all 14 districts of Kerala.

### Significance:

- This model addresses the limited access and affordability of hospitals and hospices that are prevalent worldwide.
  - While only 14% of patients globally receive palliative care, Kerala's model covers over 60% of patients in need.
- Kerala's successful integration of palliative care into public health systems challenges prevailing myths about the "impossibility of public health infrastructure in India" or the belief that "the State cannot deliver healthcare."
- This model demonstrates that public health palliative care integration is not only feasible but also essential. By effectively integrating palliative care into the public health framework, Kerala showcases the potential of government-led initiatives in providing comprehensive healthcare services.

- The Kerala model highlights the role of community organisations in this regard. The formation of such inclusive and collaborative networks showcases the power of solidarity in building a resilient and effective palliative care system that caters to the diverse needs of the population.

**Nut Graf:** Kerala's community palliative care model, driven by volunteers and nurses, is considered a global exemplar in inclusive care infrastructure. The success of the model highlights the possibilities of public health integration and demonstrates how diverse groups can come together to create effective care infrastructure.

## 10. WHO's guideline on non-sugar sweeteners

**Syllabus:** Issues related to Health.

**Mains:** Non-sugar sweeteners and associated concerns.

**Context:** Guidelines by WHO on use of non-sugar sweeteners.

### Details:

- New guidelines were issued by WHO on the use of non-sugar sweeteners (NSS) such as aspartame, saccharin, stevia, etc.
- It highlights that non-sugar sweeteners should not be used for weight control and reducing risk of non-communicable diseases (NCD).
- Notably, NSS became popular after 2015, when WHO issued a statement that high intake of free sugars is linked to weight gain and obesity.

### Non-Sugar Sweeteners:

- NSS are low or no-calorie alternatives to free sugars. It is claimed that they can aid in weight loss and controlling blood glucose in diabetes patients.
- WHO includes acesulfame K, aspartame, advantame, cyclamates, neotame, saccharin, sucralose, stevia, and stevia derivatives as NSS.

### WHO's Analysis:

- An analysis was conducted on almost 283 studies on adults and children.
- It was found that 'higher intake' of NSS results in a 76% increase in risk of obesity and a 0.14 kg/m<sup>2</sup> increase in BMI (Body Mass Index).
- Moreover, a long-term use of NSS can potentially increase the risk of cardiovascular diseases, chronic kidney disease, Type 2 diabetes, and cancer.
- However, experts point out that the evidence cited by the WHO is categorized as moderate, low or very low certainty.
  - Moderate certainty implies that WHO is moderately confident about the risks and the true effect is likely to be close to the estimate.
- The quality (nutritional profile) and quantity of diet are also important for the study.

### Associated Concerns:

- As per the National Family Health Survey (NFHS-5), one in nine women and one in 25 men are obese.
- There is a higher risk of diabetes in obese people.
- Moreover, there are around 25 million people living with pre-diabetes in India. They can further lead to heart attacks in their thirties and forties.
- It is suggested that non-sugar sweeteners are known to have an effect on the gut and bones. They also cause bloating.

### Way Ahead:

- WHO recommends foods with minimal processing and unsweetened food and beverages.
- Moreover, weight loss should not be equated with switching from sugars to NSS.
- Rather it should depend on reduced portion size or energy intake of food.
- There should also be deliberations among policy makers before accepting these guidelines.
- Efforts should also be made to tweak taste preferences and eating behaviours of people, especially youngsters.

**Nut Graf:** The World Health Organization has cautioned against the use of non-sugar sweeteners and issued guidelines for the same. They can have serious repercussions on health like affecting the gut or diabetic risks.

# HISTORY

## 1. Shilabhattacharika

**Syllabus:** Ancient History

**Prelims:** Shilabhattacharika and Chalukyas

**Context:** Decipherment of inscriptions on copper plates shed new light on Shilabhattacharika.

### Key Details:

- Researchers at the Bhandarkar Oriental Research Institute in Pune claim to have shed new light on the ancient Sanskrit poetess Shilabhattacharika, establishing her as the daughter of Chalukyan emperor Pulakeshin II of Badami (610-642 CE).
  - Bhandarkar Oriental Research Institute houses South Asia's largest collection of manuscripts and rare texts.
- This was achieved through the decoding of inscriptions on copper plates, which were found to contain a Sanskrit text with 65 lines inscribed in the late-Brahmi script.
  - The charter, which is believed to date back to the reign of the Badami Chalukya ruler Vijayaditya (696-733 CE), was held together by a copper ring featuring a varaha (boar) seal, which is a trademark of the Badami Chalukyas.
- The plates revealed that Vijayaditya, who ruled from 696-733 CE, had donated the village of Sikkatteru to a vedic scholar named Vishnu Sharma on the request of Mahendravarma, the son of Shilabhattacharika.

### Findings from the Copper Plates

- **Literary Contribution of Shila Bhattarika:**
  - Shilabhattacharika was the daughter of the Chalukya ruler Pulakeshin II and a poetess.
  - None of her siblings was inclined towards literature.
  - The recently discovered copper plate contains historical evidence that establishes Shilabhattacharika's literary contributions.
- **Content of the Copper Plate:**
  - The copper plates contain more than 60 sentences in Sanskrit written in Brahmi script.
  - One of the copper plates mentions the donation of Chigateri village in the present-day Vijayanagara district of Karnataka to a scholar named Vishnu Sharma.
  - Mahendravarma, the son of Shilabhattacharika and Dadiga, recommended the donation to the ruling king Vijayaditya Chalukya.
- **Importance of the Copper Plate:**
  - The copper plate is not only important for its information on the geography and politics of the Chalukyas but also adds vital information to its literary history.
  - This is the first hard historical evidence about Shilabhattacharika as a poetess.
- **Use of Copper Plates in Reconstruction of the Past:**
  - Copper plates often contain inscriptions of hereditary grants given by kings and are used by archaeologists, linguists, and orientalists to reconstruct the past.
  - The copper plates were bunched using a copper ring and sealed in the testimony of the respective authority.
- **Donation Made by Vakataka Ruler:**
  - Another copper plate of the same bunch spoke about a donation made by Pravarasena II, the Vakataka ruler, which extends the dynasty's geographical expanse to Odisha.
  - Khapri village, located in the present-day Durg district of Chhattisgarh, was donated by Pravarasena II.
  - The Vakatakas were the rulers of Central India during the 3-5 Century CE and were Shaivites.
  - Khapri could perhaps have been the easternmost village ruled by the Vakatakas, and at the peak of their ruling, they had reached up to eastern Chhattisgarh-Odisha.
- **Publication of the New Historical Evidence:**
  - All the new historical evidence obtained from the copper plates will be published in the annals of BORI and treasured for future reference.



### Significance of this discovery:

- This discovery marks a shift in the historiography of the Badami Chalukyas by placing Shilabhattacharika as having lived in the 7th century CE, rather than the current theory which has her as the wife of the 8th century Rashtrakuta ruler Dhruva.
- This gains significance as Shilabhattacharika stood out as a poetess in the male-dominated field of classical Sanskrit literature in ancient India.
- Shilabhattacharika was praised for her elegant and beautiful compositions by the Sanskrit poet-critic Rajashekhara, who lived in the 9th-10th century CE and was the court poet of the Gurjara-Pratiharas.
- Noted Marathi poetess Shanta Shelke too has drawn inspiration from Shilabhattacharika's verses to compose one of her most iconic songs— *toch chandrama nabhat* (it is the same moon in the sky).

### Chalukya Dynasty

- The Chalukya dynasty was a prominent royal family that ruled over parts of southern and central India from the 6th to the 12th century CE.
- **Pulakeshin II** was one of the most famous Chalukya rulers who reigned from 610 to 642 CE.
- The Chalukyas were patrons of art, architecture, and literature and made significant contributions to Sanskrit literature.
- The dynasty was known for its military prowess and extended its rule over a vast territory, including present-day Karnataka, Maharashtra, and parts of Andhra Pradesh and Tamil Nadu.
- The Chalukyas were also known for their temple architecture, and the famous Kailasanatha Temple in Ellora and the Virupaksha Temple in Hampi are some examples of their architectural achievements.
- The dynasty saw several prominent rulers, including Vikramaditya II, Jayasimha II, and Someshwara I, who made significant contributions to the dynasty's cultural and political growth.
- The Chalukya dynasty declined in the 12th century, and their territory was eventually annexed by the Hoysalas and the Vijayanagara Empire.

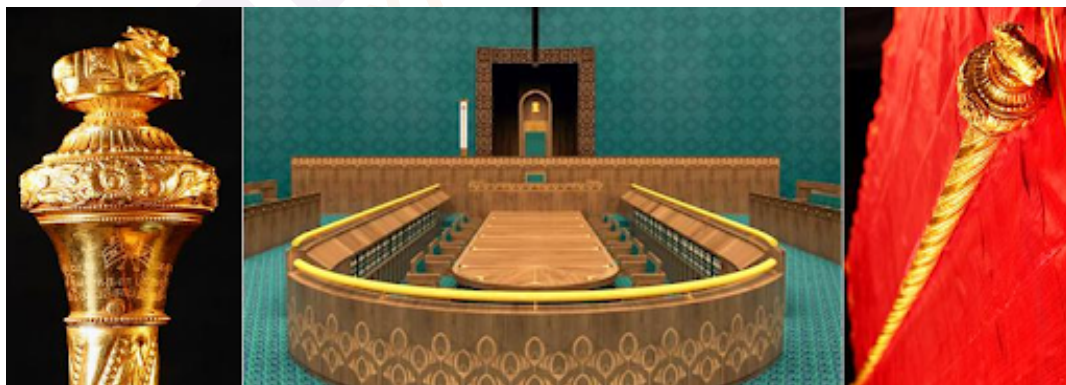
## 2. Sengol Sceptre

**Syllabus:** History - Modern History

**Prelims:** About Sengol Sceptre

**Context:** During the upcoming inauguration of the new parliament building on the 28th of May 2023, the Prime Minister of India will install the historic "Sengol Sceptre" in the building.

### Sengol Sceptre



Source: The Hindu

- The term Sengol is derived from the Tamil word "Semmai" which means "Righteousness".
  - Sengol has an important place in Tamil culture as when a new king is crowned, he would be presented with a "sengol" during the coronation ceremony as a symbol of the transfer of power.
  - This practice has existed since the Sangam Age and finds mention in texts such as the Purananuru, Kurunthogai, Perumpanatrupadai, and Kalithogai.
- The Sengol Sceptre was given by the British to India's first Prime Minister Jawaharlal Nehru and has been a significant historical symbol as it represents the transfer of power in 1947.
- Jawaharlal Nehru had consulted C. Rajagopalachari, the last Governor-General of India, who had informed him about a ceremony performed during the Chola dynasty, in which the transfer of power from one king to the other was sanctified and blessed by high priests.

- The Sengol was handed over to India's first Prime Minister Jawaharlal Nehru by Lord Mountbatten minutes before Nehru hoisted the National Flag and made his famous "Tryst with Destiny" speech on August 15, 1947.
- Sengol is a five-feet long intricately carved, unbending gold-plated silver sceptre.
- This sceptre has a finial of Nandi (divine bull deity) on top symbolising justice.
- This sceptre was specially commissioned by the Thiruvavaduthurai Adheenam.
- The golden sceptre which was studded with jewels was made by Chennai-based Vummidi Bangaru Chetty and Sons jewellers.

### 3. Excavations at Purana Qila

**Syllabus:** Ancient History

**Prelims:** About Purana Qila and findings of the excavations

**Context:** A new round of excavations at the Purana Qila (Old Fort) site has uncovered evidence of the continuous history of the city since the pre-Mauryan era.

**Details:**

Gaja Laxmi



General view of Excavation Trenches



Mauryan period ring well



Vaikuntha Vishnu

Source: PIB

- The fresh round of excavations has also excavated the remains of a 900-year-old Vaikuntha Vishnu from the Rajput period, the structural remains of a 2,500-year-old terracotta ring well from the Mauryan period, a terracotta plaque of Goddess Gaja Lakshmi from the Gupta period, and a four-room complex from the Sunga-Kushan period dating back to 2,300 years ago.
- The findings at the Purana Qila site in Delhi include shards of Painted Gray Ware pottery which are dated to around 1200 BC to 600 BC, beads, seals, copper coins and a bone needle.
- Over 136 coins and 35 seals have been found in the excavation sites so far, which indicates that the site played a crucial role as a centre for trade activities.
- The latest excavation efforts along with the ones carried out in 2013-14 and 2017-18 have revealed nine cultural levels that represent different historical periods namely pre-Mauryan, Mauryan, Sunga, Kushana, Gupta, post-Gupta, Rajput, Sultanate, and Mughal.
- It is also said that the site could host one of the events during the G-20 leadership summit in September 2023.

#### About Purana Qila

- Purana Qila is a 16th-century fort located in the South Eastern part of the present city of New Delhi.
- The Purana Qila is said to have been built by Sher Shah Suri and the Mughal emperor Humayun.
- It is believed that it was the site of Indraprastha, which was the capital of the Pandavas as mentioned in the Mahabharata.
- The fort was the inner citadel of the city of Din Panah during Humayun's rule who renovated it in 1533.
- Later, Sher Shah Suri, who was the founder of the Suri Dynasty, after defeating Humayun in 1540, renamed the fort Shergarh.
  - Sher Shah Suri added several structures in the complex during his five-year reign.
- The current Purana Qila fort complex is thus a conglomerate of various structures that lie scattered over an area of more than 300 acres.
- Purana Qila was surrounded by a wide moat that was linked to the river Yamuna- the waters of which once lapped against the eastern walls of the fort.

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# SOCIAL JUSTICE

## 1. Prevention of Sexual Harassment at Workplace Act (PoSH Act)

**Syllabus:** Welfare schemes for women and related issues

**Prelims:** About Vishakha Guidelines and Posh Act

**Mains:** Prevention of sexual harassment of Women at Workplace

**Context:**

- Many Wrestlers are protesting against sexual harassment. According to a report many Sport federations do not comply with the requirements of the PoSH Act.
- The Supreme Court Bench of India has said there are “serious lapses” and “uncertainty” regarding the implementation of PoSH Act.

**Sexual Harassment at Workplace: Legal Timeline**

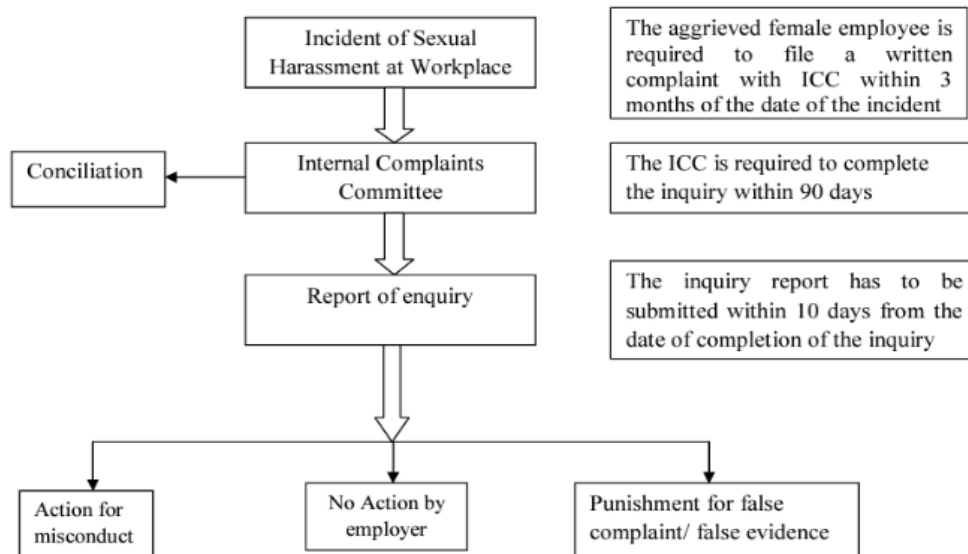
- **Provisions Indian Penal Code, 1860:** Section 354 (Outraging the modesty of a woman) and Section 509 (Insulting the modesty of a woman).
- **Vishakha Guidelines:** These guidelines drew from the following international conventions: Convention on Elimination of All Forms of Discrimination against Women (CEDAW). International Labour Convention on Discrimination (Employment and Occupation) Convention (No. C111)
- Apparel Export Promotion Council v. A.K. Chopra (1999)
- Medha Kotwal Lele & Ors v. Union of India & Ors (2013)
- Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH)

**Provisions of the PoSH Act, 2013:**

- Defines Sexual Harassment and defines a workplace
- According to the PoSH Act, sexual harassment includes acts such as physical contact and sexual advances, a demand or request for sexual favours, making sexually coloured remarks, showing pornography, and any other unwelcome physical, verbal or non-verbal conduct of a sexual nature.
- Every employer should display the details regarding PoSH safeguard for the female employees.
- Under the Act, all women employees, irrespective of their type of employment i.e. regular, temporary, contractual, ad hoc or daily wage workers can seek redressal to sexual harassment in the workplace.
- The law also applies to all public and private sector organisations throughout India.
- The PoSH Act mandates that employers with more than 10 employees must constitute an Internal Complaints Committee (ICC) which can be approached by the women employees to file a formal sexual harassment complaint.
  - **Composition of Internal Complaints Committee (ICC):**
    - ICC usually consists of four members.
    - Headed by a woman.
    - Two members amongst the employees.
    - One member from a third party such as an NGO worker with five years of experience and familiarity with the challenges of sexual harassment.
    - At least one-half of the total Members shall be women.
- The PoSH Act also requires every district in the country to set up a Local Complaints Committee (LCC) to receive complaints from women employed in firms with less than 10 employees, informal sector, domestic workers, home-based workers, social workers, etc.
  - The District Officer must designate one nodal officer in every block, taluka, & tehsil in the rural or tribal area and ward or municipality in the urban area to receive complaints and forward the same to the Committee within seven days.
- Both ICC and LCC need to file annual reports.
- Complaints can be filed only by female employees.



### Procedure for filing complaint and conducting enquiry



### PoSH Act irregularities in Sports Federations:

- 161% increase in women athletes between 2018-2020.
- 16 out of 30 sports federations do not comply with the PoSH Act.
- 4 federations do not have the “minimum number of members” needed in the ICC.
- 6 federations do not have an external member.

### Key hurdles to the implementation of the PoSH Act

- The Supreme Court has flagged lacunae in the establishment of ICCs.
  - The SC cited a newspaper report according to which 16 out of the 30 national sports federations in the country had not established an ICC to date.
- The court also noted an improper establishment of ICCs in cases where they were established.
  - Such ICCs had an inadequate number of members or lacked a mandatory external member.
- Also, there have been concerns that the law does not address the accountability aspect as it does not mention:
  - Who is in charge of ensuring that workplaces comply with the law and
  - Who must be held responsible if the provisions are not followed
- Experts have also pointed out that the law is largely inaccessible to women employed in the informal sector.
- Experts have also observed that sexual harassment cases at workplaces are largely underreported.
- The Act was formulated with a view that complaints can be more effectively handled within the workplaces so that women did not have to go through the daunting criminal justice processes.
  - However, the inefficient functioning and the lack of clarity with respect to the conduct of such inquiries have made it difficult for women.
  - Furthermore, possible repercussions also have forced women to not file complaints.

### Way forward

- There is a need to implement JS Verma Committee recommendations on Sexual Harassment at the Workplace Act.
- The apex court has directed both the Central and State governments to examine whether various Ministries, Departments, organisations, institutions, etc. have set up ICCs, LCCs and Internal Committees (ICs) as per the Act.
- Additionally, these bodies have been ordered to publish the details of their respective committees on their websites.
- Also only establishing complaint committees will not suffice unless it is empowered to investigate cases independently.
- Awareness among women and ease of filing complaints without any threat to the victim should be the responsibility of the employer.
- All the provisions of the act should be made compulsory with punishment for non-compliance.

**Nut graf:** The Supreme Court of India has flagged serious lapses with respect to the implementation of the PoSH Act. The hurdles affecting the effective implementation of the law must be immediately addressed in order to ensure a safe, secure and enabling environment for women employees.



## 2. Mahila Samman Saving Certificate Account

**Syllabus:** Welfare schemes for women

**Prelims:** Mahila Samman Saving Certificate Account

**Context:** The Union Minister for Women and Child Development and Minority Affairs opened a Mahila Samman Savings Certificate (MSSC) account.

### About Mahila Samman Savings Certificate Scheme:

- It is a new small savings scheme launched specifically for female investors and was announced in Budget 2023 to promote investment among women.
  - Accounts opened under this scheme will be single-holder accounts that can be opened at the Post Office or any registered bank.
- **Who can open a Mahila Samman Savings account:** Any woman can open a Mahila Samman account that can be opened for herself or on behalf of a little girl.
  - A time gap of three months shall be maintained between the existing account and the opening of another account.
- **Limit on minimum and maximum investment:** The minimum investment amount is Rs 1000, and the maximum investment authorised under the plan is Rs 2 lakh.
- **Interest rate:** 7.5% annually
- **Payment on maturity:** After two years from the date opening eligible balance will be paid to the depositor.
- **Withdrawal from account:** The account holder may withdraw up to 40% of the balance after the first year from the date of account opening but before the account matures.
- **Tax benefits under** Section 80C of the Income Tax Act
- **Premature closure of account:** The account shall not be closed before maturity except in the following cases, namely:
  - On the death of the account holder
  - On extreme compassionate ground
  - Life threatening disease of account holder
  - Death of the guardian on production of relevant documents
- When an account is closed prematurely, interest on the principal amount is payable at the rate applicable to the Scheme for which the account was held.

