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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  
Annot Sher Singh Bedi



Rank 5  
Abhilash Mishra



Rank 12  
Tejaswi Rana



Rank 30  
Prabhash Kumar



Rank 32  
Avdesh 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

- 1. POLITY ..... 12-25**
  - The role of Parliamentary Committees
  - The rules for recognition as a national party
  - 9th schedule
  - Pending Bills, the issue of gubernatorial inaction
  - On defamation law: a blow against freedom of speech and expression
  - Media One case - A judgment that upholds the Constitution
  - Transfer of cases
  - Misuse of Detention Powers
  - A reminder about unfettered constitutional posts
  - Nagaland's municipal tightrope
  - cVIGIL App
  - Mahanadi Water Disputes Tribunal
  - Marker of democracy made in Mysuru: unit from royal era turns out indelible ink
  - Vacancies of judges remain high, cases pile up: India Justice Report
  - Political leaders cannot claim higher immunity: SC
- 2. ECONOMY ..... 26-46**
  - Interchange fee on UPI
  - Foreign Trade Policy 2023
  - Smart Cities Mission
  - Vibrant Villages Programme
  - SEBI – new measures
  - In controlled digital lending, the issue of public interest
  - Poor testing of pashmina shawls still poses a problem
  - Dabba Trading
  - The EU's new crypto-legislation
  - Virtual digital assets
  - Wheat blast
  - Mircha rice
  - Chinese dual-use infrastructure facilities in Myanmar and Sri Lanka
  - Future of nuclear power
  - Baba Saheb Ambedkar Yatra
  - Not by Vande Bharat alone
  - Welfare of gig workers
  - Digital Highways
  - India, Malaysia move beyond dollar to settle trade in rupee
- 3. INTERNATIONAL RELATIONS ..... 47-68**
  - Understanding the Russia-Belarus nexus
  - Bhutan PM Visits India
  - No 'sayonara' for Japan in Indo-Pacific geopolitics
  - India-Armenia Relations
  - India-UAE food security partnership
  - What is behind China's renaming spree?
  - A crucial six months for India-U.S. ties
  - Political situation in South Asia
  - Finland joins NATO bloc
  - The demand for Scottish independence
  - Japan on Russian Oil
  - Saudi Arabia's quest for strategic autonomy
  - Yemen War
  - Sudan Crisis
  - The Wagner group's actions in Africa
  - Why have key oil producers vowed output cuts?
- Stockholm Agreement
  - Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)
  - World Food Programme: India to send wheat to Afghanistan
  - Philippines allots 4 more military bases to U.S. troops
- 4. ART AND CULTURE ..... 69-71**
  - Kashi-Tamil Sangamam, Saurashtra-Tamil Sangamam and Kedarnath-Tamil Sangamam
  - No idols, no arms: the Pattanam mystery
  - Bihu Dance
  - Bhoota Kola
  - India to bridge language gap with neighbours
- 5. SCIENCE AND TECHNOLOGY ..... 72-91**
  - Open-Source Seeds Movement
  - Indian Space Policy-2023
  - Second Space Age
  - Union Cabinet approves LIGO-India
  - Large Hadron Collider
  - India's semiconductor mission might need a compass
  - The Bharat 6G vision document
  - Directing AI for better and smarter legislation
  - Third-gen Web
  - Genome sequencing and the Genome India Project
  - Omicron variants evolve strategies to evade T cell immunity
  - Magnetoresistance: one more thing graphene does differently
  - The ambiguities in the nuclear liability law
  - ISRO's Reusable Launch Vehicle
  - PSLV-C55 mission and TeLEOS-2
  - Jupiter Icy Moons Explorer (Juice)
  - YZ Ceti b
  - Zero Shadow Day
  - Evolution of Dengue Virus
  - The XBB.1.16 subvariant of Omicron
  - Bioluminescence
- 6. DEFENCE AND INTERNAL SECURITY ..... 92-98**
  - CERT-In RTI exemption
  - What is LockBit ransomware and how is it specifically targeting Apple computers?
  - India's fighter jet conundrum
  - Khalistan Movement in Punjab
  - Indian DefSpace Symposium
  - Cope India Exercise
  - Pralay missiles
  - INS Tarkash, INS Sumedha and INS Teg
  - Germany may offer sale of advanced submarines to India
- 7. ENVIRONMENT AND ECOLOGY ..... 99-119**
  - Bandipur completes 50 years as Project Tiger reserve
  - Tiger Census Report 2022-23
  - Aravali green wall project
  - United Nations 2023 Water Conference
  - Climate Change and Human Health

- Can countries be sued over climate change?
  - Time to put a price on carbon emissions
  - India's solar push augurs a looming waste challenge
  - Dealing with extreme heat
  - Understanding temperature anomalies
  - How coastal species are living on plastic debris in the ocean
  - Botanical gardens and life on earth
  - Sarus crane
  - Spot Billed Pelican
  - Flamingos in Mumbai
  - Mangrove Pitta
  - Toque Macaques
  - Sloth Bear
  - Army may build Bailey bridges in Kaziranga to protect Rhino's domain
  - In a first, Eravikulam National Park gets a fernarium
  - Over ₹6,800 crore spent in 5 years on cleaning Yamuna
- 8. HEALTH ISSUES ..... 120-126**
- Global Report on Sodium Intake Reduction
  - Cannabis Cultivation
  - National Rabies Control Programme (NRCP)
  - FSSAI's Star Rating System
  - Eat right food streets project
  - National Health Accounts (NHA) Estimates for India (2019-20)
  - Malaria and Notifiable diseases in India
- 9. HISTORY ..... 127-127**
- Maulana Abul Kalam Azad
- 10. SOCIAL JUSTICE ..... 128-129**
- Daylight saving Time (DST)
  - How can a juvenile be tried as an adult in Court?
- 11. EDUCATION ..... 130-131**
- New India literacy Project
  - Removal of Darwin's theory of evolution from textbooks
- 12. GOVERNANCE ..... 132-139**
- Competition Commission - Amendments
  - Humane Policing
  - Representation in India's police forces
  - Institutional Arbitration
  - Regulation of Online Gaming in India
  - The future of India's civil society organisations
- 13. DISASTER MANAGEMENT ..... 140-144**
- The threat of rising sea levels
  - Rising Antarctic ice melt will slow global ocean flows
  - Flash drought
- 14. GEOGRAPHY ..... 145-149**
- Zealandia
  - Excess rain impacting Wheat
  - Heatwaves
  - Zojila Tunnel
- 15. INDIAN SOCIETY & SOCIAL ISSUES ..... 150-154**
- India's population to edge ahead of China's by mid-2023, says UN
  - Dalits as a social and political force
  - Hakki Pikki
- 16. MISCELLANEOUS ..... 155-155**
- International Prize in Statistics
  - One Indian Audit & Accounts Department One System (OIOS)
  - Pushkaralu festival returns to the Ganga after a gap of 12 years
- 17. YOJANA APRIL 2023 - STARTUP INDIA ..... 156-162**
- Opportunities for Youth in the Startup Ecosystem
  - Startup India Action Plan
  - Startup20 Empowerment Group
  - Agri Startups
  - Women Entrepreneurship in MSME Sector
  - Opportunities for MSMEs in 'Amrit Kaal'
  - Startups-Reaching last mile
  - Antyodaya and Mass Media
  - Incubators-The Growth enablers
- 18. KURUKSHETRA APRIL 2023 - PANCHAYATI RAJ ..... 163-167**
- Empowering Panchayati Raj Institutions
  - e-GramSwaraj
  - Good Governance at Grassroots Level
  - SVAMITVA Scheme for Providing Property Validation
  - Women Empowerment
  - 2030 Agenda for Sustainable Development
  - Water Management through Panchayats
  - Human Development through Panchayati Raj Institutions
- 19. SCIENCE REPORTER - APRIL 2023 ..... 168-172**
- Health Vision 2047: Towards a Healthy India
  - Spotlight on Alzheimer's and Dementia
  - Normalise Mental Health
  - Millets for the Future: CSIR-CFTRI's Trailblazing Research, Technologies & Products
- 20. DOWN TO EARTH - APRIL 2023 ..... 173-180**
- Deep unknown
  - Ganga Pollution
  - Banking on tradition
  - Rough Waters ahead
  - The last frontier
  - Mined TO Destruction
  - Fatal coincidence
  - Revival of a tradition

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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			
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

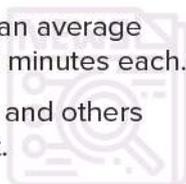


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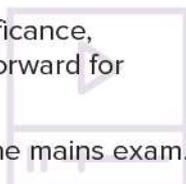
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# POLITY

## 1. The role of Parliamentary Committees

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

**Prelims:** Facts about Parliamentary Committees

**Mains:** Parliamentary Committees in India – their evolution, role and significance, associated issues and the way forward

**Context:** This article discusses the role and significance of Parliamentary Committees in the Indian Parliamentary system.

### Parliamentary Committees

- Parliamentary committees are panels that consist of various Members of the Parliament who are appointed or elected by the House or nominated by the Speaker/Chairman of the House.
- Parliamentary committees are mandated to deal with such issues which are not feasible to take up on the floor of the House and also discuss various sector-specific concerns.
- The Indian Constitution mentions two types of Parliamentary Committees namely:
  - **Standing Committees:** Committees constituted to examine bills, budgets and policies of ministries/departments of the Government.
  - **Ad-hoc Committees:** Committees that are set up for a specific purpose, and these cease to exist after their mandate is complete.
- Parliamentary committees draw their authority from **Article 105** (privileges of Parliament members) and **Article 118** (Parliament's authority to make rules for regulating its procedure and conduct of business).

### Evolution of Parliamentary Committees

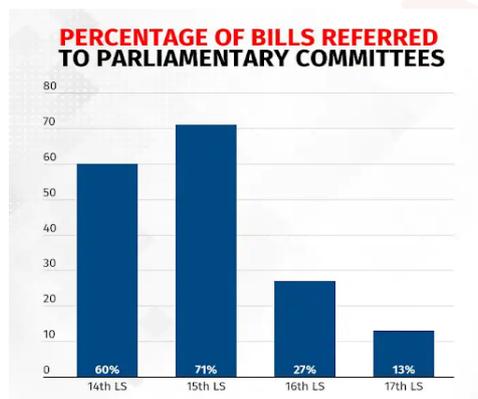
- The concept of establishing Parliamentary Committees has been borrowed from the British Parliament.
- In India, the first Public Accounts Committee was established in the year 1950.
- The practice of referring bills to committees started in 1989 as various departments of the government started creating their own standing committees to discuss various issues.
- A structured Parliamentary committee system came into existence in 1993. However, even during the struggle for Indian independence, individual committees were created for various reasons.
- Five of the many crucial committees of the Constituent Assembly are discussed below:
  - **Ad Hoc Committee on the Citizenship Clause:** Set up to discuss the nature and scope of Indian citizenship.
  - **Northeast Frontier (Assam) Tribal and Excluded Areas Sub-Committee:** The committee was chaired by G.N. Bordoloi and it discussed the issues related to the Naga, Khasi, Garo, Jaintia and Mikir Hills and collected information about the people's experiences, demands, beliefs and customs.
    - The committee also discussed aspects such as the status of land and forests, local government, local courts, finance and taxation.
  - **Excluded and Partially Excluded Areas (Other than Assam) Sub-Committee:** The committee was characterised by Jaipal Singh Munda's Minute of Dissent with regard to scheduled areas in the Chhota Nagpur Plateau.
  - **Expert Committee on Financial Provisions of the Union Constitution:** The committee was mandated to recommend the government on Union and State tax collection, excise duty, liquor revenue, divisible pool of income tax, sharing of proceeds, residuary powers, establishment of the Finance Commission, the office of Auditor General, etc.
  - **Advisory Committee on the Subject of Political Safeguards for Minorities:** This committee chaired by Sardar Patel, evaluated the abolition of reservations for religious minorities.

### The Role and Significance of Parliamentary Committees

- Parliamentary Committees take up a specific piece of legislation and they study/discuss it holistically in detail, analyse its impact and then make recommendations to the House.
  - The government is then required to table an "Action Taken" report for the House to highlight the progress or changes made based on the recommendations of the committee.
- Although the recommendations of these committees are not binding on the government, it helps the legislature have oversight or check on the executive.
  - **Example:** During the Union Budget Session 2023, reports tabled on the Demand for Grants pointed out certain discrepancies on the part of the government.
  - Furthermore, the Committee on Rural Development & Panchayati Raj in its report highlighted that the revised estimates always fell short of the budget estimates and pointed out that in 2022-23, the Ministry of Panchayati Raj spent only ₹701 crores out of the allocation of ₹905 crore.
- Certain crucial objective assessments of the functioning of the executive can only be taken up within the confines of a committee room as members from different political parties and ideologies sit together to discuss and make way for consensus.
  - However, the discussion on the floor of the House involves cameras and public attention that force the members to function as per their respective party lines and voter base.

- Further, Parliamentary committees also help make Parliament a dynamic and functional space by acting as a platform for members to converge and debate on matters that concern the nation.
- Two of the most important yet little-discussed committees include:
  - The **Business Advisory Committee** prepares the entire schedule for both Houses of Parliament.
  - The **Committee on Papers Laid on the Table** is dedicated to dealing with the papers laid on the table of the House and each individual paper is formulated after a careful and long-drawn process of deliberation.
- Additionally, the Bills that are referred to committees are often seen to have come back to the House with significant value addition. A few of the most salient recent legislations which have been referred to Committees include:
  - **Digital Data Protection Bill:** The Justice Srikrishna Committee was set up and was mandated with the task of formulating a data protection framework for India post the Puttaswamy judgment based on which Personal Data Protection Bill, 2019 was tabled in the Lok Sabha.
    - It was once again referred to a Joint Parliamentary Committee chaired by P.P. Chaudhary and based on this committee's report in December 2021, the earlier Bill was withdrawn and a new Draft Digital Data Protection Bill was introduced in November 2022.
  - **Prohibition of Child Marriage (Amendment) Bill:** The Bill that seeks to increase the legal marriageable age of women from 18 to 21 years.
  - **Anti-Maritime Piracy Bill:** Facilitates the enactment of the UN Convention on the Law of the Sea (UNCLOS) for combating piracy on the high seas
  - **Jan Vishwas Bill:** Bill amending 42 laws across sectors like agriculture and media.
  - **Wildlife Protection (Amendment) Bill:** Extending the scope of protected species.
  - **Other bills:** The Competition (Amendment) Bill, the Criminal Procedure (Identification) Bill, the Electricity (Amendment) Bill, and the Multi-State Cooperative Societies (Amendment) Bill.

### Issues Associated with Parliamentary Committees



Source: Moneycontrol

- In recent times, political rancour and polarisation have impacted the functioning of these Parliamentary committees and have highlighted serious fault lines.
- There have been instances where deliberations and consensus among these committees have been affected.
- Further, there has been a sharp decline in the instance of referring Bills to the Parliamentary committees and as a result, legislations are not subjected to expert scrutiny.
  - According to reports, only 25% of the Bills introduced were referred to committees in the 16th Lok Sabha, as compared to 71% and 60% in the 15th and 14th Lok Sabha respectively.
  - Further, during the 17th Lok Sabha, only about 14 Bills were referred to the committees.

### Way forward

- Such committees play a key role in the U.S. Congress and Bills are referred to them post-introduction for scrutiny.
  - The scrutiny by the committees allows changes and modifications of the Bill before the voting process.
  - The former President of the U.S. Woodrow Wilson had said that “it is not far from the truth to say that Congress in session is Congress on public exhibition, whilst Congress in Committee rooms is Congress at work”.
- India should also consider compulsory referral of the Bills tabled on the floor, to the appropriate committees.
- According more powers to these Committees will ensure more accountability from the executive.
- It is the need of the hour, for the parliamentary ecosystem in India to strengthen the Parliamentary Committees in order to ensure that political considerations do not hasten law-making.

**Nut graf:** The sheer volume and scale of operations of the Indian Parliament make it not feasible for the Houses of Parliament to discuss and analyse all issues. Parliamentary committees thus play a crucial role in evaluating, delving deeper into matters of public concern and coming up with expert opinions and hence, it is crucial to safeguard and strengthen these committees from a nation-building standpoint.

## 2. The rules for recognition as a national party

**Syllabus:** Salient features of the Representation of People's Act.

**Prelims:** About National and State parties

**Mains:** Criteria for being recognized as a "National or State" party and the benefits of the status

**Context:** On April 10th, 2023, the Aam Aadmi Party (AAP) was accorded the status of a national party by the the Election Commission of India (ECI).

- However, other parties such as the Trinamool Congress (TMC), the Communist Party of India (CPI), and the Nationalist Congress Party (NCP) have lost their national party status.
- The ECI also revoked the recognition of some parties as State parties.

### What is a national party?

- A national party refers to such a political party that has a presence "nationally", whereas the presence of regional parties is limited to a particular state or region.
- National parties are usually India's bigger parties, such as the Congress and BJP and a certain stature is associated with being a national party.
- According to the Representation of People Act 1951, registered political parties can get recognition as "State" or "National" parties in the due course of time.
- At present, there are six parties in India with the status of a "national party" including the BJP, Congress, Bahujan Samaj Party (BSP), CPI(M), National People's Party (NPP) and the AAP.

### Criteria to be recognised as a "national party"

- The ECI reviews the performance of recognised parties after every State Assembly election and general election to the Lok Sabha in order to accord the status of "State Party" or "National Party".
- The rules for recognition as a national party are specified by the ECI in **para 6B of the Election Symbols (Reservation and Allotment) Order, 1968**.
- According to the order, a registered party will be eligible to be accorded national status if it manages to:
  - Be recognised as a "State party" in four or more States; or
  - Secure at least 6% of the total votes polled in any four States in the last Lok Sabha or Assembly elections, and in addition, has a minimum of four of its members elected to the Lok Sabha; or
  - Wins at least 2% of seats in the Lok Sabha from not less than three States.
- The Symbols Order of 1968 was amended in 2016 to give parties one additional "pass over".
  - According to the amendment, which is in force since January 1, 2014, if a national or State party fails to meet the eligibility rules in the next general elections (i.e. 2014 Lok Sabha polls) or the Assembly election after the election in which it was recognised, the party shall remain to be recognised as a national or State party, i.e. it will not be stripped of its status.
  - However, whether it will continue to be recognised after any subsequent election would again have to be determined by the eligibility criteria.

### Criteria to be recognised as a "State party"

- A party has to secure at least 6% of the valid votes polled and two seats in Assembly polls or one in Lok Sabha polls; or
- At a General Election or Legislative Assembly election, the party must have won at least 3% of the seats in the legislative assembly of the State (subject to a minimum of 3 seats); or
- At a Lok Sabha General Elections, the party must have won at least one Lok Sabha seat for every 25 Lok Sabha seats allotted for the State; or
- At a General Election to the Lok Sabha or the Legislative Assembly, the party must have at least 8% of the total valid votes polled.

### Key benefits being recognised as national and state parties

- **Reserved political symbols:** Such parties are entitled to exclusive allotment of their reserved symbol to their candidates throughout India or the respective states.
- **National Presence:** A recognised national party can contest elections across the country which helps expand its influence.
- **Extra perks and privileges:** A recognised political party enjoys privileges such as free broadcast time on State-run television and radio such as Doordarshan and All India Radio (AIR).
- **Lenient proposer and electoral roll conditions:** Recognised State and National parties need only one proposer for filing the nomination and are also entitled to two sets of electoral rolls free of cost at the time of revision of rolls.
  - Such parties can also give their inputs on setting electoral rules and regulations.
- **More "Star Campaigners":** A National or State party can have a maximum of 40 "Star campaigners" whereas an unrecognised registered party can only nominate a maximum of 20 "Star Campaigners".
  - The expenses of star campaigners are not included in the party's overall costs of organising an election campaign.
- **Grant of government land:** A national party would get land from the government to build its headquarters.

**Nut graf:** With the Aam Aadmi Party (AAP) being recognised as a national party by the ECI and parties like the TMC, NCP and CPI having lost their national party status, India at present has six political parties with the status of "National Party".

### 3. 9th schedule

**Syllabus:** Constitution of India — features and significant provisions.

**Prelims:** 9th schedule of the Constitution

**Mains:** Important cases related to 9th Schedule:

**Context:** Recently, the Chhattisgarh Chief Minister wrote to the Prime Minister seeking the inclusion of two amendment Bills **allowing for a higher quota of reservation in jobs and educational institutions, in the Ninth Schedule of the Constitution.**

**Details about Bills:**

- In Chhattisgarh, the State Assembly unanimously approved the two amendment bills, **creating a 76% quota for members of the Scheduled Caste, Scheduled Tribes, and Other Backward Classes.**
- The **Governor** has not yet approved the bills.

**Why is there a need to Include these Bills in the Ninth Schedule?**

- The Ninth Schedule of the Constitution **includes a list of Central and State laws that cannot be challenged in courts.** Including the two amendment Bills in the Ninth Schedule **would make them immune to legal challenges.**
- The Chhattisgarh government argues that including the amended provisions in the Ninth Schedule is **crucial for providing justice to the backward and deprived classes in the State.**
- Previously, the Chhattisgarh High Court had struck down a government order **allowing 58% quota, stating that the reservation cannot exceed 50% as it is unconstitutional.**
- However, **two amendment Bills were passed by the State Assembly to provide a 76% quota for Scheduled Caste, Scheduled Tribes, and Other Backward Classes.**

**Ninth Schedule:**

- The Schedule contains a list of **central and state laws which cannot be challenged in courts** and was added by the **Constitution (First Amendment) Act, 1951.**
- The first Amendment added **13 laws to the Schedule.** Subsequent amendments in various years have taken the number of protected laws to 284 currently.
- It was created by the new Article 31B, which along with Article 31A was brought in by the government to protect laws related to **agrarian reform and for abolishing the Zamindari system.**
- While Article 31A extends protection to 'classes' of laws, Article 31B shields **specific laws or enactments.**
- While most of the laws protected under the Schedule concern agriculture/land issues, the list includes other subjects.
- Article 31B also has a retrospective operation which means that if laws are inserted in the Ninth Schedule after they are declared unconstitutional, they are **considered to have been in the Schedule** since their commencement, and thus valid.
- Although Article 31B excludes judicial review, the **Supreme court has said in the past that even laws under the Ninth Schedule would be open to scrutiny if they violated Fundamental Rights or the basic structure of the Constitution.**

**Important cases related to 9th Schedule:**

- **Keshavananda Bharati v. State of Kerala (1973):** The Supreme court upheld the judgement in Golaknath and introduced a new concept of "Basic structure of the Indian Constitution" and stated that, "all provisions of the constitution can be amended but those amendments which will abrogate or take away the essence or basic structure of constitution which included Fundamental Rights are fit to be struck down by the court".
- **Waman Rao v. Union of India (1981):** In this important judgement, the SC ruled that, "those amendments which were made in the constitution before 24th April 1973 (date on which judgement in Keshavananda Bharati was delivered) are valid and constitutional but those which were made after the stated date are open to being challenged on the ground of constitutionality.
- **I R Coelho v. State of Tamil Nadu (2007):** It was held that every law must be tested under Article 14, 19 and 21 if it came into force after 24th April 1973.
  - In addition, the court upheld its previous rulings and declared that any act can be challenged and is open to scrutiny by the judiciary if it is not in consonance with the basic structure of the constitution.
  - In addition, it was held that if the constitutional validity of any law under the ninth schedule has been upheld before, in future it cannot be challenged again.

#### 4. Pending Bills, the issue of gubernatorial inaction

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

**Prelims:** Facts about the Office of Governor

**Mains:** Issues associated with the discretionary powers of the Governor and the controversies surrounding the Governor's assent to passed Bills.

**Context:** The Tamil Nadu Governor was again in the news as the Tamil Nadu Assembly passed a resolution that sought the Union government and the President to issue instructions to the Governor to give assent to the Bills passed by the Assembly "within a specific period".

#### Background

- The resolution, among other things, also urged the Union government and the President to specify a time limit for Governors to give their assent to Bills passed by the legislators.
- The resolution was passed by the Assembly as the State Governor publicly stated that if the Bill passed by the legislature disobeys constitutional limits, then it is the responsibility of the Governor to not give assent.
- Numerous Bills passed by the State Assembly are still pending as the Governor has not taken any decision over such Bills.

#### Constitutional provisions

- According to **Article 355** of the Indian Constitution, it shall be the duty of the Union to ensure that the government of every State is carried on in accordance with the provisions of the Constitution.
  - As explained by Dr. B.R. Ambedkar in the Constituent Assembly, the general meaning and purpose of the Article were to provide justification for the "invasion of the provincial field" which the Union government may have to do.
- The Constitution mandates the Governor to act when a Bill is passed by the Assembly and present it to him based on the options provided under **Article 200** of the Constitution.
  - Article 200 mentions the options available to the Governor when a Bill is presented to him after being passed by the legislature.
  - **The options available to the Governor are:**
    - To give assent, or
    - To withhold assent, or
    - To send it back to the Assembly to reconsider it, or
    - To send the Bill to the President for his consideration.
  - If the Governor sends back a Bill to the Assembly to reconsider and if the Assembly passes the Bill once again with/without accepting any of the suggestions made by the Governor, the Governor is then bound to give his assent.
- Thus sitting on a Bill passed by the Assembly is not an option available to the Governor as per the Constitution.
  - If in case a Governor sits on the Bills indefinitely, he/she is considered to be creating a situation where the governance of the state cannot be carried on as per the constitutional provisions.
  - Hence, the State Government can invoke the provisions of Article 355 and inform the President and request the President to direct the Governor to act in such a way that the government is carried on in accordance with the Constitution.
- Further, there have been questions over the provision of Article 200 that provides an option for the Governor to withhold assent to a Bill in the exercise of their discretionary powers.
  - However, according to **Article 154** of the Constitution, the Governor can exercise his/her executive powers only on the "aid and advice of the Council of Ministers".
  - Thus, the Governor can withhold assent to a Bill only on ministerial advice.

#### Practice followed in the U.K.

- The answers to the questions raised over the option of withholding assent can be found by analysing the practice followed in the U.K. as the Indian Constitution has adopted the U.K.'s model of government.
- It can be seen that the position of the State Governor is similar to that of the Sovereign in England.
- Theoretically, the sovereign can refuse to give the assent but this right has not been exercised since the reign of Queen Anne.
- The veto power can now be exercised based only on ministerial advice and usually, the government would not veto the Bills which were formulated by themselves.
- The refusal of royal assent on the ground that the monarch strongly disapproved of a Bill or that it was intensely controversial is said to be unconstitutional.

### Key Supreme Court judgments on the issue of justiciability

- **Purushothaman Namboothiri vs State of Kerala Case, 1962:** In this case, the issue that was discussed was that a Bill pending before the State Governor does not lapse on the dissolution of the Assembly.
  - However, this judgment does not deal with the justiciability of the process of assent.
- **Hoehchst Pharmaceuticals Ltd. And ... vs State Of Bihar And Others Case, 1983:** In this case, the Court ruled that a Governor reserves a Bill for the consideration of the President in the exercise of his discretion.
- However, the Court cannot determine whether it was necessary for the Governor to reserve the Bill for the consideration of the President and hence even this case does not deal with the justiciability of assent.

**Nut graf:** *There has been an increase in the instances of the tussle between the Governors and the State governments caused due to indecision by the Governor on passed Bills. This issue requires the intervention of the Supreme Court as a judicial pronouncement on the issue of justiciability of assent is required to eliminate the existing confusion.*

## 5. On defamation law: a blow against freedom of speech and expression

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

**Prelims:** About the defamation law in India

**Mains:** Supreme Court's views on defamation law and its critical evaluation

**Context:** Former Congress President Rahul Gandhi was sentenced to two years of prison over a 2019 defamation case.

### Evolution of the defamation law in India

- At the beginning of the 17th century, there was frequent public disorder as Englishmen often challenged each other to violent duels to avenge personal insults.
  - This forced the authorities to intervene and prosecute defamation as a criminal offence and this was the origin of “criminal libel”.
- People had criticised “criminal libel” as “the greater the truth, the greater the libel.”
- In 1860, the British borrowed the idea of criminal libel into the newly formulated Indian Penal Code (IPC).
- **Section 499 of the Indian Penal Code (IPC)** criminalised intentionally defamatory statements.
- Such defamatory statements were only exempted if they were made for the “public good”.

#### Defamation laws in India

- Defamation is defined under Section 499 of the Indian Penal Code (IPC) as- “Whoever, by words either spoken or intended to be read, or by signs or by visible representations, makes or publishes any imputation concerning any person intending to harm, or knowing or having reason to believe that such imputation will harm, the reputation of such person, is said, except in the cases hereinafter excepted, to defame that person.
- Defamation is an all encompassing term, can stretch to aspersion, statements, publications malicious in nature, injurious to reputation, fame, social image, profession of person, entity group or agency.
- **‘Libel’ and ‘Slander’ are two categories into which defamation can be classified.** While the former refers to Written Defamation, the latter refers to spoken form. Although derived from English Common Law, they are indistinct in the Indian context of Jurisprudence.
- The Code of Criminal Procedure (CrPC), dealing with the procedural aspects of the law, holds such offences as non-cognizable and bailable offences.
- Defamation by nature is both a civil and criminal offence.
  - In civil law, defamation is punishable under the Law of Torts by imposing punishment in the form of damages awarded to the aggrieved party.
  - In Criminal law, Defamation is a bailable, non-cognizable offence and can be compounded.
- The Constitution of India concerning Fundamental Rights guarantees various freedoms to citizens under **Article 19**, with Defamation being one of the reasonable restrictions.