## 3. Eight Years of Jan Suraksha Schemes

**Syllabus:** Welfare schemes by the Centre and States and the performance of these schemes

**Prelims:** Various Jan Suraksha Schemes

**Mains:** Performance of various Jan Suraksha Schemes

### What is Pradhan Mantri Suraksha Bima Yojana (PMSBY)?

- It is a one-year accidental insurance scheme renewable from year to year offering coverage for death or disability due to accident. It is administered by Public Sector General Insurance Companies (PSGICs) or any other general insurance company in partnership with banks / Post offices.
- Individuals in the age group of 18-70 years having a savings bank or a post office account are entitled to enroll.
- Accidental death cum disability cover of Rs. 2 lakhs (Rs. 1 lakh in case of partial disability) for death or disability due to an accident against a premium of Rs.20/- per annum.
- As of April 2023, the cumulative enrolments under the scheme have been more than 34.18 crore and an amount of Rs. 2,302.26 crore has been paid for 1,15,951 claims.

### What is Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)?

- It is a one-year life insurance scheme renewable from year to year offering coverage for death due to any reason.
- It is administered by LIC or any other life insurance company in partnership with banks / Post offices.
- Individuals in the age group of 18-50 years having a savings bank or a post office account are entitled to enroll under the scheme.

- Life cover of Rs. 2 Lakhs in case of death due to any reason against a premium of Rs. 436/- per annum.
- As of April 2023, the cumulative enrolments under the scheme have been more than 16.19 crore and an amount of Rs. 13,290.40 crore has been paid for 6,64,520 claims.

#### What is Atal Pension Yojana (APY)?

- It was launched to create a universal social security system for all Indians, especially the poor, the under-privileged and the workers in the unorganised sector.
- It is an initiative of the Government to provide financial security and cover future exigencies for the people in the unorganized sector.
- Pension Fund Regulatory and Development Authority (PFRDA) through the National Pension System (NPS).
- All bank account holders in the age group of 18 to 40 years (the contributions differ, based on the pension amount chosen).
- Subscribers would receive the guaranteed minimum monthly pension of Rs. 1000 or Rs. 2000 or Rs. 3000 or Rs. 4000 or Rs. 5000 at the age of 60 years, based on the contributions made by them after joining the scheme.
- Subscribers can make contributions to APY on a monthly/ quarterly / half-yearly basis.
- Subscribers can voluntarily exit from APY subject to certain conditions, on deduction of Government co-contribution and return/interest thereon.
- As of April 2023, more than 5 crore individuals have subscribed to APY.

#### 4. Welfare spending has been getting a regular pruning

**Syllabus:** Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes

**Mains:** Analysis of budgetary allocations to various social welfare schemes

**Context:** Reducing shares of social welfare schemes in the Budget.

#### Details:

- It is highlighted that the experts criticize the Union Budget of 2023-24 as well as 2022-23 for ignoring social spending and favouring capital expenditure.
- However, the author presents a research analysis that the trend of declining central government spending on critical social schemes that ensure basic rights have declined as a proportion of GDP.

#### Research Analysis:

- Saksham Anganwadi and Poshan 2.0 were schemes to address child malnutrition and hunger.
  - In 2021, the Anganwadi programme (ICDS) was clubbed with POSHAN Abhiyaan and a nutrition scheme for adolescent girls.
  - Moreover, its allocation declined from 0.13% of GDP (2014-15) to 0.07% in 2023-24.
- The Mid Day Meal (MDM) scheme has shown considerable improvements in attendance, nutritional outcomes, and stunting among children.
  - The budget allocation for the scheme has decreased from 0.08% in 2014-15 to 0.04% in 2023-24.
- The maternity benefits programme or PM Matru Vandana Yojana (PMMVY) provides conditional cash transfers of ₹5000 to women in the unorganized sector.
  - According to National Food Security Act (NFSA), it requires almost ₹14000 crore, however, PMMVY Budget is yet to cross ₹3000 crore.
- The budget of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and NFSA have also been reduced as a share of GDP.
  - MGNREGA as a share of GDP has reduced from 0.26% in 2014-15 to 0.20% in 2023-24.
  - NFSA declined from 0.94% in 2014-15 to 0.65% in 2023-24.
- The share of the National Social Assistance Programme (NSAP) has considerably declined (except 2020-21) from 0.06% in 2014-15 to 0.03% in 2023-24.
- Furthermore, central expenditure on school education (primary and secondary) has constantly reduced from 0.37% in 2014-15 to 0.23% in 2023-24.
- **Areas of Gains:**
  - The central healthcare expenditure increased marginally from 0.25% in 2014-15 to 0.30% in 2023-24.
  - There was improvement in providing tangible goods like access to cooking fuel, and electricity.
  - The situation also improved in the financial inclusion of women.

**Associated Concerns:**

- As per the National Family Health Survey (NFHS)-5, the share of anaemic, underweight, and stunted children in India is 67%, 32%, and 36%, respectively.
- According to the Reserve Bank of India (RBI), real wages of casual workers grew at less than 1% per year from 2014-15 to 2021-22. It is highlighted by various economists that this is a worrying trend for economic growth.
- The pensions for the elderly have not increased since 2006. It stands at a meagre ₹200 per month for the elderly and ₹300 for widows.
- The World Social Protection Report by the International Labour Organization (ILO) highlights that approximately 24.8% of Indians are covered by at least one social security scheme against the Asia-Pacific average of 44%.
- India performs poorly on the Human Development Index with a rank of 132.

**Way Ahead:**

- As per international experience, the share of social expenditure in GDP should grow proportionately with the GDP of the country.
- It is suggested that the government should recover the revenue foregone due to tax concessions and the lowering of corporate tax rates in 2019.

**Nut Graf:** The trend analysis of various welfare schemes highlights that their share in GDP has declined during the last decade. The government should acknowledge the importance of social security programmes and raise their budget allocation.

## 5. The erosion of hard-won labour rights

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Human Resources.

**Prelims:** International Labour Day.

**Mains:** Labour Rights

**Context:** 1st May is observed as an International Labour Day.

**International Labour Day:**

- International Workers' Day or Labour Day is celebrated yearly on 1st May
- This day honours the hard work and achievements of the working class.
- Chicago (in the U.S.) became a major demonstration site for labour on 1st May 1886.
  - They were demanding an eight-hour workday.
  - The peaceful meeting turned violent on 4th May 1886.
  - It became a symbol of the international struggle for workers' rights.
- The International Socialist Conference declared May 1 as an international holiday for labour, or May Day in 1889.
- The Hours of Work (Industry) Convention was adopted by the International Labour Organization (ILO) in 1919. The convention limited the number of working hours to eight a day and 48 hours a week.
- Indians celebrated the first Labour's Day in Chennai in 1923.
  - The Labour Kisan Party of Hindustan conducted Labour's Day.

**Working Hours Regulation:**

- The issue of regulating (specifically increasing) the working hours still persists. COVID-19 provided an opportunity for various states to amend the Factories Act, 1948. For instance, Karnataka and Tamil Nadu increased the number of working hours.
- Employers, particularly from the garment and electronic industries are demanding flexible worktime regimes to focus on exports.
- Indian economists follow the wrong approach of expanding exports at the cost of labour rights and human rights on the lines of Bangladesh and Vietnam.
  - As per the Global Right Index 2022, Bangladesh ranked among the 10 worst countries where labour rights are not guaranteed.
    - Global Right Index is released by International Trade Union Confederation (ITUC).
  - Similarly, Vietnam was ranked 4 indicating systematic violation of labour rights.

**Associated Concerns:**

- Several regional governments provide many subsidies and exemptions to attract global and domestic capital in order to promote 'ease of doing business'.
- Employers demand no or weak labour unions in order to reap the maximum benefits from workers.
- This approach leads to a race to the bottom where states amend labour laws despite the fact that it does not help in reducing unemployment.
- There is also a demand for moving from a three-shift regime to a two-shift regime in order to enhance production, maximize workers' time, and reduce travelling allowance and transaction costs.
- Some workers have to travel two hours to reach their workplace. This along with 12 working hours will make it daunting for younger workers.
- It should be noted that as the workers age they become highly fatigued, less efficient, and prone to industrial accidents.
- Due to a lack of trade union cooperation and political unity, states can easily change the labour laws.
- New labour codes have not yet been implemented, which is a major cause of concern.

**Nut Graf:** Several states have extended the working hours of labour for promoting ease of doing business. It should be noted that by adopting such an approach, India is going back in time. Implementation of the new labour code is the need of the hour to maintain a work-life balance for workers/labourers.

## IAS टेबलेट कार्यक्रम

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हमारे मार्गदर्शकों द्वारा प्रत्येक छात्र हेतु मार्गदर्शन और व्यक्तिगत प्रतिपुष्टि



मानक पुस्तकों सहित समग्र और अद्यतन अध्ययन सामग्री



पुनरीक्षण नोट्स के साथ चर्चित मुद्दों पर सप्ताह में दो बार लाइव वेबिनार व्याख्यान



साप्ताहिक वेबिनार, चर्चित मुद्दे, समसामयिकी पत्र/पत्रिका और प्रैक्टिस सेट का छात्र पोर्टल उपलब्ध

# EDUCATION

## 1. Poshan bhi, Padhai bhi

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Education

**Prelims:** About Poshan bhi, Padhai bhi scheme

**Mains:** Key features of Poshan bhi, Padhai bhi scheme and the significance of Anganwadis in India

**Context:** 'Poshan Bhi, Padhai Bhi' will focus on Early Childhood Care and Education (ECCE) at anganwadis across the country.

- ECCE is an important component of Mission Saksham Anganwadi and Poshan 2.0 (Mission Poshan 2.0) and envisaged under the National Education Policy.

### Major Highlights of the Program:

- The Ministry has allocated Rs 600 crore for the training of Anganwadi Workers (AWW) to effectively implement ECCE.
- The National Institute of Public Cooperation and Child Development (NIPCCD) will provide the training for anganwadi workers.
- The objective of the program is to transform anganwadi centers into not just nutrition hubs but also education-imparting centers.
- The ECCE program will prioritize education in the mother tongue, aligning with the principles of the New Education Policy.
- Through the changes introduced by the "Poshan bhi, Padhai bhi" ECCE policy, every child would be provided with at least two hours of high-quality preschool instruction daily.

### Anganwadi:

- Anganwadi is a type of rural child care center in India.
- It was established as part of the Integrated Child Development Services (ICDS) program. Anganwadis play a crucial role in providing basic health care, nutrition, and early childhood education to children below the age of six.
- Close to 13.9 lakh operational Anganwadi centres across the country are providing supplementary nutrition and early care and education to around 8 crore beneficiary children under the age of 6 years, making it the largest public provisioning of such services in the world.

### Responsibilities of Anganwadis:

- To organize non-formal pre-school activities in the anganwadi for children in the age group 3-6 years and to help in designing and making of toys and play equipment of indigenous origin for use in anganwadi.
- To serve as centers for the distribution of supplementary nutrition, such as take-home rations or hot cooked meals, to children and pregnant/lactating women. These provisions aim to address malnutrition and improve overall health.
- To provide health and nutrition education, and counseling to breastfeeding/ Infant & young feeding practices to mothers.
- They are expected to bring social changes as well as encourage married women to adopt family planning/birth control measures.
- AWWs shall share the information relating to births that took place during the month with the Panchayat Secretary/ Gram Sabha Sewa whoever has been notified as Registrar/Sub Registrar of Births & Deaths in her village.

### Issues in Anganwadis

- Inadequate Infrastructure
- Low Remuneration
- Limited Outreach
- Monitoring and Evaluation



## 2. One in seven Indian primary schools run by a lone teacher

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Education

**Mains:** Issues related to education.

**Context:** A 'Gloom in the Classroom' report studies the situation of primary and upper-primary schools in Jharkhand.

### Details:

- According to the Unified District Information System for Education (UDISE), one-third of the primary-level schools in Jharkhand are run by single-teacher schools.
- Similarly, the proportion of single-teacher schools in India is as high as 14.7% (UDISE data).
- The Right to Education Act states that every school must have at least two teachers.
- **Performance of various states:**
  - Andhra Pradesh has 34% of single-teacher schools.
  - Whereas 30% of schools in Telangana are run by single-teacher.
  - Karnataka has nearly 29% of schools administered by a single teacher.
  - Jharkhand the proportion stands at 25%.
- **The number of pupils in single-teacher schools in different states on average are:**
  - Madhya Pradesh – 39 pupils
  - Jharkhand – 46 pupils
  - Uttar Pradesh – 70 pupils
  - Bihar – 96 pupils
- However, in some states, single-teacher schools are associated with several other factors like low population density, scattered settlement patterns, and low fertility rates. For example,
  - In Himachal Pradesh, the proportion of such schools is 27%, but the average number of students in these schools is less than 20.
- Kerala is the best performer with only 4% of single-teacher schools. Moreover, these schools have only 1% of children.

### Associated Concerns:

- Only 9 out of 21 major states in India have an average pupil-teacher ratio below 30 in single-teacher schools.
- Many state governments try to save money by understaffing schools in underprivileged areas.
- There is a high vacancy for teachers. For example, there have been no teacher appointments since 2016 in Jharkhand.
- Teachers resist remote postings.
- It should be noted that there is a huge demand for quality education in remote areas.

### Mini Schools

- Mini schools are schools with few students.
- They were established before the RTE Act to spread school education in sparsely populated areas.
- These were merged with bigger schools in many states after the RTE Act.
- However, mini-schools are not equal to single-teacher schools.

**Nut Graf:** *There are many schools in India (especially in rural areas) that are run by single teachers. This is a cause of concern for the quality of education. The state government should address this by recruiting more teachers in understaffed schools in underprivileged areas.*

### 3. The lack of teachers in higher education

**Syllabus:** Issues relating to the development and management of Social Sector/Services relating to Education

**Prelims:** All India Survey on Higher Education (AISHE)

**Mains:** Key issues and challenges associated with faculty shortages in India's higher education sector and the possible remedies.

**Context:** This article talks about the shortage of faculty in India's higher education system and the associated challenges.

**Key details:**

- Higher education institutions such as colleges and universities require a sufficient number of teachers and researchers in order to disseminate knowledge in an efficient manner.
- However, the problem of faculty shortage has been witnessed in the Indian higher education sector ever since the 1980s.
- This issue of faculty shortage seems to have become permanent in recent times and has aggravated the challenges associated with it.
- According to the author, there are two key obstacles in finding feasible solutions to the issue of faculty shortages. They are:
  - Absence of reliable data on the existing faculty resources in various higher education institutions.
  - Treating the issue of faculty shortages merely as a quantitative issue.

**Lack of reliable data on faculty shortages**

- In 2009, the then Ministry of Human Resource Development constituted a task force to look into the issue which came up with a report named "Report of the Task Force On Faculty Shortage and Design of Performance Appraisal System" in 2011.
- The report noted that the existing shortage of teaching faculties in the higher education institutions in the country was not a surprise, but the surprising fact is that this perception is not supported by factual data as there is no mechanism in place to collect regular information.
- The task force report had sought for the formulation of a standard mechanism to collect and monitor the number and quality of faculty resources and the data collected must be made available on the website of the institutions.
- Even after about 10 years post these observations by the report, little has changed. This is because most of the higher education academies or institutions have messy and incomplete websites containing only partial data about their faculties.
- While the government collects information on the number of faculty members in various colleges and universities as a part of its annual **All India Survey of Higher Education (AISHE)**, this has been a voluntary process for institutions.
  - However, the responsibility for providing accurate data rests with the institution, and the data provided is not verified by any independent agency.
- Colleges and universities have often used adjunct faculty members as 'ghost' members i.e. such adjunct or part-time faculty members are counted as regular faculty in order to highlight a favourable teacher-student ratio.
- These obstacles have made it very difficult to get a reliable estimate of the existing faculty resources in the country.

**All India Survey on Higher Education (AISHE):**

- This Report provides key performance indicators on the current status of higher education in the country.
- It has been compiled by the Ministry of Education based on the voluntary uploading of data by institutions of Higher Education listed in "aishe.gov.in" portal in specially designed format.
- The Ministry of Education has been conducting the annual web-based All India Survey on Higher Education (AISHE) since 2010-11
- AISHE aims to portray the status of higher education in the country.
- The survey covers all the Institutions in the country engaged in imparting higher education.
- Information is being collected on several parameters such as teachers, student enrolment, programmes, examination results, education finance, and infrastructure.
- Indicators of educational development such as Institution Density, Gross Enrolment Ratio, Pupil-teacher ratio, Gender Parity Index, Per Student Expenditure will also be calculated from the data collected through AISHE.

**Challenges associated with treating faculty shortages as a quantitative issue**

- The author notes that the stakeholders have misunderstood the problem of faculty shortages to be a quantitative issue.
- According to the author, the nature and scope of the faculty shortage is a complex issue as there are about six possible types of shortages and each one of them require a different set of remedial measures.
- These six identified types of faculty shortages are not necessarily mutually exclusive and they also show that the problem of shortage is not all about the numbers alone.

**The six identified types of shortages**

1. **Discrepancies across disciplines, institutions and locations:** It is often seen that there exist large discrepancies in the number of faculty members across disciplines, institutions and locations.
  - There is an oversupply of faculties in a few disciplines or locations as compared to an acute shortage in others.
  - This issue requires efforts to achieve a balance between demand and supply in specific disciplines in order to plug the shortages at different institutions or locations.
2. **The inability to hire faculties:** This type of shortage is usually seen in the case of public institutions.
  - Despite a desperate need, the institutions are unable to hire faculties owing to their financial status.
  - Most of the public and state universities are grossly underfunded, despite a large increase in the number of students.
3. **Unwillingness to hire faculties:** This type of shortage is seen among private institutions whose primary aim has been to make profits.
4. **Challenge of managing reservations in public institutions:** Reservations for members belonging to OBC and SC-ST groups has reduced the pool of qualified faculties.
5. **Unwillingness among faculties to work at a few specific institutions:** Faculty members have shown unwillingness or lack of intent to work at a few institutions due to their unfavourable location and lack of proper working or living conditions.
6. **Qualitative issue:** The shortages of faculties can also arise due to various qualitative issues where actual shortages may not exist.
  - For example, only a few candidates are really qualified for applying for PhDs programmes at Indian universities.

**Nut graf:** The issue of the shortage of faculty members in the higher education institutions of the country undermines the growth of the knowledge sector and hinders its aspiration to become the "Vishwa Guru". In this context, collecting reliable data on existing faculty resources and formulating a nuanced set of policies play a crucial role in addressing the challenges associated with the issue.

**4. PARAKH**

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Education

**Prelims:** About PARAKH

**Context:** The Education Ministry organised a workshop on PARAKH with the aim of unifying a network of 60 school examination boards of various States and Union Territories under one umbrella.

**PARAKH**

- PARAKH stands for Performance Assessment, Review, and Analysis of Knowledge for Holistic Development.
- PARAKH was set up as a National Assessment Centre for standard setting and prescribing the norms to improve the educational system of the country as a part of the National Education Policy – NEP 2020
- PARAKH has been established as an organisation under the National Council of Educational Research and Training (NCERT).
- PARAKH will act as a common platform for the interaction of all stakeholders with an aim to develop a holistic approach that ensures a fair assessment system that promotes equity in performance and equivalence in the assessment of students.
- PARAKH is also mandated to undertake efforts to bring the school boards across States and Union Territories on a common platform.
- PARAKH would also facilitate the sharing of best practices across educational institutions.
- PARAKH would oversee the process and conduct surveys such as the National Achievement Survey (NAS) and State Achievement Surveys.

# GOVERNANCE

## 1. Govt likely to ban sugar exports

**Syllabus:** Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

**Mains:** Possibility of a ban on sugar exports, key Reasons, implications and the way forward

**Context:** According to recent reports (April 2023), the Centre is planning to prohibit sugar exports due to a fall in production and a desire to avoid any inflationary pressures before the Lok Sabha elections in 2024.

### Sugar Exports from India – Ban Likely

- Sources claim that a committee of ministers has suggested that mills cease sending sugar overseas with “immediate effect.”
- The production of sugar in India is expected to drop from the previous crop year’s 359 LT to around 327 lakh tonnes (LT) in the 2022–23 crop year (October–September).
- According to sources, even though there is enough to satisfy the expected 275 LT domestic consumption need at this time, the government does not seem to want to take any chances before the upcoming state assembly elections and the 2024 Lok Sabha elections.

### Reasons for the ban on sugar exports:

- To preserve the “domestic availability and price stability of sugar”.
- The choice was made in response to “unprecedented growth in sugar exports” and the requirement to keep an adequate supply of sugar in the nation.
- The Centre is now controlling sugar exports for the first time in six years.

**CHART 1**

### INDIA'S SUGAR EXPORTS IN VALUE



**CHART 2**

### INDIA'S SUGAR EXPORTS IN LAKH TONNES

Sugar Year	Raw Sugar	White Sugar***	Total
2016-17	0	0.46	0.46
2017-18	0.47	5.73	6.2
2018-19	13.13	24.87	38
2019-20	17.84	41.56	59.4
2020-21	28.16	43.74	71.9
2021-22	56.29	53.71	110
2022-23**	19.13	30.91	50.04

Note: Sugar Year is from Oct-Sept

\*\*As on March 15; \*\*\*Includes refined sugar

Source: Business Standard

### Way forward

- The issue is that inflation has gotten entrenched and is likely to continue over the RBI's medium-term inflation target of 2-6%, despite the fact that this move will have a moderating effect on pricing pressures in the economy.
- Consistency in import policy is important because it gives the market the right signals early on. Import tariffs are a better way to intervene than quotas, which result in bigger welfare losses.

## 2. Model Prisons Act

**Syllabus:** Government Policies & Interventions for Development

**Prelims:** Model Prisons Act, 2023

**Mains:** Salient features of Model Prisons Act and the Significance of prison reforms in India

**Context:** Model Prisons Act by the Union Ministry of Home Affairs.

### Introduction:

- The Union Ministry of Home Affairs has prepared the 'Model Prisons Act 2023,' to replace the British-era Prisons Act, 1894 in order to overhaul the prison administration.
- The state governments and Union territory administrations can benefit from the Model Prisons Act, 2023 by adopting it in their jurisdictions, with such modifications which they may consider necessary, and repeal the existing three Acts in their jurisdictions.
  - Along with the Prisons Act, 1894, the Prisoners Act, 1900 and the Transfer of Prisoners Act, 1950 have also been reviewed by the Ministry of Home Affairs and relevant provisions of these Acts have been assimilated in the Model Prisons Act, 2023.
- As per the provisions of the Constitution of India, 'prisons'/'persons detained therein' is a 'State' subject.
- The responsibility of prison management and prisoners' administration vests solely with State Governments that alone are competent to make appropriate legislative provisions in this regard.
- The model Act has been prepared by MHA on the basis of a draft prepared by the Bureau of Police Research and Development after holding wide-ranging discussions with State prison authorities and correctional experts.

### Salient features of the new Model Prisons Act:

- Provision for security assessment and segregation of prisoners, individual sentence planning.
- Grievance redressal, prison development board, attitudinal change towards prisoners.
- Provision of separate accommodation for women prisoners, transgender, etc.
- Provision for the use of technology in prison administration with a view to bringing transparency in prison administration.
- Provision for video conferencing with courts, scientific and technological interventions in prisons, etc.
- Provision of punishment for prisoners and jail staff for use of prohibited items like mobile phones, etc. in jails.
- Provision regarding establishment and management of high-security jails, open jails (open and semi-open), etc.
- Provision for protecting society from the criminal activities of hardened criminals and habitual offenders, etc.
- Provision for legal aid to prisoners, provision of parole, furlough and premature release, etc. to incentivise good conduct.
- Focus on vocational training and skill development of prisoners and their reintegration into society.

### Need for new act:

- The current prison act is outdated and inadequate in addressing the current needs and challenges of the prison system. The act does not reflect the changing nature of crimes and punishments, nor does it address the increasing number of human rights violations in Indian prisons.
- Indian prisons are plagued by overcrowding, with many inmates living in inhumane conditions. The lack of staff and resources exacerbates this problem, leading to increased violence, corruption, and the spread of diseases. A new prison act is needed to address these issues and ensure the safety and well-being of prisoners and staff.
- The current prison act does not prioritize the rehabilitation and reintegration of prisoners into society. The new act focuses on providing education, vocational training, and mental health services to prisoners to enable them to lead productive lives after their release.
- The current prison act does not adequately protect the rights of prisoners or hold prison staff accountable for any violations.
- Provisions of the new act are in line with several international human rights treaties signed by India, such as the International Covenant on Civil and Political Rights and the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment.

**Nut Graf:** The union government has developed the 'Model Prisons Act 2023' to revamp prison administration by replacing the Prisons Act of 1894. The act is designed to be adopted by state and union territory administrations, with modifications if necessary. This is a long overdue measure considering the sad state of Indian prisons.



### 3. World Press Freedom Index 2023

**Syllabus:** Important aspects of governance

**Prelims:** About World Press Freedom Index

**Mains:** India's Rank In World Freedom Index 2023

**Context:** The 2023 edition of the World Press Freedom Index was published on the 3rd of May 2023.

#### World Press Freedom Index

- The World Freedom Index is published by a global media watchdog **Reporters Without Borders (RSF)**.
- The report has been published every year since 2002.
- The key objective of the Index is to compare the level of freedom enjoyed by journalists and media in countries and territories across the world.
- According to the Index, "Press freedom is defined as the ability of journalists as individuals and collectives to select, produce, and disseminate news in the public interest independent of political, economic, legal, and social interference and in the absence of threats to their physical and mental safety".
- **The Index uses five indicators to assign a score to a country or territory, namely:**
  - Political context
  - Legal framework
  - Economic context
  - Sociocultural context
  - Safety.
- A score ranging from 0 to 100 is assigned to each country or territory, with 100 being the best possible score and 0 the worst.
  - **[85 - 100 points]** good (green)
  - **[70 - 85 points]** satisfactory (yellow)
  - **[55 - 70 points]** problematic (light orange)
  - **[40 - 55 points]** difficult (dark orange)
  - **[0 - 40 points]** very serious (dark red)

Source: [rsf.org](https://rsf.org)

#### Highlights of World Press Freedom Index 2023

- The World Press Freedom Index 2023 which evaluates the environment for journalism in 180 countries and territories was published on World Press Freedom Day.
  - To mark the importance of the Press across the world, World Press Freedom Day is observed on 3rd May every year.
  - It is used as an opportunity to reflect on the professional ethics of journalists.
- As per the latest Index, the situation is "very serious" in 31 countries, "difficult" in 42 countries, "problematic" in 55 countries, and "good" or "satisfactory" in 52 countries.
- Norway has been ranked first for the seventh consecutive year which is followed by Ireland (2nd) and Denmark (3rd).
  - The last three places are occupied by Vietnam (178th), China (179th), and North Korea (180th).

#### India's Rank In World Freedom Index:

- India's ranking in the World Press Freedom Index 2023 has slipped to 161 out of 180 countries.
  - India was ranked 150th out of 180 countries in the World Press Freedom Index 2022.
- Indian neighbours such as Sri Lanka and Pakistan have been accorded better ranks as compared to India.
  - Pakistan was placed at 150 which has improved from 157th rank in 2022.
  - Sri Lanka has been ranked 135th against 146th in 2022.
- India has been steadily ranking dismally in the World Press Freedom Index.
  - India's press freedom has gone from "problematic" to "very Bad".
  - The dismal score of India is attributed to the recent violence against journalists. In 2021, four journalists were killed and seven journalists had been imprisoned in the country, till the time this survey was conducted.
- The World Press Freedom Index is not just an index of media independence. It is a diplomatic tool.
  - The ranking in the index can bring a lot of international shame to the country concerned.

# DISASTER MANAGEMENT

## 1. Groundwater exploitation and Land Subsidence

**Syllabus:** Disaster and disaster management

**Prelims:** About land subsidence

**Mains:** Correlation between overexploitation of groundwater and land subsidence

**Context:** This article discusses the impact of excessive groundwater extraction on land subsidence.

### Introduction:

- Several independent studies have found out that the excessive groundwater extraction is causing land subsidence in north-west India, including Punjab, Haryana, Delhi, and Faridabad.
- The Central Ground Water Board (CGWB), a subsidiary body of the Jal Shakti Ministry, is tasked with assessing the state of India's groundwater resources.
- It has a system of groundwater observation-wells and monitors water levels four times a year. It, however, does not analyse the consequences of 'over exploitation.'

### Land subsidence

- As per the National Oceanic and Atmospheric Administration (NOAA), which is a scientific and regulatory agency of the U.S., land subsidence refers to the sinking of the ground on account of the movement of underground material.
- Land subsidence can occur due to several reasons which are man-made as well as natural, such as the removal of water, oil, or natural resources, along with mining activities.
- Further, factors such as earthquakes, soil erosion, and soil compaction are also known to cause land subsidence.

### Joshimath land subsidence



Source: Times of India

- A few houses in Joshimath town in Uttarakhand started developing cracks in October 2021 and by January 2023, over 700 houses have developed major or minor cracks with over 145 families being moved to safer locations temporarily for safety purposes.
- Joshimath is located at a height of 6,107 feet in the Chamoli district of Uttarakhand.
- The town has a population of around 23,000 but despite low population, the town has been heavily built-on, with hotels, resorts, and markets as the town hosts several tourists, trekkers and personnel of the Army and the Indo-Tibetan Border Police (ITBP).
- Post the Sino-Indian war of 1962, Joshimath has emerged as a strategically significant location because the town leads to various villages along the India-China border.
  - Joshimath is also en route to Barahoti which is a disputed territory along the border.
- Joshimath also acts as a gateway to prominent pilgrimage sites and tourist destinations in Uttarakhand such as Badrinath, Hemkund Sahib, the international skiing site of Auli, and the Valley of Flowers which is a UNESCO World Heritage site.
- The instances of land subsidence were first observed in October 2021 near the Chhawani Bazar locality and now the cracks have appeared across the town.
  - The situation aggravated towards the beginning of 2023, as various parts of the town witnessed sudden land-sinking and major cracks in houses.

**Over exploitation:**

- Agricultural practices in north-west India are heavily dependent on groundwater withdrawal. With limited monsoon rain, the groundwater table is precariously low.
- The CGWB has reported that many groundwater blocks are over-exploited, leading to the depletion of underlying aquifers.
  - In Punjab, for instance, 76% of the groundwater blocks are 'over exploited'. In Chandigarh, it is 64% and about 50% in Delhi. This means that more groundwater than can be recharged is extracted.
- Land subsidence is caused when these aquifers run dry and the layers of soil and rock above them start to sink.
- GRACE (Gravity Recovery and Climate Experiment) satellites based analysis has shown a correlation between building deformities and groundwater withdrawals, and unplanned growth and urbanisation have exacerbated the issue in some parts of Delhi-NCR.
- Land subsidence can lead to increased flooding, as the land sinks and reduces the capacity of water bodies to hold water. In the Ganga basin, over-extraction of groundwater has caused the land to sink, leading to flooding in the area.

**Nut Graf:** Several independent studies have highlighted excessive groundwater extraction as the root cause of land subsidence in many parts of north-west India. Despite the Central Ground Water Board's monitoring of water levels, its failure to address the consequences of over-exploitation has led to agricultural practices heavily reliant on dwindling groundwater resources.

# GEOGRAPHY

## 1. India's first national water-body census

**Syllabus:** Critical geographical features – Water resources and water bodies

**Prelims:** About India's first national water-body census

**Mains:** Key findings of the national water-body census, its significance, shortcomings and the way forward

**Context:** The Ministry of Jal Shakti recently published the findings of the first-ever water body census.

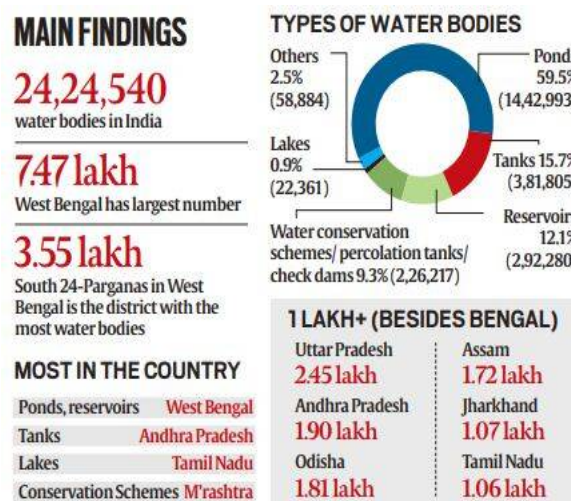
### The need for conducting a national water-body census

- India is currently experiencing a water crisis with the groundwater declining at a rapid rate, biodiversity loss, and increase in the frequency of climate change-induced floods and droughts.
- Water bodies play a crucial role in mitigating the impacts of such adversities, act as a buffer against climate variability and are a key source of water, food and livelihoods across the country.
- Water bodies in India also have cultural and ecological significance.
- However, pollution, encroachment, urbanisation, and drying pose a significant risk to the depletion of water bodies in India.
- There exists a need to conserve and manage the water bodies effectively. Since water bodies in India are managed by different agencies of the Centre and the States, there was a need for the data to be uniform and easily accessible.
- Further, there was data on reservoirs and rivers available on the India Water Resources Information System (WRIS) but there was no data on smaller water bodies that are the lifeline of Indian villages.

### India's first national water-body census

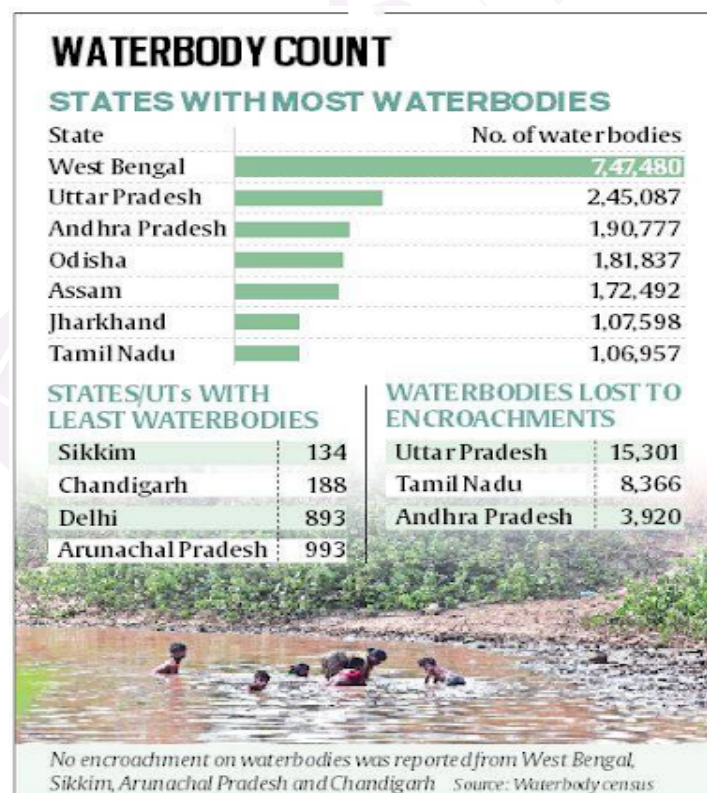
- The census report defines water bodies as "all natural or man-made units bounded on all sides with some or no masonry work used for storing water for irrigation or other purposes ( e.g. industrial, pisciculture, domestic/ drinking, recreation, religious, ground water recharge etc.)."
- The census programme categorises water bodies into five categories namely – ponds, tanks, lakes, reservoirs, and water conservation schemes.
- The key objective of the census programme was to create a national database with comprehensive data on the size, purpose, ownership, status, and conditions of water bodies.
- The programme made use of software for data entry and a mobile app for capturing the location and visual of the water bodies.
- The census also made use of the existing satellite-derived datasets which facilitate individuals to download the historical time series data on each water body.
  - The water body census programme, extended this facility to social characteristics such as ownership, use and condition.

### Key findings of the census programme



Source: Indian Express

- India has a total of 24.24 lakh water bodies such as ponds, lakes, tanks, etc.
- **Most of the water bodies in the country are small:** Majority of the water bodies in the country are less than one hectare large and the management of such water bodies is a key challenge.
- **The total composition of different types of water bodies:**
  - Ponds – 59.5 per cent (14,42,993)
  - Tanks – 15.7 per cent (3,81,805)
  - Reservoirs – 12.1 per cent (2,92,280)
  - Water conservation schemes/percolation tanks/check dams – 9.3% (2,26,217)
  - Lakes – 0.9% (22,361)
  - Others – 2.5% (58,884)
- **Water bodies in India show unique regional patterns depending on the rainfall:** Water bodies are usually larger, publicly held and are mainly used for irrigation and groundwater recharge in drier States such as Gujarat, Maharashtra, and Rajasthan.
  - Whereas in the wetter parts of India such as, Kerala, West Bengal, and Northeastern States, more than 75% of the water bodies are privately owned and are used for domestic use and pisciculture purposes.
  - Mid-sized water bodies in the country are mainly owned by the panchayat.
- **Several water bodies have not been revived:** Several water bodies were classified “not in use” which refer to those water bodies which have not been repaired or revived despite the recent interest in rejuvenation.
- **Rankings:**
  - **West Bengal's South 24 Pargana** has been ranked as the district having the highest (3.55 lakh) number of water bodies in the country which is followed by Ananthapur (50,537) of Andhra Pradesh and Howrah (37,301) of West Bengal.
  - Highest number of ponds and reservoirs – **West Bengal**
  - Highest number of tanks – **Andhra Pradesh**
  - Highest number of lakes – **Tamil Nadu**
  - Leading state with water conservation schemes – **Maharashtra**



Source: Indian Express



### Way forward

- The census programme was mainly focused on human use and there are gaps in the analysis of ecological functions of water bodies. Efforts are to be made in the coming years to address the issue as water bodies play a critical role in supporting biodiversity.
- Experts have also flagged inconsistencies regarding the categorisation of water bodies in the census programme which require attention.
- Challenges with respect to the standardised across States must be resolved.
- Despite various shortcomings, the government must continue such nationwide censuses of a vital resource, with modifications as they provide crucial information regarding the trends and the state resources in the country as a whole.

**Nut graf:** Water bodies have gained cultural and ecological significance in India. However, the country is witnessing a sharp water crisis and there is a need to manage water bodies efficiently which requires the integration of contextual and traditional knowledge of communities with the formal data. In this context, the first ever national water-body census has provided crucial data on aspects such as ownership, state of use, and the costs of repairs of water bodies.

## 2. Recent rain likely to expand cotton farming in the north

**Syllabus:** Factors responsible for the location of primary, secondary, and tertiary sector activities

**Prelims:** Cultivation of Cotton in India.

### Details:

- It is predicted by agriculture experts that as a result of recent untimely rains, the acreage of cotton plantations in northern India will increase.
  - Cotton is a Kharif crop.
  - It is usually planted from mid-April to late May in most parts of Punjab and Haryana.
- **Benefits of rain:**
  - It will prevent the problem of 'burning' due to high temperatures.
  - Rains also help in pacing up the sowing, specifically in regions with poor irrigation facilities.
  - It will enhance soil moisture content and benefit crops.
  - Consequently, the input cost would be reduced.
- The area under cotton cultivation will also increase as the government is discouraging water-guzzling rice and promoting crop diversification.
  - The government has set a target of 7 lakh hectares in Haryana for the year 2023. In 2022, cotton was planted on 5.74 lakh hectares.
  - Similarly, in Punjab, it aims to cover 3 lakh hectares. In 2022, it was approximately 2.48 lakh hectares.

### Cotton Cultivation in India

- There are ten major cotton growing states in India and are divided into three zones namely - North Zone, Central Zone and South Zone
  - North zone consists of Punjab, Haryana and Rajasthan
  - Central zone consists of Madhya Pradesh, Maharashtra and Gujarat
  - South zone consists of: Andhra Pradesh, Telangana, Karnataka Tamil Nadu
- There are four cultivated species of cotton viz. *Gossypium arboreum*, *G. herbaceum*, *G. hirsutum* and *G. barbadense*.
  - India is the only country in the world where all the four cultivated species are grown on a commercial scale.
- Cotton is grown in tropical & subtropical conditions.
  - It requires a minimum temperature of 15°C for better germination at field conditions.
  - The optimum temperature for vegetative growth is 21 to 27°C & it can tolerate a temperature range of 21°C to 43°C.
- Warm days of Cool nights with large diurnal variations during the period of fruiting are conducive to good boll & fibre development.
- Cotton is grown on a variety of soils ranging from well drained deep alluvial soils in the north to black clayey soils of varying depth in the central region and in black and mixed black and red soils in the south zone.
- Cotton is semi-tolerant to salinity and sensitive to water logging and thus prefers well drained soils.
- The sowing season of cotton varies considerably from tract to tract and is generally early (April-May) in northern India and is delayed as it proceeds down south (monsoon based in southern zone).
- Cotton is a Kharif crop in the major parts of the country viz. Punjab, Haryana, Rajasthan, Uttar Pradesh, Madhya Pradesh, Gujarat, Maharashtra and parts of Andhra Pradesh & Karnataka.
- Cotton is commonly flood irrigated although irrigation by furrow or alternate furrow method is more effective and water saving.

### 3. Lake Kivu and African Great Lakes

**Syllabus:** Salient features of the world's physical geography.

**Prelims:** Lake Kivu and African Great Lakes

**Context:** Floods in Rwanda

**Key Details:**

- At least 130 people have died after floods and landslides hit Rwanda's northern and western provinces.
- The Western Province bordering Lake Kivu and the district Rubavu are some of the badly affected regions.
- Rwanda's weather authority is linking the unusual rains seen in recent years to climate change.
- Many factors contribute to flooding, but a warming atmosphere caused by climate change makes extreme rainfall more likely.