### Supreme Court's views on defamation law

- The Supreme Court of India in 2016, dismissed a petition filed by Subramaniam Swamy challenging the constitutionality of Section 499 of the Indian Penal Code (IPC).
- The apex court held that the **“Right to Reputation”** was extended under Article 21 of the Constitution which guarantees the “Right to Life and Personal Liberty”.
  - The court declared that the **“Right to free speech”** guaranteed under **Article 19(1)(a)** had to be **“balanced”** against the **“Right to Reputation”** under Article 21.
  - However, the court did not explain how the two rights are to be balanced.
- Furthermore, the Supreme Court held that criminal defamation law protected the feeling of “fraternity or solidarity” between the members of society.

### Critical evaluation of the Supreme Court's views

- Critics believe that the observations made by the apex court which include the elevation of “reputation” to the level of a fundamental right, and to have it prevail over free speech, have no basis or backing in the text or the structure of the Constitution.
- Further, critics point out the fact that the court has radically expanded the scope of the “Right to Life and Personal Liberty” guaranteed under Article 21 and has used this expanded definition to force the state to undertake various social and welfare measures for the benefit of citizens.
  - However, in the case of defamation law, the court has used Article 21 to cut down the fundamental right to freedom of speech and expression instead of using it as a shield to protect the individual against State persecution.
- Experts have said that the principle of “constitutional fraternity” invoked by the court is not a part of **Article 19(2) of the Constitution**, which mentions reasonable restrictions the state can impose on the freedom of speech.
  - Critics have also argued that the term “Fraternity” mentioned in the Constitution’s Preamble is meant to complement civil rights, not to destroy them.
  - Thus, critics have questioned how free speech can be restricted by invoking the principle of constitutional fraternity.
- There has also been criticism over the silence of the court over Section 499 of IPC not allowing an “honest mistake” as a defence against defamation.

**Nut graf:** As a large number of journalists and political activists are facing several frivolous defamation cases in the courts of the country, there have been calls for revisiting the colonial-era laws on defamation in India as they are seen to be an impediment to freedom of speech and public interests.

## 6. Media One case - A judgment that upholds the Constitution

**Syllabus:** Separation of Powers between various organs Dispute Redressal Mechanisms and Institutions

**Mains:** Judicial restraint on the Executive.

**Context:** The Supreme Court set away the centre’s ban on the telecast of the news channel MediaOne.

### Details:

- The Supreme Court judgment in the Media One case (Madhyamam Broadcasting Ltd Media One Headquarters v. Union of India and Others) is a landmark judgment on freedom of expression and a decree against sealed cover malpractice.
- It supports the citizen’s right to question the state by differentiating the government from the nation.
- It is a rebuke against the misuse of the ‘national security’ clause that is often used by the government.

### Key highlights of Supreme Court Judgement on MediaOne Ban

- SC said that the Centre’s action is restricting press freedom.
- The SC concluded that the independence of the press is vital for a robust democratic republic.
- It said that criticism of the government’s policy should not be a reasonable restriction under Article 19(2) of the Constitution.
- It refused to accept the government’s national security angle as such a claim must be backed by material evidence.
- It also held that national security claims are big and concerning that cannot be made out of thin air without any material backing.

### Significance of the Judgment:

- It comes at a time when the government is criticized for destabilizing various institutions of democracy.
- The SC is also under criticism for delaying important cases like the dilution of Article 370, electoral bonds, etc.
- The apex court has tried to regain its glory and underline the institutional capacity of the court in troubled political times.
- The court confronted the Centre in the case and asked it to renew the licence. It considered all the aspects like the right to a fair hearing, proportionality standard, and public interest claims.
- It shows the judiciary’s efforts to resist majoritarian overtones and make quality judgments.

### A few important judgments

- In the **Bommai case (1994)**, the court held federalism and secularism as the basic features of the Constitution. However, the real dispute about the validity of the dissolution of a few state governments was not considered.
- The **Puttaswamy case (2017)** challenged the Aadhaar project. The idea of privacy was expounded by the apex court.
- In **Anoop Baranwal v. Union of India**, SC took away the power of appointment of Election Commissioners from the sole domain of the executive. It made a selection committee having the Chief Justice of India, the Prime Minister, and the Leader of the Opposition as members for the selection process.

**Associated Concerns:**

- Globally, many populist autocracies are trying to crush the judiciary with their majoritarian impulse. For instance,
  - In Israel, the government is trying to meddle with the independence of the judiciary.
  - The judges in Bolivia were arbitrarily dismissed in the last few years.
  - The retirement age of the judges was lowered in Poland to induct new loyalist judges and retire the older ones.
- It should be noted that in the absence of the politics that support the Constitution, the Constitution cannot survive for long.
- The court can only provide a constitutional or judicial check against aggrandizing State. Some cases need a political solution instead of an adjudicatory resolution.
  - The political checks on the executive require mass movements or electoral decisions.
  - However, it is suggested that the impacts in such cases can also be political.

**Nut Graf:** *The Supreme Court in the MediaOne case has set away the centre's ban on the telecast of the news channel. The apex court has tried to restrict the executive from taking any arbitrary decision. However, there are some existing challenges that need to be addressed in the upcoming judgments.*

**7. Transfer of cases**

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

**Prelims:** About Section 406 of the Code of Criminal Procedure (CrPC)

**Mains:** Discretionary powers of Supreme Court

**Context:** Supreme Court on transfer of cases under trial.

**Introduction:**

- The Supreme Court in a recent judgement held that criminal cases under trial should be transferred from one State to another only in "exceptional circumstances".
- The court opined that the power to transfer cases under Section 406 of the Code of Criminal Procedure (CrPC) should be used sparingly and only when justice was apparently in grave peril as the unnecessary shifting of cases would affect the morale of the State judiciary and prosecution agency.

**Possible situations for transfer:**

The judgement summarised a series of Supreme Court verdicts giving the possible situations in which an ongoing trial could be transferred.

**These include instances in which,**

- The State or the prosecution collaborates closely with the accused;
- When evidence suggests that the accused may sway the prosecution's witnesses or hurt the complainant physically;
- When the accused is likely to suffer comparable hardship;
- When there is a communally tensed situation indicating some proof of inability of holding fair and impartial trial because of the accusations made and the nature of the crime committed by the accused;
- Existence of some material on interference with the course of justice by interested parties.
- The convenience of parties and witnesses as well as the language spoken by them could also act as a relevant factor when deciding a transfer petition.

**Section 406:**

- The transfer of a criminal case from one state to another in India can be done under Section 406A of the Code of Criminal Procedure (CrPC) by the Supreme Court of India.
- This power is exercised by the Supreme Court in exceptional cases to ensure that the ends of justice are served.
- In order to transfer a case from one state to another, an application needs to be filed in the Supreme Court of India, either by the accused or the prosecution or any other party to the case. The application must provide reasons as to why the transfer is necessary, such as the convenience of the parties or the location of the witnesses.
- The Supreme Court will consider various factors before granting the transfer of a case from one state to another, including the nature of the offence, the stage of the trial, the availability of evidence, the convenience of the parties, and the interests of justice.
- The Supreme Court may also impose conditions or give directions to ensure that the transfer of the case does not cause undue delay or inconvenience to the parties involved.

**Nut Graf:** *Supreme Court in a recent judgement opined that the power to transfer cases under Section 406A of the CrPC is discretionary and is exercised only in exceptional cases. The Supreme Court will take a cautious approach while exercising this power and will ensure that the transfer of the case is necessary for the ends of justice.*

## 8. Misuse of Detention Powers

**Syllabus:** Indian Constitution and its significant provisions and features.

**Mains:** Preventive Detention and associated concerns.

**Prelims:** Preventive Detention.

**Details:**

- The Supreme Court (SC) of India observed that preventive detention laws are a colonial legacy and confer arbitrary powers on the state.
- The SC and High Courts (HC) of India on multiple occasions have denounced the Executive's failure to adhere to procedural safeguards while dealing with the rights of detainees.

**Concerns associated with Preventive Detention:**

- Though detentions are set aside on technical grounds, the actual relief that detainees gain is insubstantial.
- Moreover, the detention orders are quashed after several months. In some cases, the decision comes after the expiry of the full detention period.
- In preventive detention cases, courts usually examine adherence to procedural safeguards. It rarely scrutinizes the reason behind the detention.

**Facts about Preventive Detention**

- Most of the detentions are ultimately set aside due to the following reasons:
  - Unexplained delay in the disposal of representations submitted by the detainees.
  - Failure or delay in providing proper grounds for detention.
- **Other less common reasons are:**
  - Illegible copies of documents.
  - Invocation of detention for trivial reasons.
- Tamil Nadu tops the list in the number of preventive detention cases in the period 2011-2021.
- The law is misused across the country as it allows to detain suspects for a year and prevents them from obtaining bail.

**Conclusion**

- Though preventive detention is allowed by the Constitution, the government should ensure efficient policing and speedy trials to curb crimes.
- The government should not misuse the law for unfettered power and discretion.

**Nut Graf:** *The Supreme Court has raised concerns about the misuse of preventive detention by the executive. The concerns associated with it should be addressed by the legislature in a timely manner.*

## 9. A reminder about unfettered constitutional posts

**Syllabus:** Appointments to various constitutional posts.

**Mains:** Independence of constitutional authorities.

**Prelims:** Appointment to various posts.

**Context:** The comments of the Supreme Court on the concept of independence of various constitutional bodies of India.

**Details:**

- The Court in the 'Sena versus Sena' case expressed concerns about the increasing role of Governors in the political process.
- Similarly, in an earlier case, the court divested the executive of its sole discretion in appointing the Chief Election Commissioner (CEC) and Election Commissioners (ECs).

**Need for independent institutions:**

- The Constituent Assembly recognized the need for independent institutions like the Election Commission of India (ECI), the Comptroller and Auditor General (CAG), the Public Service Commission (PSC), etc to regulate sectors of national importance.
- Democracy requires a system of checks and balances to restrict the arbitrary use of power by the government.
- The constitutional bodies should function without fear or favour and in the larger interests of the nation.

### Details about Different Types of Appointments:

- The Constitution uses the phrase **'shall be appointed by the President'** in the appointment of:
  - Prime Minister (Article 75)
  - Attorney-General for India (Article 76)
  - Chairman and Members of the Finance Commission (Article 280)
  - Chairman and Members of the Public Service Commission (Article 316)
  - Special Officer for Linguistic Minorities (Article 350B)
- It uses the phrase **'subject to any law made in that behalf by Parliament'** for the appointment of:
  - Chief Election Commissioner (CEC)
  - Election Commissioner (EC)
- The words **'shall be appointed by the President by warrant under his hand and seal'** is used for the purpose of appointing:
  - Supreme Court and the High Court Judge (Articles 124 and 217)
  - CAG (Article 148)
  - Governor (Article 155)
  - Chairman and members of the National Commissions for SCs, STs, and BCs (Article 338, 338A, and 338B).
- In *N. Gopalaswami and Ors vs The Union of India case*, SC held that the President should act on the aid and advice of the Council of Ministers, with the Prime Minister as the head.
- It should be noted that various amendments were moved in the Constituent Assembly to make the position of CAG stronger so that he is not influenced by anyone.
- Similarly, amendments were also made in the draft Constitution for the appointment of the Governor, and the clause **'The Governor of a State shall be appointed by the President by warrant under his hand and seal'** was added.
- Notably, **'by warrant under his hand and seal'** assigns special status to CAG, Judges, and Governors to distinguish them from other constitutional positions.

### Way Ahead:

- Constitutional authorities should be kept free from political and executive pressure.
- A well-defined procedure and criteria should be established for the appointment of CAG.
  - A Committee comprising the Speaker of the Lok Sabha, the CJI, and the Chairman of the Public Accounts Committee can be formed in this regard.
  - Shortlisted names can then be sent to the President for final selection.

**Nut Graf:** *The essential attribute of the independence of India's constitutional bodies should not be diluted by the executive. A strong and independent regulatory mechanism in the country strengthens Democracy.*



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## 10. Nagaland's municipal tightrope

**Syllabus:** Devolution of powers and finances up to local levels and challenges therein.

**Prelims:** About Urban Local Bodies (ULBs) and Article 371A of the Constitution.

**Mains:** Issue of extending reservations to women in ULB elections in Nagaland.

### Background

- The Nagaland government decided to be in contempt of the Supreme Court rather than going against the community-based organisations and facing their wrath by repealing the Nagaland Municipal Act of 2001.
- The move led to the cancellation of the State Election Commission's notification for conducting the Urban Local Bodies (ULBs) elections in Nagaland with 33% of the seats being reserved for women.
- However, the Supreme Court has stayed the notification cancelling the ULB elections body polls.
- Further, in the Legislative Assembly elections held in 2023, two women were elected to power for the very first time in Nagaland.

### Opposition to ULB polls

- Nagaland is said to be the only State in the country where Urban Local Bodies seats are not reserved for women which are mandated under clause IV of the 74th Constitutional Amendment Act of 1992.
- The key reason for not extending the reservation to women is that several traditional tribal and urban organisations have opposed the 33% reservation of seats for women.
- These organisations believe that such reservations would violate the special provisions extended to Nagaland through **Article 371A** of the Constitution.
- According to Article 371A, no Act of Parliament would apply to the religious or social practices of the Nagas, their customary laws, administration of civil and criminal justice, and ownership and transfer of land and resources.
- Apex tribal hohos (bodies) argue that women have not been part of decision-making bodies as per their customs and traditions.
- The first and only ULB elections in the State were held in 2004 without reservation for women.
  - In 2006, the State government amended the Municipal Act of 2001 to extend 33% reservation for women as mandated by the 74th Constitutional Amendment.
  - This led to widespread opposition from local organisations which forced the government to postpone the ULB polls in 2009.
  - Again in 2012, efforts to conduct the elections were met with strong protests.
  - Later in September 2012, the State government enacted a resolution to exempt Nagaland from **Article 243T** of the Constitution which mandates the reservation for women in ULB elections.
  - The resolution to exempt the state from Article 243T was revoked in 2016 and elections with 33% reservation were notified. This notification resulted in widespread protests and large-scale violence and the government declared the process to conduct the election null and void in February 2017.

### Recent developments

- Due to the pressure from the Supreme Court, the current Nagaland government after consulting various stakeholders such as churches, NGOs, and tribal bodies, established the ground for conducting elections in March 2022.
- The State Election Commission March notified the election dates.
- However, the tribal hohos and various civil society organisations opposed the move and cautioned the government that they would boycott the polls until the Municipal Act which extends reservations for women is reviewed and rewritten as per the will of the Naga people.
- Due to public pressure, the government has repealed the Municipal Act as the people "cannot be compelled" to participate in the elections.

### Path ahead

- Various tribal and civil society organisations demand a "guarantee" that extending reservations to women would not violate the provisions of Article 371A.
  - They say that before conducting the ULB elections, the duration of the reservation must be capped at two tenures and have demanded that the post of chairperson must not be reserved for women.
- The Naga Mothers' Association (NMA) has held that the State government should have listened to or consulted women's organisations before taking such decisions.
  - Various women organisations have argued that reservations do not infringe upon Article 371A of the Constitution.
- The Supreme Court has also criticised the State government for adopting an "ingenious method" of repealing the Municipal Act to escape the court's orders.
- The Supreme Court also pointed out that nothing so far has emerged w.r.t. Article 371A that denies the right of equality to women.

**Nut graf:** The government of Nagaland is caught between the Supreme Court and other organisations as there is resistance among various sections of the civil society on the matter of extending reservations for women in local body polls. Proper discussions and deliberations are to be undertaken to address the conflicting views and resolve the reservation issue.

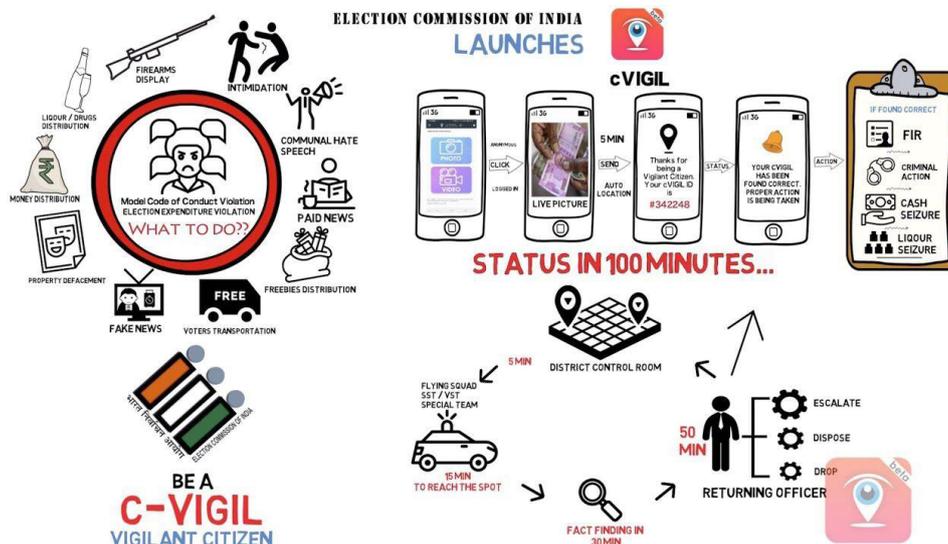
## 11. cVIGIL App

**Syllabus:** Polity; Election Commission of India

**Prelims:** Facts about cVIGIL App

**Context:** Over two thousand complaints have been received through the cVIGIL mobile application so far as the Model Code of Conduct (MCC) is in place in Karnataka.

### cVIGIL App



Source: The Election Commission of India

- The cVIGIL App facilitates citizens to report MCC violations such as bribery, gifts, liquor distribution, and use of loudspeakers beyond the permissible time during the elections.
- cVIGIL App has been designed and developed by the Election Commission of India (ECI).
- The cVIGIL App was used for the first time during the five states' Assembly General elections between October to December 2018.
- In cVIGIL, citizens by using a simple mobile app can capture live photos and videos.
- The app also facilitates citizens to raise complaints anonymously, without revealing their identity.
- Further, every cVIGIL case is acted upon and replied back with the action taken in the 100-minute timeline. This "100-minute" rule has made the app reliable.
- cVIGIL Investigator app has been developed for the field units such as Flying Squads & Static Surveillance Team to investigate the cVIGIL cases and conduct Suo-Moto reporting.
- Also, cVIGIL Monitor App provides access to all cases filed in the jurisdiction to Chief Electoral Officers (CEOs) and ECI Officials.

## 12. Mahanadi Water Disputes Tribunal

**Syllabus:** Inter-State relations and disputes

**Prelims:** About Inter-State Water Disputes in India

**Context:** A controversy has erupted as Chhattisgarh released Mahanadi water into the lower catchment area of the river system as experts and leaders of Odisha have accused Chhattisgarh of attempting to mislead the Mahanadi Water Disputes Tribunal.

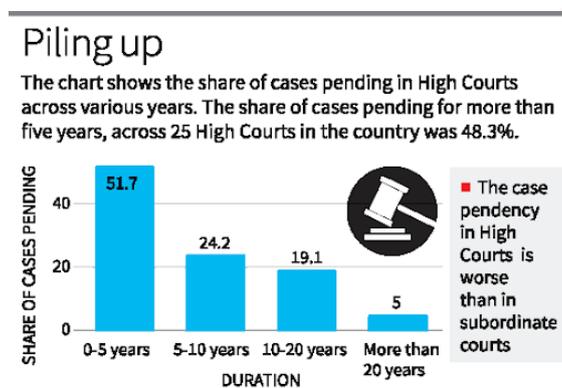
### Details

- As per the allegation of the Water Resource Department of Odisha, Chhattisgarh has opened the gates of Kalma Barrage through which 1,000-1,500 cusecs of water is flowing into Mahanadi and have said that it is unusual for Chhattisgarh to release water during non-monsoon season.
- The officials of the department claim that gates were opened ahead of the scheduled visit of the former Supreme Court Justice A.M. Khanwilkar who is the Chairperson of the Mahanadi Water Disputes Tribunal.
- Odisha has expressed concerns over Chhattisgarh's management of Mahanadi river water in the upper catchment area as Chhattisgarh in recent times has constructed several barrages restricting the flow of water in Odisha which is a lower catchment area.
- The non-availability of water in the Mahanadi River during the non-monsoon season has adversely impacted rabi crops and reduced drinking water availability in Odisha.
- The **Mahanadi Water Disputes Tribunal** was constituted in March 2018 as Odisha filed a complaint with the Ministry of Jal Shakti under **Section 3 of the Inter-State River Water Disputes (ISRWD) Act, 1956**.
  - The tribunal has been tasked to submit its report by December 2025.

### 13. Marker of democracy made in Mysuru: unit from royal era turns out indelible ink

- All the elections taking place in India have a link with Mysuru, (which is renowned as the city of palaces in Karnataka) as Mysore Paints & Varnish Ltd. is the only company authorised to produce the indelible ink used in general elections in the country.
- Mysore Paints & Varnish Ltd. was set up in 1937 by Nalwadi Krishnaraja Wodeyar, the then Maharaja of Mysore.
- Mysore Paints & Varnish Ltd. became a public limited company in 1947.
- In 1962, the Election Commission in collaboration with the Law Ministry, the National Physical Laboratory of India and the National Research Development Corporation made an agreement with Mysore Paints and Varnish Ltd. to manufacture ink that couldn't be wiped off easily.
  - Since then, the company has supplied indelible ink for every Lok Sabha, Assembly and local body election across India.
  - Furthermore, the company has also exported the ink to over 30 countries.
  - The company also manufactures lac used for sealing waxes and paints.
- The indelible ink is made of chemicals formulated in a laboratory and the entire process of its mixing, bottling, sealing, packing and transportation takes place in a secured area.
  - It is known to contain silver nitrate and remains bright for about 10 days, after which it starts fading.
  - Each vial consists of 10 ml of ink and will be able to cover about 700 voters.

### 14. Vacancies of judges remain high, cases pile up: India Justice Report



Source: The Hindu

- The India Justice Report (IJR), 2022 has pointed out that Indian courts are being loaded with cases and at the same time are experiencing an increasing pendency as they are functioning with fewer judges than the sanctioned number.
  - The IJR is a collaborative effort undertaken in partnership with DAKSH, Common Cause, Centre for Social Justice, Commonwealth Human Rights Initiative, TISS-Prayas, and Vidhi Centre for Legal Policy.
- As per IJR, as of December 2022, the High Courts were functioning with only 778 judges as compared to a sanctioned strength of 1,108 judges.
  - Further, the subordinate courts were seen functioning with 19,288 judges as compared to a sanctioned strength of 24,631 judges.
- The report points out that, at the High Court level, Uttar Pradesh has the highest average pendency i.e. the number of cases has remained pending for an average of 11.34 years and in West Bengal average pendency was seen to be 9.9 years.
  - The lowest average High Court pendency was seen in Tripura (1 year) followed by Sikkim (1.9 years) and Meghalaya (2.1 years)
- The report further notes that the number of cases a judge has to deal with has steadily increased.
- The case clearance rate (CCR) provides an idea about the number of cases disposed of in a year measured against the number filed in that year.
  - A CCR of over 100% suggests that the number of pending cases is reducing.
  - According to the report, during 2018-19 only four High Courts had a CCR of 100% or more. However, in 2022, the number of courts with a CCR of 100% or more was 12.
  - The High Courts of Kerala (156%) and Odisha (131%) have higher CCRs whereas the High Courts of Rajasthan (65%) and Bombay (72%) have the lowest CCRs.
- The number of court halls seems to be sufficient for the number of actual judges but the space will become a problem if all the sanctioned posts are filled.

**15. Political leaders cannot claim higher immunity: SC**

- The Supreme Court of India has held that political leaders stand absolutely on the same footing as any ordinary citizen of India and are not entitled to “higher immunity” from investigation, arrest or prosecution.
- The Supreme Court’s observations came while looking into a joint petition filed by a united Opposition of 14 national parties which claimed that the Centre was arbitrarily using agencies such as the ED and the CBI to arrest and initiate criminal proceedings against Opposition leaders who expressed dissent or disagreed with the government.
- The opposition parties had suggested a “triple test” before ordering the arrest of political leaders and also said that alternatives such as interrogation at fixed hours or, at most, house arrest be used to meet the demands of investigation.
- The Chief Justice of India, however, observed that a political leader is basically a citizen and as citizens, all are amenable to the same law. Political leaders do not enjoy immunity.
- The opposition parties in their petition had claimed that between 2004 and 2014, about 60% of the political leaders investigated by the CBI, were from the Opposition. However, this figure has increased to over 95% in recent years.
  - The opposition parties withdrew their joint petition following the Supreme Court’s observations.

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# ECONOMY

## 1. Interchange fee on UPI

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

**Prelims:** About NPCI and UPI

**Mains:** Details about Prepaid Payment Instruments (PPIs) and PPI interoperability, its advantages and latest developments

**Context:** Recently National Payments Corporation of India (NPCI), Prepaid payment instruments (PPIs) are now permitted to participate in the interoperable Unified Payments Interface (UPI) ecosystem.

- The NPCI has implemented interchange fees of up to 1.1% on retailer UPI transactions using prepaid payment instruments (PPIs) beginning April 1.

### National Payments Corporation of India (NPCI)

- The National Payments Corporation of India (NPCI) is an initiative taken by the Reserve Bank of India (RBI) and Indian Bank's Association (IBA).
- NPCI serves as an umbrella body for the operation of retail payment in India.
- NPCI was founded in the year 2008 under the Payment and Settlement Systems Act, 2007.
- NPCI has been incorporated as a 'not for profit' company under section 8 of Companies Act 2013.
- Some of the key products and services of NPCI include RuPay, Bharat Interface for Money (BHIM), Unified Payments Interface (UPI), National Common Mobility Card, etc.

### Unified Payments Interface (UPI)

- UPI is a real-time payment system that helps in instant and quick transfer of funds between two bank accounts.
- The transfer of funds is done through a single mobile application. Some of the important features of UPI are listed below.
- The idea of UPI was developed by the National Payments Corporation of India (NPCI).
- The UPI interface is based on the authentication of two factors. This is in line with the regulatory guidelines making it very safe. Two-factor authentication is very much similar to One Time Password (OTP).

### Key Highlights

- **Applicability:** The new NPCI wallet interoperability standards establish an interchange fee for wallet usage, which will be paid to wallet issuers such as Paytm, PhonePe, and Google Pay, among others.
  - Charges for UPI-wallet loading will also be paid by wallet issuers to remitter banks or the bank accounts from which the amount is debited.
- **Benefit for wallet players:** The interoperability standards will allow wallets to be universally accepted across all UPI QR codes and devices, boosting the salience or importance of wallets.
  - In addition, it will promote uniformity and parity by clearly specifying interchange fees for wallet payments, as opposed to the current practice of bilateral agreements between wallet issuers and payment systems.
- **Interchange fees:** The interchange charges range from 0.5 percent to 1.1 percent depending on the merchant category code.
  - Fuel, education, agriculture, and utility payments have lower exchange rates of 0.5-0.7%; convenience stores, specialty retail outlets, and contractors have the highest interchange rate of 1.1%.
- **Wallet transactions:** Merchants pay interchange fees to wallets or card issuers, which are normally absorbed by the merchant.
  - Smaller merchants and retailers are unlikely to be affected because it applies only to payments of more than 2,000 rupees.
  - In certain situations, the MDR, or merchant discount rate, is applicable for wallets-on-UPI, and this shift may result in larger MDRs imposed on merchants, depending on payment firms' ability and desire to pass on the interchange.

### Impact on Customers

- The rules are likely to boost wallets' attractiveness, scope, role, and usefulness because they can now be used to perform UPI payments across QR codes and devices, providing customers with more payment options.
- Users will also be able to fill their wallets from anywhere, including credit or debit cards, BNPL (Buy Now Pay Later), and net banking, among other options, establishing a system for using any instrument for UPI transactions, whether directly or indirectly.
- MDR for bank-to-bank UPI transactions is now nil.

### Prepaid Payment Instruments (PPIs)

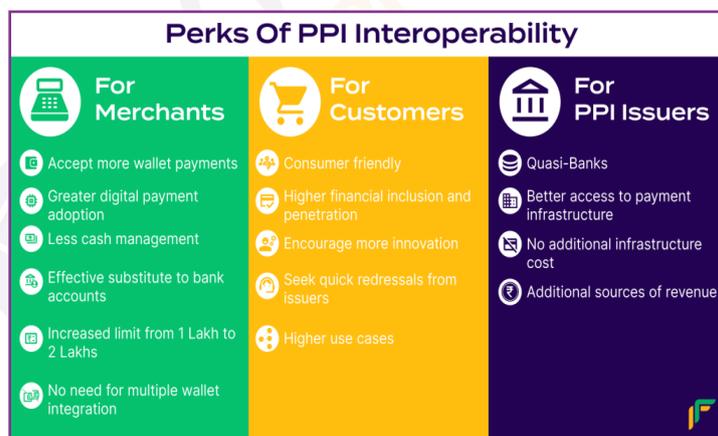
- Prepaid Payment Instruments (PPIs) are a type of payment method that is used to purchase various goods and services as well as send or receive money by using the stored value in the wallet.
- Under the PPI mode of transaction, the users must pre-load the digital wallet with a desired amount by using cash, or debit to a bank account, by credit/debit cards, or UPI.
- PPIs can be in the form of mobile wallets, vouchers, secure tokens, physical smart cards, or any other form that allows access to prepaid funds.
- The most prevalent form of PPI used in India at present is the mobile wallet.
- It is to be noted that PPIs can only be used in Indian rupees.
- Closed System PPIs: These PPIs are issued by a single entity solely for the purpose of facilitating the purchase of goods and services from that entity. Withdrawals of cash are not permitted. These instruments may not be used to pay for or settle third-party services.