**African Great Lakes:**



Source: World Atlas

- The Great Lakes of Africa refer to a series of large, interconnected lakes in East and Central Africa, including Lake Victoria, Lake Tanganyika, Lake Malawi, Lake Albert, Lake Edward, and Lake Kivu.
- These lakes are some of the deepest and largest freshwater lakes in the world, with a combined surface area of over 143,000 square kilometres and a total volume of about 18,000 cubic kilometres. They hold approximately 27% of the world's freshwater.
- The lakes are an important source of water, food, and livelihoods for millions of people in the region, supporting fishing, agriculture, and other economic activities.
- The lakes also play a crucial role in the region's ecology, supporting a rich array of aquatic plant and animal species, including several endangered species such as the Nile crocodile and the hippopotamus.
- Lake Victoria is the largest of the Great Lakes of Africa, with a surface area of over 68,800 square kilometres. It is set between the Rift Valleys and is bounded by uplifted mountains and highlands associated with rifting.
  - Compared to the other lakes, it is geologically younger (less than half a million years) and much shallower with markedly lower water clarity.
  - It is shared by three countries: Tanzania, Uganda, and Kenya.
- Lake Tanganyika is the second-deepest lake in the world and the longest freshwater lake in the world. It is shared by four countries: Tanzania, the Democratic Republic of Congo, Zambia, and Burundi.
- Lake Malawi is the third-largest of the Great Lakes of Africa. It is shared by Malawi, Tanzania, and Mozambique.

- Lake Albert is located on the border between Uganda and the Democratic Republic of Congo, and is named after Prince Albert of Belgium. It is relatively shallow and has a maximum depth of about 50 metres.
- Lake Edward is located on the border between Uganda and the Democratic Republic of Congo, and is named after Prince Edward of the United Kingdom.
- Lake Kivu is located on the border between the Democratic Republic of Congo and Rwanda, and is one of only three known lakes in the world that contains a large amount of dissolved gas, primarily methane and carbon dioxide.

**Significance and Challenges:**

- The Great Lakes of Africa have a complex political and historical significance, as they have often been the site of conflict and disputes between neighbouring countries over issues such as territorial claims, resource management, and environmental degradation.
- In recent years, the lakes have also faced significant challenges from pollution, overfishing, and the impacts of climate change, which have threatened the ecological balance of the lakes and the livelihoods of the people who depend on them.
- The Great Lakes of Africa are a focus of international attention and cooperation, with various regional and international organisations working to address the environmental and social challenges facing the lakes and their surrounding communities.
- The lakes are also an important tourism destination, attracting visitors from around the world to explore their natural beauty and rich cultural heritage.

**4. Cyclone Mocha**

**Syllabus:** Important Geophysical phenomena – cyclones

**Prelims:** About Cyclone Mocha

**Context:** Cyclone Mocha makes landfall in Myanmar.

**Cyclone Mocha**

- Cyclone Mocha will be the first cyclonic storm of the year 2023.
- The name “Mocha” (pronounced as Mokha) was suggested by Yemen.
  - It is named after the Red Sea port city, which is known to have introduced coffee to the world over 500 years ago.
- On May 13, 2023, Cyclone Mocha became the second-most intense cyclone to develop in the Bay of Bengal in the month since 1982.
- Cyclone Mocha was termed as “Extremely Severe Cyclonic Storm” by the India Meteorological Department (IMD) and a “Super Cyclone” by a frontline international weather website.
- Cyclone Mocha had intensified from category 1 (120 kmph) to category 4 (212 kmph) in just 24 hours.
- India has bi-annual or dual cyclone seasons namely – pre-monsoon (April-June) and post-monsoon (October-December).
- Experts noted that cyclones are becoming more intense and more frequent in the Bay of Bengal region because of climate change.

# INDIAN SOCIETY & SOCIAL ISSUES

## 1. Women Entrepreneurship in MSME Sector

**Syllabus:** Role of women and women's organization

**Mains:** Challenges to work participation rate for women in India and various initiatives undertaken

**Context:** According to a report by the Registrar General of India, the work participation rate for women in India is only 25%.

### Key reasons for low work participation rate for women in India

- Lack of safe and quality childcare support
- lack of infrastructural facilities for women at workplaces
- Report of the Expert Committee on Micro, Small and Medium Enterprises (2019) and 2022 report by the International Finance Corporation (IFC)

### Efforts undertaken by Government:

- **Maternity Benefit (Amendment) Act, 2017:** The main aim of the Act is to regulate the employment of women during the period of childbirth. It increased the duration of paid maternity leave available for women employees from 12 weeks to 26 weeks.
- Permitting women workers in night shifts, with adequate safety measures.
- Training institutes and programs.
- **Equal Remuneration Act, 1976 which is now replaced by Code on Wages, 2019:** The Act provides for payment of equal wages for work of the same and similar nature to male and female workers and for not making discrimination against female employees in the matters of transfers, training and promotion etc.

### MSMEs and Women:

- 18.67% of the total MSMEs registered on the Udyam Registration Portal in the last three years are women owned.
- 23.59% of employees of MSMEs registered on Udyam Portal in the last 2.5 years are women.
- **Udyam Portal:**
  - It was launched on 1st July, 2020.
  - It's an online system for registering MSMEs, launched by the Union MSME ministry.
  - It is linked to the databases of the Central Board of Direct Taxes(CBDT) and Goods and Services Tax Network (GSTN).
- **Udyam Sakhi Portal:**
  - Launched in March, 2018 to provide information regarding the financial schemes, policies and programmes of the Ministry of Micro, Small and Medium Enterprises (MSME) to existing and prospective women entrepreneurs.
  - The portal helps women to start, build and grow their businesses.

### Initiatives by Ministry of MSME for Women Entrepreneurs:

- Public Procurement Policy for Micro and Small Entrepreneurs Order, 2012 (Amended in 2018): 3% total annual procurement from women led MSEs.
- National Scheduled Caste Scheduled Tribe Hub
- Credit support under Prime Minister's Employment Generation Programme
- Concessions under Credit Guarantee Scheme for Micro & Small Enterprises
- Efforts by KVIC (Khadi and Village Industries Commission): ~80% of artisans under its Khadi Program are women. Undertakes multiple skill development training Programs. Training by Coir Board in Coastal States
- Cluster Development under SFURTI Scheme (Scheme of Fund for Regeneration of Traditional Industries)

## 2. Countering false narratives and propaganda

**Syllabus:** Salient features of Indian Society-Challenges posed by Diversity

**Mains:** Various issues associated with using movies to promote false narratives and propaganda.

**Context:** Demand for a ban on the movie 'The Kerala Story'.

### Background:

- The Supreme Court and High Courts of Kerala and Madras have rejected pleas seeking ban on the movie "The Kerala Story".
  - It is now legally settled that once a film has been certified by the statutory authority, there is really no case to ban one.
- Those seeking the ban accuse its makers of trying to stoke communal passions and the projecting of a fake narrative against Muslims.
- The movie gained negative attention due to a teaser that made a sensational claim that 32,000 girls in Kerala went missing, possibly to join a terrorist group.
- The film-makers have agreed to withdraw the teaser and carry a disclaimer that the film's content is fictional.
- However, threats of protests have resulted in some cinema owners choosing not to screen the film.

### False narratives and propaganda:

- False narratives and propaganda in Indian movies have been a long-standing issue. Historically, movies have been used to create a sense of national identity and to promote social values.
- In recent years, there has been a growing concern about the use of movies to propagate false narratives and propaganda in India.
- Movies are an integral part of Indian culture, and they have a significant influence on people's perceptions and beliefs.
- The power of movies to shape public opinion has been recognized by governments and political parties, and they have been used to push their own agendas.
- However, the use of movies to spread false narratives and propaganda is a dangerous trend that needs to be addressed.
- Stereotypes and the use of selective facts are few of the most common ways in which false narratives and propaganda are propagated.

### Impact on Society:

- The impact of false narratives and propaganda on society is profound.
- It can lead to the polarisation of communities and the creation of divisions based on religion, caste, and ethnicity. This can lead to violence, as we have seen in several instances in India.
- False narratives and propaganda can also affect people's perceptions of reality. It can create an environment in which people start to believe in things that are not true, and this can lead to irrational behaviour.
- For example, if a movie portrays a particular community as being responsible for all the crime in a city, people might start to believe that all members of that community are criminals. This can lead to the ostracization of that community and the creation of a hostile environment.

### Countering False Narratives and Propaganda in Indian Movies:

- Even if a film contains objectionable content, banning it would not be a productive approach. Court rulings can overturn bans, and such actions often create curiosity about the film, leading to more people forming opinions about its content.
- While laws related to public order grant the police and local authorities the authority to stop the screening of a film, it would be hazardous to use this power each time a group calls for a ban.
- Banning movies that some people deem to be promoting false narratives can stifle the freedom of expression and the exploration of different viewpoints.
- The decision to ban movies based on complaints that they promote false narratives is subjective and can be influenced by political or ideological agendas. This can lead to the selective censorship of movies that challenge the dominant narratives and perspectives of those in power.
- A more effective way to tackle concerns regarding this would be to encourage critical thinking and media literacy among the general public. This can help people to differentiate between fact and fiction and to engage with movies in a more informed and nuanced way.



- Central Board of Film Certification (CBFC) in India, could be strengthened and made more transparent to ensure that movies are certified based on objective standards and criteria.
- Ultimately, it is important to strike a balance between freedom of expression and responsible filmmaking. While false narratives should not be promoted, banning movies outright is not the solution. Instead, a more nuanced and multi-faceted approach is needed to tackle this issue.

**Nut Graf:** False narratives and propaganda in Indian movies have been a long-standing issue. The impact of false narratives and propaganda on society is profound. The harm caused by a misleading portrayal of reality can be effectively addressed by exposing the falsehood and the motive behind it, rather than resorting to abrupt bans.

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## MISCELLANEOUS

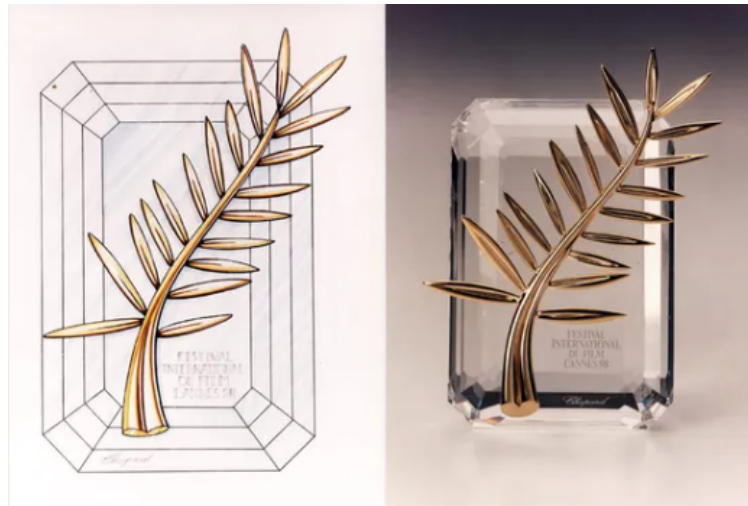
### 1. Palme d'Or and Cannes Film Festival

**Syllabus:** Miscellaneous

**Prelims:** About Palme d'Or and Cannes Film Festival

**Context:** Justine Triet became only the third woman to win Palme d'Or at the Cannes Film Festival 2023.

#### Palme d'Or Award



Source: [www.festival-cannes.com](http://www.festival-cannes.com)

- Palme d'Or, which translates to "The Golden Palm" is said to be one of the most prestigious awards in the film industry.
- Palme d'Or is awarded to the film which is judged as the best among those competing at the Cannes Film Festival.
- It was introduced in 1955 by the festival's organising committee.
- The Palme d'Or awards are regarded as jewellery marvels. The award is of 24-carat gold, is hand-cast into a wax mold, then affixed to a cushion of a single piece of cut crystal and is now presented in a case of blue Morocco leather
- The award is designed in a way to reflect Cannes's coat of arms and the palm trees lining the Promenade de la Croisette, which is the road with the convention centre that hosts Cannes every year.
- 1946's Neecha Nagar, directed by Chetan Anand is the only Indian film to win a Palme d'Or award.

#### Cannes Film Festival

- Cannes Film Festival is one of the "big five" international film festivals which also include the Venice Film Festival, the Berlin International Film Festival, the Toronto International Film Festival and the Sundance Film Festival.
- The first Cannes festival was supposed to be held in 1939, however, it was delayed until 1946 owing to World War II.
- This Film Festival is held annually in Cannes, France.
- The festival was formally accredited by the FIAPF in 1951.
- It previews new films of all genres, including documentaries, from all around the world.

### 2. 10 Indian languages to get technical-term dictionaries

- The Commission for Scientific and Technical Terminology (CSTT) is dealing with technical and scientific terminology in 10 Indian languages that are under-represented in the field of education.
- It will introduce fundamental (basic) dictionaries in a span of three to four months.
- These dictionaries will contain 5000 words per language.
- The dictionaries will be digital and free of cost.
- The CSTT will print about 1000 to 2000 copies in each language.
- It should be noted that languages like Bodo, Santhali, Dogri, Kashmiri, Konkani, Nepali, Manipuri, Sindhi, Maithili, and Sanskrit lack words to describe scientific and technical terms.

- The initial task of CSTT is to cover 15 disciplines such as journalism, public administration, chemistry, botany, zoology, physics, computer science, engineering (civil and electrical), etc.
- It will further enable textbook formulation for middle, high, and university levels.
- The dictionaries will be distributed to education boards, universities, and testing agencies to aid in content preparation.

### 3. Study on sludge finds high potential for use as fertilizer after treatment

- In a first-ever study conducted on the sludge found in Indian sewage treatment plants (STP), it was found that most of the sludge had a “high potential” for use as fertilizer, but it required treatment before it could be used in an unrestricted manner in farms or as a biofuel.
- One of the initiatives of the National Mission for Clean Ganga is to derive livelihood opportunities from the river rejuvenation programme.
  - “Arth Ganga” is one of the measures under the mission that aims to “monetise” and reuse treated wastewater and sludge.
  - This involves converting sludge into usable products such as manure and bricks.
  - Sludge is a thick residue that usually consists of rich organic chemicals as well as heavy metals, industrial effluents and bacterial contaminants.
- According to the standards of the United States Environment Protection Agency, treated sludge can be categorised into class A or B.
  - Class A is regarded as safe to be disposed of in the open and can be used as organic fertiliser.
  - Class B sludge can be used in a “restricted” manner in agricultural applications and the edible parts of the crop should not be exposed to the sludge-mixed soil.
  - India, however, does not have any such standards in place to classify sludge.
- A recent study conducted by the Indian Institute of Technology (IIT), Roorkee has revealed that most of the sludge analysed fell into the class B category.

### 4. One-stop centres for zero waste to be launched in cities

- The government, with a move to reduce the waste generation in urban India, will be setting up one-stop centres where citizens can deposit old clothes, shoes, books, toys and plastic that can be reused or recycled.
- These “Reduce, Recycle and Reuse (RRR)” centres will pass on the deposited waste items to various stakeholders to refurbish, reuse or recycle them into new products contributing to a circular economy.
- The RRR centres will be established as part of a nationwide campaign “Meri LiFE, Mera Swachh Shehar” (My Life, My Clean City) under the aegis of the Swachh Bharat Mission – Urban 2.0.
- The objective of the campaign is to take collective action for the protection and conservation of the environment by adopting sustainable daily habits.

### 5. Police stations in Visakhapatnam likely to get e-Malkhana facility








- All 23 police stations in Visakhapatnam are likely to get an e-Malkhana facility by June.
- e-Malkhana facility is a scientific way of storing property and evidence recovered from crime scenes.
  - With the help of the e-Malkhana facility, various properties and evidence collected from the crime scene can be stored in cardboard boxes and a dynamic QR code will be generated and pasted on the box.
  - A dedicated website will host all the details pertaining to the case and the property collected will also be uploaded.
  - Such details can be accessed by just scanning the QR code.
- The facility was first commissioned at Narsipatnam Police Station (currently in Anakapalli district) in July 2021.
- Earlier the police used to store the recovered properties and evidence in storerooms and they often faced difficulty in finding and accessing them.

## 6. Golden Globe Race

- Commander (retd.) Abhilash Tomy returned to India after creating history as the first Indian to complete the Golden Globe race.
  - He finished second in the 2022 edition after South African sailor Kirsten Neuschafer.
- The Golden Globe Race is a non-stop, solo, unassisted yacht race around the world which was held for the first time in 1968-69.
- This race prohibits the use of modern technology and restricts boat designs and technology to those prior to 1968.
- Participants are not allowed to use GPS, satellite communication, or navigational aids, but are provided with a satellite phone for medical emergencies.
- Satellite phones would be available for extremely restricted use, up to four short messages a day, and use of the GPS chart plotter carried in a sealed box (for emergency) would lead to disqualification from the race.
- And the sailing would be along a stipulated route, rounding the three great capes, the Cape of Good Hope in South Africa, Cape Leeuwin in Australia and Cape Horn in Chile.
- In the 1968 race, Sir Robin Knox-Johnston became the first person to complete a non-stop solo circumnavigation.
  - Knox-Johnston used the boat called Suhaili, which was built in Bombay with assistance from the Royal Bombay Yacht Club in 1963.
- The GGR is the longest sporting event in the world.
- The 2022 edition commenced on September 4, 2022, from Les Sables-d'Olonne in France.

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# YOJANA MAY 2023 - TECHADE

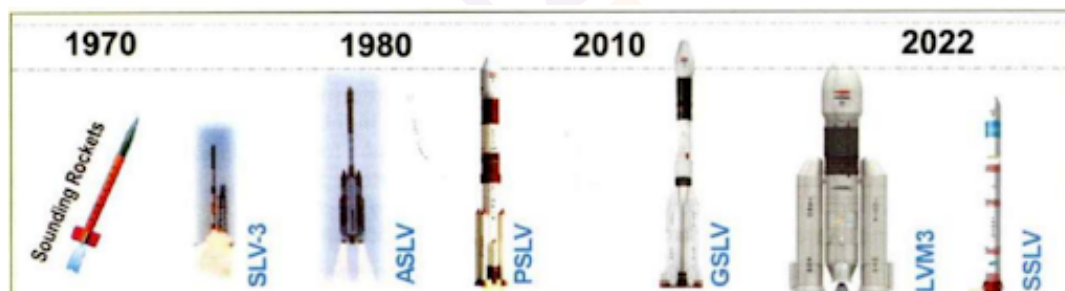
## 1. Innovation in Space Technology

### Introduction:

- Indian Space Research Organisation (ISRO) has been at the forefront of space technology and exploration since its inception.
- Over the years, leveraging its key resources, the organisation has made several strides in space technologies, making India a major player in the global space arena.
- In ISRO, the evolution of space technology and innovation had taken place in various technological frontiers.

### Space transportation system:

- The 1970s marked the beginning of the space transportation system with the development of solid-propulsion-based Sounding Rockets, which are capable of putting 30 kg of payload in 120 km of altitude.
- It was followed by the subsequent development of first generation launch vehicles, i.e., Satellite Launch Vehicles (SLV) and Augmented SLV (ASLV) with the induction of liquid-propulsion technology.
- The integration of solid and liquid propulsion and the development of various key technologies have resulted in the development of the Polar Satellite Launch Vehicle (PSLV), with the capability of placing a 1700 kg payload into polar orbit.
- The indigenous development of a Cryogenic propulsive engine was the major technology leap in the development of third generation rockets i.e., GSLV launch vehicles, which have the capability of placing a 2000 kg payload in Geo-Synchronous Transfer Orbit (GTO).
- Launching of high-throughput communication satellites necessitated the development of a further advanced launch vehicle, i.e Launch Vehicle MK3 (LVM3).
  - Powered by the world's 3rd largest solid boosters, high-capacity liquid and cryogenic engines, LVM3 has the capability of putting 4000 kg payload in GTO.
- ISRO recently introduced the Small Satellite Launch Vehicle (SSLV).



Source: Yojana

### Space Infrastructure:

- In the early years, ISRO focused on developing satellite launch vehicles like SLV-3 and ASLV, which were used to launch small satellites into low earth orbit.
- In the late 1990s, ISRO began work on the GSLV, a more powerful rocket capable of launching heavier payloads into geosynchronous transfer orbit.
  - The first successful launch of the GSLV took place in 2001, and since then, it has been used to launch a number of important satellites.
- In the 2000s, ISRO began focusing on deep space exploration with the launch of Chandrayaan-1, India's first lunar mission, in 2008.
  - This was followed by the Mars Orbiter Mission in 2013, which made India the first country to successfully launch a spacecraft to Mars on its first attempt.
- In 2016, ISRO launched the Indian Regional Navigation Satellite System (IRNSS), a satellite-based navigation system similar to GPS.
  - This system, now known as NavIC, provides accurate position information to users in India and surrounding regions.
- In recent years, ISRO has been working on developing the infrastructure for human spaceflight.
  - This includes the development of a crew module for carrying astronauts and the testing of a crew escape system. ISRO also plans to launch its first crewed mission, Gaganyaan, in 2024.



**Space Applications:**

- Earth Observation (EO) applications by ISRO are institutionalised across many user Ministries/Departments, towards National security, Agriculture, Agroforestry, Disaster management, Fishery, Land Use Land Cover (LULC), Resource Mapping, Planning, Monitoring & Evaluation and decision support for major flagship programmes of the government.
- In order to meet above requirements for remote sensing/PO applications, a great deal of development had taken place in ground infrastructure and imaging technologies.
- Ground technologies for tracking multiple objects in space, including the establishment of multi-object tracking radar, an integrated multi-mission ground segment for earth observation satellites, Polarimetric Doppler Weather Radar, state-of-the-art advanced ground station for Earth Observation satellites at Bharti station, Antarctica have facilitated the uninterrupted usage of satellite services.