### PPI interoperability

- Earlier, in order to use PPI at any merchant, it was mandatory for the respective merchant to be engaged directly by the specific PPI issuer (specific network).
- The PPIs with which the merchant did not have a direct tie-up used to get rejected.
- This provision restricted the customers of one specific mobile wallet to use the money in the wallet only at those merchant locations which had a direct tie-up with the same PPI wallet provider.
- i.e. if a customer had a Paytm wallet, he/she could only use the money in the wallet for making payments to those merchants who accepted Paytm QR codes.
- The RBI has now mandated interoperability among different PPI wallet providers to address the issues associated with this limitation of PPIs.
- The PPI issuers have now tied up with NPCI for issuing interoperable RuPay PPI cards and for developing interoperable wallets on UPI rails.
- PPIs in the form of mobile wallets can now be linked to UPI which creates interoperable wallets on UPI rails.

### The working of PPI interoperability through UPI

- Linking one's PPI wallet to UPI would enable individuals to transact using the Scan and Pay option on all UPI interoperable QR codes and facilitate the use of PPI wallets at all merchant locations.
- With the help of PPI interoperability, individuals can also send or receive money to any other wallet user.
- Likewise, a merchant with any UPI QR code would be able to accept payments from any PPI issuer or mobile wallet.
- PPI on UPI is expected to increase the incidence of merchant transactions in rural areas and enhance digital financial inclusion by catering to services such as healthcare, education, utility bills, transit, etc.



Source: Cashfree Payments

### Challenges of digital transactions

- **Digital illiteracy:** A sizable segment of the population, particularly in rural regions, may be unfamiliar with digital payment systems and may struggle to use them.
- **Issues with connectivity:** Digital transactions necessitate a consistent internet connection, which may not be available in all places. This can result in payment delays and inconveniences.
- **Concerns about security:** Digital payments might be exposed to cyber threats and fraud. Bad actors have the ability to steal critical financial information and conduct illicit transactions.
- **Technical errors** can occur during digital transactions, resulting in failed transactions or inaccurate transfers.
- **Transaction fees:** Certain digital payment systems may levy transaction fees, discouraging users from utilising them.
- **Acceptance is limited:** Not all retailers and service providers accept digital payments, particularly in rural areas.
- **Overdependence on technology:** Those who rely on digital payment methods may be subject to disruptions in the event of technological breakdowns or system outages.

### Way forward

- Digital transactions have become an essential aspect of modern commerce, providing customers and organisations with convenience, security, and speed.
- There is a need for regulatory intervention to investigate alternative payment mechanisms that offer cheaper transaction fees, such as digital wallets and UPI.
- Ultimately, the advantages of digital transactions outweigh the disadvantages, and as technology advances, we should expect further innovation in the payments sector.

**Nut graf:** The NPCI has stated that merchant transactions exceeding ₹2,000 in value done using PPI Wallets on UPI will attract an interchange charge of 1.1% starting from the 1st of April 2023. However, the NPCI has clarified that there are no charges to customers and for bank-account to bank-account-based UPI payments as it is only applicable for PPI merchant transactions.

## 2. Foreign Trade Policy 2023

**Syllabus:** Indian Economy and issues relating to planning, mobilization, of resources, growth, development, employment and changes in industrial policy

**Mains:** Key Features of New Foreign Trade Policy 2023

**Context:** The Union government unveiled the new foreign trade policy.

### Introduction:

- The Union Minister of Commerce and Industry, Consumer Affairs, Food and Public Distribution, and Textiles has released the Foreign Trade Policy (FTP) 2023, which took effect on April 1, 2023.
- FTP 2023 is a policy document based on the continuity of time-tested export facilitation schemes, as well as a document that is flexible and sensitive to trade requirements.
- The new policy will replace the existing policy that had been in place since 2015. The new policy aims to almost triple India's goods and services exports to \$2 trillion by 2030, from an estimated \$760 billion in 2022-23.
  - The previous foreign trade policy for 2015-2020 had targeted exports of \$900 billion by 2020. This target was extended along with the policy for three years till March 2023.
  - India's exports were \$435 billion in 2015-16 and have grown nearly 75% to an estimated \$760 billion in 2022-23.
- The new policy will have no sunset date and will be tweaked based on the emerging world trade scenario and industry feedback.

### What are the specifics of FTP 2023?

- The policy is built on the ideas of trust and partnership with exporters, and it aims at process re-engineering and automation to make it easier for exporters to do business.
- The Key Approach is founded on four pillars:
  - Incentive to Remission,
  - Export Promotion through Collaboration - Exporters, States, Districts, Indian Missions,
  - Ease of Doing Business, Transaction Cost Reduction, and E-initiatives, and
  - Emerging Areas - E-Commerce Developing Districts as Export Hubs, and Streamlining Special Chemicals, Organisms, Materials, Equipment, and Technologies (SCOMET) Policy.

### What are the key features of Foreign Trade Policy (FTP) 2023?

- **Aim:** By 2030, India's goods and services exports will have nearly tripled to \$2 trillion.
- **Ease of doing business:** By digitising applications, shortening application processing timescales, and lowering transaction costs for exporters.
- **FTP 2023 has enabled Indian intermediaries** to conduct merchanting transactions involving the shipment of products from one foreign country to another without passing through Indian ports.
- **Policies are being simplified** in order to enable the export of dual-use high-end items and technology such as UAVs [unmanned aerial vehicles], drones, cryogenic tanks, and certain chemicals.
- **International trade settlement** -in the Indian Rupee (INR), offering advantages to exporters paid for in rupees.
- A special **advance authorisation procedure** has been launched for the clothes and apparel sector in order for them to respond to market demands and fashion trends more quickly.
- **Star ratings:** To recognise exporters, lower qualification limits will be available.
- **PM MITRA (Pradhan Mantri Mega Integrated Textile Region and Apparel)** parks will gain as common service providers.
- **Towns of Export Excellence (TEE):** TEEs are towns that produce items worth Rs750 crore or more and have the potential for export growth.
  - TEE also gains global awareness and brand trust.
  - Four new towns, namely Faridabad, Mirzapur, Moradabad, and Varanasi, have been designated as Towns of Export Excellence (TEE) in addition to the existing 39 towns.
- **Online trade** entails encouraging cross-border trade in the digital economy, as well as steps to encourage the formation of specialised e-commerce export centres.
- **E-commerce exports:** E-commerce exports will receive all FTP benefits.
  - To facilitate e-commerce, specific zones with warehousing facilities should be established.
- **Remissions on input duties** are still in effect.

- **Status Holders** – The strategy has reduced the minimum exports required for exporters to be recognised as Status Holders.
- **Streamlining SCOMET Policy:** More emphasis on the “export control” regime for better integration with export control regime countries.
  - Many smaller exporters can get better status and profit from lower transaction expenses.
- **MSME:** Charges for MSME have been reduced to \$5,000 under the popular Advance Authorizations and Export Promotion Capital Goods (EPCG) scheme.
- **Amnesty Scheme:** In line with the “Vivaad se Vishwaas” initiative, the government is introducing a special one-time Amnesty Scheme under the FTP 2023 to address default on export obligations.
  - This will provide relief to exporters who have been unable to meet their obligations under EPCG and Advance Authorizations, and who are burdened by high duty and interest costs associated with pending cases.

#### Challenges:

- **Access to credit is limited:** Indian exporters have limited access to trade finance and export credit. This is especially true for Micro, Small, and Medium Enterprises (MSMEs), despite accounting for over half of total Indian exports.
- **Indian exporters** receive significantly less financial assistance than their counterparts in other countries. India received \$7.6 billion in funding from export credit agencies, whereas China received \$39.1 billion.
- **Bureaucracy:** Due to the extensive documentation required, the export process in India takes longer than in many other nations. For each stage of the shipping procedure, Indian exporters must prepare a huge number of paperwork.
- **It is also critical to plan ahead** of time because certification authorities at Indian ports are not available 24 hours a day, seven days a week.
- **Inadequate infrastructure:** India’s weakest link is its infrastructure. In 2019, India ranked 68.1 out of 100 countries depending on the quality of its infrastructure, according to statistics firm Statista. To put this in context, top-ranked Singapore received 95.4 points, while bottom-ranked Bolivia received 57.1 points, trailing India by 10 points.

**Nut Graf:** Union government has unveiled a new foreign trade policy that moves away from providing incentives to exporters, but lowers a few costs for smaller firms and promises swifter clearances, along with a one-time amnesty scheme for export obligation defaults.

### 3. Smart Cities Mission

**Syllabus:** Infrastructure

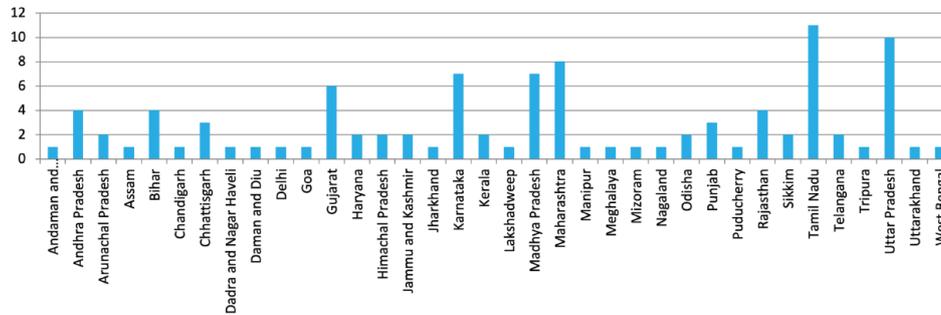
**Prelims:** About Smart Cities Mission

**Mains:** Important details about the Smart Cities Mission

**Context:** In a report of a parliamentary standing committee, it was mentioned that the Union Housing and Urban Affairs Ministry informed it that the extension of the Smart Cities Mission (SCM) beyond its current deadline of June 30th 2023 is an open issue.

#### Report of the panel:

- This report which is based on the demand for grants of the Ministry of Housing and Urban Affairs was submitted to the Lok Sabha by the Standing Committee on Housing and Urban Affairs and noted the following points.
- **Contrasting differences in the performance of the cities under Smart City Mission (SCM)**
  - 32 cities completed more than the number of projects planned for implementation
  - 68 cities are yet to meet the targets wherein the performances of some are quite poor
  - Hence the total number of completed projects gives a misleading picture, as it contains the excess projects accomplished by 32 smart cities too.
- **Progress of the mission:**
  - Out of a total of 7,821 projects worth Rs. 181 lakh crore, 5,343 projects worth Rs. 1 lakh crore have been successfully finished.
  - So far, out of the total Rs. 48000 crore for the mission, Rs. 36,561 crore has been released and out of this 90% of the fund has been utilized by the cities.
- **Recommendations of the panel chaired by MP Rajiv Ranjan:** A thorough evaluation and resolution of the factors causing significant project delays must occur before any further extension of the deadline is granted.



Source: MoHUA

### About Smart Cities Mission:

- The Smart Cities Mission is an initiative of the Union Housing and Urban Affairs Ministry that was launched in 2015.
- Cities across the country were asked to submit proposals for projects to improve municipal services and to make their jurisdictions more liveable.
- Between January 2016 and June 2018 (when the last city, Shillong, was chosen), the Ministry selected 100 cities for the Mission over five rounds.
- The projects were supposed to be completed within five years of the selection of the city, but in 2021 the Ministry changed the deadline for all cities to June 2023, which was earlier the deadline for Shillong alone.
- **Vision:** With an increase in urban population and rapid expansion of areas, the government is looking at smarter ways to manage complexities, increase efficiencies and improve quality of life.
  - This has created a need for cities that monitor and integrate infrastructure to better optimise resources and maximise services to citizens.
- **Objective:** The objective of the smart city initiative is to promote sustainable and inclusive cities that provide core infrastructure to give a decent quality of life, a clean and sustainable environment through application of some smart solutions such as data-driven traffic management, intelligent lighting systems, etc.

### The core elements of Smart Cities Mission:

- Sanitation, including solid waste management
- Efficient urban mobility and public transport
- Safety and security of citizens, particularly women, children and the elderly
- Good governance, especially e-Governance and citizen participation
- Affordable housing, especially for the poor
- Robust IT connectivity and digitalization
- Sustainable environment
- Health and education
- Adequate water supply
- Assured electricity supply

### Coverage:

- The mission will cover 100 cities that have been distributed among the States /Union Territories (UT) on the basis of an equitable criteria.
- The formula gives equal weightage (50:50) to urban population of the State/UT and the number of statutory towns (a town with a municipality, corporation, cantonment board or notified town area committee) in the State/UT.
- Based on this formula, each State/UT will, therefore, have a certain number of potential Smart Cities, with each State/UT having at least one.

### Strategy:

- **Components of area-based development in the 100 Smart Cities Mission in India** comprise city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development), along with a pan-city initiative.
- **Area-based development that will transform existing areas**, including slums, into better planned residential areas by retrofitting and redevelopment, thereby improving habitability of the whole city
- **Greenfield projects** that will develop new areas in the city to accommodate the expanding population in urban areas
- **Pan-city development** envisaging the application of select smart solutions to the existing city-wide infrastructure

### Administrative Structure:

- Guidelines on Smart City provide monitoring at three levels – national, state and city
- **National:** An Apex Committee, headed by the Secretary of the Ministry of Urban Development and comprising representatives from related ministries and organisations, has the mandate to approve proposals, monitor progress and release funds.
- **State:** A High Powered Steering Committee (HPSC) to be headed by the Chief Secretary of the State, which would steer the Smart City Mission as a whole.
- **City:** A Smart City Advisory Forum in all Smart Cities, comprising the District Collector, Chief Executive Officer of Special Purpose Vehicle (an SPV is created for implementation at the city level. Its role is to release funds, and implement, monitor and evaluate the Smart City development projects), member of Parliament, member of Legislative Assembly, Mayor, local youth, technical experts and representatives of the area Resident Welfare Association to advise and enable collaboration

### Financing:

- The Smart Cities Mission in India is a centrally sponsored scheme. It also requires state governments and urban local bodies (ULBs) to contribute an equal amount for implementing projects under the Smart City Proposal (SCP).
- States are expected to seek funds for projects outlined in the Smart City Proposal from multiple sources including the following:
  - Using State/ULB's resources (from collection of user fees, beneficiary charges & impact fees, land monetisation, debt, loans, etc.)
  - Deploying additional resources transferred due to acceptance of recommendations of the Fourteenth Finance Commission (FFC)
  - Utilising innovative finance mechanisms, such as municipal bonds with credit rating of ULBs, Pooled Finance Development Fund Scheme and Tax Increment Financing (TIF)
  - Leveraging borrowing from financial institutions including bilateral and multilateral institutions (both domestic and external sources)
  - Availing the National Investment and Infrastructure Fund (NIIF)

### Convergence with Other Government Schemes:

- There is a strong similarity between the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and Smart Cities Mission in achieving urban transformation. While AMRUT follows a project-based approach, the Smart Cities Mission follows an area-based strategy.
- Similarly, significant benefits can be derived by seeking integration of other Central & State Government Programmes/ Schemes with the Smart Cities Mission.
- At the planning stage, cities must seek convergence in the Smart City Proposal (SCP) with AMRUT, Swachh Bharat Mission (SBM), National Heritage City Development and Augmentation Yojana (HRIDAY), Digital India, Skill Development, Housing for All, Construction of Museums funded by the Culture Department and other programmes pertaining to social infrastructure such as Health, Education and Culture.

### Issues:

- Lack of cooperation
- States not fulfilling their financial obligations
- West Bengal govt opposed New Town smart city – no uniform development
- Opposition to Special Purpose Vehicle (SPV) – an entity set up to achieve specific objectives
- Lack of coordination between large number of govt departments
- The projects completed does not represent the clear picture

## 4. Vibrant Villages Programme

**Syllabus:** Growth, development and employment.

**Prelims:** Vibrant Villages Programme and Shinku-La tunnel

**Mains:** Significance of Vibrant Villages Programme

**Context:** The Union Home Minister unveiled the ₹4,800-crore Vibrant Villages Programme (VVP).

### Key Details

- The Union Government approved the Vibrant Villages Programme (VVP) with central components of ₹4800 crores which includes ₹2500 crores for road connectivity for the FYs 2022-23 to 2025-26.
- Further, the Union Cabinet has approved the formation of seven additional ITBP (Indo-Tibetan Border Police) battalions
- The Cabinet has also approved a 4.1-kilometer Shinku-La tunnel on the Manali-Darcha-Padum-Nimmu axis to provide all-weather access to Ladakh.

**Shinku-La tunnel:**

- It is a 4.1-kilometre tunnel on the Nimu-Padam-Darcha Road link that provides all-weather connectivity to Ladakh's border areas.
- It will also facilitate the movement of security forces in that area.
- It is extremely important in terms of the country's security and safety.
- The tunnel is expected to be finished by 2025.

**What is Vibrant Villages Programme?**

- It is a Centrally Sponsored Scheme introduced in the Union Budget 2022-23 (until 2025-26) for the development of northern border villages.
- The programme aims to improve the quality of life of people living in specified border villages and also encourage people to stay in their native locations which helps reverse the trend of migration away from these villages as well as enhancing the security of the border.
- Under the programme, more than 2900 villages from the districts of the states of Arunachal Pradesh, Sikkim, Uttarakhand, Himachal Pradesh and UT of Ladakh have been identified for comprehensive development.
- The district administration will build vibrant Village Action Plans with the assistance of Gram Panchayats.
- There shall be no duplication with the Border Area Development Programme.

**Objectives:**

- The scheme assists in identifying and developing economic drivers based on local, natural, human, and other resources of northern border settlements.
- Growth is centred on a 'hub and spoke model' of promotion of social entrepreneurship, empowerment of youth and women through skill development, and entrepreneurship.
- Exploiting tourism potential by promoting local, cultural, traditional knowledge, and legacy;
- Development of sustainable eco-agribusinesses based on the 'one village-one product' principle through community-based organisations, cooperatives, and non-governmental organisations (NGOs).

**Significance of Vibrant Villages Programme**

- The goal is to fortify the security grid along the Line of Actual Control (LAC). It will also allow the ITBP to rest, recoup, and train its people.
- The decision to establish additional battalions was made with the necessity for effective border monitoring and the battalion in mind.
- The government's decision to approve a financial package for border villages and strengthen security comes at a time when disputes with China along the LAC in Ladakh remain unresolved.
  - The PLA is still occupying the Depsang Plains and Demchok.
  - China is also working to improve its infrastructure along the LAC.
- The scheme's objectives are to identify and exploit the border village's local, natural, human, and other resources as economic drivers.
- Every person living in a village will have access to services provided by the Indian government, and residents would receive the advantages of numerous programmes.
- The plan also aims to increase employment prospects in these areas by promoting local, cultural, and traditional knowledge, and history in border regions, which has the potential to boost tourism.

**5. SEBI – new measures**

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

**Mains:** Various measures undertaken by SEBI to strengthen the securities market in India.

**Context:** The Securities and Exchange Board of India (SEBI) recently launched the 'Corporate Debt Market Development Fund' to help prevent financial crises.

**Securities and Exchange Board of India (SEBI)**

- Securities and Exchange Board of India (SEBI) is an autonomous organization that works under overall administrative supervision of the Union Finance Ministry.
- The SEBI was established under the Securities and Exchange Board of India Act, 1992 to protect the interests of the investors in securities along with promoting and regulating the securities market.
- Headquarters: Mumbai, Maharashtra
- Regional offices: Ahmedabad, Chennai, Delhi and Kolkata.
- SEBI is empowered to frame rules, regulations, guidelines and direction etc. in respect of both primary and secondary securities markets.

### What is the Corporate Debt Market Development Fund?

- During market disruptions, the Corporate Debt Market Development Fund (CDMDF) provides a backstop facility for selected debt funds.
  - In a securities offering, a backstop is the act of providing last-resort support or security for the unsubscribed portion of shares.
  - When a company seeks to acquire capital through an issuance, it may receive a backstop from an underwriter or a big shareholder, such as an investment bank, to purchase any unsubscribed shares.
- The fund's purpose is to provide liquidity assistance in the case of a financial catastrophe.
- It attempts to boost confidence among corporate bond market players while also improving secondary market liquidity.
- Mutual funds will contribute an initial corpus of Rs 3,000 crore to the planned CDMDF.
- The government has granted a fund leverage of ten times (Additional corpus), allowing CDMDF to raise funds of up to Rs 30,000 crore.
- Contributions to the fund can be made by the specified debt-oriented mutual fund schemes and mutual fund asset management organisations.
- The National Credit Guarantee Trust Company (NCGTC) guarantees this fund, and SBI Mutual Fund will handle the backstop facility.
- Specified mutual fund schemes will have access to the fund for the purpose of selling securities during market disruption.
- This access is proportional to the mutual fund contribution given to the fund.

### SEBI to regulate index providers - What are market index providers?

- Index providers are organisations that create and manage indices.
- One of the index provider's major duties is to classify and characterise markets, as their indices represent a market or segment of a market and give a performance benchmark for that market or sector.
- They are responsible for establishing the rules that govern which securities are included in each index, how the index is managed, and how securities are added or removed from the index over time.
- They also usually determine how stocks are categorised, such as whether they are Healthcare or Oil & Gas stocks, or if they are Developed or Emerging market stocks.
- An index provides a glimpse of the market for investors and other stakeholders.
- Indexes are provided by globally famous institutions such as S&P Dow Jones, MSCI, and Bloomberg.
- In India, this practice is typically carried out via stock exchange subsidiaries. The most important indices in India are the Nifty50 supplied by NSE Indices and the Sensex provided by a collaboration of S&P Dow Jones Indices and BSE Ltd.

### SEBI approves ASBA like facility for trading in secondary market - What is Application Supported by Blocked Amount (ASBA)?

- SEBI created this method to apply for IPOs, rights and debt issues, FPS, and other securities.
- It means that the cash to be paid for subscribing to the shares is not debited from the investor's account until the company has allotted the shares.
- Investors can apply for ASBA and have the bank hold the application funds until the shares are allocated to them.
- This mechanism will only allow the investor to subscribe if his or her application is chosen for the issuance.
- Self-Certified Syndicate Banks (SCSB) perform this blocking.
- The funds are paid once the issuance has been approved by the investor.
- **Self-Certified Syndicate Banks (SCSBs):** These are SEBI-authorized banks that accept applications, verify and block the amount to the extent required by the application, upload the details to the web, and stay updated with the process until the shares are allotted.
- If the issue is withdrawn or the investor is not assigned shares, SCSBs reimburse the money to the investor's account.
- Since 2016, subscribing to issues via ASBA has been a required option.
- If the funds are held in an interest-bearing ASBA account, they will continue to collect interest during the time it takes to receive the share allotment. To qualify for ASBA, the investor must be a resident of India.
- The purpose of implementing this approach was to eliminate the trouble of looking for refunds or having shares not be awarded.

### Disclosure Norms

- The Securities and Exchange Board of India (SEBI) requires that large listed businesses confirm or refute price-sensitive market rumours within 30 minutes, and that key board decisions be disclosed to stock exchanges within 30 minutes.
- The SEBI board makes it essential for the top 100 listed businesses by market capitalization to verify, confirm, deny, or clarify any market rumours in order to increase transparency and ensure timely disclosure of material events or information by listed entities.
- This would take effect on October 1, 2023.
- In the event of the top 250 listed businesses by market capitalization, the deadline to comply with this standard would be April 2024.
- The markets regulator has also made upstreaming of clients' cash to Clearing Corporations mandatory for stock brokers and clearing members.

**Nut graf:** The changes suggested by SEBI have the potential to improve corporate governance in India and strengthen the securities market. If implemented effectively, these changes may lead to greater transparency, accountability, and investor protection. This could ultimately contribute to the growth and development of the Indian economy.

## 6. In controlled digital lending, the issue of public interest

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

**Prelims:** Controlled Digital Lending

**Mains:** Copyrights and associated concerns

**Context:** There was a legal tussle in the United States regarding the development of a globally accessible digital library.

### Details:

- The four major publishers in the USA and Internet Archive (IA), a non-profit organization that is building a globally accessible digital library are engaged in a legal tussle.
- The incident has once again brought to the fore the issue of copyright law and technological advancements.
- It raises the question of “Whether copyright law should protect the public interests or the commercial interests of the copyright holders?”

### Internet Archive

- It is an American digital library to access information, especially for persons with disabilities.
- It is also a non-profit organization that advocates free and open Internet.
- It has archived approximately 735 billion web pages, 41 million books and texts, 14.7 million audio recordings, 8.4 million videos, 4.4 million images, and around 890000 software programs.

### Details about the Legal Dispute:

- It has been alleged by the publishers that nearly 3.6 million books made available by the IA for borrowing are copyrighted.
- It is argued by the publishers that IA violated the rights provided under copyright law for 127 titles published by them.
- The publishers are especially concerned about the ‘National Emergency Library’, which was established at the peak of the Covid-19 pandemic.
- However, IA rebutted by highlighting that books under copyright protection are lent to the users in a regulated manner through ‘Controlled Digital Lending’ (CDL).
- IA also highlighted that through the CDL route, the sales of print and electronic copies from the publisher’s preferred platforms were not hampered.
- The district court for the Southern District of New York ruled that the activities of IA have violated several rights of publishers under copyright law. Furthermore, they do not constitute ‘fair use’ under the same law.
- The court concluded that the benefits provided by IA “cannot outweigh the market harm to the publishers.”
- It is argued that the court ignored the judgment of the U.S. Supreme Court in the *Google LLC vs Oracle America, Inc.* case (2021).
  - It was directed that it is important to consider the public benefits of copying while analyzing potential financial losses for copyright holders.

### Controlled Digital Lending:

- Under Controlled Digital Lending (CDL), IA avails one digital copy of each non-circulating print book it has stored. It then lends it like the physical library (i.e. lending one owned copy to one person at a time).
- Moreover, it counts one copy per library (from libraries participating in the digitization process), irrespective of the number of physical copies.
- It is found that lending books from libraries physically is on the decline. This was further hampered by the pandemic. However, it should be noted that the number of readers has not gone down, instead, they prefer reading on tablets and mobile phones.
- CDL has various advantages:
  - It bridges the gap between privileged and unprivileged readers and urban and rural readers.
  - It increases the accessibility of books, even to the remotest locations.
  - They also provide books that have gone out of print.
  - It invokes benefits for education, research, and cultural participation.

### India’s Scenario:

- Currently, India has no major CDL initiative. However, it is speculated that there can be CDL in the future as digitization projects in India have also begun (for example, the NLSIU initiative).

### Conclusion:

- The case can have serious implications in other countries also.
- It is said that even the current lending process can be threatened if economic interests are prioritized over the public interest.
- It should be realized that the copyright system should not only protect the rights of copyright holders but also the interests of the users of copyrighted works.

**Nut Graf:** The legal dispute between the publishers and a non-profit organization in the United States has once again highlighted the tussle between copyright and public interests. The matter needs a deeper analysis as the interest of copyright users should also be incorporated with the interests of copyright holders.

## 7. Poor testing of pashmina shawls still poses a problem

**Syllabus:** Industries- Handicraft industries.

**Prelims:** Pashmina

**Mains:** Concern associated with the pashmina shawl trade.

### Details

- The Kashmir Chamber of Commerce and Industries (KCCI) has raised concerns about the confiscation and poor testing of pashmina shawls.
- KCCI highlights that there is a growing seizure of shawl consignments by the Customs Department at international airports in India.
- It is said that if the hurdles are removed exports of Kashmiri Shawls would reach between ₹1,000 crores and ₹2,000 crores.
- The craft also employs tens of thousands of males and females.

### The official figure of exports from Kashmir Handicrafts Department

Year	Shawl exports
2018-19	₹305 crore
2019-20	₹272 crore
2020-21	₹172 crore
2021-22	₹166 crore

### Associated concerns

- Notably, the basic microscopes at the airport detect banned shahtoosh guard hair (wool from the chiru goat or Tibetan antelope) in what are classified as pashmina shawls (wool from the pashmina goat).
  - The thread width of pashmina wool is 13 to 16 microns, whereas shahtoosh has a width below 11 microns.
- The shawls are then sent to testing laboratories at Dehradun or Kolkata and the reports are generated after months.
- Moreover, reports are inconclusive in various cases.
- In between the generation of reports, either traders are questioned or CBI raids are carried out on the artisans.
- According to the Wildlife Trust of India (WTI), around 537 illegal imports of shahtoosh scarves were reported by Switzerland authorities in the last five years.
- There is a risk of contamination of pashmina shawls with shahtoosh as artisans can't make out the difference.

### Shahtoosh Ban

- The J&K government imposed a ban on Shahtoosh in 2002 as the chiru population started declining in the 1980s.
- It reached between 200-500 in the trans-Himalayan deserts of Ladakh in 2003. However, the population is stabilizing now.

### Way Ahead

- The KCCI has demanded the installation of the latest pashmina testing machine in Srinagar and Delhi for simplification of Customs clearance.
- Moreover, instead of basic microscope testing, DNA testing should be adopted.

**Nut graf:** The poor testing of pashmina has raised various concerns about the exports of pashmina shawls. Its export is witnessing a continuous decline over the last five years. It is suggested that the handicraft should be looked at from a scientific perspective and that the concerns are addressed in a timely manner.

## 8. Dabba Trading

**Syllabus:** Economy; Issues relating to planning and mobilization of resources

**Prelims:** About Dabba Trading

**Mains:** Issues associated with Dabba Trading and possible ways to curb the prevent it

**Context:** Recently, the National Stock Exchange (NSE) issued notices to entities involved in “dabba trading”.

### What is Dabba Trading?

- Dabba trading is a type of informal trading that occurs outside of the purview of stock exchanges.
- In this practice, traders speculate on stock price movements without engaging in a physical transaction to acquire physical ownership of a certain stock, as is done in an exchange.
- This leads to unlawful and unregulated gambling focusing on stock price changes.
- For example, suppose an investor makes a \$1,000 bet on a stock. He/she would profit \$500 if the price point rose to \$1,500. However, if the price falls below 900, the investor must pay the difference to the dabba broker.
- As a result, it is possible to deduce that the broker’s profit equals the investor’s loss and vice versa. The equations are especially important during bull or bear markets.

### Legality:

- It is defined as an offence under **Section 23(1) of the Securities Contracts (Regulation) Act (SCRA), 1956**, and conviction can result in imprisonment for up to ten years or a fine of up to Rs. 25 crore, or both.

### Issues Associated:

- **Cash Transactions:** Cash transactions are facilitated, and the process is operated using unrecognised software terminals, allowing dabba traders to avoid taxation.
- Because they employ cash, they are outside the purview of the regular banking system. It causes a loss to the government’s coffers.
- **Investors Lack Security:** Being outside the regulatory purview implies that investors lack formal provisions for investor protection, dispute resolution systems, and grievance redressal mechanisms that are accessible within an exchange.
  - The major risk is that the broker fails to pay the investor or that the firm becomes insolvent or bankrupt.
- **Black Money:** It has the potential to stimulate the rise of ‘black money’ while also supporting a parallel economy, potentially leading to hazards such as money laundering and criminal activity.

### How can Dabba Trading be Prevented?

- **Strict Law Enforcement:** The Securities Contracts (Regulation) Act of 1956 already forbids ‘dabba trading’ and imposes harsh fines for conviction. However, these regulations must be strictly implemented, and offenders must be punished in order to dissuade others from engaging in such acts.
- **Increasing Awareness:** Retail investors must be taught and made aware of the risks associated with “dabba trading.” Financial regulators can run awareness campaigns and spread information about the risks of such trading.
- **Monitoring Social Media and Mobile Apps:** ‘Dabba trading’ is frequently made possible by mobile apps and social media. Regulators can keep an eye on these platforms and take action against people who promote or participate in them.

## 9. The EU’s new crypto-legislation

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

**Prelims:** Markets in Crypto Assets (MiCA).

**Mains:** EU’s crypto legislation.

**Context:** European Parliament approved the Markets in Crypto Assets (MiCA).

### Details

- The European Parliament has approved the Markets in Crypto Assets (MiCA).
  - It is the world’s first set of comprehensive rules for regulating largely unregulated cryptocurrency markets.
  - It will come into force after the formal approval by member states.
- It will not only harmonize the crypto industry but also provide a competitive edge to the EU in comparison to the U.S. and the U.K.
- The law became urgent as the year 2022 saw some of the biggest failures in the crypto markets. For instance, the collapse of the crypto exchange FTX and the failure of Terra LUNA cryptocurrency.

### Salient Features of MiCA:

- MiCA describes crypto assets as “ a digital representation of a value or a right that uses cryptography for security and is in the form of a coin/token/any other digital medium which may be transferred and stored electronically, using distributed ledger technology or similar technology”.
- However, it will not be applied to transferable digital assets like securities and shares that already qualify for financial instruments.
- It will also exclude non fungible tokens (NFTs).
- Moreover, it will not regulate digital currencies and assets issued by the European Central Bank or national banks of EU member states.
- The rules will be applied to the issuer of cryptoassets or cryptoasset service providers (CASPs) that provide one or more services like:
  - Operation of a trading platform
  - Provides custody and administration of crypto-assets on behalf of third parties (customers)
  - Facilitates exchange of crypto assets
  - Provides advice on crypto assets and crypto-portfolio management
- MiCA requires every CASP to get incorporated as a legal entity in the EU. CASPs will then be supervised by regulators like the European Banking Authority and the European Securities and Markets Authority.
- The rules also mandate furnishing key information like the terms of the offer to the public, details of crypto products, type of blockchain verification mechanism, etc.

### Response to the Legislation:

- The overall response to the regulation is positive as it is better to have a regulatory framework than to have no rules at all.
- However, some experts feel that MiCA is laggard in covering newer vulnerabilities in the crypto industry like crypto staking and lending.

### Crypto Regulation in India:

- Presently, India does not have a comprehensive regulatory framework for crypto assets.
- However, the Government of India has taken several steps to regulate it. For instance,
  - The Union Budget 2022 imposed a 30% tax on income from the “transfer of any virtual digital asset.”
  - In March 2023, the government decided to place all transactions involving virtual digital assets under the purview of the Prevention of Money Laundering Act (PMLA).

**Nut Graf:** *The Markets in Crypto Assets (MiCA) is the first comprehensive law in the world that aims to regulate the ever-increasing crypto market. Similar efforts should be made across the world including India to safeguard the public and overall economy of the country.*

## 10. Virtual digital assets

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

**Mains:** Significance & Challenges of Digital Currencies.

**Context:** Regulation of virtual digital assets in India.

### Introduction:

- Virtual digital assets (VDA) are digital representations of value that are created, stored, and exchanged electronically, typically using blockchain technology.
- These assets can be used for a variety of purposes, including as a form of currency, as a store of value, or as a means of accessing and participating in decentralised applications and ecosystems.

### Money laundering and VDA:

- With the growing popularity of virtual digital assets such as cryptocurrency, the Indian government has been taking steps to regulate and monitor the use of these assets to prevent money laundering and other illegal activities.
- On March 7, 2023, the Union Finance Ministry, in a gazette notification, extended anti-money laundering provisions under the Prevention of Money Laundering Act (PMLA) Act of 2002 to virtual digital asset businesses and service providers.
- **Activities under these provisions includes,**
  - Exchange between virtual digital assets and fiat currencies
  - Exchange between one or more forms of virtual digital assets
  - Transfer of virtual digital assets
  - Safekeeping or administration of virtual digital assets or instruments enabling control over virtual digital assets, and
  - Participation in and provision of financial services related to an issuer’s offer and sale of a virtual digital asset.
- As per the notification, virtual digital assets platforms carrying out the above activities will now have to register as a reporting entity with the Financial Intelligence Unit-India.
- Reporting entity platforms such as CoinSwitch are now mandated to implement ‘know your customer’, record and monitor all transactions, and report to the Financial Intelligence Unit-India as and when any suspicious activity is detected.

**Significance:**

- The regulation of virtual digital assets will help improve investor protection and reduce the risks associated with investing in these assets.
  - By bringing these assets under the prevention of money laundering provisions, the government can help create a more secure and transparent investment environment.
- This can also help promote innovation in the financial sector. By providing a clear regulatory framework, the government can encourage the development of new and innovative financial products and services that use virtual digital assets.
- It can also help India keep pace with other countries that are already regulating these assets.
- Such rules are already applicable to banks, financial institutions and certain intermediaries in the securities and real estate markets.
- These risk-mitigation measures are in line with global guidelines put forward by the International Monetary Fund and the Financial Action Task Force (FATF).

**Way Forward:**

- India's G-20 presidency could provide an opportunity to spearhead critical discussions on establishing a global regulatory framework for virtual digital assets.
- There is also an opportunity to consider the steps taken by other G-20 nations.
  - Japan and South Korea have established a framework to licence Virtual Asset Service Providers (VASPs), while the Markets in Crypto-Assets (MiCA) regulation has been passed by the European Parliament.
- Implementing increased regulation within the domestic virtual digital assets ecosystem could offer essential reassurance to both regular users and regulators.
- A forward-thinking regulatory framework will ignite the entrepreneurial spirit within India's innovation economy and cement India's position as a leader in virtual digital assets.

**Nut Graf:** The Indian government has extended anti-money laundering provisions to virtual digital assets, including registration as a reporting entity with the Financial Intelligence Unit-India. This will help improve investor protection, promote innovation, and keep pace with global regulations.

**11. Wheat blast**

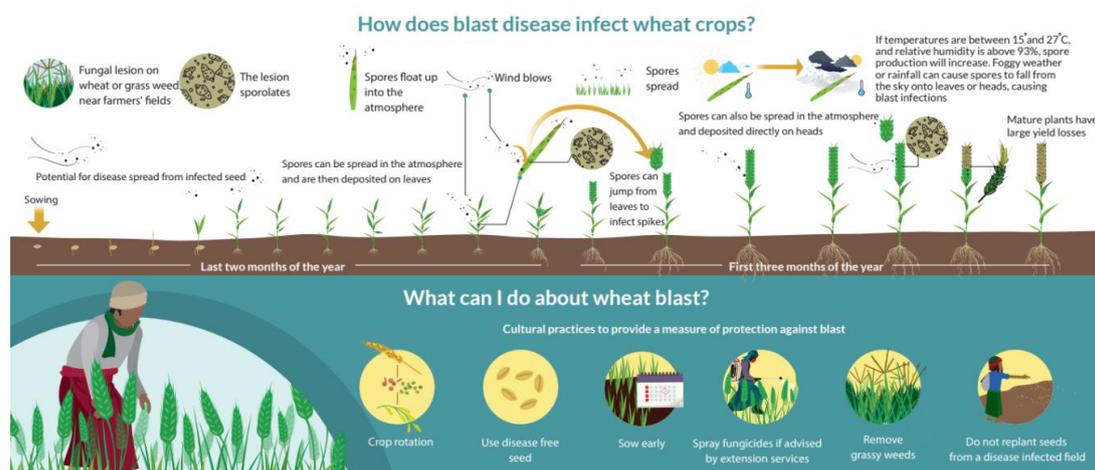
**Syllabus:** Agriculture - issues and related constraints

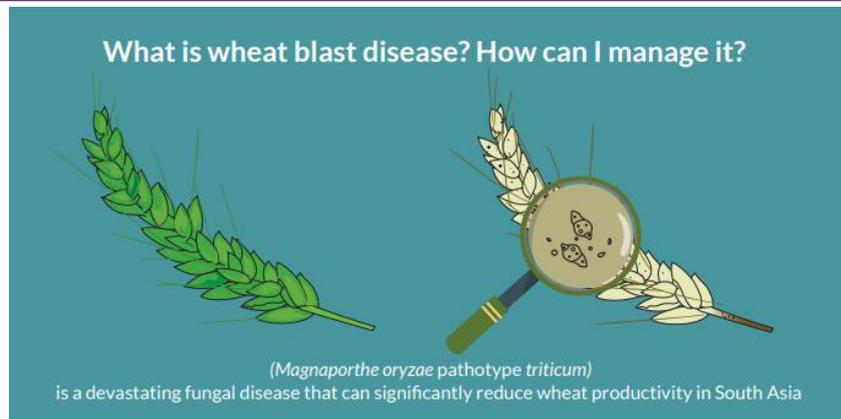
**Prelims:** Wheat Blast

**Context:** According to a new study, the world's most important food crop, wheat, is under peril from a blast disease pandemic.

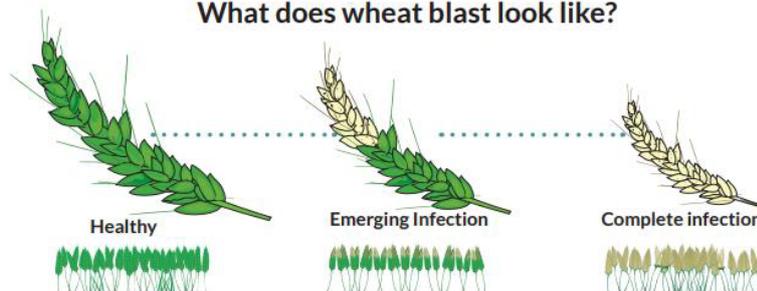
**What is Wheat Blast?**

- Wheat blast is a fungal disease that wreaks havoc on wheat production in tropical and subtropical areas.
- Magnaporthe oryzae pathotype Triticum (MoT) causes it. It was discovered in Brazil in 1985.
- The fungus infects both wild and cultivated grasses, including rice and wheat.
- It spreads through contaminated seeds and crop leftovers, as well as through airborne spores that can travel considerable distances.
- It extended to key wheat-producing areas of the country before spreading to other South American countries such as Bolivia, Paraguay, and Argentina.
- In 2016, Bangladesh announced Asia's first outbreak of this pathogenic wheat blast.





### What does wheat blast look like?



#### About Wheat

- It is India's principal cereal crop. After rice, it is India's second most significant cereal crop.
- Wheat grown in central and western India is often hard and heavy in protein and gluten.
- Rabi Crop is sown from October to December and harvested from April to June.
- Temperature should be between 23°C and 16-20°C for optimum tillering.
- Rainfall ranges between 50 to 100 cm.
- Wheat cultivation requires soils with a clay loam or loam texture, good structure, and moderate water holding ability.
- Wheat is grown in the following Indian states: Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Rajasthan, Bihar, and Gujarat.

## 12. Mircha rice

**Syllabus:** Agriculture

**Prelims:** Mircha rice and Geographical Indication (GI) Tag

**Context:** Mircha' rice of Bihar's West Champaran has been awarded the GI tag.

#### About Mircha Rice:

- Mircha rice is grown in West Champaran District, Bihar.
- The size and shape of the grain appear like that of black pepper. Hence, it is known as Mircha or Marcha Rice.
- **Characteristics:** The grains and flakes of this rice have a unique aroma that makes it different. This rice is famous for its aroma, palatability and its aromatic chura (rice flakes) making qualities. The cooked rice is fluffy, non sticky, sweet and easily digestible with a popcorn-like aroma.



Source: newsonair

### About Geographical Indication (GI):

- Geographical Indication (GI) is an indication used to identify goods having special characteristics originating from a definite geographical territory. The Geographical Indications of Goods (Registration and Protection) Act, 1999 seeks to provide for the registration and better protection of geographical indications relating to goods in India.
- It is governed and directed by the WTO Agreement on **Trade-Related Aspects of Intellectual Property Rights (TRIPS)**. It was decided and also stated under Articles 1 (2) and 10 of the Paris Convention that the protection of industrial Property and Geographical Indication are elements of Intellectual Property. It is primarily an agricultural, natural or a manufactured product (handicrafts and industrial goods).
- **Validity:** This tag is valid for a period of 10 years following which it can be renewed.
- **Significance:** Once a product gets this tag, any person or company cannot sell a similar item under that name. GI registration of a product provides it legal protection and prevention against unauthorised use by others. GI tag helps in promoting the exports of the product. It also provides comfort to customers about the authenticity of that product.
- **GI Registration:** There is a proper process of registration of GI products which includes filing of application, preliminary scrutiny and examination, show cause notice, publication in the geographical indications journal, opposition to registration, and registration.
- Any association of persons, producers, organisation or authority established by or under the law can apply. The applicant must represent the interest of the producers.
- **GI Tag Products:** Some famous goods which carry this tag include Basmati rice, Darjeeling Tea, Chanderi Fabric, Mysore Silk, Kullu Shawl, Kangra Tea, Thanjavur Paintings, Allahabad Surkha, Farrukhabad Prints, Lucknow Zardozi, Kashmir Saffron and Kashmir Walnut Wood Carving.

### 13. Chinese dual-use infrastructure facilities in Myanmar and Sri Lanka

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

**Mains:** Impact of the policies and politics of China on India's interests.

**Context:** Recent satellite images showing the construction of a military facility on Coco Islands in Myanmar and a proposed remote satellite receiving ground station system in Sri Lanka, both coming up with Chinese help, have raised concerns in India of possible surveillance across the region.

#### What is a dual use facility?

- A dual-use facility is a building, infrastructure, or equipment that can be used for both civilian and military purposes.
- Such facilities can be used for a range of activities, such as research and development, manufacturing, transportation, communication.
- While these facilities may be primarily intended for peaceful civilian purposes, they can also be used for military purposes if necessary



Source: colombo telegraph.com

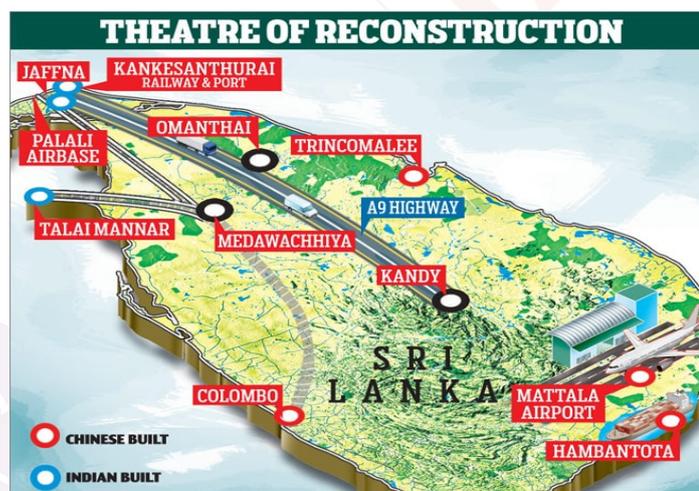
#### Chinese dual use facility in Myanmar and Sri Lanka.

- **In Myanmar:**
  - **China's Belt and Road Initiative:** In Myanmar, China has invested heavily in infrastructure projects, including ports, railways, and pipelines as a part of China's Belt and Road Initiative.
  - **Kyaukpyu deep-water port:** capable of handling large ships and could be used by the Chinese military.
    - Kyaukpyu deep-sea port in Rakhine state is also strategically located near the Bay of Bengal and the Indian Ocean.
  - **Signals intelligence facility on Coco Island:** Recent satellite images show the construction of a military facility on Coco Islands which is capable of collecting intelligence on ships and aircraft in the region.)
    - The island is located very close to the Andaman and Nicobar island chain.
  - **Airport in Hanthawaddy:** It is capable of handling large military aircraft.



● **In Sri Lanka:**

- **Hambantota Port:** Capable of handling large ships and could be used by the Chinese military
- **Mattala Rajapaksa International Airport:** capable of handling large aircraft and could be used by the Chinese military
- **Colombo Port City:** China has also invested in the Colombo International Container Terminal (CICT) and the project has been described as a “strategic asset” by China, and there are concerns that it could be used for military purposes in the future.
- China has also proposed setting up a remote satellite receiving ground station system in Sri Lanka in collaboration.
  - Given its critical location, it can be used to spy on Indian assets and intercept sensitive information and also across the region.



**Concerns for India:**

- China's growing influence in the region
- The potential for these facilities to be used for military purposes
- The risk of debt traps

**Way forward for India:**

- Promote Economic cooperation with Sri Lanka and Myanmar in areas such as trade, investment, and infrastructure development.
- Security cooperation: India can also offer security cooperation to Sri Lanka and Myanmar.
- Promote regional cooperation.

**Nut Graf:** China's investment in dual-use facilities in Myanmar and Sri Lanka has raised concerns and created unease among its neighbours about China's growing influence in the region and the potential security implications of these projects.

## 14. Future of nuclear power

**Syllabus:** Infrastructure: Energy

**Mains:** Global prospects of nuclear energy.

**Context:** This article discusses the outlook for nuclear power.

### Introduction:

- India is one of the countries that rely significantly on nuclear power as a source of energy.
- The country has been pursuing nuclear power since the 1950s, and currently, it operates 22 nuclear power reactors with a total installed capacity of 6,780 MW.
- India's nuclear power program is based on a three-stage strategy.
- Overall, nuclear power is an important part of India's energy mix, and the country has plans to continue expanding its nuclear power capacity in the coming years.

### Outlook for nuclear power:

- Globally, the outlook for nuclear power is mixed. On one hand, there is increasing interest in nuclear energy as a low-carbon alternative to fossil fuels, particularly as countries seek to reduce their greenhouse gas emissions and meet climate targets.
- Some countries, such as China and Russia, are investing heavily in new nuclear power plants, while others, such as the United States and many European countries, are focused on maintaining and upgrading their existing nuclear infrastructure.
- Over the past two years, there has been a resurgence in nuclear power, particularly following the Ukraine war.
- Countries such as China, South Korea, and Japan are increasing their use of nuclear power, with Japan restarting reactors that were shut down after the Fukushima accident.
  - This is partly due to the high cost of importing coal and natural gas. In the UK, nuclear power is seen as necessary for decarbonising the electricity sector.

### Implications of growth in solar and wind power:

- The growth in solar and wind energy has significant implications for the future of nuclear power globally and in India.
- Solar and wind energy are becoming increasingly competitive with nuclear power in terms of cost, making it more difficult for new nuclear power plants to be economically viable.
- The increasing focus on renewable energy sources may lead to decreased investment in nuclear power projects, which could lead to a decline in the industry over time.
- Nuclear power is a controversial energy source due to concerns about safety and waste disposal. The growth in solar and wind energy may exacerbate these concerns and make it more difficult for nuclear power to gain public support.
- Solar and wind energy are more flexible than nuclear power, which can take a long time to ramp up or down. This means that renewable energy sources can respond more quickly to changes in demand, making them more attractive to energy companies and governments.
- However, solar and wind energy are not always available, due to factors such as weather conditions. Nuclear power plants, on the other hand, can generate electricity continuously, which is an advantage in terms of meeting energy demands.

### Future of Nuclear Power in India:

- India's nuclear plan is limited by its supply of enriched uranium.
- While nuclear power is only a small percentage of India's energy mix, the country has limited potential for hydropower because of conserving biodiversity and the costs of rehabilitating and compensating landowners and the heavy reliance on coal.
  - At present, India has 210 gigawatts of coal capacity, and it produces 73% of electricity in India, whereas nuclear is only around 3.2%.
- To achieve net-zero emissions, a combination of small modular and large reactors will be needed, but this cannot be achieved by one company (all reactors are operated by the Nuclear Power Corporation of India Limited).
- Multiple government companies like NTPC (National Thermal Power Corporation) need to be involved in the civilian nuclear program, which is currently a monopoly. A portfolio of technologies within and outside the nuclear sector is necessary, with designs that interplay well.
- Ultimately, the future of India's nuclear power depends on a range of factors, including the country's energy needs, environmental concerns, public opinion, and the availability of alternative energy sources. It is important for India to carefully evaluate the costs and benefits of nuclear power in the context of its broader energy policies and goals.

**Nut Graf:** Nuclear power outlook is mixed globally, with some investing in new plants while others maintaining existing ones. Solar and wind energy competitiveness makes new nuclear plants economically challenging. India's nuclear future depends on careful energy policy evaluation, considering the limited uranium supply and alternative sources.

## 15. Baba Saheb Ambedkar Yatra

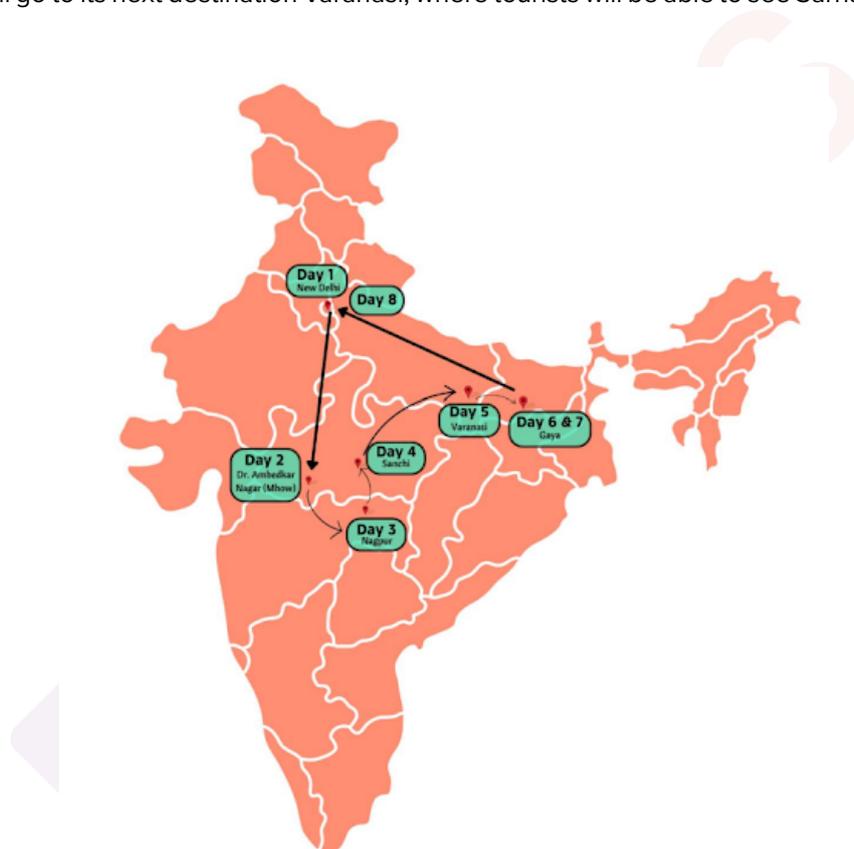
**Syllabus:** Infrastructure - Railways

**Prelims:** About Baba Saheb Ambedkar Yatra

**Context:** To commemorate the birth anniversary of Dr BR Ambedkar, the union government has inaugurated the “Baba Saheb Ambedkar Yatra” tourist train.

### Baba Saheb Ambedkar Yatra

- This train was opened on 14th April 2023 to mark the birth anniversary of Baba Saheb Ambedkar.
- **The train is expected to visit those places which are associated with the lifetime of India’s pride Dr Ambedkar.**
- IRCTC will be operating the Baba Saheb Ambedkar Yatra tour package under the “**Dekho Apna Desh**” initiative, covering some of the prominent sites associated with the life of Dr Bhim Rao Ambedkar.
- This **Bharat Gaurav tourist train** with a journey of 7 nights and 8 days was first taken to **Baba Saheb’s birthplace (Bhim Janmabhoomi) Dr. Ambedkar Nagar (Mhow)**.
  - After leaving for Nagpur railway station, **the tourists reached Deeksha Bhoomi, a prestigious monument of Navayana Buddhism.**
  - Then the pilgrims reached **Sanchi via Bhopal to visit the famous Sanchi Stupa and other Buddhist places.**
  - After this, it will go to its next destination Varanasi, where tourists will be able to see Sarnath and Kashi Vishwanath Temple.



Source: PIB

- **Bharat Gaurav Tourist Train** launch is in line with the Government of India initiative “**Dekho Apna Desh**” to promote special interest circuits in domestic tourism.
  - **IRCTC in association with the Ministry of Tourism** is operating its **first tour on the Ambedkar circuit** on an 8 days special tour from Hazrat Nizamuddin Railway Station starting April 14, 2023.
  - The ‘Bharat Gaurav Tourist train’ is being operated under the ‘Dekho Apna Desh’ initiative which is aimed at promoting domestic tourism.
  - The Ambedkar Circuit was the **fourth in the list of special tourist circuits** namely,
    - Ramayana Circuit,
    - Buddhist Circuit, and
    - North East Circuit.
- The move is expected to attract a lot of tourism to the places associated with Dr Ambedkar.

## 16. Not by Vande Bharat alone

**Syllabus:** Infrastructure-Railways

**Mains:** Need and significance of the railway reforms in India.

**Context:** This article discusses the need for broader metrics to analyse the performance of the Indian Railways.

### Introduction:

- Indian Railways is one of the largest railway networks in the world, spanning over 67,000 kilometres and serving over 8 billion passengers every year.
- It is not only an important mode of transportation but also a significant contributor to India's economic growth.
- With the frequent launch of Vande Bharat trains across different regions of the country in recent days it can be easy to overlook the bigger picture and the critical challenges that the Indian Railways is facing.
- Therefore, it is essential to analyse the performance of the Indian Railways using broader metrics that take into account all its functions and roles.

### Need for broader metrics:

- The Indian Railways Annual Plan outlay has increased by 137% to ₹2,60,200 crore in the Budget for 2023-24. However, there is a need for more relevant metrics to evaluate its performance, as the investments need to translate into concrete progress towards capacity building.
- The National Rail Plan 2030 aims to increase the rail share in freight traffic and raise the average speed of goods trains while reducing tariff rates for freight by up to 30%.
  - The rail share of freight carried for leads over 300 km reduced from 51.5% in 2008-09 to 32.4% in 2018-19, and there is no evidence of higher levels of traffic being achieved with the diversification of commodities carried or an increase in rail share compared to road transport. Hence, the Indian Railways has a significant gap to bridge to achieve the goals set in NRP 2030.
- Punctuality is a key operational index for the Indian Railways. Therefore, Indian Railways should aim for international standards in punctuality, similar to Japanese Railways which measures the punctuality of their high-speed trains in seconds.
  - Indian Railways should aim to be within five minutes of the scheduled time without any adjustment.
  - The current system of destination punctuality needs to be replaced with a more comprehensive index that reflects the punctuality at key intermediate stations with the help of IT and data analytics.
- The Indian Railways should also focus on improving the passenger experience by addressing issues of financial performance, physical performance, safety, organisational/human resource issues, project execution, customer relations, and the impact of dedicated freight corridors on the Indian Railways system capacity.
- The government should table an annual report on the performance of the Railways in Parliament — on the lines of the annual Economic Survey.
  - This report could act as an internal performance audit that would provide a useful reference for policymakers, scholars, and researchers interested in the field of rail transport.