**Ongoing projects:**

- Strides in space technology innovation continue in the thrust areas of Reusable Launch Vehicles, Stage Recovery and Reuse, Vertical Take-off Vertical landing (VTVL), LOX-Methane engine, Air breathing/ Hybrid Propulsion, Space Robotics, Humanoid robots, Advanced Inertial systems, Low Cost Spacecrafts, Quantum Communication, advanced Scientific Payloads, Space Based Surveillance and Atomic Clock.
- In an effort to develop technologies for low-cost access to space and space travel, ISRO is working on a Reusable Launch Vehicle (RLV) programme.
- ISRO is also working on Air breathing propulsion with reusable capability for a cost-effective futuristic space transportation system.
- The ISRO's current focus is on the development of critical technologies towards the realisation of a vehicle-integrated scramjet engine called the Hypersonic Air Breathing Vehicle with Airframe integrated system (HAVA).
- For the first time in India, ISRO achieved a breakthrough demonstration of free-space Quantum Communication over a distance of 300 m using the Prepare & Measure Protocol and Quantum Entanglement protocols.
- ISRO has been actively pursuing several R&D programmes related to Space Robotics Vyom Mitra (Humanoid robot), Lander and Rover for Chandrayaan-3 mission, On-orbit Satellite refuelling, Planetary Rock Sampler, Space-based robotic manipulator, Robotic arm-based umbilical systems, 3D printing in Space among others.

**2. Startups-Revolutionising India's growth story****Introduction:**

- In recent years, startups have emerged as a key driver of economic growth in India. With the government's focus on promoting entrepreneurship and innovation, the startup ecosystem in India has been growing at a rapid pace.
- According to a report by NASSCOM, India is the third-largest startup ecosystem in the world, with over 50,000 startups.
- The country's entrepreneurial ecosystem has also seen an exponential spurt in funding activities over the past few years. Indian startups raised over \$25 billion in 2022 alone.
- India is home to over 108 unicorns today -becoming the second-largest unicorn nation in the world.
- These startups are revolutionising India's growth story by creating new job opportunities, driving innovation, and contributing to the country's GDP.

**Increased funding:**

- The spike in funding for startups was majorly led by the increased adoption of digitisation and the easy availability of capital at the early stages of growth for startups.
- Startup India has introduced various schemes to simplify and facilitate the process of raising funds at both early and mature stages.
- One such scheme, supporting early-stage funding from angel investors and venture capital firms, is the Startup India Seed Fund Scheme (SIFSS) with an outlay of Rs 945 crore, which provides financial assistance to early-stage startups for proof of concept, prototype development, product trials, market entry and commercialisation.
- Another government scheme committed to assisting startups financially is the Fund of Funds scheme launched in 2016.
- Apart from the several managerial and regulatory challenges, one of the biggest problems faced by startups is easy access to early-stage debt to finance their capital requirements. Traditional lending institutions, such as commercial banks, rely on the same old mandate.
- The Government has established the Credit Guarantee Scheme for startups for providing credit guarantees to loans extended to DPIIT-recognised startups by Scheduled Commercial Banks, Non-Banking Financial Companies (NBFCs), and Venture Debt Funds (VDFs) under SEBI registered Alternative Investment Funds.

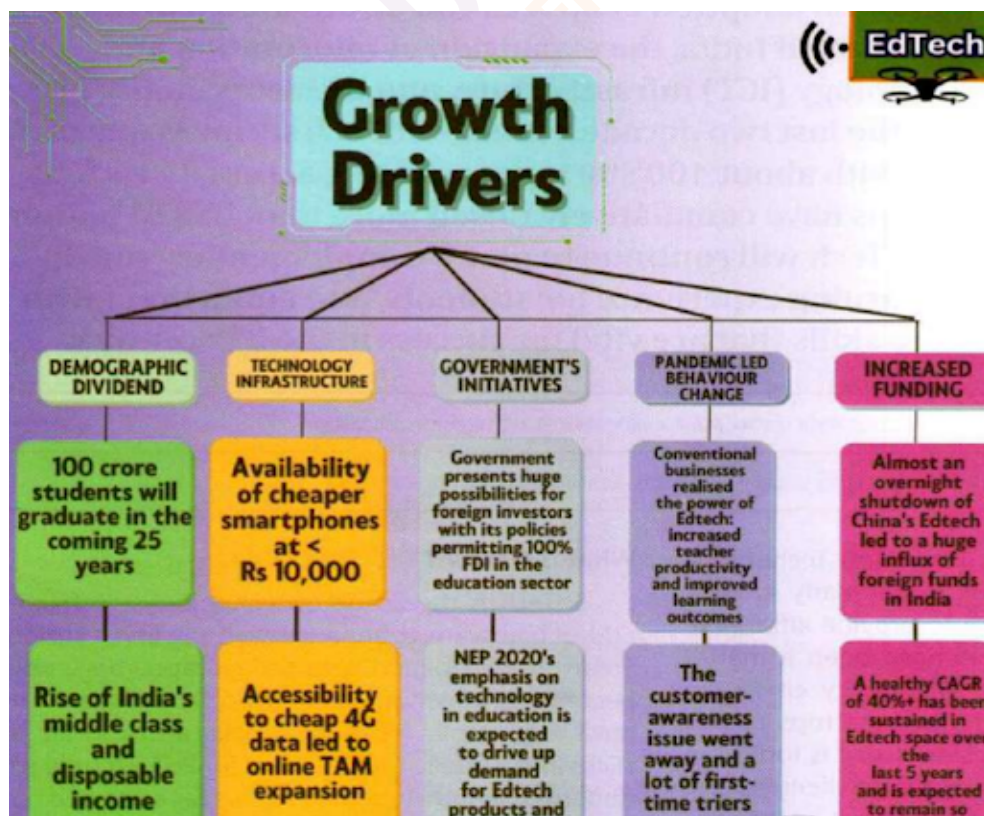
### 3. Potential of India's Edtech sector

#### Background:

- EdTech or Education Technology is the usage of technology – software and/or hardware, to enhance teaching and learning.
- Smartphones loaded with EdTech apps have now become synonymous with education. The potential for EdTech to reach underprivileged students in areas far and wide has played and will continue to play a big role in the sector's growth in the coming years.
- The needs of each student are different, as are the pace and style with which they learn. EdTech enables everyone to get a consistent quality of education, no matter their age or learning abilities.

#### India's ICT Revolution:

- For EdTech to flourish, there is a need for the availability of and access to a robust Information and Communication Technology (ICT) ecosystem.
- The Indian ICT industry has been growing rapidly over the last quarter century. In FY 2022, the industry crossed US\$200 billion in total revenue and 5 million in total workforce. By the end of 2023, it is predicted to spend US\$144 billion on ICT.
- The services segment is expected to make up about 52% of this spending. EdTech is an important sector in the industry's transition from enterprise servicing to enterprise solution provision.
- The emergence and rapid adoption of EdTech can also be attributed to the fast-paced digitalisation of India, the expansion of ICT infrastructure, and the accessibility of gadgets and data over the last two decades.
- Between 2010 and 2022, the number of internet users in India has increased by 10x, from 92.5 million to 932.2 million. This is expected to rise to 1.53 billion by 2040.
  - This could also be attributed to the fact that India has one of the cheapest mobile data rates globally, with 1 GB costing only Rs 14, a 90% reduction from 2013.
- There has been a 27X increase in the number of smartphone users in India, from 34 million in 2010 to 931 million in 2022. This is expected to rise to 1.53 billion by 2040.
- The development of these factors and the tangible benefits that EdTech provides in the teaching-learning process have presented a significant opportunity for the EdTech sector and its diverse players to expand their presence and adaptability.



Source: Yojana

**Significance of Edtech to students and Teachers:**

- Technology has made education inclusive and affordable for all strata of students and learners.
- Catalysed by India's digital revolution, EdTech has enabled accessibility by reaching the remotest parts of India.
- **Three major benefits of EdTech for students include:**
  - Learning while playing: Gamified techniques used in EdTech, especially K-6, make concepts easier for students to understand and make learning a fun activity.
  - Classes anywhere and anytime: EdTech makes learning inclusive by reaching the remotest parts of India, Students can access these classes at their convenience and pace. Working professionals can devote their free time to learning a new skill,
  - Access to quality teachers: EdTech facilitates access to quality teachers in every town and village in India.
- EdTech not only benefits students but also teachers by providing engaging pedagogical practices to complement their teaching.
- EdTech can also help in the process of academic administration through automated grading, classroom management tools, paperless classrooms, and eliminating guesswork.
- Classroom management tools help create a less chaotic, more collaborative environment. Paperless classrooms reduce printing budgets and promote greener policies.
- EdTech can assess student skills and needs in real time, leading to proactive plans to help struggling students, thereby eliminating guesswork.

**Financial Potential:**

- EdTech in India can be classified into six categories based on the target user it serves.
- Most users fall within the student demographic, ranging from preschoolers to college graduates and professionals. However, teachers, schools, and universities also make up a significant user segment for EdTech B2B platforms.
- The Indian EdTech sector was valued at US\$750 million in 2020 and has grown to reach US\$ 5.8 billion by early 2023, at a CAGR of 43%.
- Furthermore, the market size is estimated to grow 3.7X over the next five years, from the current levels to \$10.4 billion. By 2027, the sector is expected to grow to US\$10.1 billion.
- This growth is driven by rising demand for non-academic courses from Tier II and III cities and the need for personalisation in the EdTech space.
- The EdTech sector witnessed unprecedented growth and funding during the Covid-induced lockdown, when online education became a necessity instead of a luxury.
- India's EdTech sector is one of the largest in the world, with about 400 startups operating across its various sub-sectors.

**Challenges:**

- Psychological and Social Effects of Online Digital Education: Online digital education can have psychological and social effects on students.
  - Lack of face-to-face interaction and socialisation opportunities can affect their mental health and social skills. It is important to consider these effects when designing online education programmes and to provide students with opportunities for social interaction and emotional support.
- Perception of Parents: Parents may have reservations about the effectiveness of EdTech and may prefer traditional classroom-based education for their wards. It is important to address the concerns of parents and provide them with information about the benefits and effectiveness of online education to increase acceptance.
- Pupil-teacher Ratio: It is important to maintain a low pupil-teacher ratio in online education programmes to ensure that students receive personalised attention, support, and mentorship from teachers.

**Road Ahead:**

- To ensure the holistic impact of EdTech, it is important to strike a balance between technology and traditional education methods.
- The use of technology should not compromise the quality of education, but rather enhance it. Three critical success factors that can enhance this impact of EdTech include:
- Integrate Practical Work: EdTech programmes must integrate internships/ apprenticeships as part of the curriculum design.
  - This will help students develop group dynamics, team building, and interpersonal skills that are vital at the workplace.
- Create Multilingual Content: According to the last Census, only 10% of the Indian population speaks English and 45% speaks Hindi. Hence, EdTech platforms need to focus on content creation in regional languages to ensure wider reach, usage, and relevance.
- Focus on Holistic Education: EdTech programmes must ensure that the core elements of holistic education that include environmental responsibility and sustainable development at the planet level, self-reliance at the national level, community wellbeing at the societal level, and cultivation of human values.

#### 4. Leveraging technology for transforming healthcare

##### Growth of digital health interventions:

- The global market size of digital health was estimated at USD 332.53 billion in 2022, it is anticipated to peak around USD 1,694.21 billion by 2032.
- While the use of mobile-aided health interventions has been around for some time now, it is widely believed that the global pandemic gave a major push to the quick adoption of digital health innovations and mainstreamed them.
- At a time when healthcare received the highest priority and attention both from the healthcare seekers and providers, technology facilitated solutions to scale up services and also broadened them to cover a large number of beneficiaries who could access quality services often from the confines of their homes.
- The use of telemedicine platforms and remote monitoring solutions increased significantly, thereby enabling healthcare providers to remotely monitor patient health and provide care.
- Furthermore, rapid investments in the healthcare IT infrastructure, particularly in developing and developed nations, is also estimated to be conducive to scaling up market growth.
- One of the major advantages of telemedicine is that it can save time and efforts especially for rural patients, who need not travel long distances for obtaining consultation and treatment.
- This is also accompanied by reduced financial costs associated with travel as travel for seeking healthcare by marginalised and disadvantaged communities is often accompanied by loss of work hours, loss of wages, and lower productivity.
- As per a recent impact study by an NGO, each tele-consultation at an Ayushman Bharat Health & Wellness centre saves an average of a journey of up to 21.58 km, and more than Rs 941 as Out-of-Pocket- Expenditure (OOPE) on healthcare.
- Women caregivers in families, especially expecting and feeding mothers, have been known to be burdened with travel related to health services.
- Digital health solutions can help manage chronic diseases such as diabetes, cardiovascular diseases, and cancer more effectively by providing personalised care plans, monitoring patient health remotely, and improving patient engagement.

##### Digital Health Solutions in India:

The following are some of the initiatives that have seen a vast acceptance among people, accompanied by innumerable advantages.

- Ayushman Bharat Digital Mission
- CoWIN: Cowin stands for Covid Vaccine Intelligent Network. The platform was unveiled by the union government in January 2021 to launch a vaccine drive across the country.
- Tele-MANAS
- Nikshay 2.0: President Draupadi Murmu launched the 'Pradhan Mantri TB Mukta Bharat Abhiyan' and the Nikshay 2.0 portal to eliminate TB by 2025.
  - Nikshay 2.0 is a digital platform for community support for the persons diagnosed with tuberculosis.
- Health Technology Assessment (HTA): The Government of India has created an institutional arrangement called the Health Technology Assessment in India (HTAI) under the Department of Health Research (DHR) to facilitate the process of transparent and evidence informed decision-making in the field of health.

#### 5. Quantum Computing-Transforming Technology

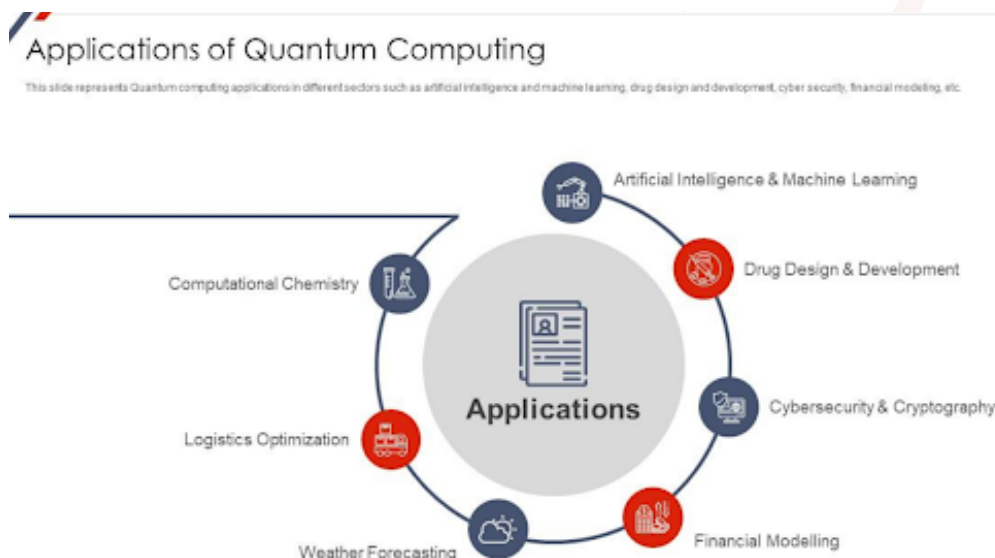
##### Quantum Computing:

- Quantum computing differs from traditional computing, which uses 'bits'—binary digits of 0s and 1s to represent information.
- However, quantum computing uses quantum bits or 'qubits' which can exist in multiple states simultaneously, instead of just two states (i.e., 0 and 1).
- This property of qubits, known as 'superposition' allows quantum computers to perform many computational calculations orders of magnitude faster than classical computing.
- Further, quantum computing also borrows inspiration from another property of quantum mechanics called entanglement, wherein two qubits could be connected in such a way that the state of one qubit intrinsically affects the state of the other qubit.
- Nations and industries are slowly and steadily gearing up to leverage the quantum computing wave through strategic collaborations and investments in research and innovation.



### Impact of Quantum Computing:

- Given India's growing capabilities in the space of information technology (IT) and IT-enabled services, the future of quantum computing is going to drastically revolutionise the skill needs and capabilities of the emerging skill force, which is gradually gearing up in the space of data science, artificial intelligence, machine learning, and decision sciences.
- Faster data analysis in industrial data science applications: Quantum computers can perform certain types of calculations significantly faster than classical computing logic.
- Improved machine learning outcomes: Machine learning algorithms are increasingly being used for predictive capabilities and enhanced data-driven decision-making.
- Quantum computers could potentially improve machine learning by enabling more efficient optimization of these algorithms so that computer vision capabilities become more efficient, accurate, and fast.
- Further, in applications of generative artificial intelligence, quantum computing could provide better recommendations since it is possible to create architectures that analyse real-time additions to the web of knowledge in the digital world to create advice.
- Improved optimization for complex problems: Many analytics problems involve finding the optimal solution to a complex problem. Quantum computers can potentially solve these problems much faster than classical computers, enabling more efficient optimization of complex systems.
- Improved industrialisation: Realisation of industrial maturity levels such as Industry 4.0 and beyond, through platforms like digital twins would be enabled through quantum computing.
- Improved process efficiencies in digital transformation: Quantum computing may result in faster process automation by analysing real-time data generated in the organisation processes.



### Implications for practice and policy:

- Quantum computing is an advanced area where research and development are still at a nascent stage.
- However, this presents an opportunity for India to establish well-funded Research Centres of Excellence in the leading technological institutions.
- Long Term schemes of the Department of Science and Technology could possibly be introduced whereby strategic infrastructure and manpower training projects can be funded in the established technology engineering institutions.
- This would need to cover both hardware and software to further develop a homegrown quantum technology industry.

## 6. AI Chatbots-Future and Challenges

### AI Chatbots:

- Chatbots are computer programs that use artificial intelligence (AI) to simulate human-like conversation with users via text or voice. They can be used in a wide variety of applications, such as customer support, sales, and personal assistants.
- Chatbots use natural language processing (NLP) to understand and interpret user input and generate appropriate responses.
- They can be designed to operate autonomously or in conjunction with human operators, depending on the specific use case and level of complexity required.
- They have progressed into more sophisticated, context-aware, and self-learning programmes that rely on machine learning and deep learning to create a detailed knowledge base of questions and responses.



**Use cases of Chatbots:**

- AI chatbots can transform the healthcare sector by offering numerous services to both healthcare providers and patients. They can function as virtual aides, offering assistance to patients with their healthcare inquiries.
- Chatbots can work around the clock, providing support to customers and employees at any time.
- Chatbots are capable of handling repetitive and mundane tasks such as customer support, appointment scheduling, and data entry. This can help businesses save time and improve efficiency by freeing up human workers to focus on more complex tasks.
- Chatbots can be used to provide healthcare assistance, such as diagnosing symptoms and recommending treatments.
- Chatbots can act as personal assistants, helping users manage their schedules, set reminders, and even order food.
- Chatbots can help automate HR processes, such as onboarding new employees and answering HR-related questions.
- E-commerce companies are using AI chatbots to help their customers locate products that match their needs by asking questions about preferences and showing relevant products and automated tasks such as collecting customer feedback are also managed post sales.
- Generative AI can help in the digital transformation of our education system and make it more efficient and accessible. It can help with content creation, the translation of educational material into multiple languages, and even play the role of a tutor or instructor where there is a lack of teaching resources.

**Challenges:**

- The biggest concern about AI chatbots is that their increasing use can result in a considerable number of people losing their jobs since AI is gaining capabilities to match human output and intelligence.
- Chatbots must be able to interpret and understand the nuances of human language, including slang, regional dialects, and context.
- Chatbots can inherit the biases and discriminatory practices of their developers and data sources.
- Chatbots must be transparent and trustworthy, especially when dealing with sensitive or personal information.
- Chatbots can be vulnerable to security threats, such as hacking or phishing attacks.
- Chatbots must be integrated with existing systems, such as customer relationship management (CRM) software, to provide a seamless user experience. However, this can be challenging when dealing with legacy systems.

**7. 5G Cyber Security Challenges****Introduction:**

- 5G is the 5th generation mobile network. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks.
- It enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices.
- Internet speeds in the high-band spectrum of 5G has been tested to be as high as 20 Gbps (gigabits per second), while, in most cases, the maximum internet data speed in 4G has been recorded at 1 Gbps.

**Geopolitics of 5G:**

- Given its potential to influence our digital future and bring economic transformation, the major world telecom leaders have taken the lead in developing 5G technology.
- However, the real thrust has come from the Chinese telecom companies, which have been aggressively penetrating new markets by commercialising the technology and offering it at cheaper rates than their competitors.
- This has sparked concerns that China may be strategically pushing these companies to capture global markets and, therefore, may establish a vast eavesdropping network.
- There are apprehensions that China might weaponise 5G technology by coercing the Chinese telecom companies to share their consumer data with the government or even force them to shut down 5G networks in times of geopolitical crisis.
- Consequently, in the last few years, the United States has spearheaded a campaign to counter the Chinese telecom companies' dominance in the 5G market.
- As a result, there have been efforts to bring together like-minded and leading democratic states to jointly tackle the tech challenge posed by authoritarian regimes such as China and Russia.
- The Quadrilateral Security Dialogue, or the Quad too has pledged to advance interoperability and security and work on 5G supplier diversification and Open RAN, which uses software to replicate signal-processing functions.