**Nut Graf:** Frequent launches of Vande Bharat trains in recent days may overshadow the major challenges faced by Indian Railways. More relevant metrics are needed to evaluate its performance and capacity-building progress as it is not valid to let the performance of the Indian Railways be judged merely on the basis of certain well-publicised services.

## 17. Welfare of gig workers

**Syllabus:** Growth, Development & Employment

**Mains:** Gig Economy in India and steps that need to be taken to ensure social security of gig workers.

**Context:** Draft bill by Rajasthan state government on Platform-based Gig Workers.

### Gig Economy

- The gig economy in general is defined as an arrangement between the 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.
- 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, independent contractors, are examples of gig workers.

**Background:**

- The gig economy has become a significant source of employment for the youth in India, with approximately eight million people employed in this sector. The flexible hours and quick payment options have made it a popular choice for informal workers who use gigs for moonlighting.
- However, with growing competition among platforms and the availability of cheap labour, gig workers' incentives have decreased, while their workload and uncertainty of work hours have increased significantly relative to pay.
- Additionally, gig workers lack social security benefits and are not recognized as "workers" by most aggregating platforms, making their working conditions increasingly harsh.
- In response to this, the Rajasthan government has introduced a draft bill to create a Rajasthan Platform-based Gig Workers (Registration and Welfare) Bill, 2023, which aims to create a welfare board to hear grievances and design welfare policies for gig workers.

**Possible implications of Rajasthan's initiative:**

- The draft bill aims to create a welfare board to hear grievances and design welfare policies for gig workers. The board will work towards a social welfare corpus financed by a cess on the digital transactions made by consumers on the platforms that utilise gig worker labour.
- To fund the welfare of gig workers, the state government has proposed the Rajasthan Platform-Based Gig Workers Social Security and Welfare Fund, which will start with seed money of ₹200 crore.
- Provisions of the bill are aimed at altering the current dynamic where aggregators refer to gig workers as their partners, which implies no employer-employee relationship and relieves them of any obligation to offer benefits.
- The scheme is similar to those implemented for platform workers in the transport sector in Thailand and Malaysia.
- This draft bill is significant, especially since the Union government recently passed the Code on Social Security, which allowed for some social security for gig workers, but without proper implementation.
- If this bill is successfully implemented and its provisions prove to be effective in improving the working conditions of gig workers, other states in India may also be encouraged to introduce similar measures to ensure the welfare of gig workers in their respective regions.
- This would not only benefit gig workers across the country but also contribute to the standardisation of regulations and policies regarding gig work, providing a more consistent and stable environment for workers and employers alike.

**Nut Graf:** Rajasthan state government introduced a draft bill aimed at providing social welfare for gig workers. This could pave the way for other states to adopt similar measures and promote the much-needed standardisation of regulations in the gig economy.

**18. Digital Highways**

**Syllabus:** Infrastructure

**Prelims:** About Digital Highways and Optic Fibre Cable (OFC)

**Context:** The National Highways Authority of India (NHAI) has announced a plan to build around 10,000 km of Optic Fibre Cable (OFC) infrastructure across the country by fiscal year 2025.

- The NHAI plan is in line with the United Nations' Sustainable Development Goals (SDGs), which seek to provide safe, cheap, accessible, and sustainable transport systems for all by 2030.

**What is OFC?**

- Fibre-optic cables resemble tubes that contain small glass or plastic wires. They use light to deliver data considerably faster than traditional lines that use power.
- Metal wires are preferable for transmission in optical fibre communication because they cause less damage to the signals.
- The optical fibre operates on the total internal reflection (TIR) concept.
  - TIR is the total reflection of a beam of light from the surrounding surfaces back into a medium such as water or glass.
- Light rays can convey a large amount of data (in the event of a long straight line with no bends).
  - In the event of a bend, the optical cables are intended to bend all light beams inwards (using TIR).

**Development of OFC Network:**

- The National Highways Logistics Management Limited (NHLML), an NHAI-owned special purpose company (SPV), will build the OFC network.
- It will put in place a network of Digital Highways by constructing integrated utility corridors alongside National Highways to build OFC infrastructure.
- The NHAI has identified approximately 1,367 kilometres of the Delhi-Mumbai Express and 512 kilometres of the Hyderabad-Bangalore Corridor as pilot routes for the Digital Highway construction.
- The OFC network will help to accelerate the rollout of new-age telecom technologies such as 5G and 6G by providing internet connectivity to remote locations around the country.

### What are Digital Highways?

- Digital highways, often known as roads, are digital platforms that provide both public and private services.
- They use data, technology, and connection to improve the design, building, operation, and usage of the Strategic Road Network (SRN).
- This will result in safer travel, faster deliveries, and overall improved experiences for everyone.

### 19. India, Malaysia move beyond dollar to settle trade in rupee

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

**Prelims:** India-Malaysia trade deal.

**Context:** India and Malaysia settle Trade Agreement on Indian Rupee.

- The Ministry of External Affairs informed that India and Malaysia have agreed to settle trade in Indian rupees.
- It is a consequence of the efforts made to safeguard Indian trade from the impact of the Russia-Ukraine war.
- The move also indicates that India is willing to take concrete steps towards the de-dollarisation of its international trade and shift away from the U.S. dollar (the dominant reserve currency in the international market).
- The Union Bank of India became the first bank in India to operationalize this option and open a Special Rupee Vostro Account through the India International Bank of Malaysia.
- In July 2022, the Reserve Bank of India allowed the settlement of international trade in the Indian Rupee (INR) to facilitate the growth of global trade and support the interests of the global trading community in Indian rupees.
- As a result of sanctions on Russia, payments in U.S. Dollars have become very difficult. This in turn has triggered de-dollarisation and a search for solutions in national currencies.
- In a response to a question in Rajya Sabha, it was informed that RBI has allowed banks from 18 countries to open Special Rupee Vostro Accounts to settle payments in the rupee.
- The move would help in achieving better prices for goods and services traded. It would benefit traders in both India and Malaysia.
- It should be noted that Malaysia is the third largest trading partner of India in the ASEAN (after Singapore and Indonesia).
- The bilateral trade between the two countries reached \$19.4 billion during 2021-22.

## IAS टेबलेट कार्यक्रम

सर्वोत्तम व्याख्यान की  
कहीं भी और कभी भी उपलब्धता



500 से अधिक घंटों का प्रारंभिक और मुख्य परीक्षा के पाठ्यक्रम को आवृत्त करता हुआ व्याख्यान



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

# INTERNATIONAL RELATIONS

## 1. Understanding the Russia-Belarus nexus

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

**Mains:** The Russia-Belarus nexus and its implications on the ongoing war

**Context:** Amidst the latest escalation of the Russia-Ukraine war, the Russian President has announced that Russia would house tactical nuclear weapons in Belarus.

### Key Details

- As per the Russian President, the latest move to station tactical nuclear weapons in Belarus is against the UK's announcement of supplying armour-piercing rounds containing depleted uranium to Ukraine.
- Depleted uranium supplies, which have been regarded as "chemically and radiologically toxic heavy metal" by the United Nations Environment Programme (UNEP), would help Ukraine strengthen its ability to overcome defences on tanks.
- Russia is hence looking to place its tactical nuclear weapons which refer to small nuclear warheads and delivery systems used during wartime for limited strikes in Belarus.
- According to Russia, housing its tactical nuclear weapons in Belarus does not violate any international treaties signed by Russia as the control over the weapons would remain with Russia similar to how the US retains control over its nuclear weapons on the territories of its ally nations.
  - The US has positioned its nuclear weapons in territories of countries such as Belgium, Germany, Italy, the Netherlands, and Turkey.
- Furthermore, it is not the first time that Russia is deploying nuclear weapons outside its territories.

### Russia-Belarus Nexus



Source: Al Jazeera

- Belarus, which is a former Soviet state, has enjoyed close military and political ties with Russia and is seen as one of the closest of the few remaining allies of Russia.
- The majority of the population in Belarus are Orthodox Christians just like Russians and are entirely-Russian speaking.
- Belarus is a member of the Russian-led Collective Security Treaty Organization (CSTO) and the Eurasian Economic Union (EAEU).
  - Russia has also leased two military installations in Belarus.
- Belarus further gets subsidised oil and natural gas from Russia.
- In February 2022, Russia helped to quell the anti-government protests that had emerged in Belarus.
- The geostrategic location of Belarus, which is between Russia and Ukraine, makes it advantageous for Russia.
  - Additionally, Belarus also shares borders with three NATO members namely Lithuania, Latvia, and Poland.
- Stationing weaponry in Belarus would help Russia carry out easier and faster strikes.

### Path Ahead

- Russia has already helped Belarus upgrade its warplanes to enable them to carry nuclear weapons.
- The latest move by Russia is expected to further escalate the Russia-Ukraine war and push it towards the nuclear realm.
- By placing tactical nuclear weapons next to some of the NATO members, Russia is looking to dissuade the West from giving more advanced weapons to Ukraine.
- However, the latest move might have provided an opportunity for the West to use it as a reason to isolate and blame Russia at international institutions.

**Nut graf:** Russia has struck a deal with its neighbouring country Belarus to station tactical nuclear weapons on its territory. The move, however, is seen by the Western world as an attempt to escalate the Russia-Ukraine war and has been heavily criticised.

## 2. Bhutan PM Visits India

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

**Mains:** India - Bhutan relations

**Context:** Bhutan's King paid a visit to India and met with the Indian Prime Minister, during which both leaders discussed bilateral cooperation as well as national and regional issues.

### What are the Key Highlights of the Meeting?

- **Bhutanese Transformation Initiatives and Reforms Process:** The emphasis was mostly on Bhutanese Transformation Initiatives and Reforms Process, as well as India's assistance for Bhutan's development ambitions, including the 13th Five Year Plan, which begins in 2024.
  - Bhutan is scheduled to leave the list of Least Developed Countries in 2023, with the goal of becoming a developed country with a per-capita income of USD 12,000 during the next ten years.
- **Credit Facility and Financial Support:** India has agreed to extend Bhutan a third additional standby credit facility, as well as financial support for reforms and institutional capacity building, infrastructure and connectivity projects, energy cooperation, including hydropower and solar energy projects, and space cooperation, including the recent launch of the India-Bhutan satellite.
- **Power Pricing for Hydro-Electric Project:** The Indian government has agreed to a long-standing request from Bhutan to raise power costs for the Chhukha hydro-electric project, which began operations with India's assistance in 1986.
  - Additionally, India has agreed to talk about purchasing power from the Basochhu hydroelectric plant, which was developed with Austrian assistance in 2008.
  - The two parties will also aim to speed up negotiations on the reservoir-based 2,500 MW Sankosh hydel project, which has been stalled for decades due to environmental and cost concerns.
- **Integrated Check Post:** India is also looking into the prospect of establishing the first Integrated Check Post along the India-Bhutan border at Jaigaon, as well as accelerating the projected Kokrajhar-Gelephu rail link project.
- **Train and Air Link:** Bhutan is building its second international airport near the border with India, and the rail link project will help transform the southern Bhutanese city into an international investment centre.
- **Digital Infrastructure:** Beyond the traditional realms of cooperation, cooperation in newer areas such as new STEM-based initiatives, establishment of digital infrastructure such as the Third International Internet Gateway, integration of Bhutan's DrukRen with India's National Knowledge Network - a key cooperation in the domain of e-Learning, E-library project complementing Bhutan's efforts at digital transformation, e-learning, were also discussed.
- **Financial Cooperation or Integration:** The initial phase of the RuPay project was launched under Financial Cooperation or Integration, and India's Bharat Interface for Money (BHIM) was also launched in July 2021.
- The two parties will also discuss the BHIM app's rollout in Bhutan.

### Background of India-Bhutan relations

- India and Bhutan have exceptional bilateral ties founded on mutual trust, goodwill, and understanding. India and Bhutan established formal diplomatic ties in 1968.
- The Treaty of Friendship and Cooperation signed by the two countries in 1949, which was extended in February 2007, serves as the foundation of India-Bhutan relations.
- Regular high-level interactions between the two countries have helped to strengthen bilateral ties.
- In 2007, India renegotiated the 1949 pact with Bhutan and signed a new friendship treaty.
  - The new treaty replaces the provision requiring Bhutan to follow India's foreign policy direction with broader sovereignty and does not require Bhutan to seek India's consent for weaponry imports.

### Way Forward

- In the context of Indo-Bhutan relations, the importance of environmental sustainability cannot be stressed. Both India and Bhutan have an abundance of natural resources, and it is critical that they collaborate to preserve and maintain these riches for future generations.
- As a result, it is critical that India and Bhutan maintain a focus on environmental sustainability in their bilateral ties and work together to achieve their shared goals of fostering sustainable development and conserving natural resources.

### 3. No 'sayonara' for Japan in Indo-Pacific geopolitics

**Syllabus:** Effect of policies and politics of developed countries on India's interest.

**Mains:** Japan's role in Indo-Pacific geopolitics.

**Prelims:** India-Japan relations.

**Context:** Japanese Prime Minister, Fumio Kishida visited India in March 2023.

**Details:**

- Japanese Prime Minister, Fumio Kishida engaged with Indian Prime Minister, Narendra Modi on bilateral and global issues during his two-day visit to India in March 2023.
- He focused on cooperation between G-7 and G-20, as Japan and India are holding their presidencies respectively.
- Mr. Fumio Kishida also announced, "Japan's New Plan for a Free and Open Indo-Pacific" (FOIP). He also talked about strengthening the "Japan-India Special Strategic and Global Partnership".
- It was highlighted that in the backdrop of the Russia-Ukraine conflict, and China's increasing assertiveness in the South China Sea, East China Sea, Taiwan Strait, and India's LAC (Line of Actual Control), the concept of FOIP needs further momentum.
- The New Plan for the FOIP emphasizes rule-based order and mutual respect for each other's territories.

**Associated Concerns and Way Ahead:**

- The new policy of Japan focuses on the plethora of issues in the Indo-Pacific like food security, cyberspace, freedom of seas, connectivity, etc.
- There is a lack of united stand on the understanding of "what the international order should be".
  - However, it is suggested that FOIP will embrace diverse voices and create an atmosphere of cooperation and collaboration.
- Japan can address these concerns through:
  - Japan needs to collaborate with other like-minded countries like India under FOIP.
  - Rule-making through dialogue should be encouraged.

**Japan's course of Action:**

**Japan has outlined four pillars of cooperation under FOIP:**

- **Principles for peace and rules for prosperity**
  - It is pointed out that vulnerable countries are impacted the most by the erosion of the rule of law.
  - Thus, Japan is willing to engage in economic development programmes like the implementation of the G-20 Principles for "Quality Infrastructure Investment".
- **Addressing challenges in an Indo-Pacific way**
  - Mr. Kishida talked about incorporating realistic and practical projects in the fields of climate change, health, food security, etc.
  - In this direction, Japan is focusing on connectivity projects bilaterally with many countries in the Indo-Pacific region.
- **Multi-layered connectivity**
  - The three areas identified under this pillar are Southeast Asia, South Asia, and the South Pacific/Pacific Island countries.
  - Japan has taken several steps in this regard. For instance,
    - The commitment of \$100 million towards the Japan-ASEAN Integration Fund.
    - Japan is promoting the Bay of Bengal-Northeast India industrial value chain concept in cooperation with India and Bangladesh.
    - It is also supporting the development of the new Palau International Airport Terminal project.
- **Extending efforts for security and safe use of the "sea" to the "air"**
  - Under this, it will strengthen the capabilities of maritime law enforcement agencies in other countries.
  - It will implement the "strategic use of Official Development Assistance (ODAs)" and will put forth the guidelines for ODA for the next 10 years.
  - Furthermore, it will introduce a new framework for "private capital mobilization-type" grant aid and revise the Development Cooperation Charter.

**Analysis of Japan's stand:**

- Japan is trying to reinforce its centrality in the emerging geopolitics of the Indo-Pacific.
- It is concerned about the growing Chinese belligerence in the region.
- The new FOIP aims to stabilize the regional order, uphold peace and accommodate differing voices of countries.
- Japan is preparing for any unforeseen challenges both for itself and the Indo-Pacific region as a whole.

**Nut Graf:** Japanese Prime Minister unveiled a new plan for a Free and Open Indo-Pacific. This highlights that Japan is focusing on the Indo-Pacific region and is deeply investing in stability and prosperity.

#### 4. India-Armenia Relations

**Syllabus:** Bilateral Relations with West Asian Countries

**Mains:** Institutionalised in a long-term cooperation between India and Armenia

**Context:** This article discusses India-Armenia relations.

**Introduction:**

- India and Armenia are two ancient civilizations that have had historical links for centuries.
- Despite being geographically distant, India and Armenia have maintained diplomatic ties since the Soviet era.
- India recognized the Republic of Armenia in 1991, and since then, the bilateral relations between the two countries have grown stronger.

**Historical links:**

- The links between India and Armenia go back to ancient times. According to Mahabharata, Ila, son of King Vaivasvata Man is believed to have migrated to Armenia and founded the country. Similarly, Armenian legends speak of the arrival of a prince named Haik, who is believed to have come from the Indian subcontinent.
- Armenia was one of the first countries in the world to adopt Christianity as its state religion, but before that, Buddhism had a significant presence in the country.
- According to some scholars, Armenian Buddhism was influenced by Indian Buddhism. Numerous Buddhist stupas in Armenia show a significant cultural exchange between India and Armenia in ancient times.

**Cultural ties:**

- India and Armenia share a rich cultural heritage. One of the most significant cultural ties between India and Armenia is the Indian classical dance form, Bharatanatyam, which has become popular in Armenia in recent years.
- In 2017, the Indian Council for Cultural Relations (ICCR) sent a group of Bharatanatyam dancers to Armenia to perform at the Yerevan International Dance Festival.
- Indian films have gained popularity in Armenia, and the Armenian film industry has also made a name for itself in India.

**Economic ties:**

- India and Armenia have been exploring ways to strengthen their economic ties in recent years. The two countries have identified several areas of cooperation, including IT, pharmaceuticals, agriculture, and tourism.
- In 2017, a delegation of Indian business leaders visited Armenia to explore investment opportunities in the country. The Indian companies were particularly interested in the IT sector, which is one of the fastest-growing sectors in Armenia.
- The Armenian government has also been promoting the country as an attractive destination for IT companies by providing tax incentives and other benefits.
- In the pharmaceutical sector, India is one of the world's largest producers of generic medicines, and there is a significant potential for cooperation between India and Armenia in this sector.
- Armenia is a country with a rich cultural and historical heritage, and India could explore opportunities to promote religious tourism to Armenia, given the country's significant Christian heritage.
- Another sector that holds great promise for cooperation is renewable energy. Armenia has set a target to generate 50% of its electricity from renewable sources by 2025, and India, as a leader in renewable energy, could provide expertise and investment in this area.

**Political and Defence ties:**

- India and Armenia share a common interest in promoting peace, stability, and development in their respective regions. The two countries have been cooperating in various international fora, including the United Nations and the Non-Aligned Movement.
- In 2017, then Indian Foreign Minister, Sushma Swaraj, visited Armenia to participate in the Non-Aligned Movement (NAM) Ministerial Meeting and discussed ways to strengthen their political and economic ties.
- In 2018, the Armenian President, Armen Sarkissian, visited India and met with Indian President Ram Nath Kovind, Prime Minister Narendra Modi, and other senior officials. The two sides discussed ways to boost trade and investment, particularly in the IT sector.
- In October 2022, Armenia signed a major defence deal with India for procurement of Pinaka multi-rocket launch systems and their ammunition, among others, in a deal worth around ₹2,500 crore.

**Nut Graf:** India and Armenia have a lot of untapped potential for cooperation in various sectors, and both countries have expressed their commitment to strengthening their bilateral relations further.

## 5. India-UAE food security partnership

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

**Mains:** India's role in the global food security scenario

**Context:** This article discusses various aspects of India-UAE cooperation on food security.

### Introduction:

- Despite the efforts to increase domestic food production, the UAE still heavily relies on global markets for its food security.
- The country imports about 90% of its food requirements, including staple foods such as rice, wheat, and meat.
- The UAE's reliance on global markets for its food security is driven by a number of factors, including the limited availability of arable land, water scarcity, and a harsh climate.
- The UAE is now prioritising the attainment of both food accessibility and preparedness for potential supply chain disruptions.
- As the world's second-largest food producer, India is a crucial collaborator for the UAE in its efforts to enhance food security.

### India's capabilities:

- India is the world's second-largest producer of food, with a diverse range of crops grown across the country. India's vast agricultural potential and growing export capabilities have positioned it as a global agri-export powerhouse.
- India's top agricultural exports include rice, wheat, spices, fruits, and vegetables. The country has also been able to establish itself as a leading exporter of organic products, such as tea, coffee, and spices.
- India's growing agricultural exports have also been supported by the government's initiatives to promote trade and investment in the sector. For example, the government has set up dedicated export zones and provided incentives for agricultural exports.
- India has demonstrated a strong commitment towards enhancing its agri-capabilities in the global food marketplace through significant budgetary investments in setting up large food parks and modernising supply chain management.
- These efforts have been further bolstered by India's focus on leveraging bilateral trade agreements to maximise its potential in the food sector.
- In recent years, India has also acted as a humanitarian provider of food to developing countries, demonstrating awareness of its evolving role in advancing regional and global food security.
- Concurrently, India runs the Public Distribution System, the world's largest food subsidy programme, which offers subsidised grains to almost 800 million citizens.
- India's focus on promoting the consumption and farming of millets as a part of its G-20 presidency reflects its commitment to the global food security dialogue with an emphasis on building resilience.
- During its G-20 presidency, India is focusing on three major issues, referred to as the "three Cs", which are Covid, Conflict, and Climate, that pose a significant threat to food security in India and around the world.
- India can use its position to establish sustainable, inclusive, efficient, and resilient trade pathways with the UAE to shape the future of food and drive global development.

### UAE's contribution to India-UAE food security partnership:

- At the I2U2 (India, Israel, the United Arab Emirates, and the United States) summit held in July 2022, the UAE pledged a \$2 billion investment to build food parks in India.
- The India-UAE food corridor scheme signed during the Comprehensive Economic Partnership Agreement (CEPA) negotiations with logistics partner DP World is a strategic initiative aimed at promoting food security and increasing bilateral trade between India and the UAE.
- The scheme involves the establishment of a dedicated logistics network to facilitate the movement of food products from India to the UAE and other parts of the world.
- The India-UAE food corridor scheme is expected to enhance the competitiveness of Indian agriculture and food products in the international market, create new employment opportunities, and generate significant foreign exchange earnings for India.
- It is expected to benefit as many as two million farmers across various Indian states and generate as many as 200,000 additional jobs over the next three years.
- An Indian-owned business conglomerate in Abu Dhabi, the Lulu Group, is planning to invest \$8 million in setting up cold storage and sorting facilities in the Union Territory of Jammu & Kashmir to facilitate the export of fruits and vegetables grown in the state.
  - The group already imports the world-famous Kashmiri apples and saffron from the UT into the UAE.
- Apart from maintaining and diversifying its food reserves, the UAE stands to gain numerous benefits from the food corridor scheme.
- By leveraging its strategic location between Asia and Europe, the UAE could potentially serve as India's food export gateway to West Asia and Africa, and even beyond, thereby strengthening trade linkages between the two nations.

**Nut Graf:** India's G-20 presidency provides a crucial opportunity for India and the UAE to demonstrate viable strategies and frameworks that can form the foundation of food security in the Global South.

## 6. What is behind China's renaming spree?

**Syllabus:** India and Neighborhood Relations.

**Mains:** India-China Relations.

**Context:** The government of China announced that it would “standardize” the names of 11 places in Arunachal Pradesh.

### Details:

- On 2nd April 2023, the Chinese government announced that it would “standardize” the name of eleven places in Arunachal Pradesh.
- The Ministry of Civil Affairs in China published a list of 11 places along with a map displaying Arunachal Pradesh as a part of China's Tibet Autonomous Region.
- India has dismissed the renaming and highlighted that the move is unlikely to have any major impact on the border dispute.
- However, it has underlined the hardening Chinese stance on the boundary and the strained relationship between the two countries.

### Details about the places:

- China claims approximately 90000 sq km of land in the eastern sector of the India-China boundary.
- All eleven sites are in the Indian territory and the notification has announced the names for public use in Mandarin, Tibetan, and English.
- Notably, China refers to the location of the site as “Zangnan”, or “south Tibet”.
- The new set of management rules guides the naming, renaming, and standardization of places.
- This is the third time after 2017 and 2021 that China has issued names for places in Arunachal.
  - In 2017, it was seen as a retaliatory move after the Tibetan spiritual leader, Dalai Lama visited Arunachal Pradesh.
  - In 2021, the list coincided with the new border law of China. The list included names of eight towns, four mountains, two rivers, and the Sela mountain pass.

### China's New Border Law:

- The border law contains 62 articles covering delineation, border defence, immigration, border management, and trade.
- Article 7 contains provisions for issuing of new names.

### China's Stand:

- The Chinese government is hardening its stand on territorial disputes.
- The moves like renaming and the new border law highlight that Beijing is prioritizing the protection of national sovereignty and territory.
- The local-level authorities have also stepped up programmes to build new civilian settlements and border infrastructure.
- China has been very vocal about its claim in Arunachal Pradesh and has re-iterated that any settlement would require India to give up territory in the east.

### Implications on Boundary dispute:

- It is suggested that it is a symbolic gesture and might not have a real impact on the ground.
- However, it does point out the changing situations along the borders.
- In 1988, China and India agreed to normalize the ties and shelve the differences. They also appointed Special Representatives (SRs) in 2003 to find a solution to the dispute.
- The 2020's transgression by China has left the arrangements in tatters.
- A large number of troops from both sides are stationed in the forward areas and the disengagement talks have not yet achieved much.
- The move to rename areas in the state of Arunachal Pradesh has left the prospects of a settlement dimmer than ever.

**Nut Graf:** *The Chinese Government has renamed eleven places in Arunachal Pradesh. Thus, highlighting China's hardening stance on the boundary. Though India has dismissed the renaming, it points out that the future prospects for better relations have become dimmer than ever.*

## 7. A crucial six months for India-U.S. ties

**Syllabus:** Bilateral agreements involving India and/or affecting India's interests.

**Mains:** India-U.S. Relations.

**Context:** The U.S. announced its Ambassador to India after a gap of two years.

### Details:

- The United States announced its ambassador to India in March 2023, after a gap of two years.
- There will be greater engagement between India and the U.S. in forums like G20, I2U2, and Quad.
- Moreover, Indian Prime Minister Narendra Modi will visit the U.S. in June 2023 and American President Joe Biden will visit India in November 2023.

### Strong Areas of Cooperation between India and the U.S.:

- The India-U.S. Initiative on Critical and Emerging Technology (introduced in 2022) has the potential to expand strategic technology partnerships and defence industrial cooperation between the two countries.
- The U.S.-India Strategic Energy Partnership was introduced in 2020 to enhance cooperation in the fields of energy security, energy access, and climate change.
- The Indo-Pacific partnership intends to enhance security and economic growth, promote trade and investment, and ensure connectivity in the region.
  - It is based on the concept of free, open, and inclusive Indo-Pacific region including the sovereignty and territorial integrity of all countries.
  - One of the major objectives is to counter China's growing influence in the region.
  - It involves a range of initiatives like information sharing, joint military exercises, etc. They also cooperate in the field of cybersecurity, maritime security, and counter-terrorism.
- India and the U.S. also share concerns about China's growing assertiveness in the South China Sea, and its efforts to establish economic dominance through the Belt and Road Initiative (BRI).
- India's expanding consumer market makes it an attractive destination for U.S. businesses.
- There is a growing demand for diversifying supply chains due to geopolitical tensions.

### Successful Initiatives of India-U.S. Ties:

- Some of the key moments of the relationship between the two are the nuclear deal, the liberalization of markets, and the U.S.-aided Green Revolution.
- The U.S. also played a role in making India an IT superpower.
- In the area of combating climate change, both countries have cooperated for renewable energy, and joint research and development.
- Additionally, India and the U.S. have worked together on space technology.

### Areas of Concern:

- The U.S. is demanding India change its stance on the Ukraine crisis, whereas India is seeking stronger action from the U.S. against China.
- India is looking forward to better relations with the U.S. However, it is also reluctant to sever its ties with Russia.
- Moreover, India is a president (till September 2023) of the Shanghai Cooperation Organization, which includes China and Russia as its members.
- Russia in its new foreign policy strategy has identified India and China as its major allies.
- Realigning U.S. supply chains to India has multiple challenges. For instance,
  - India does not have a developed infrastructure, logistics, and regulatory systems like China.
  - The legal and bureaucratic system in India is complex.

### Conclusion:

- Despite the deepening relations between the U.S. and India, there are areas where both countries diverge and face trust issues.
- The governments of both countries should take steps to promote closer economic ties and facilitate investment.