**Cyber threat landscape:**

- 5G's cyber threat landscape extends beyond the risks of Chinese telecom companies dominance and hardware.
- The fundamental drivers (geopolitical rivalries, commercial motives, and data harvesting) behind the recently increased cyberattacks and data breaches from adversarial states and other threat actors remain intact. Therefore, they will pose threats to even 5G networks.

- Considering the potential role that 5G will play in national development and economic growth, it can undoubtedly be regarded as a critical infrastructure. Hence, 5G communication networks will represent a valuable target for cyberattacks, including sabotage.
- In addition, as mentioned earlier, the 5G network will bring about a wider proliferation of IOT-enabled devices.
- According to one estimate, by 2025, there will be approximately 27 billion connected IOT devices.
- 5G also inherits the vulnerability from previous generation protocols, i.e., threat actors can get hold of the International Mobile Subscriber Identity (IMSI) – the number used to identify and authenticate subscribers on the mobile network.

**Way Forward:**

- 5G offers new opportunities for digitalisation and development, but the technology and network are not secure by design. Therefore, countries, like India, adopting 5G must have a cyber resilience plan in place.
- Much depends on the cyber and information-security policies of the ecosystem's various elements. Organisations connecting to the 5G network must be cognisant of the evolving threat landscape, adopt security protocols accordingly, determine their threat posture, and secure their digital infrastructure.
- A critical element of this resilience will also be the awareness of end-users. Their cyber hygiene – their understanding of safe practices in cyberspace – can help them better tackle the threats and protect themselves.

**8. Digital Publishing- Expanding the horizon****Growth of Digital Publishing:**

- With the advent of technology, there has been a significant transformation in the publishing industry.
- Traditional print media has given way to digital publishing, making it easier for publishers to reach a wider audience. Digital publishing is still in its nascent stages in India.
- It accounts for about 8-10% of the country's publishing sector. However, the digital publishing sector in India has witnessed significant growth in recent years. According to a report, digital and regional content will drive the growth of Indian media.
- The digital sector is expected to grow at a rate of 29.1% between FY 2019 and FY 2024.
- Driven by the strength of regional content, it would reach INR 621 billion by 2024.
- With the substantial growth of smartphones, tablets, and e-readers, access to information has become more accessible than ever.
- Unlike traditional publishing, digital publishing does not require printing, shipping, or storage expenditures. Publishers can save on production and distribution costs, which can be passed on to consumers through lower prices.
- E-books have played a significant role in the growth of digital publishing in India. According to a Nielsen report, e-books accounted for 20% of book sales in India in 2018. E-books offer several advantages over traditional books, including cost and convenience.

**Challenges:**

- One of the main challenges is piracy.
- With digital content being easily accessible, it becomes easier for people to illegally download and distribute copyrighted material.
- Another challenge of digital publishing is constant updates and maintenance.
- With so much content available online, publishers need to make sure their content is engaging and eye-catching.

**Conclusion:** Digital publishing has revolutionised how content is created, distributed, and consumed in India. It has opened up new opportunities for publishers, authors, and readers alike. However, some challenges still need to be addressed before it becomes a mainstream publishing mode in India. With the right infrastructure and awareness campaigns, digital publishing can become a game-changer for the Indian publishing industry.

## 9. Use of Technology in Urban Planning

### Introduction:

- Urban planning is the process of both developing and designing open land, urban areas, and the built environment.
- Urban Planning dates back its history since the town and cities have existed. Early city planning revolved around some essential and significant elements like building structures and bastions with fortification, and has experienced a huge change throughout the centuries.
- Urban planning is a many-sided process involving infrastructure like physical and social, utility systems, communication networks, distribution chains, and more. Urban planners, also known as city planners, design cities and create plans for future improvements and growth.
- In the modern era, the rapid boom of Information Technology and Artificial Intelligence has more significant potential to incorporate diverse issues of city planning into a general platform, as well as leading to a better way to deal with the challenges of complexity.
- The use of Information Technology has helped urban planners in many aspects, especially with softwares based on GIS (Geographic Information System).

### Contemporary technologies to aid urban planning:

- There are various urban planning apps that can be used by urban planners, and that use contemporary technologies as well as open data to build up comprehensive and lively spaces for inhabitants and commercial businesses.
- There are various planning tools which help in the urban design process and assist to generate areas that the population of a city needs.
- GIS in urban planning is becoming gradually more helpful over time. With open source data, many open source Various GIS softwares have come up as a free and open-source cross-platform.
- With the help of GIS improved mapping along with locational attributes, this has been possible, which was missing in the earlier drawing and mapping software.
  - GIS is being used in all the Government offices for record keeping, such as property mapping, utility services like water supply and sewerage networks for seeing the coverage of water supply and sanitation system;
  - GIS is also used in network analysis by transport planners in order to analyse the road network, to identify the conflict points at various junctions, to identify the various road hierarchies, etc.
- Urban planners can establish a database to get information about specific metropolitan regions using cloud technologies.
- Cloud computing technologies can also aid in the planning of bigger infrastructure projects.
- Urban planners may use the internet to create cities that are accommodating to distant workers. As a result, urban designs have better transportation alternatives and reduced traffic congestion.

### Internet of Things and Urban Planning:

- Several fundamental IoT tools such as intelligent street lights that automatically turn off to conserve energy are already in use in India.
- Urban planners can create ideas that improve the infrastructure of cities by employing technology to establish self-management strategies to create smarter cities and put more emphasis on growing communities and neighbourhoods.
- Cities achieve more financial stability, independence, and provision of green space this way. These instances demonstrate how technology may be utilised to develop smarter city plans and foster more community participation.
- Technology will also enable urban planners to concentrate more on creating communities, leading to a higher level of municipal self-sufficiency.
- Citizens may participate more actively in the creation of sustainable and environmentally friendly cities in this way.

# KURUKSHETRA MAY 2023 - RURAL CRAFTS

## 1. Potential of Rural Crafts

### Introduction

- India has a rich tradition of crafts that is inherited from generation to generation.
- Rural crafts are also a source of livelihood for many communities in Indian villages.

### Benefits of Rural Crafts

- They provide skill development and entrepreneurship opportunities, thereby increasing income and employment.
- They contribute significantly to the rural economy. It also diversifies the source of income for people in rural areas.
- Rural crafts also attract tourists to India. They encourage rural tourism.
- It will promote rural tourism, which in turn would promote sustainable development by promoting traditional skills, supporting local agriculture and food production.
- It preserves India's rich culture and heritage.
- It can further reduce migration from rural to urban areas.
- They support the "Made in India" ideology and "Aatma Nirbhar Bharat Value".
- They also support exports.

### Government Initiatives

- The Government of India has initiated a rural development plan called **One District One Product (ODOP)** to promote traditional handicraft products in every district of India.
  - It aims to create employment opportunities and enhance the income of rural artisans and entrepreneurs while preserving traditional crafts.
- Another programme is **Linking Textile with Tourism** where the government has identified eight craft villages across the country to promote craft and tourism at a single location.
  - Its aim is to bring together India's heritage through the growing tourism industry.



- Ek Bharat Shrestha Bharat initiative essentially promotes intercultural exchanges and helps travelers in understanding rural India's diversity and rich cultural traditions.
- Moreover, organizations/agencies like Tribes India, Crafts Council of India, Saras (by Ministry of Rural Development), and state emporiums have raised awareness, given the cottage industry bigger markets, and helped them in addressing the present demands.
  - Saras Aajeevika Mela: It is an annual event to promote rural livelihoods and products.
  - Surajkund Crafts Mela: It provides a platform for artisans, craftsmen, and performers to display their skills and creations.
  - Aadi Mahotsav: It celebrates the spirit of tribal culture.
- The government is also boosting handicraft export through the export promotion council, international trade fairs, and exhibitions.

#### EKTA MALL

- Ekta Mall at Statue of Unity, Kevadia, Gujarat is a great initiative in promoting rural craft.
- It offers a platform for local artisans and craftsmen to showcase their skills and sell their products.
- It encourages entrepreneurship among local artisans and attracts tourists and visitors.
- This approach can be emulated in other places also.

#### POCHAMPALLY VILLAGE

- The United Nations World Tourism Organization chose Telangana's Pochampally as the top tourist destination.
- The village is famous for the handloom industry, especially Pochampally Sarees also called Ikat Sarees.
- The Pochampally Handloom Park was established in 2018. It attracts tourists and showcases the history and development of the industry.

## 2. Rural Crafts through Ritualistic and Indigenous Traditions

### Details

- Rural crafts have a strong cultural and religious significance and are rooted in the traditions of communities.
- They have a long and rich history dating back thousands of years. For instance, the earliest evidence of rural crafts is from the Indus Valley civilization, where products associated with pottery, weaving, and metalworking were found.
- In the Mauryan Empire, textiles were promoted with specialized workshops for weaving and dyeing fabrics.

### Shadow Puppetry

- Tholpavakoothu and Tholu Bommalata are traditional forms of shadow puppetry that originated in South India. They use leather puppets that are intricately carved and painted.
- Puppetry is also an integral part of traditions in other parts of India like Kathputli in Rajasthan.



Source: keralatourism.org

### Toys

- Kondapalli toys are believed to have originated in the Vijaynagar empire.
  - The Aryakshatriya community known for their wood carving skills created Kondapalli dolls.
  - During the festival of Sankranti, Kondapalli dolls are used to create a display called Bommala Kovulu.





Source: The Times of India

### Rituals and Traditions in Art and Craft

- Many communities observe certain preparatory rituals before beginning any craftwork. For instance,
  - Kutchi artisans in Gujarat follow the 'Gadhvi' tradition and light a lamp in their workshop singing folk songs and praying for protection and blessings.
  - Madhubani painters in Bihar paint only during the waxing phase of the moon.
  - Before beginning the Kalamkari art of Andhra Pradesh, the artisans fast and purify themselves through ritual bathing.
- Rural crafts also hold importance in places of worship.
- In Sikhism, making of the Chauri is an important craft. It is used to fan the Guru Granth Sahib as a sign of respect and devotion.
- In Jainism, intricate rangolis are highly valued.

### 3. Betting Big on Bamboo

#### Bamboo: Green Gold

- Bamboo is used to make toothbrushes, tableware, furniture, biomass pellets, etc.
- Bamboo is green gold and has unlimited potential in usage and creating eco-friendly products.
- They are eco-friendly and affordable alternatives to plastic, wood, and even aluminum.
- It has excellent structural properties with minimum ecological impacts. It is considered the building material of the future.
- It is a durable and high-quality wood substitute.

#### India's Bamboo Wealth

- India's bamboo wealth is the second largest in the world with approximately 136 species spread across nearly 14 million hectares.
- According to the Forest Survey of India estimates (2021), Madhya Pradesh has the maximum bamboo-bearing area followed by Arunachal Pradesh, Maharashtra, and Odisha.
- According to the National Bamboo Mission, the annual bamboo production in India is 14.6 million tonnes and annual yield varies from 1 to 3 tonnes per ha.
- India exports bamboo and bamboo products to more than 154 countries.
- India is a net importer of bamboo.
- Bamboo industry in India is one of the oldest traditional cottage industries in India.

#### National Bamboo Mission:

- The Department of Agriculture and Farmer Welfare is implementing the re-structured National Bamboo Mission(NBM) from 2018-19.
- It aims to develop complete value chains of the bamboo sector to link growers with consumers including plantation, collection, processing, marketing, skill development, and brand building.
- It is implemented through State Bamboo Missions and Bamboo Technology Support Groups.
- Government has also approved externally aided projects for the development of the bamboo sector in the NorthEast region.
- Moreover, Self Help Groups (SHGs) of women that are traditionally involved in making bamboo products are given priority in skill enhancement and micro-loans disbursement.
- NBM has helped in the bamboo plantation in non-forest farmlands, community lands, arable wastelands, etc.

### Bamboo Products to National and Global Markets

- Reaching out to people in urban centres, especially outside India is a major challenge for rural people.
- Government is promoting the use of gov.in and gem.gov.in portals for marketing and procurement of bamboo products.
- More than 20 Bamboo Mandis have been approved for the promotion and e-trading of bamboo.
- Several states have also launched dedicated websites for online sales of bamboo products.
- Other opportunities in international markets include bamboo charcoal which has a high demand hovering at \$1.5-2 billion. It is growing at the rate of 6% per annum.
- It can also be used in soil nutrition and as a raw material for Activated Charcoal.

## 4. J&K Changing Dynamics of Handicrafts Sector

### Introduction

- Jammu and Kashmir is famous for traditional crafts like shawl, weaving, carpets, paper mache, and copperware.
- The handicrafts sector is a long and integral part of the culture and economy of J&K.
- It is home to the most unique and finest artisans that also provide significant employment opportunities.
- It should be noted that the handicraft sector relies on human labour as the products are usually crafted using hands.
- Handmade items from Kashmir have gained appreciation from all across the world.

### Historical Background

- Shahi Hamdan, a Persian Sufi Saint of the 14th century is credited for making a substantial contribution to the development of handicrafts in J&K.
- He travelled to Kashmir and brought with him various skilled craftsmen from Persia, who introduced new techniques and designs to local artisans.
- The innovative approaches to calligraphy, wood carving, carpet weaving, metalworks, etc are inspired by Persia.
- During the Mughal era, J&K was a significant hub for manufacturing shawls. Mughals were great patrons of art and craft.

### Present Status of Handicraft Industry in Jammu and Kashmir

- The handicraft and handloom industry in Jammu and Kashmir is significantly impacted by Globalization.
- It has reached a global audience.
- The government is taking several initiatives to support artisans.
- There is also increasing use of technology in the sector. Many artisans use online platforms to sell their products and reach a wider audience.
- The government introduced the "Wool Processing, Handloom, and Handicraft Policy 2020" for holistic development of the sector.
  - It aims to implement a multi-faceted approach for the promotion of craft, availability of raw materials, training, infrastructure development, and marketing.
  - It also launches several innovative programmes to assist artisans.
- The Geographical Indication(G.I.) Act was introduced for the purpose of preventing cheap machine-made-fakes from genuine handicraft products. It helps in verifying the authenticity of the products.
  - Some of the new additions in the registered G.I. products from J&K are Kashmir Sozni, Kani Shawl, Kashmir Walnut Wood Carvings, etc.

### Srinagar: UNESCO Creative City

- Srinagar has been included in UNESCO's creative city network for art and crafts.
- Its inclusion has provided it with the opportunity to promote its handicraft on a worldwide scale.
- The Department of Handicraft has also started Crafts Safari to augment and strengthen the handicraft ecosystem.
- The growing interest in sustainable and eco-friendly products has led to renewed appreciation for handmade goods globally.

### E-Commerce Platforms

- It is argued that the rise of e-commerce platforms has tremendously impacted the handicraft industry.
- They help artisans and weavers to showcase their creations to a larger audience.
- It has raised its consumer base and increased its revenue.
- Some of the popular examples of e-commerce platforms are Amazon Handmade, Etsy, Handicraft Mall, etc.

### Startups for Handicraft Industry

- There is a rise of successful startup ventures in J&K that have created a brand for products originating from Kashmir.
  - **Kashmir Box:** It began operation almost a decade ago and is a well-known brand for purchasing products originating from Kashmir.
  - **Kashmir Origin:** It is an e-commerce platform that began in 2019. It is an online boutique for authentic handicrafts and works directly with artisans.
- These startups have not only created employment opportunities but have also helped in reviving some of the dying crafts.

## 5. Rural Crafts for Livelihood

### Introduction

- Rigveda, Ramayan, Mahabharat, Greek historians, etc have mentioned the spinning, weaving, and high-quality cotton and silk in India.
- These materials were traded and exported to different countries in ancient times also.
- It was stated in a paper by Exim Bank (2019) that arts and crafts are a constituent of India's creative economy.
- Craft means an occupation, trade, or activity requiring manual dexterity or artistic skills. They are not only pleasing to the eye but also have utility.

### Importance of Crafts

- It is the backbone of the rural economy and provides employment to many people. It is estimated that there are approximately 200 million artisans in India.
- Once promoted adequately, they can fetch foreign exchange earnings.
- It can give a competitive global advantage.
- It preserves India's rich culture and tradition.

### Challenges

- Handicraft industry is usually an unorganized sector in India's economy.
- Artisans are unable to gauge market dynamics. They have little knowledge to optimize social media outreach.
- There is low penetration of technology in rural areas.
- Inaccessibility of funds and poor institutional framework are other serious issues.
- Despite superior skills, wages are not in accordance with income growth in other sectors.
- According to the Fourth All India Handloom Census 2019-20, 66.3% of the weaver household earns less than Rs 5000 per month.

### Interventions to Boost Handicraft Industry

- The Office of Development Commissioner (Handicrafts), Ministry of Textiles implement schemes like **National Handicraft Development Programme** and **Comprehensive Handicrafts Cluster Development Scheme**.
- Artisans are mobilized under **Ambedkar Hastshilp Vikas Yojana** to provide direct benefits, technology and infrastructure support, marketing support, etc.
- **'Shilp Guru' awards** and **National Awards** are given by the Ministry of Textiles to give recognition to legendary craftsmen for their excellence.
- **TRIFED** is a national apex body under the Ministry of Tribal Affairs. Its main aim is retail marketing development of tribal handicrafts and handloom products.
- Several NGOs like Indian National Trust for Art and Culture Heritage (INTACH) works with craft clusters to develop community-based enterprise.

## 6. Fostering Rural Crafts through One District One Product

### One District One Product (ODOP)

- Based on the agenda of balanced regional development, the central government has implemented the One District One Product scheme.
- It is an augmented version of a Japanese business development concept 'One Village One Product' (OVOP).
  - It was introduced in 1979.
  - OVOP aims to promote localized products and services to improve the standard of living of local artisans.
  - Moreover, it intends for making the presence of local contributions to nation-building.
- The sole purpose of ODOP is to recreate and revive the lost creative products and processes to safeguard traditional knowledge.
- It aims to create a sustainable environment for art and craft products.
- ODOP was first implemented in Uttar Pradesh in 2018. After its success in the state, it was launched in all states and UTs of India.

- It includes both agricultural and non-agricultural products including food grains, food products, handicrafts, handlooms, textiles, etc.
- It will not only help the artisans/craftsmen reach consumers outside India but will also transform their skills into profit-making ventures.
- The ODOP has been merged with the 'District Export Hub' (DEH) of the Directorate General of Foreign Trade.

### Major Goals of ODOP



### List of Art and Craft and Places of Production

Art and Crafts (Products)	Main Places of Production (City / District / State)
Zari (Zardozi Embroidery)	Surat, Bareilly, Varanasi, Agra, Hyderabad, Lucknow, Vadodara, Lathur, Jaipur, Barmer
Carpet	Bhadoli, Varanasi, Mirzapur, Agra, Jaipur, Bikaner, Kashmir, Panipat, Gwalior, Elluru. In states like West Bengal, Uttarakhand, Karnataka, Andhra Pradesh
Rugs and Durries	Agra, Bhadoi, Mirzapur, Jaipur, Panipat, Kashmir, Bhavani, Navalgund, Warangal, Jaisalmer, Barmer. In states Uttar Pradesh, Rajasthan, Haryana, Tamil Nadu, Karnataka, Andhra Pradesh
Textile (Handloom)	Bahraich, Bhuj, Karimnagar, Patan, Varanasi, Nawan, Shaheer, Boudh
Textile (Hand Embroidery)	Lucknow, Barabanki, Unnao, Sitapur, Rae Bareilly, Hardoi, Amethi
Textile (Hand Printing)	Hyderabad, Machalipattanam, Varanasi, Farrukabad, Bagh, Behrorgarh, Indore, Mandas, Burhanpur, Ahmedabad, Rajkot, Kutch, Bagru, Chittroli, Sanganeer, Jaipur, Jodhpur. In states like Andhra Pradesh, Uttar Pradesh, Odisha, Madhya Pradesh, Gujarat, Maharashtra, Rajasthan
Wood (Carving)	Bhopal, Nagpur, Chennai, Madurai, Mysore, Kashmir. State like Manipur
Wood Inlay	Mysore, Bengaluru, Bijnor, Saharanpur. In states like Punjab, Uttar Pradesh, Karnataka
Wood (Turning & Lacquer Ware)	Etikoppaka, Ernakulam, Chennapatna, Chitrakoot, Davangere, Medak, Sankheda, Varanasi
Stone Carvings	Agra, Bhubaneswar, Puri, Jaisalmer, Cuttack, Cuddapah, Bankura, Kanchipuram, Patna, Mysore, Rajkot, Gwalior, Puducherry, Mahanandi
Stone Inlay	Jodhpur, Jaisalmer, Agra. State like Rajasthan
Cane and Bamboo Crafts	Lakhimpur, Bongaigaon, Guwahati, Agartala, Nalagarh. In states like Assam, West Bengal, Odisha, Arunachal Pradesh, Manipur, Arunachal Pradesh, Tripura
Pottery and Clay Objects	Asharikandi, Bulandshahar, Bhadravati, Nizamabad, Pune, Chandrapur. State like Assam
Terracotta	Several parts of India like Pottery
Horn and Bone Work	Lucknow, Moradabad, Sambhal, Sarai Tarin, Honawar, Gajapati, Jodhpur, Thiruvananthapuram. In states like Uttar Pradesh, Odisha, Rajasthan, Kerala
Folk Paintings	In states like Odisha, West Bengal, Madhya Pradesh, Rajasthan, Bihar, Gujarat, Andhra Pradesh
Conch-Shell Crafts	In states like West Bengal, Tamil Nadu
Theatre, Costumes and Puppet	In states like Odisha, Karnataka, Andhra Pradesh, Tamil Nadu, Bihar, Kerala



## Significance of ODOP

Category	Prospect & Benefits
Local/Rural/Community Development	<ul style="list-style-type: none"> <li>● In-situ employment and livelihood</li> <li>● Local empowerment</li> <li>● Better standard of living</li> <li>● Decrease in migration</li> <li>● Rural women empowerment</li> <li>● Grass-root development</li> <li>● Sustainable income source</li> </ul>
Promotion and Preservation of Art, Craft and Culture	<ul style="list-style-type: none"> <li>● Culture based development</li> <li>● Revival of various art and craft</li> <li>● Fostering traditional knowledge</li> <li>● Spreading awareness</li> </ul>
Skill and Training	<ul style="list-style-type: none"> <li>● Skill enhancement</li> <li>● Promotion of localized entrepreneurship and innovation</li> <li>● Community Development</li> </ul>
Nation Building	<ul style="list-style-type: none"> <li>● Promotes tourism</li> <li>● Local to global approach</li> <li>● Export promotion</li> <li>● Reduces inequality and poverty</li> <li>● Ensures inclusive development</li> <li>● Encourages <u>MSME sector</u></li> <li>● Regional and balanced development</li> <li>● Contributes to national income</li> <li>● Contributes to Atma Nirbhar Bharat</li> </ul>

## Challenges

- Poor institutional arrangement
- Lack of Funds
- Inefficient linkages for marketing
- Low adoption of technology
- Lack of marketing skills

## 7. Promotion and Development of Handloom and Handicraft Sector

## Details:

- India has assimilated different cultures and evolved as a stronger and more resilient country.
- The different art forms have evolved as a result of several factors such as availability of raw materials, legacy skill transfer, Environment, local agricultural traditions and religious beliefs
- Some of the examples affected by local factors are:
  - Clay pottery in Gorakhpur (Uttar Pradesh) has grown due to availability of the special type of clay.
  - Kanjeevaram saree have motifs drawn from nearby temples.
  - Bangle making and lacquer industry have grown around lacquer-producing areas in Rajasthan.
  - Pashmina is a goat wool fabric from Ladakh and Jammu and Kashmir.

## Other Details

- The handicraft industry and textile manufacturing were significantly damaged by the arrival of the East India Company in India.
- The production of art and craft declined during British rule.
- It could only survive in places with local needs and support. For instance, brassware and expensive silver decorations like filigree were supported by royal families.
- Some arts were preserved by the passion of the family. For example, the Salvi family of Patan, Gujarat preserved the Patola saree weaving tradition.



# SCIENCE REPORTER - MAY 2023

## 1. Train Ticket to Tomorrow

### Introduction:

- Indian Railways, a cornerstone of India's transportation infrastructure, has undergone remarkable growth and technological advancements since its inception in 1853. With an extensive network spanning over 1,23,236 km, it serves as a lifeline for millions of passengers and plays a crucial role in the country's economic development.

### Historic Milestones

- **Inauguration of the First Passenger Service (1853):**
  - Indian Railways commenced its journey on April 16, 1853, with the inauguration of the first passenger service between Bombay (now Mumbai) and Thane. This marked a significant milestone in India's transportation history, revolutionizing travel and trade across the country.
- **Completion of Major Rail Lines:**
  - Over the years, Indian Railways expanded its network, connecting various regions and enhancing connectivity.
  - Notable achievements include the completion of the Howrah-Delhi and Delhi-Madras rail lines, which contributed to national integration and facilitated the movement of people and goods across vast distances.
- **Introduction of Railway Zones and Divisions:**
  - To streamline operations and management, Indian Railways established railway zones and divisions across the country. This decentralization allowed for better coordination, efficient resource allocation, and improved service delivery.

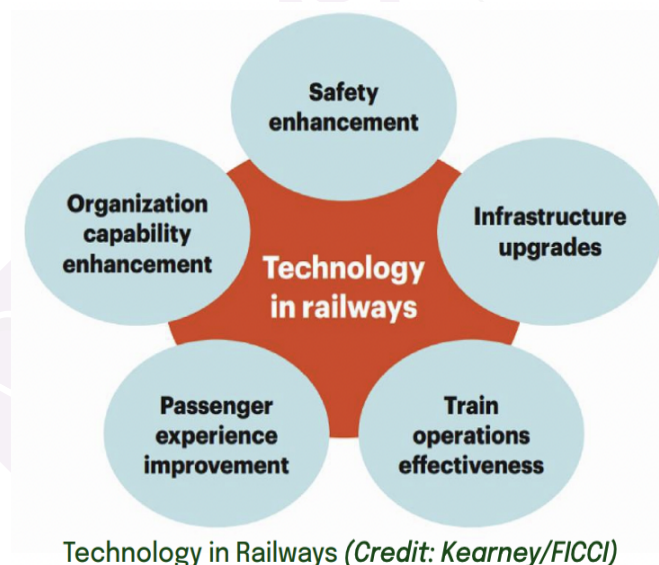
### Technological Innovations

- **Electric Locomotives:**
  - The advent of electric locomotives brought a significant transformation to Indian Railways. The introduction of the first electric train in 1925 between Bombay VT and Kurla marked a shift towards cleaner and more efficient transportation. Today, Indian Railways boasts an extensive fleet of electric locomotives, reducing dependence on fossil fuels and minimizing environmental impact.
- **High-Speed Railways:**
  - Recognizing the need for faster and more efficient travel, Indian Railways has embarked on the development of high-speed rail corridors.
  - The Mumbai-Ahmedabad High-Speed Rail (MAHSR) project, often referred to as the bullet train project, aims to revolutionize intercity travel by operating trains at speeds up to 350 km/h. This initiative demonstrates India's commitment to embracing cutting-edge technology in the railway sector.
- **Dedicated Freight Corridors (DFCs):**
  - To optimize freight transportation and reduce congestion on existing tracks, Indian Railways is constructing dedicated freight corridors.
  - The Eastern and Western DFCs, spanning over 2,800 km combined, will provide exclusive train tracks for freight trains, enabling faster and more efficient movement of goods across the country.



### ● Digitization and E-Governance:

- Indian Railways has embraced digitization and e-governance to enhance passenger experience and operational efficiency. Initiatives such as the Indian Railways Catering and Tourism Corporation (IRCTC) online booking system, the Railways Reservation Enquiry System (NTES), and the integrated e-procurement system have simplified processes, reduced paperwork, and improved transparency.



### Green Initiatives

- In line with global environmental concerns, Indian Railways has implemented several green initiatives. Using bio-toilets in trains, solar power installations at railway stations and office buildings, and adopting renewable energy sources demonstrate the commitment to sustainable practices.
- Such initiatives not only reduce carbon emissions but also promote a greener and cleaner future.

### Conclusion:

- Indian Railways has played a vital role in shaping India's development journey, connecting people, cultures, and economies across the country. From its historic milestones to technological innovations, Indian Railways continues to evolve and adapt to the changing needs of its passengers and the nation. As India moves towards a sustainable and technologically advanced future, Indian Railways stands as a shining example of innovation, efficiency, and inclusivity in the realm of transportation.

## 2. Killer Kitchens: Deleterious Impacts of Biomass Fuels

### Introduction:

- There is a significant health burden faced by women and children due to toxic fumes emitted by traditional cooking stoves fuelled by solid fuels. It emphasizes the need to address this issue and provides insights into the double burden of air pollution experienced by the poorest households in India.

### Health Risks of Traditional Cooking Stoves:

- The use of open-fire traditional cooking stoves, known as chulhas, fuelled by solid fuels leads to the release of smoke, causing indoor air pollution. This smoke, equivalent to 400 cigarettes every hour, poses severe health risks to women and children.
- The toxic fumes contain various pollutants such as particulate matter, carbon monoxide, nitrogen monoxides, and polycyclic aromatic hydrocarbons, which contribute to chronic obstructive lung diseases, lung cancer, cataracts, strokes, and ischemic heart disease.

**Table 2: Trends of solid fuel or Biomass energy use across India**

States/UTs	NFHS-3 (Percentage of households)	NFHS-4 (Percentage of households)
Andhra Pradesh	66.3	38
Assam	75.8	74.9
Bihar	89.7	82.2
Chandigarh	86.7	NA
Goa	38.3	15.9
Haryana	69.1	47.8
Jharkhand	89.1	NA
Karnataka	63.8	45.3
Madhya Pradesh	80.3	70.4
Maharashtra	48.1	40.1
Manipur	64.7	57.9
Meghalaya	78.9	78.2
Nagaland	76	NA
Odisha	88.6	NA
Rajasthan	77.2	NA
Sikkim	52.4	40.9
Tamil Nadu	60.5	27
Tripura	80.4	68.1
Uttar Pradesh	81.7	
Uttarakhand	61.7	49
West Bengal	79.2	72.1

### Disproportionate Exposure to Ambient Air Pollution:

- The poorest households in India not only face indoor air pollution caused by traditional cooking stoves but also suffer from disproportionate exposure to ambient air pollution. Affluent urban households with higher consumption emissions per capita contribute to this burden.

### Impact on Women's Health:

- Women, particularly in the age group of 30-50 years, experience chronic lung diseases due to prolonged exposure to cooking stove heat.
- They also face adverse pregnancy outcomes, including stillbirths, neonatal deaths, low birth weight, and an increased risk of cancer and eye problems.
- The health risks associated with domestic smoke pollution severely affect women during their most productive years.

**Impact on Children's Health:**

- Children are highly vulnerable to indoor smoke pollution due to factors such as immature respiratory defence mechanisms, higher oxygen demands, increased respiration rates, and smaller airway diameters.
- Exposure to indoor air pollution from solid fuels is responsible for a significant number of children's deaths from acute lower respiratory infections.
- It has been linked to stunting, which adversely affects mortality, cognitive and motor development, and educational outcomes.

**Environmental and Socioeconomic Implications:**

- The reliance on traditional biomass-based fuels for cooking and energy needs leads to forest degradation, unsustainable fuelwood harvest, and significant greenhouse gas emissions.
- Inadequate access to clean and affordable energy sources contributes to a lower quality of life, particularly in developing countries like India.

**Government Initiatives and Challenges:**

- Efforts to improve cookstove designs and reduce indoor air pollution have shown limited progress.
- The National Biomass Cookstoves Initiative (NBCT) launched in 2009 has approved various cookstove models, but their effectiveness in reducing indoor air pollution needs further evaluation.
- The government's flagship scheme, Pradhan Mantri Ujjwala Yojana (PMUJ), aims to provide LPG connections to 80 million households. However, challenges such as affordability, logistical difficulties, and resistance to change hinder the widespread adoption of clean cooking solutions.

**Conclusion:**

- The health burden faced by women and children due to traditional cooking stoves fuelled by solid fuels is a critical issue. There is importance of promoting cleaner cooking solutions, improving access to clean and affordable energy sources, and raising awareness about the health impacts of indoor air pollution. Addressing these challenges is crucial for mitigating health risks and improving the well-being of vulnerable populations.

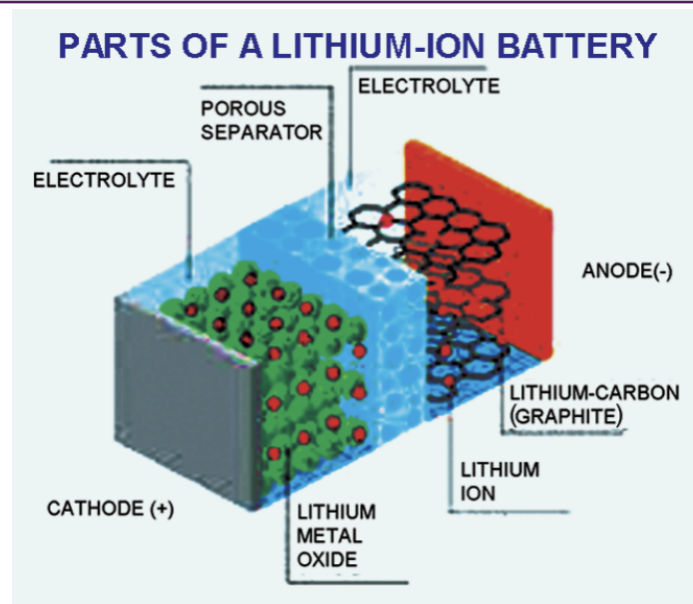
### 3. Lithium: White Gold of Energy Storage

**Introduction:**

- The global objective of achieving zero emissions to combat climate change has prompted countries to adopt time-bound targets. European nations have set their sights on 2050, while China and India have opted for 2060 and 2070 respectively.
- To achieve these goals, a significant reduction in greenhouse gas emissions, particularly from carbon-intensive fossil fuels, is crucial. The lithium-ion battery has emerged as a promising solution, finding applications in various sectors such as medicine, electronics, space, and transportation.

**Rise of Lithium-Ion Batteries:**

- Electric Vehicles (EVs) powered by lithium-ion batteries accounted for 14% of global passenger vehicle sales in 2022, with an expected increase to 25-36% by 2030.
- India, too, is accelerating its adoption of lithium-ion batteries, projected to grow at a compound annual growth rate of 23.7% by 2028. This growth aligns with the Indian government's ambitious plan for EV penetration in the automobile industry.



#### India's Breakthrough:

- India has made significant strides in the lithium-ion battery industry, with the Indian Space Research Organization's Vikram Sarabhai Space Centre developing lithium-ion cells for satellites and launch vehicles.
- The technology transfer of this development to domestic manufacturers will pave the way for establishing battery cell production facilities in India.

#### Lithium Availability:

- The limited availability of lithium poses a challenge for expanding the lithium-ion battery industry. The major lithium deposits globally are found in Bolivia, Argentina, the US, Chile, and Germany.
- India recently joined this list with the Geological Survey of India announcing the discovery of 5.9 million tonnes of inferred lithium resources in Jammu and Kashmir. This discovery could significantly enhance India's domestic metal demand, reducing dependence on imports.

#### Significance of Lithium:

- Lithium, known as the "White Gold" of energy storage technology, is a scarce resource on Earth. It is formed through stellar explosions and distributed throughout the galaxy. Its properties, such as being the lightest among metals and highly reactive, make it ideal for energy storage applications.
- Lithium compounds have diverse industrial applications, including heat-resistant glass, ceramics, alloys, and lithium-ion batteries.

#### Advantages of Lithium-Ion Batteries:

- Lithium-ion batteries offer advantages such as lightweight, higher energy density, and storage capabilities for renewable energy sources like solar and wind.
- These batteries have revolutionized electronic communications, computing, and digitization, as well as powering electric vehicles. The reversible reduction of lithium ions in these batteries enables efficient energy storage.

#### Nobel Prize-Winning Development:

- Stanley Whittingham, John Goodenough, and Akira Yoshino were awarded the 2019 Nobel Prize in Chemistry for their contributions to lithium-ion battery development. Their work in the 1970s and 1980s led to the creation of functional and powerful lithium-ion batteries that are widely used today.

#### Challenges

- Despite the promising prospects, there are challenges to overcome. Extracting lithium from hard rock mining involves significant water consumption and carbon emissions.
- The seismic sensitivity of the mining area in Jammu and Kashmir raises concerns about potential environmental and social consequences. India may need technology transfer from South American countries, such as Bolivia, Chile, and Argentina, which have robust regulatory frameworks for lithium mining.



**Conclusion:**

- India's discovery of lithium reserves in Jammu and Kashmir is a significant development in the quest for self-sufficiency in energy storage. The growth of the lithium-ion battery industry will help India achieve its ambitious targets for EV penetration and reduce dependence on imports.
- Addressing environmental and social concerns associated with lithium mining requires the adoption of sustainable practices and knowledge sharing with countries experienced in lithium extraction.
- The revolution in lithium-ion battery technology holds immense potential for clean energy and sustainable development in India.

**4. Tardigrades****About Tardigrades:**

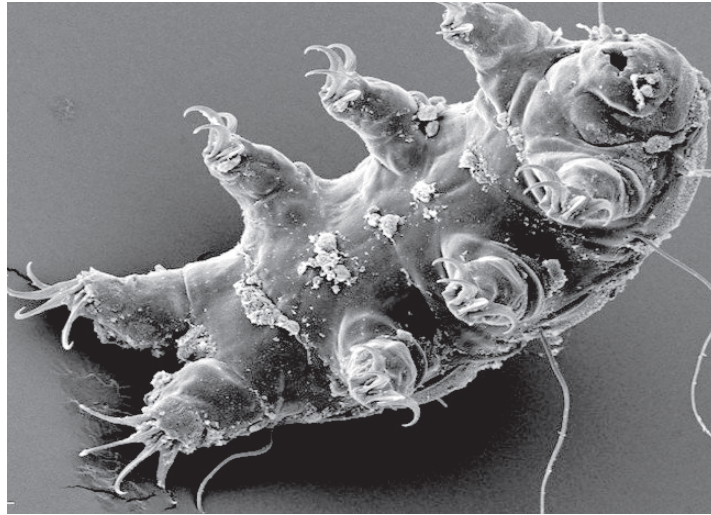
- An organism gifted with the ability to adapt to various types of environments is the tardigrade. **It was first described in the year 1773 by JAE Goeze.**
- **Discovered almost 230 years ago**, till now, 900 species of this animal have been found living on different lands, freshwater lakes and seas.
- Tardigrades are also called 'Water Bears' as they look like miniature bears living in water and 'Moss Piglets' as on land, they are mostly found in various types of mosses.
- **Structure:**
  - Under the microscope, tardigrades look like small gummy bears, having plumpy segmented bodies. They have four pairs of legs each having four to eight claws. The limbs are used for locomotion and grabbing lichens and mosses.
  - Most tardigrades have a body **length ranging from 40- 1200  $\mu\text{m}$  (juvenile - adult)** but despite their microscopic size, the internal organisation of tardigrades is complex like in larger animals.
  - Their mouth parts have sharp and slurping feeding apparatus that is utilised for sucking food from bacteria, cyanobacteria, protozoans, microalgae, fungi and plants to other smaller invertebrates (like nematodes, rotifers, and other tardigrades).
- **Reproduction:** Tardigrades reproduce sexually as well as asexually. They are oviparous and fertilisation is mostly external.
  - Smooth or complex foetal membrane covers the eggs laid by female tardigrades, or placed inside an old exuvia (cast cuticle – e.g., telluric Echiniscoidea and many eutardigrades).



**Image: tardigrade's long gut (gray) and ovary above (yellow)**

**Source: livescience.com**

- **Distribution:** Apart from fresh water and sea water, scientists have found them in the hot-springs, on top of the higher mountain ranges, and even metres deep inside layers of solid ice.
- **Lifespan:** Tardigrades live between one year to one and half years. They also shed approximately 12 times in their lifespan and reach sexuality after two or three times of exfoliation.



Source: science reporter

#### What gives them the exceptional ability to adapt to extreme conditions?

- When the environment dries up around them, that is “Anhydrobiosis”, a form of “Cryptobiosis” (life without water), they go into deep sleep, almost lifeless.
- Trehalose (a sugar) replaces itself with the water lost, and the tardigrades form themselves into a shrunken round structure known as “tun”.
- The metabolic rate decreases to 0.01% from normal. It takes a few minutes or maybe hours for a tardigrade to get active again during favourable conditions, depending upon how long they have been in an inactive state.
- Tardigrades can also survive any extreme temperature, dehydration and radiation conditions even in space. A strain of Tardigrades even uses fluorescence and glows brightly to survive UV radiations.

#### Research on Tardigrades:

- Researchers have also performed many experiments to test the strength of Tardigrades.
  - In one such experiment, they loaded a freshwater species of Tardigrade known as *Hypsibius dujardini* inside a bullet with gun powder and fired it at specific targets. The Tardigrades were not affected.
- Tardigrade species have even survived space travel during their anhydrobiosis. *Paramacrobiotus richtersi* species were made to float in low-earth orbit for about 12 days. They had a high survival rate (approx. 95%) and no damage was seen in their DNAs.
- Takekazu Kunieda, a molecular biologist from Tokyo, sequenced the genome of the tardigrade species *Ramazzottius varieornatus*, a well-known stress-tolerant species and revealed that a protein known as Dsup (contraction of damage suppressor) prevented the DNA from damage due to dehydration.

#### Significance for humans:

- Tardigrades may provide important insights into improving stress tolerance in humans.
- The genetic treasure that the Tardigrade genome represents is already under exploration and might lead to further advancements in medical and space science.

# DOWN TO EARTH - MAY 2023

## 1. A silent crisis

**Context:** Recent studies have indicated that prolonged undernutrition alongside a heavy reliance on rice, might be fuelling diabetes among tribal population in Bilaspur, Chhattisgarh.