**Nut Graf:** *The future of the India-U.S. relationship is crucial as there are multiple diverging points between the two in geopolitics. The relationship should be taken forward constructively, make it reach its potential, and look for positive areas of cooperation.*

## 8. Political situation in South Asia

**Syllabus:** India and its Neighborhood – Relations

**Mains:** India's leadership in South Asia for a better future.

**Context:** This article discusses the current political situation in South Asia.

### Introduction:

- South Asia is a region known for its political, economic, and social complexities. It is home to some of the world's most populous and diverse countries, each with its own set of unique challenges.
- In recent years, South Asia has experienced political turmoil, economic crises, and security threats, which have further complicated the situation.
- This includes political crises in Pakistan and Nepal, upcoming elections in Bangladesh and the Maldives that could tilt the balance between democracy and authoritarianism and Sri Lanka's economic recovery.
- However, India has endured because of its ability to absorb and internalise change while retaining its personality, a quality that some of its neighbours lack.

### Unique Indian values:

- The South Asian region constituted an integrated civilisational area bound together by shared historical, religions, languages, cultural traditions and blood ties. Yet, the values underlying the Indian state stood out in contrast to those adopted by several of its neighbours.
- India followed values such as secularism, democracy, federalism, and linguistic autonomy to preserve Indian unity and integrity.
- India openly accepted democratic values that emerged in Western Europe in the 19th century and were absorbed and internalised during India's century-long freedom struggle.
- Hence, local government, free press, trade union rights, liberal democratic multiparty competitive politics, adult suffrage, apolitical functioning of the Indian armed forces, secular outlook and acceptance of the state as a vehicle of development became pillars of freedom struggle.

### India as a unity:

- India has a solid and enduring basis for its nationhood, as it is bound together by shared religions, languages, cultural traditions, and blood ties.
- The concept of India as a cultural, civilisational unity differentiated from its surroundings was several millennia old and formed the basis of its nationhood.
  - Very few present-day nation-states in the world could claim such a solid and enduring basis for their nationhood.
- The unity and integrity of a nation must be based on a social contract among the people, which should be formulated and sustained through representative structures.
- The shared historical memories bind people together as a nation, not language or religion. The article notes that many present-day nation-states lack a solid basis for their nationhood.
- India also faces a struggle between those who want to build the country based on continually evolving knowledge and those based on traditions, scriptures and belief systems formulated centuries ago.

### Way Forward: Keys to Coexistence

- India has an important role to play in promoting coexistence in South Asia, given its size, population, and economic power in the region.
- One of the keys to coexistence in South Asia is fostering dialogue and cooperation among the countries of the region.
- India can also play a role in promoting cultural exchange and understanding among the countries of South Asia.
- India can play a role in promoting economic development and reducing poverty in the region, which can help to address some of the underlying causes of conflict.
- As a major military power in the region, India can work with its neighbours to address common security challenges, such as terrorism, piracy, and the proliferation of weapons of mass destruction to promote regional security and stability.

**Nut Graf:** *The current state of politics in South Asia is marked by uncertainty, complexity, and multiple challenges. The region's political, economic, and social problems are deeply intertwined, and solutions require a nuanced understanding of the complexities at play.*

9. Finland joins NATO bloc

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

**Prelims:** About NATO

**Mains:** Finland’s move to join NATO – historical underpinnings, implications and the way forward

**Context:** Finland, on April 4, 2023, joined the North Atlantic Treaty Organization (NATO) and became the 31st member of the Organization.

**About North Atlantic Treaty Organisation (NATO):**

- It is an intergovernmental military alliance.
- It was set up in 1949 by the western countries.
- 31 member states – 28 European, 2 North American & Turkey.
- It is **headquartered in Brussels, Belgium.**
- **NATO’s “open door policy” is based on Article 10** of its founding treaty. Any decision to invite a country to join the Alliance is taken by the North Atlantic Council on the basis of consensus among all Allies.
- **Minimum Requirements for NATO Membership:**
  - NATO membership is potentially open to all of Europe’s emerging democracies that share the alliance’s values and are ready to meet the obligations of membership.
  - New members must uphold democracy, including tolerating diversity.
  - New members must be making progress toward a market economy.
  - Their military forces must be under firm civilian control.
  - They must be good neighbors and respect sovereignty outside their borders.
  - They must be working toward compatibility with NATO forces.



## Details



Source: The Economist

- The Finnish President, Sauli Niinistö, stated that “the era of military non-alignment in our history has come to an end”.
  - Finland, after repelling an invasion attempt by the Soviet Union during the Second World War, had opted for non-alignment and maintained friendly relations with Russia.
- The latest move has led to concerns among the Russian leadership and Russia has warned about initiating countermeasures to ensure their tactical and strategic security.
  - The Russian Foreign Ministry has also stated that Russia will respond with “military-technical measures” and its actions will depend on the terms under which Finland has joined NATO.
- Experts, however, believe that Finland is not the first and would not be the last neighbour of Russia to join NATO.
  - Before Finland, countries like Norway (1949, and a founding member), Latvia (2004), Estonia (2004), Poland (1999) and Lithuania (2004) joined NATO.

### Rationale behind Finland Joining NATO

- Experts view the latest move made by Finland as a rational choice considering the existing circumstances post the Russian invasion of Ukraine.
- Finland has engaged with NATO even in the past.
  - In 1994, Finland collaborated with NATO for the Partnership for Peace (PfP) programme.
  - Finland had the status of an “Enhanced Opportunity Partner” and had played an active role in the NATO-led operations in the Balkans, Afghanistan and Iraq.
- As per the Constitution of Finland, every citizen of the country is obligated to participate in national defence. This has led to sufficient and able resources for the country’s army, navy and air force to act effectively in a war situation and defend itself against possible aggression.
- However, the key rationale behind Finland’s latest move has been to receive additional security guarantees from NATO.
  - According to **Article 5 of NATO’s founding treaty**, “an armed attack against one or more of them in Europe or North America shall be considered an attack against them all”.
  - This binds the members together, committing them to protect each other.
- Experts believe that Finland’s move to join NATO can be viewed through the lens of “conventional deterrence”.
  - According to Professor John Mearsheimer, who described the concept, “conventional deterrence is an attempt to persuade an adversary not to initiate a war because the expected costs and risks outweigh the anticipated benefits”.

### Evolution of Finland-Russia Relations

- The relationship between the two countries has been impacted by struggle and compromise for over 200 years.
- The Russian Tsar Alexander I defeated Sweden in 1809 and acquired Finland.
  - He further made Finland an autonomous Grand Duchy of the Russian Empire.
  - However, the collapse of the Tsarist regime in 1917 followed by the Bolshevik Revolution led to the creation of full independence of Finland.
- **First Soviet-Finnish War or the Winter War of 1939-1940:** In October 1939, Stalin proposed a revision of the Finnish-Russian border and a month later, the Soviet Union attacked Finland.
  - The tensions from the Russian Revolution and the Finnish Civil War, and the existing issues from the Treaty of Dorpat in 1920 were key reasons for the start of the First Soviet-Finnish War.
  - The war lasted three and a half months and the Finns lost key portions of their territory but continued to retain their independence.
- **The Second Soviet-Finnish War (1941-1944):** The war between the then Union of Soviet Socialist Republics (USSR) and Finland resumed in 1941 which was supported by the Finnish alliance with the Third Reich.
  - This war ended with the defeat of Finland. The country lost several territories to the USSR and was forced to pay war reparations.

- These wars and their outcomes influenced Finland to pursue a pragmatic and flexible security policy which enabled the country to balance its autonomy with military cooperation with the West.
- Concessions were made by Finland to the Soviet Union, which includes the Finno-Soviet Treaty of 1948.
  - The Finno-Soviet Treaty, despite allowing Finland to remain neutral, barred any foreign troops on its soil without permission from Moscow.
  - The treaty helped Finland improve its trade with the Soviet Union but it also made Finland become heavily dependent on Russia and made the country vulnerable to economic and political developments in the Soviet Union.
- **Paasikivi's line:** Post the Second World War, the skilful diplomacy and pragmatism displayed by Finnish President Juho Kusti Paasikivi helped the country to save itself from the spread of communist ideology.
  - In 1948, the Agreement of Friendship, Cooperation, and Mutual Assistance was signed between the USSR and Finland.
  - Paasikivi's line was based on the idea of peaceful coexistence with the USSR and neutrality was the key motive. This helped Finland address the complexities in global geopolitics post the Second World War.
  - This became popular as "Finland's neutrality".
- **Post-Cold War phase:** After the collapse of the USSR in 1991, Finland looked to develop deeper ties with Russia while also seeking greater integration with Europe.
  - Ever since the Soviet disintegration, Finland has played an active role in various European security initiatives like the Common Security and Defence Policy (CSDP) and the Nordic Defence Cooperation (NORDEFCO) and at the same time, it has maintained close economic ties with Russia.
  - However, tensions between Finland and Russia have been common due to the flux in domestic politics in both countries.

### Possible alternative to joining NATO

- Experts believe that an alternative for Finland apart from joining NATO would have been to develop its own military capabilities and pursue a deeper level of cooperation with other European countries.
- However, Russia's Annexation of Crimea in 2014, Russia's invasion of Ukraine in 2022, and a declining Russian influence forced Finland to join NATO in order to negate any possible security risks in the future.

### Way forward

- The move will further escalate tensions as Russia will look to increase its troops along the Russo-Finnish border.
- It is important that NATO and Russia look for ways to break the existing vicious cycle of undertaking "measures" and imposing "countermeasures".
- With a "security dilemma" unfolding in the region, Russia and NATO are required to exercise cautious behaviour vis-à-vis each other. This requires at least some NATO members to rely on diplomatic tools instead of military brute force.
- The newly elected centre-right government in Finland must not escalate the tensions with Russia and should look to engage in bilateral dialogue.

**Nut graf:** Finland has officially become the 31st member of NATO and this is seen as a significant event as Finland shares a 1,340-kilometre border with Russia. The move to join NATO was influenced by the Russian invasion of Ukraine, Finland's historical troubles with Russia, and the decline of Russian influence in global geopolitics.

## 10. The demand for Scottish independence

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

**Mains:** Key issues associated with the demands for Scottish independence from the U.K.

**Context:** Recently, the British Prime Minister rejected a call from the new First Minister of Scotland, Humza Yousaf, to hold a second referendum for Scotland's independence from the U.K.

### Historical background

- The independent Kingdom of Scotland was formed in the 9th century and it indulged in various wars to remain independent from the Kingdom of England.
- The two kingdoms, however in 1603, signed a personal union agreement and were ruled by the same monarchs.
- Further, in 1707, both British as well as Scottish Parliaments enacted the Acts of Union to enter into a political union under the name of Great Britain on account of various economic and political vulnerabilities prevailing on both sides.
- Despite Scotland retaining some of its decision-making powers, it however failed to get equal representation in the united Parliament which gave rise to various cultural and political differences.
  - Also, the demands for self-governance started to become more prevalent which led to two referendums in 1979 and 1997 and the subsequent formation of a Parliament of Scotland in 1999.
  - This newly devolved Parliament of Scotland was empowered to formulate legislations on issues like health, transport, education, etc. whereas the powers to legislate on issues such as defence, currency, trade, and foreign policy were reserved.
- The latest referendum for Scottish independence was held in 2014, wherein 55% of the Scottish population voted in favour of the union whereas 45% voted to walk out.

## The demand for independence



Source: World Atlas

- The Scottish National Party (SNP), formed in 1934 with the merger of two parties, started a campaign seeking the independence of Scotland from the union post the discovery of oil in the North Sea in the 1970s.
  - The SNP had argued that if the British had no control over reserved matters, the proceeds from the oil from the North Sea would significantly benefit the Scottish economy.
  - According to the SNP, the U.K. is using the revenues from the North Sea oil to fund its current expenses instead of using the revenues to invest in future generations of Scots.
- According to the SNP, the Scottish population must have the right to decide if they want to be an independent country.
  - To address the existing concerns over how an independent Scotland would function without British assistance, the party has come up with White Papers on its vision for “building a new Scotland”.
  - The party has also announced plans to rejoin the European Union (EU) to enhance its trade in the bloc, and to receive other associated benefits.
- SNP further argues that Scotland is different from the U.K. and that the electoral system of Scotland is fairer and more proportionally represented than the U.K.
- SNP also argues that the interests of Scotland are different from that of the U.K. which include Scotland’s stand on open immigration policies, an increased push for the green transition, free university education, taxation on higher earners, and inclusion of the LGBTQ community.
- The party further argues that the U.K. could make other unilateral decisions such as Brexit in the future which might undermine Scottish interests.
- Furthermore, a large percentage of the Scottish population sees independence from the U.K. as a matter of self-determination and identity.

#### The U.K.’s stand

- The British government has said that the SNP has not provided clarity on how the issues related to pensions and healthcare would function in an independent Scotland.
- Further, the British government has warned Scotland that if it rejoins the EU, it would lead to the creation of a hard border between Scotland and Britain.
- The Economic Affairs Committee of Westminster had stated that it would be difficult for Scotland to assume its share of the U.K.’s public debt, which runs into billions and the decommissioning of North Sea Oil will have economic and trade implications for Britain.
- Experts from the U.K. believe that the biggest implication of Scotland leaving the Union would be on the perceptions of “Englishness” among the English, who account for about 85% of the U.K.’s population, and the “projection of Englishness as a national identity” to the world.

### Path ahead

- As the British Prime Minister has rejected the idea to hold a second referendum for Scotland's independence, Mr. Humza Yousaf now faces the difficult task of realising the party's central vision of independence.
- Mr. Humza Yousaf has in the past reiterated that his focus is not mainly on the idea of the "de facto referendum" but his priority is to first gain support for independence among the Scottish population.
  - Recent reports indicate that the support for an independent Scotland has declined to 39% in the country which is less than what was during the 2014 referendum.

**Nut graf:** *Despite the prevailing concerns over how an independent Scotland would actually function without British assistance, the rise of the Scottish National Party in Holyrood, the Scottish Parliament, has provided momentum to the demands for the independence of Scotland from the U.K.*

## 11. Japan on Russian Oil

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

**Mains:** Impact of the price cap on Russian oil on global oil supply.

**Context:** Japan circumventing sanctions on Russian oil.

### Introduction:

- Japan has been purchasing oil from Russia at a price above the \$60 per barrel price cap imposed by the Western allies. This has led to speculation that Japan may be breaching an agreement reached in 2022 to cap the price of Russian oil.
- The G-7 countries, the EU, and Australia imposed a \$60 per barrel price cap on oil purchased from Russia starting in December 2022.
- The move was part of the wider economic sanctions imposed by the West to punish Russia following its invasion of Ukraine.
- This was to restrict the amount of money that Russia can make by selling its oil, but without severely affecting the global oil supply.

### Why is Japan breaking ranks with the West?

- While many European countries have reduced their dependence on Russian energy supplies, Japan has stepped up its purchases of Russian natural gas over the past year. Japan is the only Group of Seven nation not to supply lethal weapons to Ukraine, and Prime Minister Fumio Kishida was the last G-7 leader to visit Ukraine after Russia's invasion.
- Japan got the U.S. to agree to the exception as it needed it to ensure access to Russian energy. The concession shows Japan's reliance on Russia for fossil fuels.
  - Japan has almost no fossil fuel of its own and relies on imported natural gas and coal for much of its electricity.
  - Russia accounts for nearly one-tenth of Japan's natural-gas imports.
- Japan's oil import contributes very little to Russia's overall oil production, which was about 10.7 million barrels per day in 2022, and thus does not significantly subvert the West's efforts to restrict the Kremlin's oil revenues.
- Japan was granted an exception to the cap for oil purchased from the Sakhalin-2 project in Russia's Far East.

### Future of price cap:

- Several countries including India are believed to be paying more than \$60 per barrel to purchase oil from Russia.
- As oil prices rise, the chances of a rift developing even among signatories to the oil price cap arrangement are growing higher.
- Oil traders are subverting sanctions and delivering supplies from Russia for buyers who are willing to pay more than \$60 per barrel.
- Continuing the price cap could be difficult as it works against strong economic incentives and it is impossible to keep track of all shipments in such a large, opaque oil market.
- Recently, OPEC and Russia decided to cut their oil output by 3.66 million barrels per day, sending oil prices soaring by 6%.
- Russian Urals, the flagship crude oil sold by Russia, also soared above \$60 per barrel, thus breaching the West's price cap.
- Thus it is difficult for the West to implement the price cap that would keep Russia's oil revenues in check despite rising oil prices.

**Nut Graf:** *Japan's purchase of oil from Russia above the \$60 per barrel price cap imposed by the Western allies has led to speculation of a breach of the agreement. Japan relies on Russia for fossil fuels and was granted an exception for oil purchased from the Sakhalin-2 project.*

## 12. Saudi Arabia's quest for strategic autonomy

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

**Mains:** Understanding the shift in Saudi Arabia's foreign policy, the rationale behind and its implications.

**Context:** Saudi Arabia is following a course correction and looking to autonomise its foreign policy by reaching out to old rivals and enemies and also by seeking to balance between great powers.

### Saudi's changing foreign policy



Source: The Hindu

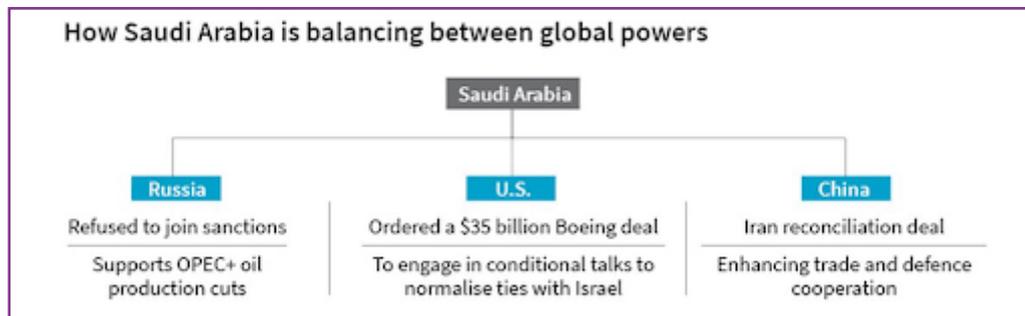
- Traditionally, Saudi Arabia's foreign policy has been hostile towards Iran. This had led to proxy conflicts across the West Asian region. The instances of proxy conflicts include:
  - In Syria, which is said to be Iran's only ally in West Asia, Saudi collaborated with its Gulf allies and Turkey along with the West supported a rebellion against President Bashar al Assad.
  - Also in Yemen, when its capital Sana'a was taken over by the Iran-backed Shia Houthi rebels in 2014, the Saudis resorted to a bombing campaign.
  - Further, one of the major demands made by the Saudis to Qatar while imposing a blockade in 2017 was to cut its ties with Iran.
- Despite the traditional hostility, Saudi Arabia, in March 2023 announced the efforts to normalise diplomatic relations with Iran which were mediated by China.
- Post the announcement of the Saudi-Iran detente, reports have now claimed that Russia is mediating talks between Saudi Arabia and Syria.
  - These talks could result in Syria re-entering the Arab League before its next summit which will be held in May 2023 in Saudi Arabia.
- Most recently, a Saudi-Omani delegation reached Yemen to hold discussions with the Houthi rebels for bringing about a permanent ceasefire.
- These latest moves by Saudi Arabia indicate a significant shift in the policy adopted by Crown Prince Muhammad bin Salman.
- Saudi's foreign policy is undergoing a change as aggressiveness is being replaced by diplomacy and loyal alliances are being kept aside for pragmatic realignments.
- Furthermore, the change in Saudi's foreign policy is taking place at a time when Saudi is also trying to balance between the U.S. (Saudi's largest arms supplier), Russia, (Saudi's OPEC-Plus partner) and China (the rising superpower in the region).

### Rationale behind Saudi's changing foreign policy

- Experts feel that these changes do not mean that the relations between Saudi Arabia and Iran are undergoing a structural transformation as Iran is expected to continue to drive Saudi Arabia's security and strategic concerns.
  - However, Saudi's response to the challenges imposed by Iran is changing from strategic rivalry and proxy conflicts to tactical de-escalation and mutual coexistence.
- There exists a wide range of factors that have influenced the change in Saudi's attitude, they are:

- Recent unsuccessful ventures by Saudi Arabia.
- In Syria, President Bashar al Assad, who was supported by Russia and Iran, won the civil war.
- Also in Yemen, the Saudi-led interventions have failed to oust the Houthi rebels from Sana'a and now the Houthis using their drones and short-range missiles pose a serious security threat to Saudi itself.
- The change in the priority of the U.S., away from West Asia. The U.S. has been Saudi's most important security partner and this change in U.S.'s priority has forced Saudi to establish closer ties with Iran.

### Balancing act of Saudi



Source: The Hindu

- **With the U.S.:** The U.S. is still the largest defence supplier for Saudi.
  - Saudi Arabia is also looking to enhance its advanced missile and drone capabilities to counter Iran's advancements in these areas with help of the U.S.
  - Saudi Arabia has ordered Boeing aircraft worth \$35 billion and has involved itself in conditional talks with the U.S. on normalising ties with Israel.
  - However, Saudi has now realised that the U.S.'s deprioritisation of West Asia would alter the post-War order of the region and is trying to use the vacuum created by the U.S.'s deprioritisation to autonomise its foreign policy.
- **With Russia:** Unlike the other Western allies of the U.S. Saudi Arabia has not imposed any sanctions on Russia.
  - Despite concerns from the West, Saudi Arabia has collaborated with Russia to bring about oil production cuts twice since the start of the war in Ukraine.
  - This move to keep the prices high would benefit both Russia as well as Saudi Arabia as the kingdom is currently undertaking large infrastructure projects to transform its economy.
- **With China:** At the same time, Saudi has developed deeper trade and defence ties with China.
  - Furthermore, the Saudi and Iran reconciliation deal was mediated by China.

### Implications for the region

- If the normalisation of ties and the following negotiations result in Syria rejoining the Arab League, it would be seen as a victory for President Bashar al Assad in the civil war and will also help improve the relationship between Damascus and other Arab capitals.
- Similarly, if the Saudis end the war in Yemen by holding talks with the Houthis, Saudi Arabia will have a peaceful border while Iran could also retain its existing influence in the region.
- However, the path ahead may not be smooth which has been evident in the recent escalation in the Israel and Palestine conflict and the escalation of tensions between Israel and Iran.
- It is also important for Saudi Arabia to continue its course of autonomy without irking or damaging its relations with the U.S. and the West.
- In post-War West Asia, the U.S. had been the mediator or broker for most of the major realignments which includes the Suez War and the Abraham Accords.
- However, there has been a change as now China and Russia are mediating realignments successfully.
- Further, with Saudi Arabia looking to build its own autonomy, the U.S., despite having a significant military presence in the region, is now being reduced to a spectator.

### India's stand:

- India has responded cautiously to this development. The region is geographically close to India and falls within its security parameters.
- Additionally, the region is a significant source of India's oil imports and investments. It is also a critical destination for Indian manpower exports, and an essential trading partner, including projects. Moreover, India has historical linkages with the region.
- India's official policy is centred on prioritising bilateral relations and refraining from getting involved in regional disputes.
- To maintain these priorities, India has focused on supporting cooperative security and ensuring the freedom of waterways and navigation.

**Nut graf:** Saudi Arabia, which had traditionally adopted an aggressive foreign policy is now looking for a course correction by trying to engage with its rival nations, trying to balance between great powers and autonomise its foreign policy. These actions are expected to change the security dynamics and bring about peace and stability in the Gulf region.

### 13. Yemen War

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

**Mains:** Consequences of Yemeni civil war

**Context:** A Saudi-Omani delegation in Yemen on talks to end the Yemen war.

**Introduction:**

- The Yemen War is an ongoing conflict that began in 2015 between two factions vying for control of Yemen, the internationally recognized government led by President Abdrabbuh Mansur Hadi and the Houthi rebels.
- The conflict escalated when the Houthi rebels, who are backed by Iran, seized control of Yemen's capital city of Sana'a in 2014 and forced President Hadi to flee to Saudi Arabia.
- The Houthis, who ousted the internationally recognised government from Sanaa in late 2014, are de facto authorities in North Yemen and say they are rising up against a corrupt system and foreign aggression.
- A Saudi-Omani delegation is planning to travel to Yemen's capital Sanaa to work on a permanent ceasefire deal with Houthi officials and end the war.



Source: Alamy

**Significance of this delegation:**

- The visit by Saudi officials to Sanaa is an indication of progress in Oman-mediated talks between the kingdom and the Iran-aligned Houthi movement, which run in parallel to UN peace efforts.
- It is also an indication of the easing of regional tensions. This comes after years of hostility between Saudi Arabia and Iran, who have supported opposing sides in various Middle Eastern conflicts, including Yemen.
  - In March 2023, Iran and Saudi Arabia agreed to re-establish diplomatic relations and reopen their embassies.
- The discussions focusses on a full reopening of Yemen's ports and airports, payment of wages for public servants which could aid in the rebuilding process and a political transition.

**Significance to India:**

- Yemen holds strategic importance for India due to its location at the entrance of the Red Sea, a crucial trade route for Indian shipping.
- The Bab-el-Mandeb strait, which lies between Yemen and Djibouti, is a major choke point for oil tankers travelling to and from the Suez Canal, through which a significant portion of India's oil imports pass.
- India has also historically had cultural and economic ties with Yemen, with a significant population of Indians living and working in the country before the outbreak of the Yemen War.
- India has provided humanitarian aid to Yemen, and Indian naval ships have been involved in evacuating Indian citizens and providing assistance during the conflict.
- Additionally, Yemen's instability and conflict have had regional security implications, including the threat of piracy in the Indian Ocean and the spread of extremism.
- As a major regional power, India has an interest in promoting peace and stability in Yemen and the wider Middle East region.

**Nut Graf:** The Yemen War is an ongoing conflict between the government led by President Hadi and the Houthi rebels backed by Iran. A Saudi-Omani delegation's visit to Sanaa signals progress in talks for a permanent ceasefire with the Houthis, and easing of regional tensions.

## 14. Sudan Crisis

**Syllabus:** Effect of politics of developed and developing countries on India's interests and Indian diaspora.

**Prelims:** Operation Kaveri

**Mains:** Sudan crisis and its Impact on India

**Context:** Unrest in Sudan.

### Introduction:

- Fighting broke out between the Sudanese army and the country's main paramilitary group on April 15, 2023.
- Paramilitary forces claim to have taken control of the international airport in Khartoum as well as a second airport in Meroe.
- The paramilitary Rapid Support Forces also claimed to have taken over the Presidential Palace and Army Chief General Burhan's residence.
- Many videos appeared on social media showing armed fighters driving across the runway of the city's international airport, conducting checkpoints at crucial traffic intersections, and moving through residential areas.

### Background:

- Sudan has experienced significant political and social unrest in recent years. In 2019, mass protests erupted across the country calling for an end to the 30-year rule of former President Omar al-Bashir.
- The protests were sparked by rising food prices and a failing economy, but also highlighted broader frustrations with corruption, repression, and the lack of political freedoms.
- In April 2019, al-Bashir was removed from power by the military in a coup.
- After months of negotiations, a power-sharing agreement was reached between the military and civilian opposition groups in August 2019.
- However, the transition to civilian rule has been challenging, with ongoing tensions between the military and civilian leaders, and continued protests calling for more progress on political and economic reforms.
- In addition to the political unrest, Sudan has also faced significant social and economic challenges, including a severe economic crisis, ongoing conflict in some regions of the country, and a large influx of refugees from neighbouring countries.

### Challenges in Sudan:

- One of the major challenges faced by the people in Sudan is that the banks have stopped functioning. Moreover, petrol pumps are not working. This has made both transactions and movement nearly impossible.
- There is a collapse in the digital banking sector and people are forced to use the limited hard currency for survival.
- The festival of Id has also added to the difficulty as Sudanese transporters usually take their buses to village homes.
- Biological Risk: According to the World Health Organization, the national public laboratory in Sudan has been occupied by the fighters.
  - It is said the situation is extremely dangerous as the lab holds samples of various diseases like polio, measles, and a range of deadly diseases.
  - The director of the lab warned about the danger of the depleting stocks of blood bags.
- The UN Health Agency reported that there have been 14 attacks on the healthcare facility in Sudan.
- Even the humanitarian workers and ambulances are being attacked.

### Impact on India:

- The unrest in Sudan may have several indirect impacts on India, particularly in the areas of trade, energy, and security.
- Sudan is an important trading partner for India, with bilateral trade between the two countries totaling around \$1.5 billion in 2020. The instability in Sudan could disrupt trade flows and impact Indian businesses operating in the country.
- Sudan is also a key source of crude oil for India. Any disruptions to oil supplies from Sudan could impact India's energy security and result in higher fuel prices.
- The instability in Sudan could also have implications for regional security. Sudan shares a border with several countries in East Africa, some of which have been affected by conflicts and insurgencies.
- India has consistently emphasised the need for dialogue and negotiations between all parties in Sudan to find a solution that respects the aspirations of the Sudanese people for a democratic and stable country.
- The crisis has once again brought to focus the challenges faced by India due to around 14 million non-resident Indians and more than seven million annual tourists and travellers.
  - Many Indians work in dangerous environments such as nurses in Iraq or Yemen, students in Ukraine, labourers in Libya, Syria, and Lebanon, etc.
  - This increases the responsibility of the Indian Government.

### Operation Kaveri

- As per reports, close to 3,000 Indians are 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.
- Stranded Indian citizens are being evacuated from Port Sudan.
- Operation involves efforts from both the Indian Air Force as well as the Indian Navy.
- 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.
- INS Teg has also joined Operation Kaveri and provided additional support in the form of essential relief supplies.
- India is coordinating with other countries like the U.S., the U.K., the UAE, and Saudi Arabia, on the logistics and timing of the evacuation process.
- Sri Lanka has reached out to Indian authorities to evacuate its citizens stranded in Sudan.

**Nut Graf:** The Sudan crisis is impacting countries across the world, including India. There are several associated challenges. India is taking serious efforts to ensure the safety of its citizens stranded in Sudan. It is also coordinating with other nations to deal with the matter efficiently.

## 15. The Wagner group's actions in Africa

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

**Prelims:** Facts about the Wagner group

**Mains:** Wagner group's involvement in Africa, its key objectives and implications on the region.

**Context:** In the wake of the political crisis in Sudan which recently has turned into a countrywide armed conflict, there have been questions raised over the involvement of the Wagner group.

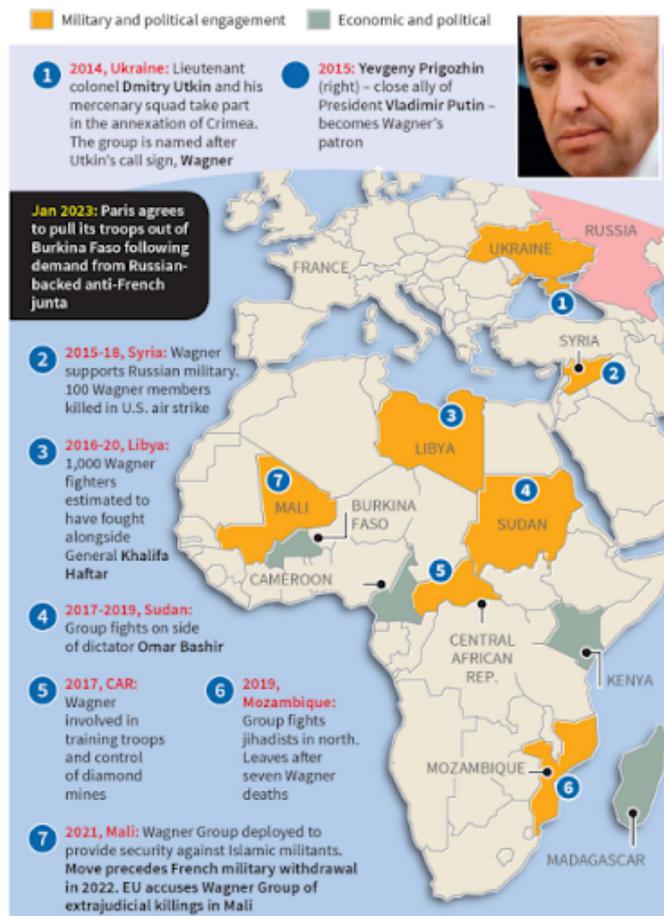
### Wagner Group

- The Wagner group is a Russian private paramilitary organisation which is led by Yevgeny Prigozhin, a rich businessman who is famously known as "Putin's chef".
- The Wagner Group is known to have very close ties with Russian President Vladimir Putin.
- The first operation of the Group was helping Russia annex Crimea in 2014 and since then the Wagner Group has been used in various Russian military operations in many countries.
- Although the Wagner group works closely with the Russian security apparatus, it is legally not recognised as a Russia-based private military company as private mercenary groups are illegal in Russia.
  - However, in 2018, the Russian President recognised the group saying that the group has the right to pursue its interests anywhere in the world as long as they do not break Russian law.
- Apart from engaging in counter-militancy operations in Africa, the group is also involved in various political, economic and military fields.
  - The group has been active in countries like Sudan, Mali, the Central African Republic, Mozambique and Libya in Africa.

### Note:

- The **UN's International Convention against the Recruitment, Use, Financing and Training of Mercenaries** states that the states are required to bear the responsibility for the activities of the mercenaries who violate principles of international law which threaten sovereign equality, political independence, territorial integrity of states and self-determination of people.
- However, the Wagner Group is not a Russia-based private military company legally.

## Wagner Group's Involvement in Africa



Source: The Hindu

- **Sudan:** The group started its engagements in Sudan during the rule of its former President Omar al-Bashir in 2017.
  - The key objective of the ties with Sudan was to safeguard the country's mineral resources, especially the gold mines, and support the government against international opposition.
  - The group also played an active role in suppressing the Sudanese uprising in 2019 that toppled Bashir's regime.
  - Russia has recently developed a strong relationship with the Rapid Support Forces (RSP) and its commander, General Mohamed Hamadan Dagalo, who is a rival leader fighting against the Sudanese army.
  - Russia is also looking to sign an agreement with Sudan to build a military base in Port Sudan on the Red Sea.
  - However, in recent times, there have been allegations about the Wagner group's involvement in the ongoing violence in Sudan.
- **Central African Republic (CAR):** The Wagner group started its engagement in the country in 2018 to protect President Faustin-Archange Touadéra against rebel groups.
  - The group helped in training the country's army and local security forces and in exchange the Group has received licences for diamond and gold mining.
  - Further, the CAR government has also granted the subsidiary unrestricted logging rights across 187000 hectares. The group hence makes profits by importing timber.
- **Mali:** Wagner group's deployment in Mali led to a decline in France-Mali relations and the end of France's Operation Barkhane.
  - The group is filling in the void created by anti-French sentiments which led to the withdrawal of the French forces from Africa.
  - The group is currently involved in training the local forces and providing security services in fighting extremist groups.
- **Libya:** The mercenaries of the Wagner groups have been deployed in Libya since 2019 and are believed to have fought for rebel leader Khalifa Haftar.
  - In return, the Wagner Group has received licenses for mining in civilian areas.
- **Mozambique:** The government in Mozambique invited the Wagner Group in 2019 against the backdrop of escalations of the al-Shabab insurgency.
  - According to reports, the group still maintains its presence in the country and has left behind a small cyberwarfare cell employed by the government.

### Key reasons for the Wagner group's active involvement in Africa

- The main objective of the group's involvement is to gain access to key natural resources in the region.
  - Reports suggest that the Wagner group's presence and moves make up one of the strategies of Russia to secure access to Africa's rich natural resources.
- Russia's access to natural resources in African nations has been providing key financial support to continue the war in Ukraine.
- Further, Russia looks at the Wagner group as an instrument of diplomacy in Africa.
  - This Russian strategy comes with minimal economic costs but ensures heavy political returns.
  - In recent times, Russia has been successful in securing 15 abstentions from African countries against the UN's resolution condemning Russia.

### Implications for Africa

- The increasing reliance on the Wagner group mercenaries implies more violence, intimidation and uncertainties for African nations.
- As per a UN report published in June 2021, private military groups, especially Wagner Group have violently harassed people and committed sexual violence.
  - Additionally, there have been allegations of extrajudicial killings in the Central African Republic and Mali.
- The involvement of the group poses a significant threat to democratic governance and democratic values in the region.
- The current trends among African countries to seek the assistance of Russian mercenaries suggest mounting security concerns and increasing authoritarian footprints of Russia across the continent.

**Nut graf:** The recent crisis in Sudan has brought the debates over the involvement of the Wagner group in African nations into the limelight as there have been allegations of human rights violations and gross abuse of civilians in Africa by the Group and claims that its involvement has impacted the democratic process in Africa.

## 16. Why have key oil producers vowed output cuts?

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

**Mains:** Reduction in Crude oil production by oil producing countries and its implications.

**Context:** Major oil-producing countries have announced cuts in oil production.

### Details:

- Several oil-producing countries like Saudi Arabia, Iraq, the United Arab Emirates, and Russia have announced cuts in oil production that might last until the end of 2023.
- This has caused an instant increase in the prices of crude oil.
- On 3 April 2023, the Organization of the Petroleum Exporting Countries (OPEC) at its 48th meeting of the Joint Ministerial Monitoring Committee acknowledged the announcement.
- These cuts are in addition to that announced in October 2022.
- The U.S. has called OPEC's decision as unadvisable.

### Background Details:

- As per OPEC's official statement, the decision to cut production is aimed at supporting market stability.
- In February 2023, as a response to the price cap on Russian crude by the Western countries, Russia announced cutting crude oil production by half a million barrels a day.
- The recent developments in the banking sector in the U.S. and Europe like Silicon Valley Bank and Credit Suisse have fuelled the possibility of an incoming recession.
- It should be noted that in March 2023, oil prices slipped 1% to a two-week low highlighting the speculations of recession.
- According to *Reuters*, the production cut is also a way of punishing short sellers who bet on oil prices declining.
- Apart from the two million barrels per day cut announced in October 2022, the details of voluntary reductions in different countries are as follows:

COUNTRY	REDUCTION (IN BARRELS PER DAY)
Saudi Arabia	5,00,000
Iraq	2,11,000
United Arab Emirates	1,44,000
Kuwait	1,28,000
Kazakhstan	78,000
Algeria	48,000
Oman	40,000
Gabon	8,000

**Implications for India:**

- India is the third largest crude importer (after China and the US) and ranks 21 and 26 in crude oil and natural gas production respectively.
- It thus shows India's high dependence for its energy needs.
- The imports of crude oil from Russia have increased significantly touching 1.6 million barrels per day. On the other hand, the supply from Iraq and Saudi Arabia has decreased.

**Nut Graf:** *The Organization of the Petroleum Exporting Countries (OPEC) has announced a cut in the production of crude oil. This might lead to an increase in crude oil prices and the stabilization of the market. However, countries like the USA are opposed to the move.*

**17. Stockholm Agreement**

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

**Prelims:** About Stockholm Agreement and Yemen War

**Context:** Several prisoners detained during the Yemen war were recently reunited with their families as diplomatic efforts are underway to put an end to the conflict.

**Stockholm Agreement**

- The Stockholm Agreement was signed in December 2018 between the warring parties in control of parts of Yemen.
- The Stockholm Agreement was brokered by the United Nations (UN).
- The agreement contains three key components namely:
  - **The prisoner exchange agreement:** As per this agreement, both parties had agreed to free conflict-related prisoners or detainees.
  - **The Hudayah agreement:** This agreement included a ceasefire in the city of Hodeidah and other conditions such as no military reinforcements in the city and increased UN presence.
  - **The Taiz agreement:** This agreement includes the establishment of a joint committee with participation from civil society and the UN.

**18. Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)**

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

**Prelims:** CPTPP

**Context:** U.K.'s accession to Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)

**Key Details:**

- The U.K. acceded to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) on March 31, 2023.
- The agreement will now need to be ratified by the UK parliament and each of the CPTPP countries.
- This move is expected to add £1.8 billion (\$2.2 billion) annually to the U.K. economy in the long run. This, however, translates to a modest boost of 0.08% to GDP.
- It is also seen as a "gateway" for the U.K. to the Indo-Pacific region which would account for a majority (54%) of global economic growth in the future.

**19. World Food Programme: India to send wheat to Afghanistan**

- India has signed a Memorandum of Understanding (MoU) with the World Food Programme (WFP) for sending 10,000 tonnes of wheat to the people of Afghanistan.
- The signing ceremony between officials of the Ministry of External Affairs and the United Nations WFP was held in Mumbai and the WFP has promised speedy delivery of wheat to the most vulnerable sections of the Afghan population.
- The fifth tranche, which will be shipped through the Chabahar port of Iran, builds upon assistance already delivered to those in need by the WFP in Afghanistan.
- India had committed at the India Central Asia Joint Working Group on Afghanistan to send 20,000 MT of wheat through the Iranian port of Chabahar.
  - This commitment by India indicated that India would not send humanitarian assistance such as food and medicines to Afghanistan through the transit route over Pakistan.
- According to WFP, nine out of 10 Afghan families could not afford enough food and about 20 million Afghans are facing the threat of starvation with six million of them being one step away from famine.
- India has not recognised the Taliban government in Kabul which took charge in August 2021, but India has continued to send humanitarian goods to the vulnerable people of the country.

**20. Philippines allots 4 more military bases to U.S. troops**

- The Philippines announced the location of four more military bases to be used by U.S. troops, with one site near the South China Sea and another close to Taiwan.
- The 2014 Enhanced Defence Cooperation Agreement (EDCA) had given the U.S. access to five bases in the Philippines and the treaty allies had agreed in February 2023 to expand cooperation in “strategic areas”.
- The expansion of cooperation in “strategic areas” between the U.S. and the Philippines is aimed at countering China’s increasing assertiveness over self-governed Taiwan and the building of Chinese bases in the South China Sea.
- The four sites have been assessed by the Philippine military and deemed “suitable and mutually beneficial” and the bases would also be used for humanitarian and relief operations during disasters.



Source: The New York Times

# ART AND CULTURE

## 1. Kashi-Tamil Sangamam, Saurashtra-Tamil Sangamam and Kedarnath-Tamil Sangamam

**Syllabus:** Salient aspects of Art Forms

**Prelims:** About Ek Bharat, Shreshtha Bharat Scheme

**Context:**

- After the 'success' of the Kashi-Tamil Sangamam, the Union government is set to hold the Saurashtra-Tamil Sangamam in Gujarat from April 17 to 26.
- The third will be the Kedarnath-Tamil Sangamam, which will celebrate the civilisational links between people from the southern part of the country and the sacred shrines of Uttarakhand in the north.

**Why was Kedarnath chosen?**

- Kedarnath, one of the four sacred shrines of Shiva among the Char Dham (four shrines), situated on the banks of Mandakini, 3,583 metres above sea level, is the eleventh out of 12 jyotirlingas (shrines dedicated to Shiva) of India. The Char Dham also comprises Badrinath, Gangotri, and Yamunotri temples.
- Tamilians are ardent Shiva worshippers, and every year thousands of people from TN and other southern States, including Karnataka and Kerala visited Kedarnath during the yatra. The priests of Kedarnath were chosen by the Rawals, who belonged to Karnataka's Veerashaiva Lingayat community.

**Saurashtra-Tamil Sangamam:**

- The event will showcase the cultural links between Saurashtra and Tamil Nadu and will feature poetry recitals, classical music performances, and dance shows.
- The event is aimed at promoting cultural unity and highlighting the shared heritage and traditions of the two regions. The event is expected to receive widespread support from the people of both regions.

**Kedarnath-Tamil Sangamam:**

- Kedarnath, one of the four sacred shrines of Shiva, is a popular pilgrimage site for people from Tamil Nadu and other southern states.
- The event is expected to showcase the shared traditions and cultural ties between the people of Tamil Nadu and Uttarakhand. The event will feature poetry recitals, classical music performances, and dance shows.

**Kashi-Tamil Sangamam:**

- **King Parakrama Pandya**, who ruled over the region around Madurai in the 15th century, wanted to build a temple to Lord Shiva, and he travelled to Kashi (Uttar Pradesh) to bring back a lingam.
- While returning, he stopped to rest under a tree — but when he tried to continue his journey, the cow carrying the lingam refused to move.
- Parakrama Pandya understood this to be the Lord's wish, and installed the lingam there, a place that came to be known as Sivakasi, Tamil Nadu.
- For devotees who could not visit Kashi, the Pandyas had built the Kasi Viswanathar Temple in what is today Tenkasi in southwestern Tamil Nadu, close to the state's border with Kerala.

**Ek Bharat, Shreshtha Bharat:**

- **Launched:** It was launched in 2015 to promote engagement amongst the people of different States/UTs so as to enhance mutual understanding and bonding between people of diverse cultures, thereby securing stronger unity and integrity of India.
- **Ministry Involved:** It is an initiative of the Ministry of Education.
- **Activities Under the Scheme:** Every State and UT in the country would be paired with another State/UT for a time period, during which they would carry out a structured engagement with one another in the spheres of language, literature, cuisine, festivals, cultural events, tourism etc.
- **Objectives:**
  - Create the Unity in Diversity of our Nation
  - Promote the Spirit of National Integration
  - Showcase the rich Heritage and Culture, Customs and Traditions of either State
  - Create an environment which promotes learning between States by sharing best practices and experiences.

## 2. No idols, no arms: the Pattanam mystery

**Syllabus:** Indian Culture and Architecture from ancient times.

**Mains:** Excavations in Pattanam and the observation of its culture.

**Prelims:** Pattanam.

### Details

- Pattanam is a village in central Kerala. It is said to be the only multicultural archaeological site on the southwestern coast of the Indian subcontinent.
- Pattanam is a part of Muziris which is called the 'first emporium' of the Indian Ocean.
  - The Greco-Roman classical age came into direct contact with an ancient South Indian civilization in Muziris.

### Excavations in Pattanam

- The excavations in the region have unearthed less than 1% of the site.
- More than 45 lakh sherds (or ceramic fragments) have been unearthed from the region. These comprise around 1.4 lakh items belonging to regions of the Mediterranean, the River Nile, the Red Sea, the eastern and western Indian Oceans, and the South China Sea.
- The seal of a sphinx was also found, which belongs to the ancient Greek city of Thebes.
- Based on technological, metallurgical, literary, and artistic advances, it is found that there were rigorous cultural and commercial exchanges in Pattanam.
- It is thus inferred that Pattanam was a thriving urban centre that existed from the 5th century B.C. till the 5th century A.D. Moreover, a peak phase was experienced from 100 B.C. to A.D. 300.
- Notably, there is no evidence of the existence of institutionalized religion in ancient Pattanam. Moreover, there are no findings of the graded inequality of the caste system that has described contemporary Kerala and most of India.
- It should be noted that Pattanam lacks sophisticated weaponry. This is in stark contrast to other contemporary sites like Berenike in Egypt and Khor Rori in Oman.
- The fragmentary skeleton remains at graves highlight the "secondary" nature of burial. The dead were first cremated and then osseous remains were ceremoniously buried.
- Furthermore, people of different backgrounds were buried in the same way. Thus suggesting the prevalence of a secular ethos.
- The genotype and ancestry analyses of samples show the link to South Asian, West Asian, and Mediterranean lineages.
- No artefact indicates any religious customs.
- Material evidence highlights that the society lived in harmony with nature, much like the several indigenous societies.
- However, much of the site remains to be unearthed.

**Nut graf:** The excavations in Pattanam highlight that there was no caste or institutionalized creed and use of weapons. Moreover, it was a thriving urban centre with a secular society. However, much of the region remains to be excavated.

## 3. Bihu Dance

**Syllabus:** salient aspects of Art Forms,

**Prelims:** Folk Music; Traditional Dances; Folk Festivals

**Context:** World record performance of Bihu Dance.

### Introduction:

- 11,304 dancers and musicians performed the traditional Assamese dance, Bihu, in Sarusajai Stadium, Guwahati and set two world records on April 13, 2023.
- The artists achieved the world record for largest Bihu dance performance and largest performance by folk musicians.
- More than 7,000 dancers, over 3,000 dhol drummers and other musicians were chosen to perform.

### About Bihu:

- Bihu is a traditional folk dance from the Indian state of Assam.
- It is performed during the Bihu festival, which is celebrated three times a year – in January (Magh Bihu), in April (Rongali/Bohag Bihu), and in October (Kati Bihu).
- The Bihu dance is a celebration of the harvest season and is performed by both men and women in groups.
  - The Bohag Bihu marks the first day of the Hindu solar calendar and is also observed in Bengal, Manipur, Mithila, Nepal, Orissa, Punjab, Kerala and Tamil Nadu.
- The dance is characterised by brisk steps, swaying hips, and the use of traditional musical instruments such as the dhol (drum), taal (cymbals), and pepa (horn).
- The dancers wear traditional Assamese costumes, which include a dhoti, gamocha (scarf), and chadar (shawl).
- During the dance, the performers move in a circular pattern and form various patterns and formations.
- The lyrics of the Bihu songs are usually about love, nature, and the joy of life. The dance is a vibrant expression of the rich cultural heritage of Assam and is enjoyed by people of all ages.
- The Bihu dance has gained popularity across India and has even been performed on international stages.

#### 4. Bhoota Kola

**Syllabus:** salient aspects of Art Forms,

**Prelims:** About Bhoota Kola

#### Bhoota Kola



Source: The Hindu

- *Kola or Nema* is a fierce dance accompanied by drums, music, and other rituals.
- It is performed to invoke the spirit of nature as Tuluvas (people who speak the Tulu language) believe in animism.
- The traditional right to perform the kola belongs to the Nalike and Parava tribes of the region.
- A Bhoota Kola season begins in January and extends to May.
- Bhoota Kola is performed in the open air. It is a ritual performance that begins at the night and is carried on till the early hours of the morning.
- It comes in the forms of Panchuruli, Kallurutti, Koragajja, etc.
- It is originally from the Dakshina Kannada and Udupi districts of Karnataka and the northern parts of the Kasaragod district, Kerala.
- It is similar to Kerala's Theyyam.
- The trained performer of Bhoota Kola in a possessed state is revered as the manifestation of God.
- Costume of Bhoota Kola:
  - It is not as strikingly colorful as those of the Theyyam.
  - It is made of intricately woven palm leaves.
  - The face painting is elaborate (similar to Theyyam).
- The performance gained popularity from a movie named *Kantara*.

#### 5. India to bridge language gap with neighbours

- With an aim to expand its cultural footprint in other nations, especially those in its immediate neighbourhood, India is looking to create a pool of experts in languages spoken in countries like Myanmar, Sri Lanka, Uzbekistan and Indonesia.
  - The move is expected to facilitate better people-to-people exchanges.
- The Indian Council for Cultural Relations (ICCR) has come up with a special project titled "The Language Friendship Bridge", which envisages to train five to 10 people in the official languages of each of these countries.
- The ICCR has so far finalised 10 languages for the project which include Kazakh, Uzbek, Bhutanese, Ghoti (Tibet), Burmese, Khmer (Cambodia), Thai, Sinhalese and Bahasa (Indonesia and Malaysia).
- In India, the focus has mainly been on learning languages such as Spanish, French, German, Chinese and Japanese. However, considering the cultural linkages between India and a few countries, India cannot afford to ignore countries like Myanmar, Sri Lanka, Uzbekistan and Indonesia.
  - India has so far relied on translators, interpreters and teachers in the languages of these countries with which it shares a cultural history.
- The ICCR is discussing the future of the project with various universities such as Jawaharlal Nehru University, Delhi University, Hyderabad's English and Foreign Languages University, Banaras Hindu University, etc.
- There are two possibilities for the project:
  - To have tie-ups with the teachers from these countries to come and teach courses in India.
  - Offering scholarships to Indian students to go and study these languages in those countries.
- Experts have welcomed the move and believe that the ICCR's list of languages must be expanded as a large number of people are visiting India from countries such as Turkey, Bangladesh, Afghanistan and Maldives.

# SCIENCE AND TECHNOLOGY

## 1. Open-Source Seeds Movement

**Syllabus:** Awareness and issues relating to intellectual property rights.

**Prelims:** About plant breeders' rights (PBR) and patents.

**Mains:** Issues associated with plant breeders' rights (PBR) and patents and the significance of the Open-source seeds model.

**Context:** The sudden increase in the number of IP-protected plant varieties and the disproportionate rise of private companies in the seed sector due to the IPR regime have necessitated the adoption of other alternatives. The open-source seed approach is seen as one such alternative that can help overcome the challenges associated with the IPR regime.

### About the rights and patents of plant-breeders:

- Traditionally, farmers and cultivators have innovated and shared seeds without any intellectual property rights (IPR) for centuries.
  - However, the advent of hybrid seeds and advancements in scientific plant-breeding have led to the grant of plant breeders' rights (PBR) and patents.
- As per PBR and patents regime, rights-holders can demand royalty on seeds and legally enforce intellectual property rights (IPR) and in the case of a few regimes, rights-holders can also limit the unauthorised use of such seeds.
- Further, the establishment of the World Trade Organization (WTO) helped to put in place a global IPR regime for plant varieties.
  - The Trade-Related IPR Agreement (TRIPS) also mandated countries to extend a minimum of one form of intellectual property (IP) protection.
- These developments led to the consolidation of rights in the seeds sector which led to various concerns about the freedom to innovate.
- The genetic revolution in agriculture, unlike the Green Revolution, was mainly led by the private sector, as hybrid seeds developed have been protected by strong IPRs.

### Concerns associated with IPR protection in the agriculture sector:

- There are mainly two modes of IPR protection in agriculture namely plant-breeders rights (PBR) and patents.
- These modes of IPR protection have restricted the rights of the farmers and the freedom to develop new varieties using germplasm from IP-protected varieties.
- Further, the high costs and prices associated with genetically modified seeds and IP claims have given rise to various problems and issues which have led to the State's intervention in Bt cotton seeds in India.
- Also, the IPR regime in agriculture has led to the decline of public-sector breeding and the domination of private companies in the seed sector.

### Open-source seeds model:

- In 1999, a plant-breeder T.E. Michaels recommended the application of the principles used for the open-source software approach to seed innovation.
- In the coming years after the proposal in 1999, various scholars and civil-society members formulated policies on the open-source model for seeds and plant varieties.
  - The German NGO Agrecol started an initiative in Europe and according to this model, the user agrees not to patent seeds bought under the open-source licence.
  - Also in the U.S., a pledge-based model for sharing seeds was adopted as a part of the open-source seeds initiative.
- In India, the Hyderabad-based Centre for Sustainable Agriculture (CSA) came up with a model that included an agreement between the CSA and the recipient of the seed or germplasm.
- As per the provisions of India's Plant Variety Protection and Farmers' Rights Act 2001, farmers are allowed to register certain farmer varieties only if they meet certain conditions, and will be granted the right to reuse, replant, and exchange seeds.
  - However, the farmers are mandated not to breed and trade such varieties protected under the Act for commercial purposes.

### Significance of open-source seeds model:

- The open-source approach leads to farmer-led seed conservation and distribution systems.
- The open-source approaches also play a significant role in ensuring food security and climate resilience in the country.
- There are various traditional-variety conservation and sharing methods adopted in India that are unique to specific regions and have specific features.
  - However, such traditional varieties lack uniformity and cannot produce quality seeds.
  - The open-source seed model can help address these issues by enabling testing, improvisation, and adoption.
- The open-source seed model also helps in promoting farmer-led participatory plant-breeding exercises.

**Nut graf:** The sudden increase in the number of IP-protected plant varieties and the disproportionate rise of private companies in the seed sector due to the IPR regime have necessitated the adoption of other alternatives. The open-source seed approach is seen as one such alternative that can help overcome the challenges associated with the IPR regime.

## 2. Indian Space Policy-2023

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

**Prelims:** About Indian Space Policy 2023

**Mains:** Key features and the significance of Indian Space Policy

**Context:** The Indian government has adopted a new space policy that allows non-government Entities (NGEs) to provide national and international space-based communication services via self-owned or leased satellite systems.

- Non-government entities are organisations or institutions that are not directly controlled by the government, such as private enterprises, non-governmental organisations (NGOs), and community organisations.

### Key Features of the Policy

- It aims to institutionalise private sector participation in the space industry, with ISRO focussing on advanced space technology research and development.
- The strategy will allow the private sector to participate in end-to-end space activities such as the development of satellites, rockets, and launch vehicles, as well as data collecting and dissemination.
- 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 spaceflight, 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.

### Significance

- India’s current contribution in the global space economy is less than 2%, and the space policy will assist it rise significantly to 10% in the future.
- It will pave the path forward with much-needed clarity in space reforms and boost private industry participation to advance the country’s space economy opportunity.
- The latest policy gives the much needed clarity on all space activities such as space communication and other Applications.
- Industry experts have welcomed the policy and believe that it is a “futuristic” one that will propel the Indian Space Sector in the 21st century.

**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.

### 3. Second Space Age

**Syllabus:** Awareness in Space Sector

**Mains:** Challenges and opportunities for ISRO in new Space age

**Context:** This article discusses the future prospects of India in the second space age.

#### Introduction:

- The Space Age began in 1957 with the launch of the satellite Sputnik 1, followed by Yuri Gagarin's historic journey into space in 1961, and Neil Armstrong's iconic walk on the moon in 1969, marking the realisation of the First Space Age.
- The contrast between the present-day space domain and that of the Cold War era is stark.
- From the 1950s until 1991, the United States and the Soviet Union dominated the field, with an annual average of 60 to 120 space launches, with the latter two countries accounting for 93% of them.
- Currently, there are many more participants in the space arena, the majority of whom are private companies.
- Since 2020, 90% of all space launches throughout the world have been undertaken by and for the benefit of the private sector.
  - In 2022, there were 180 rocket/space launches, with 61 of them being carried out by SpaceX (a private corporation).

#### India's space journey:

- Over the past few decades, India has made significant strides in space exploration, placing it in the league of the world's leading spacefaring nations.
- From launching satellites to exploring the moon and beyond, India's space program has come a long way since its humble beginnings.
- Initially, India's space program was focused on developing satellite launch vehicles and building ground-based infrastructure for space research.
- It has come a long way since, with over 15,000 employees and an annual budget between ₹12,000 crore-₹14,000 crore in recent years.

#### Focus on societal benefits:

- ISRO's commitment to societal objectives can be traced back to its early years when it was established in 1969. At the time, India was a newly independent country that was grappling with several social and economic challenges.
- The founders of ISRO recognized the potential of space technology to address some of these challenges and set out to build a space program that would serve the country's development needs.
- Over the years, ISRO has launched several communication satellites that have revolutionised communication in the country. These satellites have enabled the provision of telephony, television, and internet services to remote and underserved areas, thereby bridging the digital divide.
- The agency's remote sensing satellites have provided valuable information for natural resource management, environmental monitoring, and disaster management.
- For example, ISRO's satellites have helped in the detection and monitoring of forest fires, floods, and cyclones, which has facilitated timely response and assistance to affected communities.
- The agency has launched several satellites that are specifically designed for applications such as telemedicine, education, and disaster management.
  - For example, ISRO's GSAT-11 satellite has been used to provide telemedicine services to remote and underserved areas, while its EDUSAT satellite has facilitated the provision of education services to rural and remote areas.
- The field of satellite-aided navigation began with GAGAN to augment Global Positioning System (GPS) coverage of the region, to improve air traffic management over Indian airspace. This has now been expanded to a regional navigation satellite system called Navigation with Indian Constellation (NavIC).