### More on the news

- Every other household of the Gond community in the region is affected by lean diabetes.
- District's health office data shows about a thousand new cases of diabetes and hypertension patients between April 2022 and February 2023.
- Ironically, non-communicable diseases (NCDs) like diabetes have so far been believed to be rare among these communities.
- The Union Ministry of Health and Family Welfare data show that the deaths due to ncds rose from 37 per cent in 1990 to 61 per cent in 2016.
- A study by Jan Swasthya Sahyog (JSS), a public health initiative in rural Chhattisgarh, showed that over 70 per cent had a body mass index BMI less than the ideal 18.5.
- Men have an earlier onset than women in general for NCDs in tribes.

### What is lean diabetes?

- It is a condition of dual stress of intermittent starvation and overload on carbohydrate metabolism.
- The prevalence of lean diabetes in the country could be as high as 23 per cent.
- **Its characteristics include:**
  - Onset of diabetes before the age of 30 years
  - A bmi lower than 18 kg per sq m
  - Absence of ketosis (metabolic state that occurs when your body burns fat for energy instead of glucose) on withdrawal of insulin.
  - A poor socio-economic status
  - History of childhood malnutrition and rural origin.
- According to the fifth National Family Health Survey (NFHS) for 2019-21 only 11.3 percent of all children between 6-23 months receive an adequate diet.
- Moreover, about 36 per cent, 19.3 percent and 32.1 percent under-five children are stunted, wasted and underweight respectively.

### The Rice factor

- Rice being a high glycemic index dietary element has been associated with the onset of diabetes.
- Poor tribals consume rice in multiple ways and times everyday.
- It is considered an unintended consequence of the Green Revolution followed by food security policy.
- The easy supply from the public distribution system has also aggravated the situation.
- The National Nutrition Monitoring Bureau (nnmb) survey has also shown that nutritional diversity among tribals has decreased over the past decades.
- Millets, fruits and vegetables intakes declined and marketed food items are being increasingly used leading to protein-vitamin deficiencies.

### Lifestyle shift

- Lesser physical activity, introduction of machinery, reducing agricultural labour, has made the tribal population more vulnerable to a host of ncds.
- The tribal lifestyle altered by diabetes makes the patient weaker and unable to be physically active.

### Role of social inequity

- Lack of awareness and social inequalities add up to the already prevalent health issues.
- Although rural India has seen a marked rise in income and material resources, it cannot reap the benefits due to socio-economic inequalities.

### Way forward

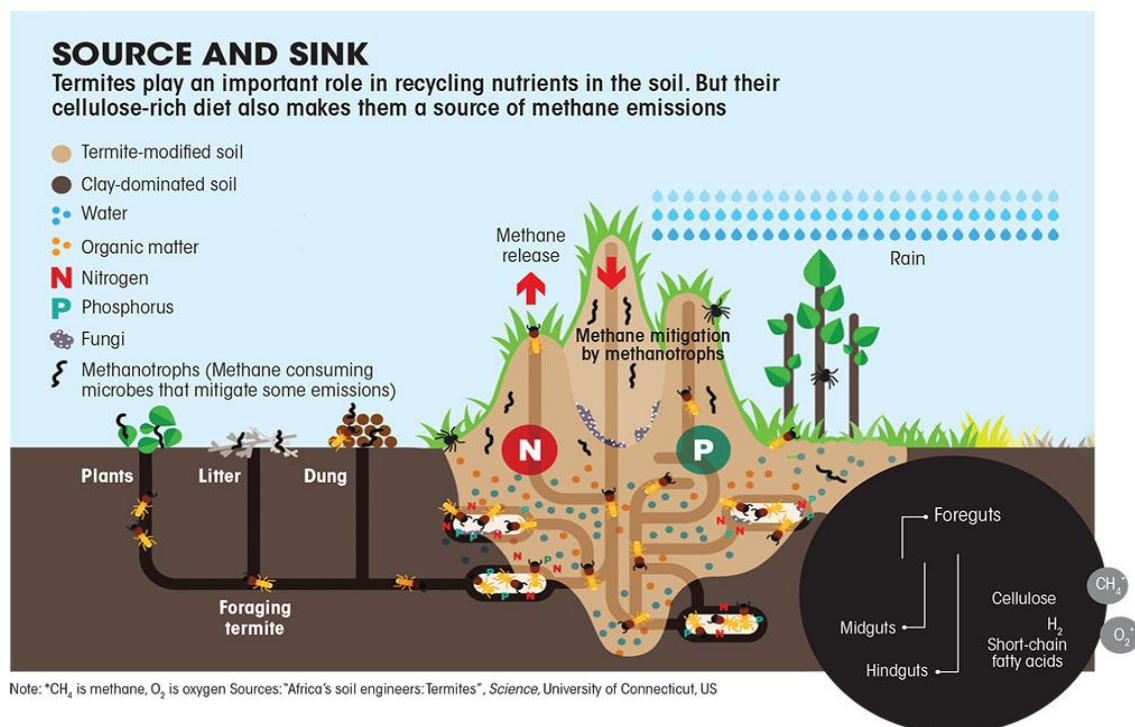
India needs to look beyond the entire healthcare model revolving around acute care. Although investment in the role of physicians, hospitals and asha workers has shown benefits, what is required by chronic care are good data systems, decentralised care and establishing other non-medical approaches like peer support groups.

## 2. Potent Emitter

**Context:** Although termites are a major source of methane emissions, determining the risk posed to global warming by these tiny creatures is fraught with uncertainty.

**More on the report**

- Termites are small insects, who live in the mounds as colonies of 60,000-200,000.
- They are found in almost every tropical forest, grassland or warm, humid and wooded area.
- They contribute about 1-3 percent of global methane emissions every year.
- About 10-15 percent of 3,000 termite species identified globally are categorised as pests.
- Methanogenic microorganisms in the gut of termites break down the cellulose and release methane.
- Interestingly, they also release a group of bacteria consuming methane in mounds.
- Therefore, the balance between the two gives the net addition to the methane pool.
- Global Carbon Project, in Global Methane Budget published in 2020 estimated that in 2008-17, about 576 Tg (1 Tg or teragram is equal to  $10^{12}$  g) of methane was emitted per year
- Termites contributed 9 Tg, says the Other estimates put the emissions at 2-15 Tg per year.



Source: DTE

**Difficulties in estimation**

- There are practical challenges in exact calculation of emission data from termites.
- Their habits and habitat, composition of mounds made, climatic factors influence the data collection.
- Different species of termites and even the same species from different habitats have shown varied emissions levels.

**Conclusion**

Since there is a lack of abundant research and verifiable data from different regions and species, the calculations remain mere approximations. However, the insects being a potent and natural source as well as sink of methane provides us with enough reasons to explore more about the mysteries and maintain ecological balance.

### 3. Rise of Fungus

#### Why in the news?

Recently, a first of its kind of a case was reported from Kolkata wherein *Chondrostereum purpureum*, a fungus that causes silver leaf disease in plants, caused disease in a human. Such cross-kingdom human pathogens, and potential plant reservoirs, have important implications for emergence of infectious diseases.

#### What is fungus?

- They are among the first complex life forms on land and have been around for probably more than a billion years.
- They helped evolution on land by dissolving mineral-rich rocks and secreting carbon-based organic acids.
- They converted barren lands into fertile, carbon-rich soils.
- They are called master decomposers and help maintain ecological nutrient balance.

#### Relationship with Plants and Humans

- Over 90% of land plants share a symbiotic relationship with a variety of fungi species.
- They are associated with plant roots wherein they help in absorbing nutrients and in turn plants provide them with food for survival.
- In humans, they form a commensal association.
- They live on human skin, in mucosal surfaces such as the oral cavity and vagina and in the gut.
- They assist in digestion and training the immune system and its responses.

#### Applications

- The vast array of bioactive chemical compounds they produce for almost everything—food (bread, cheese and wine), fuels (ethanol and biogas), pest control (herbicides, pesticides) and antibiotics.

#### Habitat

- They can be found from stratosphere to the bottom of the dead sea, from Antarctic glaciers to torrid deserts, from the gut of flies to deep oceanic sediments.
- From an estimated 6 million species of fungi, we have so far identified only about 150,000 species.

#### Infection potential

- So far, only about 600 fungal species have been found to cause disease in human beings at least once.
- Whereas, about 50,000 fungal species can cause diseases in insects and up to 270,000 can infect plants.
- The fungal kingdom thrives at ambient temperatures found in nature.
- The normal body temperatures of humans and other mammals are too high for most fungi to invade.
- Therefore, fungi that cause athlete's foot, ringworm, and other skin problems are often found outside of the body.
- Fewer species thrive inside the body under normal conditions.

#### Increasing threats from fungi

- They are fast acquiring traits to overcome our immune system's barriers.
- Recent reports show that invasive and chronic fungal diseases are particularly on a dangerous rise.
- In October 2022, the World Health Organization (who) considered fungal pathogens a "major threat" to public health.

#### Opportunists in modern world

- Medicines including Immunosuppressants, persistent HIV infection and diabetes load are helping fungi thrive.
- Organ transplants, chemotherapy and radiation make patients immunocompromised for brief or extended periods.
- Similarly, diabetic patients having high blood glucose levels provide a fertile ground for fungi to grow.
- The cases of black fungus causing mucormycosis in India showed similar patterns in recent years.

#### Shape-Shifting In a Warming World

- Fast adapting to the higher temperatures, fungi species are becoming pathogenic.
- They are also exhibiting resistance to our limited arsenal of drugs.
- There are only four classes of antifungals—Azoles are the most commonly used class and essentially inhibit fungal growth.
- But overuse of Azoles are making them resistant.
- Nearly two million deaths every year are caused worldwide due to fungal infections.



### Lack of Knowledge and Resources

- India, which probably has the highest load of fungal infections, has just nine mycology laboratories; every state needs at least one.
- Reports say that over five million people, or 4.1 per cent of the country's population, suffer from a serious fungal disease.

### Strengthen Coordination

- Over 80 per cent of patients can be saved if specialized diagnostics and antifungals were available across the country.
- The immediate goal should be to strengthen existing antifungal therapies by preventing further resistance, (enhancing) efficacy and (minimizing) toxicity.
- Fungal infections receive less than 1.5 percent of all infectious disease research funding which is another roadblock.

### Growing Concerns

- The resistance to popular and effective antifungal drugs pose another threat.

There are signs of disease-causing fungal species developing resistance to the eight antifungal agents used across the world to treat infections

ANTIFUNGAL	ROUTE(S)	PRIMARY INDICATIONS	RESISTANCE CONCERNS
Griseofulvin	Oral	Tinea corporis and capitis	Some clinical resistance described
Fluconazole	Oral, Intravenous	Mucosal candidiasis, prophylaxis in leukaemia, HSCT and intensive care, treatment and maintenance therapy for cryptococcosis	All moulds, including <i>Aspergillus</i> , resistant. Lower response rates for endemic mycoses such as histoplasmosis. All <i>Candida auris</i> and <i>Candida krusei</i> strains resistant—some other species less susceptible or resistant
Amphotericin B	Intravenous, topical	Invasive candidiasis and cryptococcal meningitis, endemic fungal infections. Empiric therapy in febrile neutropenia. Lower response rate for invasive aspergillosis than azoles	<i>Aspergillus terreus</i> and <i>nidulans</i> resistant. Some strains of <i>Candida auris</i> resistant. Several intrinsically resistant fungi
Flucytosine	Oral, Intravenous*	Cryptococcal meningitis, neonatal candidiasis and <i>Candida</i> endocarditis and endophthalmitis, other rare fungal infections	Low levels of resistance in <i>Candida</i> and <i>Cryptococcus</i> . <i>Aspergilli</i> and most moulds and endemic fungi resistant
Itraconazole	Oral, Intravenous*	All skin infections, all forms of aspergillosis, endemic fungal infections, mucosal candidiasis, prophylaxis in leukaemia	Rising problems with resistance in <i>Aspergillus fumigatus</i> , <i>flavus</i> and <i>niger</i> . Some cross resistance with fluconazole in <i>Candida</i>
Voriconazole	Oral, Intravenous	Invasive and chronic aspergillosis, some rare moulds	Some azole cross resistance in <i>Aspergillus</i> . Mucorales intrinsically resistant
Natamycin 5%	Topical, eye	Fungal keratitis	Most effective agent, but some rarer fungi resistant, probably
Echinocandins (micafungin, caspofungin, anidulafungin)	Intravenous	Candidaemia, invasive candidiasis, invasive and chronic pulmonary aspergillosis, prophylaxis	Most effective agent for most <i>Candida</i> infections, notably the majority of <i>Candida auris</i> strains. Less effective than azoles for aspergillosis.



#### ***Cryptococcus neoformans***

Inhalation of this yeast that lives in the environment causes cryptococcosis, a fatal lung infection. It leaves patients severely immunocompromised.



#### ***Candida auris***

Contact with this globally distributed yeast causes life-threatening invasive candidiasis of blood, heart, central nervous system, eyes, bones and internal organs.



### ***Pneumocystis jirovecii***

This globally distributed fungus causes pneumonia, a lung infection transmitted by air or person to person



### ***Paracoccidioides* species**

These dimorphic fungi are endemic to Central and South America. Inhalation or penetration of skin by spores infects lungs, mucous membranes and skin.



### ***Aspergillus fumigatus***

Contact with this globally distributed mould leads to aspergillosis, causing a range of infections from allergies to invasion of organs and systems.



### ***Candida albicans***

This globally distributed yeast is a common part of healthy human microbiota. However, it can multiply in mucous membranes and cause life-threatening candidiasis.



### ***Nakaseomyces glabrata***

Also called *Candida glabrata*, this globally distributed yeast is a leading cause of candidiasis, second only to *Candida albicans*.



### ***Histoplasma* species**

These are globally distributed and live as mould in the environment and as a yeast-like form at human body temperature. They affect the lungs and central nervous system.



### ***Eumycetoma* causative agents**

These include fungal species living in soil and water. They cause Eumycetoma, a deep tissue infection that especially affects the poor.



### ***Mucorales***

This is a group of globally distributed moulds. Inhalation of spores causes mucormycosis in lungs and sinus and can affect eyes, central nervous system and gastrointestinal tract.



### ***Fusarium* species**

This group of globally distributed moulds occurs mostly in tropical regions. They cause invasive disease (invasive fusariosis), mainly in the respiratory system and the eyes.



### ***Candida tropicalis***

Like some other *Candida* species, this globally distributed yeast is a part of healthy human microbiota but has potential to cause invasive candidiasis of the blood, heart and other organs.



### ***Candida parapsilosis***

This globally distributed yeast is a part of healthy human microbiota that can cause candidiasis, particularly in immunocompromised patients.



### ***Scedosporium* species**

These are globally distributed opportunistic moulds causing invasive and potentially deadly infection (scedosporiosis), of the respiratory system and other parts of the body.



### ***Lomentospora prolificans***

This is a globally distributed opportunistic mould causing invasive and usually deadly infection (lomentosporiosis) in the body.



### ***Coccidioides* species**

This is a group of highly virulent fungi distributed in the Americas. They live as moulds in the environment and cause a life-threatening infection (coccidioidomycosis) when inhaled.



### ***Pichia kudriavzevii***

Also called *Candida krusei*, this globally distributed opportunistic yeast is common in the human microbiota. It can invade mucosae and cause candidiasis of multiple systems.



### ***Cryptococcus gattii***

This is a globally distributed yeast primarily found in tropical and subtropical areas. Inhalation of spores can cause cryptococcosis.



### ***Talaromyces marneffei***

This dimorphic fungus is endemic to Southeast Asia and some areas of China. Spore Inhalation affects lungs, central nervous system and blood.

## Way forward

While fungi are an integral living part of this planet and help human beings in many ways, the need of the hour is to generate public awareness about the plethora of fungal infections that can be fatal for human beings as well. At the same time, an increased level of research and funding and treatment facilities needs to come up in significant numbers across the nation. The larger problem of pathogen resistance promoted by drug misuse and climate change would need careful planning to maintain a sustainable balance in the ecosystems.

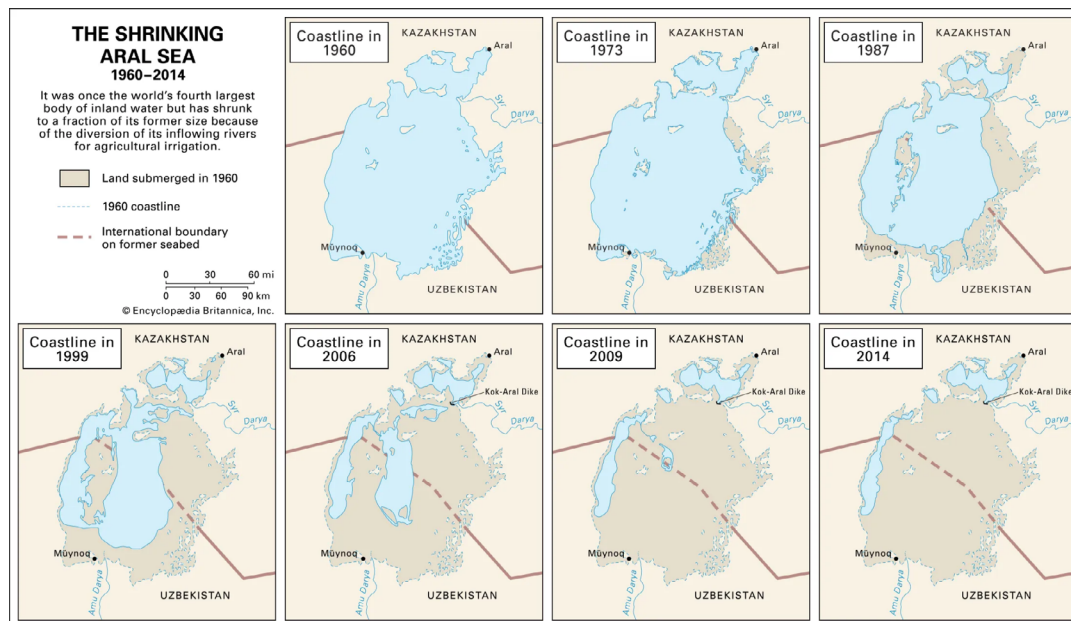
## 4. Will the Aral Sea ever come back?

**Context:** The article highlights how the excessive use of water from the Aral Sea for irrigation of cotton and rice fields in Central Asia reduced its volume dramatically and led to an increase in salt concentration.



Source: Research Gate

## Key points



Source: Britannica

- The watershed of the Aral Sea is shared among five nations-Turkmenistan, Kyrgyzstan, Tajikistan, Kazakhstan and Uzbekistan.
- During the past four decades environmental pollution and economic policies in the region has led to the virtual drying up of the Aral sea.
- Amu Darya and Syr Darya are the two important feeder rivers of the Aral sea.
- The river waters upstreams were diverted to Central Asian steppes to cultivate cotton and rice.
- The Soviet's plan to compensate for the water loss by diverting Siberian rivers met with vehement protest from the locals and could not see the light of the day.
- The total volume of water in the Aral Sea is now a quarter of what it used to be while the salt concentration has increased.
- The World Bank had predicted that with the current trend, the Aral sea will disappear in 20 years time.

## 5. Homeless Hilsa

**Context:** The article highlights the plight of Hilsa fish due to silting, dams and pollution leading to shortage and also loss of varieties in the Indian and Bangladesh rivers.

### Key Points

- Hilsa is an anadromous fish which lives most of its lifetime in the seawater but for spawning it comes back to freshwater sources.
- Due to lesser volume of freshwater being added in the dry seasons, Hilsa is forced to go deeper in the sea.
- Construction of the Farakka barrage in northern Bengal in 1975 led to gradual decline of water in Padma river of Bangladesh.
- Pollution from industries situated in Sylhet district and other coastal areas of Bangladesh further led to species loss from once 70 to 10.
- A ban on jatkhilsa or *Tenualosa ilisha* (juveniles) fishing was introduced to increase the population of Hilsa.

### About Hilsa fish

- Hilsa (*Tenualosa ilisha*) is an anadromous fish belonging to the Clupeidae family.
- Hilsa is a very popular and one of the most sought-after food fish in the Indian Subcontinent, and is also the national fish of Bangladesh.
- The world famous Hilsa fish is found in the Padma River Bangladesh.
- Extant geographical location: Bangladesh; India; Iran, Islamic Republic of; Iraq; Kuwait; Malaysia (Peninsular Malaysia); Myanmar; Oman; Pakistan; Qatar; Saudi Arabia; Sri Lanka; Thailand; United Arab Emirates; Vietnam.
- IUCN Red list Status: Least Concern



## 6. Are we there yet?

**Context:** The archive article highlights the status of the PM's dream goal of "doubling farmers' income by 2022.

### Key Highlights

- Doubling farmers' income by 15th August 2022 was announced as a cherished dream by the Prime Minister during a farmer rally in Bareilly, Uttar Pradesh.
- However, the government's own data says that agricultural growth is nowhere close to realising that dream.
- The Economic Survey 2019-20 showed the annual growth rate of agriculture and its allied sectors in real terms was 2.88 per cent between 2014-15 and 2018-19.
- The estimated growth rate in 2019-20 was 2.9 per cent.
- In 2017, Indian Council of Agricultural Research (icar) decided to adopt and develop two villages in each district of the country as models.
- Other villages in the country were to be developed on the same lines by the respective state governments by observing the model villages.
- However, the surveys showed that none of the villages adopted by the Krishi Vigyan Kendras could come even close to achieving the targets.



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