#### Space potential:

- In 2020, the global space economy was estimated at \$450 billion, growing to \$600 billion by 2025.
- The Indian space economy, estimated at \$9.6 billion in 2020, is expected to be \$13 billion by 2025.
- However, the potential is much greater with an enabling policy and regulatory environment. The Indian space industry could exceed \$60 billion by 2030, directly creating more than two lakh jobs.
  - Broadband, OTT and 5G promise a double-digit annual growth in demand for satellite-based services.
  - In terms of the end-user revenue, only a fifth is generated by the government. Media and entertainment account for 26% of India's space economy, with consumer and retail services accounting for another 21%.
  - In terms of space activities, downstream activities such as satellite services and associated ground segment are dominant, accounting for over 70% of India's space economy; upstream activities of satellite manufacturing and launch services contribute the smaller share.

#### Creating an enabling environment:

- The Indian private sector is responding to the demands of the Second Space Age.
- There are over 100 space startups today along with the growth of investment from \$3 million in 2018 to \$65 million in 2021.
- Today, ISRO manages 53 operational satellites – 21 for communication, 21 for earth observation, eight for navigation and the remaining as scientific experimental satellites (China operates 541).

- In addition, ISRO has missions such as Chandrayaan, Mangalyaan and Gaganyaan.
- To achieve success in the second space age, India needs to invest more in research and development in the space sector. This investment would allow for the development of new technologies and innovation to support India's space missions.
- Collaboration between the government and private sector companies can help create an ecosystem that supports innovation, technology development, and talent acquisition in the space sector. This partnership would help bridge the gap between the government and the private sector.
- India should forge stronger international partnerships with other countries, space agencies, and private sector companies to facilitate knowledge exchange, technology transfer, and cooperation in space missions.
- The government should encourage entrepreneurship in the space sector by providing support for start-ups, such as funding and access to technology, infrastructure, and facilities.

**Nut Graf:** India's space program has come a long way since its beginnings in the 1960s. The potential for India's space industry is high, with an enabling policy and regulatory environment, with the Indian private sector responding to the Second Space Age. Collaboration between the government and private sector companies can help achieve success in India's space missions.

#### 4. Union Cabinet approves LIGO-India

**Syllabus:** Awareness In the field of Space.

**Prelims:** About LIGO

**Context:** The government has given the final go-ahead to India's Laser Interferometer Gravitational-Wave Observatory or LIGO - India.

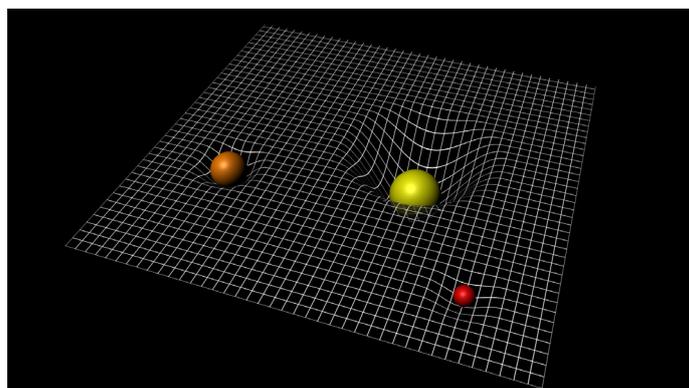
- This has cleared the way for the construction of the country's biggest scientific facility that will join the ongoing global project to probe the universe by detecting and studying gravitational waves.

#### About Laser Interferometer Gravitational-wave Observatory (LIGO):

- LIGO is an international network of laboratories that detect the ripples in spacetime produced by the movement of large celestial objects like stars and planets.
- These ripples were first postulated in Albert Einstein's General Theory of Relativity that encapsulates our current understanding of how gravitation works.
- LIGO is the world's most powerful observatory that exploits the physical properties of light and of space itself to detect and understand the origins of gravitational waves.
- At the moment, there are two such observatories in the US that are separated by a distance of 3000 kilometres that work in tandem to pick up these gravitational waves.
- Each LIGO detector consists of two arms, each 4 kilometres long, comprising 2-meter-wide steel vacuum tubes arranged in an "L" shape and covered by a 10-foot wide, 12-foot tall concrete shelter that protects the tubes from the environment.

#### What is a Gravitational Wave?

- It is an invisible (yet incredibly fast) ripple in space.
- They travel at the speed of light.
- These waves squeeze and stretch anything in their path as they pass by.
- Albert Einstein predicted the existence of gravitational waves in 1916 in his general theory of relativity.
- Einstein's mathematics showed that massive accelerating objects (such as neutron stars or black holes orbiting each other) would disrupt space-time in such a way that 'waves' of undulating space-time would propagate in all directions away from the source.



### About LIGO-India Project:



Source: Thehindu

- LIGO-India will be an advanced gravitational-wave observatory to be located in Maharashtra, India, as part of a worldwide network.
- It is envisaged as a collaborative project between a consortium of Indian research institutions and the LIGO Laboratory in the USA, along with its international partners.
- It will be built by the Department of Atomic Energy and the Department of Science and Technology, with a memorandum of understanding (MoU) with the National Science Foundation, the US, along with several national and international research and academic institutions.
- LIGO-India is a collaboration between the LIGO Laboratory (operated by Caltech and MIT in the US) and three Institutes in India: the Raja Ramanna Center for Advanced Technology (RRCAT, in Indore), the Institute for Plasma Research (IPR in Ahmedabad), and the Inter-University Centre for Astronomy and Astrophysics (IUCAA, in Pune).
- Significance: The information gathered by LIGO India could be used in the field of gravitation, relativity, astrophysics, cosmology, particle physics, and nuclear physics.

## 5. Large Hadron Collider

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

**Prelims:** Large Hadron Collider (LHC)

**Mains:** Details about Large Hadron Collider (LHC), how it functions and its findings

### Large Hadron Collider

- The Large Hadron Collider (LHC) is the world's largest and most powerful particle accelerator.
  - It is also regarded as one of the world's largest science experiments.
- LHC is a collider that accelerates two beams of particles in opposite directions and smashes them head-on.
  - These beams of particles are Hadrons.
  - Hadron is a subatomic particle made of quarks, gluons and anti-quarks.
  - Hadrons are the heaviest particles and are composed of two or more quarks that are held strongly by electromagnetic force.
- LHC is built by the European Organization for Nuclear Research (CERN).

### Functioning of Large Hadron Collider

- The LHC uses Protons, which are made up of quarks and gluons and it energises the protons by accelerating them through a narrow circular pipe that is 27 km long.
- This circular pipe encircles two D-shaped magnetic fields, created by close to 9,600 magnets.
- In the pipe, Protons are made to move by turning on one hemisphere of magnets and turning off the other and once it reaches a specific position the magnetic polarity is reversed by turning off the first hemisphere and turning on the second.

- This makes the Proton move in an anticlockwise direction and by switching the direction of the magnetic field rapidly, Protons are accelerated through the beam pipe.
- There are a few other components placed in the pipe that ensure that the particles do not hit the pipe's walls.
- This process makes the Protons move at 99.999999% of the speed of light which helps them accrue a tremendous amount of energy as per the special theory of relativity.
- When two antiparallel beams of energised particles collide head-on, the energy at the point of collision is equal to the sum of the energy carried by the two beams.
- At the time of the collision, chaos is witnessed and parts of energy coalesce into different subatomic particles based on the fundamental forces of nature.
- The particles take shape depending on the amount and flavour of energy available and which other particles are being created or destroyed around them.
  - A few particles are created very rarely i.e. are created with a probability of 0.00001%.
  - A few other particles are quite massive and require the right kind of energy to be created.
  - A few other particles are extremely short-lived and the detectors studying them need to record them in a similar timeframe.
- The LHC is built in such a way that scientists can alter all these parameters to study different particle interactions.

### The Findings of the LHC

- The LHC has nine detectors that are placed at different points on the beam pipe. These detectors are used to study particle interactions in different ways.
- Annually, these detectors generate close to 30,000 TB of data worth storing, Physicists filter this data with the help of computers to identify and analyse specific patterns.
  - This is similar to how the ATLAS and CMS detectors helped discover the Higgs boson.
- The LHC is known for accelerating a beam of hadronic particles to certain specifications and delivering it which facilitates scientists to do different things with the beam.
- With the help of data generated from all these collisions, researchers have tested the predictions of the Standard Model of particle physics, the reigning theory of subatomic particles, observed exotic particles such as pentaquarks and tetraquarks and examined the extreme natural conditions that existed right after the Big Bang.

### Path ahead

- LHC has to date failed to find “new physics”, which is the collective name for particles or processes that can explain the nature of dark matter or why gravity is such a weak force, and other mysteries.
- Efforts are underway to enhance LHC's luminosity which is a measure of the machine's ability to produce particle interactions of interest.
- There is a controversial idea to develop a bigger version of the LHC as it is believed that such a machine will be able to find “new physics” at higher energies.
  - As CERN and China have announced their plans to develop bigger machines, the scientific community is divided on the use of billions of dollars. Few experts argue that money can be used to build less-expensive equipment such as colliders, with guaranteed outcomes instead of speculative results.

**Nut graf:** The Large Hadron Collider (LHC), which is on the energy frontier of physics research, conducting experiments with highly energised subatomic particles is expected to start collecting data again from mid-May and the LHC is undergoing upgrades that will better the collider and its detectors to capture more sensitive and accurate data.

## 6. India's semiconductor mission might need a compass

**Syllabus:** Developments in the field of Science and Technology.

**Mains:** Semiconductor Mission.

**Prelims:** Semiconductors.

### Details:

- In March 2023, the United States and India signed a Memorandum of Understanding to ensure that subsidies by both countries do not hamper India's semiconductor dream as adopted by the Semiconductor Policy (2021).
- Moreover, the U.S. has also engaged with India to beef up the sector-specific export control laws in the field of semiconductors.
- Notably, the Indian government is trying to involve global majors like Intel to establish a greenfield wafer fabrication plant in the country. However, even after two years of deliberations, it has not been implemented.

### Background Details:

- In 1983, the central government established the Semi-Conductor Laboratory (SCL) at Mohali.
- The aim was to create a domestic electronic ecosystem in the country.
- However, the hopes were dashed due to a fire in SCL in 1989 and the opening up of the market in 1991.
- Despite various efforts to revive the semiconductor facility in Mohali, India's semiconductor mission remained a distant dream.

- After a 15-year stint of SCL with the Department of Space, in December 2021, the laboratory was transferred back to the Ministry of Electronics and Information Technology (MeITy).
- MeITy since then is trying to attract Intel to set up a fab. It should be noted that Intel operates at <22nm node and 300mm. It would thus require \$10 billion to upgrade the SCL.

#### Way Ahead:

- Leverage human and capital assets at SCL in a targeted manner to build on what exists.
- It is important to take advantage of technological breakthroughs in a class of semiconductors that do not require advanced lithography equipment and jumpstart India's semiconductor mission.
- It should be noted that the "More than Moore" segment of >180 nm node comprising mixed-signal analog (BCD and SiGe), wide bandgap (GaN, GaAs, Silicon Carbide) for RF and power markets are already in place at the SCL.
  - An additional investment of \$50-\$100 million would help in developing automotive electronics, PV-Inverters, 5G infra-power amplifiers, and railway electronics at par with global players like Mitsubishi, Bosch, Thales, etc.
- Currently, the Production Linked Incentive/Design Linked Incentive scheme has no provision for incentives to proven global fabless design companies.
  - The upgrades should be backed by subsidies for global fabless design companies that will facilitate India-specific products like motor drives for BLDC fans or e-bike chargers.
- The government's effort under the Semiconductor Mission to open up subsidies to global small and medium-sized enterprises in the upstream supply chain is a good step.
  - But it should be coupled with other initiatives and target different sets of players.
- It is important to correct the course, provide more clarity and act efficiently for a multifaceted market.
- SCL should have a full-time director with prior "More than Moore" foundry experience to execute the vision in the next five years.

**Nut Graf:** India has an ambitious plan in the semiconductor sector. However, it has some lacunae like lack of clarity and inaction that needs to be addressed through investment, policy change, and incentives.

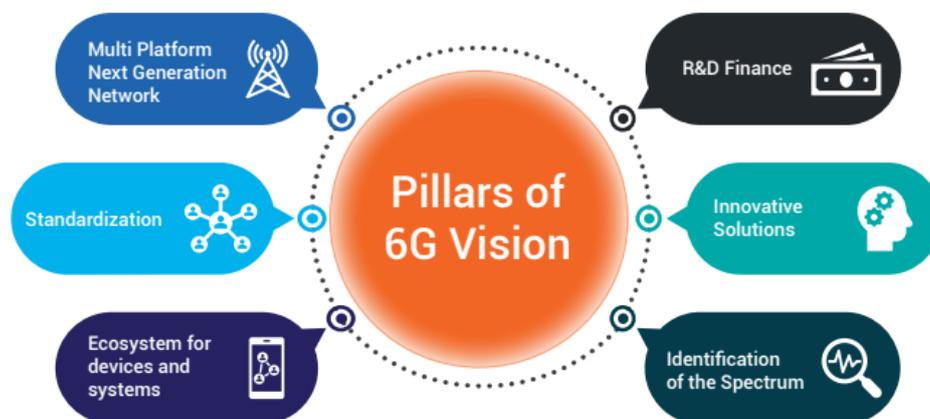
## 7. The Bharat 6G vision document

**Syllabus:** Indigenization of technology

**Mains:** Bharat 6G Vision Statement and the significance of faster adoption of 6G technologies.

**Context:** The Prime Minister of India unveiled the Bharat 6G Vision Document in March 2023.

#### Bharat 6G Vision Statement

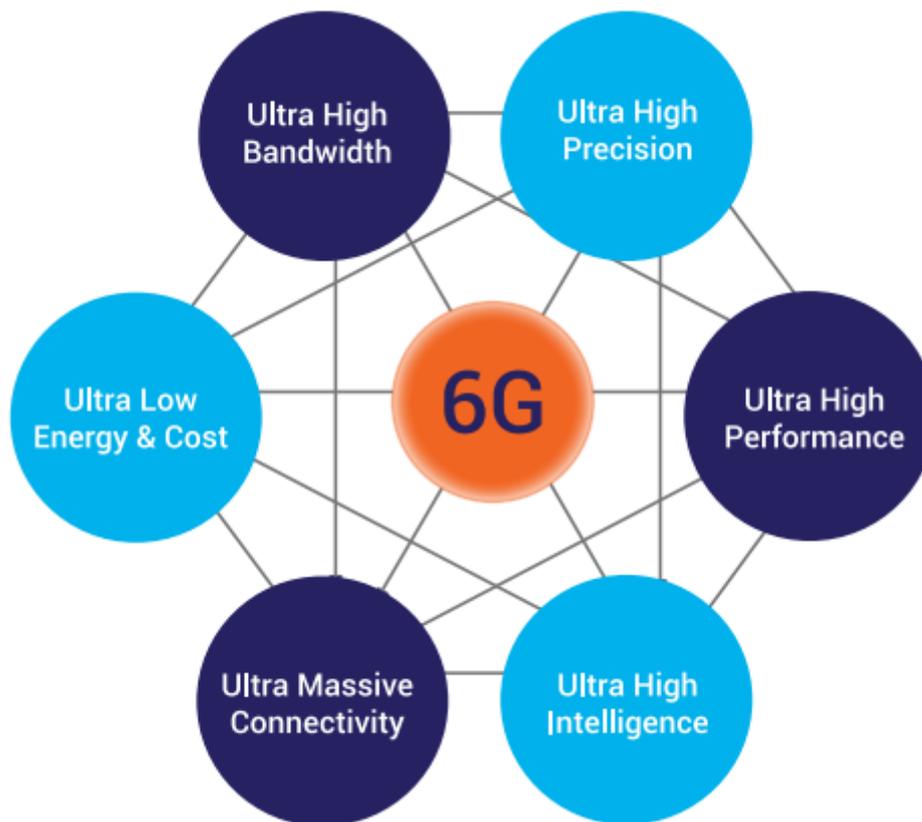


Source: Bharat 6G Vision Statement

- Through a 6G vision document, the government has made it clear that it wants to improve India's wireless data consumption and become a global leader in terms of setting up the standards for 6G.
- The key goals of the government are:
  - Guarantee every citizen a minimum bandwidth of 100Mbps
  - Ensure that every gram panchayat has half a terabit per second of connectivity
  - To blanket the country with 50 million internet hotspots, with thirteen per square kilometre.
- In order to achieve the intended goals, the government is looking to promote local manufacturing of telecom gear, support domestic companies and involve engineers in international discussions around standardisation.
- In the vision document, the government has also acknowledged the delays in the adoption of previous generations of telecommunication technologies in India and the government does not want to repeat the same.
  - For example, 5G was adopted in India, years after countries such as South Korea and the U.S. had adopted it in their major urban centres.
- The government in the vision document has said that the spectrum has been congested currently, especially in the low and mid-bands. Such frequencies in 4G networks may not be able to keep up with the demand for traffic.

- More data can be transferred in higher frequencies.
- Apart from promoting greater participation in standardisation discussions, the government through the vision document also looks to extend financial support to research and development in order to advance connectivity goals, leveraging talent in academia and companies.
- As per the government, an apex body would be established to take Bharat 6G Vision forward for its implementation.

### Difference between 6G and 5G



Source: Bharat 6G Vision Statement

- The 6G technology ensures that the websites would load faster, videos look better, and files download faster.
- The 6G technology offers **much lower latency**, which is the time taken for a data packet to move from one place to another.
- 6G is anticipated to provide higher speeds as compared to 5G.
- Higher speeds and lower latency associated with the 6G networks will help deliver new-age innovations such as holographic communication, improved artificial intelligence, and expanded reality (XR).

### Path ahead

- According to the vision document, satellite constellations will connect telecom towers and base stations, integrating networks and extending them to rural areas.
- Further, countries such as South Korea, Japan and Germany are working in mission mode to adopt 6G technology by encouraging the development of key original technologies and domestic production of core equipment.
  - India must look to collaborate with such countries to fasten the adoption of 6G technologies in India.
- The Bharat 6G Vision statement also cites Europe's equivalent of the document which says that "the key vision is to ensure leadership in strategic areas and establish secure and trusted access to key technologies making Europe a sovereign, independent, and reliable source for 6G public and private network solutions and services."

**Nut graf:** The formulation of a Bharat 6G Vision Document is regarded as a landmark step as the policymakers and the industry gear up for the adoption of the next generation of telecommunication. However, India should first focus on improving telecommunication connectivity as more than 45,000 villages of the country still lack even 4G connectivity.

## 8. Directing AI for better and smarter legislation

**Syllabus:** Indigenization of Technology & Developing New Technology

**Mains:** Utilisation of Artificial Intelligence for better law making process.

**Context:** This article discusses the potential of AI for better and smarter legislation.

### Introduction:

- Artificial intelligence (AI) has emerged as a significant technological advancement that can revolutionise various fields. In recent years, it has been increasingly applied in the field of law, particularly in drafting and implementing legislation.
- India, being the world's largest democracy and a country with a vast population, could significantly benefit from the use of AI in legislation.
- AI has the potential to create better, more efficient, and smarter legislation that could help address the challenges that the country faces.
- The COVID-19 pandemic has given a strong thrust to the Digital India initiative and a digitisation of services. This momentum needs to be kept up and utilised in the field of law, policy-making, and parliamentary activities, harnessing the power of AI.

### Concerns of AI:

- India is one of the fastest-growing economies in the world and has been actively exploring the use of AI in various industries. However, there are also concerns about the economic and privacy implications of AI in India.
- **Economic Implications:**
  - AI can automate many jobs and lead to job displacement, particularly in industries such as manufacturing, retail, and customer service.
  - The widespread adoption of AI may require a significant skill upgradation of the workforce to ensure that they are equipped to work with AI-enabled systems and technologies.
  - The adoption of AI could exacerbate existing economic inequalities, with some segments of society benefiting more than others.
- **Privacy Implications:**
  - The use of AI requires access to large amounts of data, and there are concerns about how this data is collected, stored, and used.
  - The use of AI for surveillance purposes, such as facial recognition technology, raises concerns about privacy violations.
  - AI algorithms can be biased, leading to discrimination against certain groups of people. This could have serious implications for privacy and human rights.

### Challenges in the Current Legislative Process in India:

- The legislative process in India faces several challenges, including delays, inefficiencies, and lack of transparency. The current legislative process is time-consuming and involves multiple stages, including drafting, review, and approval.
- The legislative process involves multiple stakeholders, including lawmakers, bureaucrats, and stakeholders. The lack of coordination among these stakeholders can lead to delays, redundancies, and inconsistencies in the legislation.
- Transparency is another challenge in the current legislative process in India. The legislative process is often opaque, with limited access to information for the public. This lack of transparency can lead to mistrust among the public and limit their participation in the legislative process.

### Applications of AI in Lawmaking:

- One of the most significant applications of AI in the lawmaking process is legal research and analysis. AI-powered tools can be used to analyse vast amounts of legal data, such as case law, statutes, and regulations. This can help lawmakers identify legal precedents and trends and make more informed decisions when creating legislation.
- AI tools can also be used to analyse the impact of legislation on different sectors, such as the economy, environment, and society. This can help lawmakers create legislation that is well-informed and addresses the needs of all stakeholders.
- AI can also be used to draft legislation. AI-powered tools can help lawmakers create legislation that is clear, concise, and free of errors. These tools can also ensure that legislation complies with legal principles, such as due process and equal protection.
- AI tools can also help lawmakers identify potential conflicts and ambiguities in legislation and suggest revisions to address these issues.
- AI can also be used to review legislation and identify potential issues, such as conflicting provisions or redundant clauses.
- AI can also be used to increase public participation in the lawmaking process. AI-powered tools can provide greater access to information about legislation and its implications. This can help increase public awareness of the legislation and encourage public feedback and participation.
- It can also help in flagging laws that are outdated in the present circumstances and which require amendment.
  - For example, 'The Epidemic Diseases Act, 1897' failed to address the COVID-19 pandemic situation during its peak due to its outdated policies.

**Global Scenario:**

- Many Parliaments across the world are now actively experimenting with AI-powered assistants. The House of Representatives in the United States has introduced an AI tool to automate the process of analysing differences between Bills, amendments and current laws.
- The Netherlands House of Representatives, for instance, has implemented the “Speech2Write” system which converts voice to text and also “translates” voice into written reports.
- Japan’s AI tool assists in the preparation of responses for its legislature and also helps in the automatic selection of relevant highlights in parliamentary debates.
- Brazil has developed an AI system called Ulysses which supports transparency and citizen participation.

**Recommendations for Using AI in Legislation:**

- India must codify its law for effective use of AI in legislation as there is a huge translation gap between law-making, law-implementing and law-interpreting organisations.
- India Code portal which contains all the Central legislations cannot be entirely relied upon as a ‘single source of truth’.
- The interface should contain a complete chain, right from the parent Act to the subordinate pieces of legislation passed by the union government and the amendment notifications, enabling any entity to get a 360° view.
  - Such a requirement becomes more critical in special situations such as COVID-19. For example, in measures related to COVID-19, the central government issued over 900 notifications while State governments issued over 6,000 notifications on the subject.
- One of the most critical recommendations is to ensure that AI is used in a way that is compatible with the values and principles of democracy. The use of AI should not compromise the principles of accountability, transparency, and public participation.
- Collaboration among stakeholders is also crucial for the effective use of AI in legislation. The use of AI should not be limited to lawmakers but should also involve other stakeholders, such as civil society organisations and the public. This can help ensure that the legislation reflects the needs and concerns of all stakeholders.
- The adoption of stronger competition regulations could prevent large companies from using AI to gain unfair advantages over smaller competitors.
- It is also essential to ensure that the use of AI in legislation is accompanied by appropriate legal frameworks and ethical standards. This can help ensure that the use of AI is fair, transparent, and accountable.
- India could adopt stricter privacy regulations to protect the personal data of individuals from being collected, analyzed, and shared without their consent.
- More investment in research and development to develop new AI technologies that are designed with privacy and ethical considerations should be promoted.

**Nut Graf:** AI has the potential to revolutionise the legislative process in India. The use of AI can create better, more efficient, and smarter legislation that can help address the challenges that the country faces. AI can streamline the legislative process, improve the quality of legislation, and increase transparency and public participation.

**9. Third-gen Web**

**Syllabus:** Developing New Technology-IT & Computers

**Mains:** Advantages of Web3 in relation to rural India.

**Context:** This article discusses the potential of Web 3.0 for the public good in India.

**Introduction:**

- Web 3.0 is the next evolution of the World Wide Web, also known as the “Semantic Web.”
- While Web 1.0 was focused on providing static web pages and Web 2.0 brought about user-generated content and interactive web experiences, Web 3.0 aims to provide a decentralised, peer-to-peer web that is more intelligent, secure, and private.

**Web 3 v/s Web 3.0:**

- Web 3 and Web 3.0 are often used interchangeably to refer to the next generation of the internet, but they do have slightly different meanings.
- “Web 3” generally refers to the evolution of the internet beyond the current Web 2.0, which is characterised by social media, mobile devices, and cloud computing.
- Web 3 aims to create a more decentralised, secure, and privacy-focused internet, powered by emerging technologies like blockchain, artificial intelligence, and the Internet of Things.
- On the other hand, “Web 3.0” specifically refers to the semantic web, which is an extension of the current web that aims to make information more easily discoverable and understandable by machines.
  - The semantic web is built on top of the existing web, using technologies such as RDF (Resource Description Framework), OWL (Web Ontology Language), and SPARQL (SPARQL Protocol and RDF Query Language) to allow machines to understand the meaning of data on the web and make more intelligent decisions.
- Web3 seeks to transform the way data is generated, monetized, shared, and circulated. It advocates for decentralisation of data storage systems and aims to break the oligopolistic grip of technology behemoths over data.

- Web3 assigns a strategic role to non-custodial wallets, which function as digital passports for users to access blockchain-enabled transaction platforms. These wallets aid the creation of an ownership economy where creators control their content.
- Web3 seeks to replace micro-economic organisations with decentralised autonomous organisations (DAOs) and create a distributed economic system where native digital tokens and cryptocurrencies form the media of monetary circulation.
- Web3 platforms aim to raise the efficiency of peer-to-peer transactions.
- Web3 systems seek to generate fungible digital assets to reward local providers of data storage capacity for their services.
- Asset tokens that are native to the new-gen web can function as capital mobilisation tools for Web3 projects, and stakeholders of DAOs can utilise tokens to exercise their voting rights.
- In short, while “Web 3” is a broad term that encompasses a range of emerging technologies and trends, “Web 3.0” refers specifically to the semantic web and its associated technologies.

#### Potential of Web 3.0 for public good in India:

- The handicraft industry in India is well-known for its creative designs and innovative ideas, which unfortunately often lack protection under intellectual property laws.
- By utilising digital tokens generated through Web 3 platforms, our handicraft businesses would have the means to safeguard their unique innovations.
- Using Web 3-powered educational resources, grassroots innovations developed by master artisans can be quickly shared with other members, ultimately leading to a boost in the economic prosperity of craftsmen and artisan communities.
- India’s major digital public infrastructure push and the large-scale deployment of Internet of Things (IoT) in rural development projects offer major possibilities for deploying Web 3 in rural areas.
- The lack of data analysis capabilities at the community level has prevented the full utilisation of the Atal Bhujal Yojana. Web3’s decentralised analytics systems offer a solution to this limitation.
- Web 3.0 can also yield insights from large volumes of community data, generated by IoT-enabled development programmes such as the Jal Jeevan Mission.
- Web 3.0’s natural advantage of facilitating ‘analytics at the edge’ provides considerable scope for mapping the water use habits of communities.
- The use of Web 3.0 technology will enhance early warning systems for floods, as it allows for data analysis capabilities to be implemented at the sub-basin level.
- India has a rapidly growing pool of talented individuals in data analytics and web design. By incentivizing decentralised analytics and implementing tokenization (as envisioned in Web 3), it is possible to leverage this talent pool to benefit rural communities.

**Nut Graf:** *Web 3.0, the next evolution of the World Wide Web, aims to provide a decentralised, intelligent, secure and private internet. Web 3.0 has great potential for public good in India, including protecting innovations, improving rural education and providing early warning systems for floods.*

## 10. Genome sequencing and the Genome India Project

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

**Prelims:** About Human Genome Project, Genome India Project and INSACOG

**Mains:** Genome sequencing – details, applications and its significance.

**Context:** According to the Department of Biotechnology, around 7,000 Indian human genomes have already been sequenced as a part of the Genome India Project.

#### What is genome sequencing?

- The genetic code of every individual is contained in its Deoxyribose Nucleic Acid (DNA) which is regarded as the “building blocks of life”.
- A genome is the entire set of DNA, including all of its genes residing in the nucleus of every cell of the human body.
  - In simple terms, a genome refers to all the genetic matter in an organism.
- A genome consists of complete genetic information which is responsible for the functioning and development of an organism.
- The DNA is structured as a “double helix” i.e. it consists of a double-stranded molecule built up by four bases.
  - The sequence of base pairs is identical in all humans but there will be differences in the genome of every human being that makes them unique.
- The process involved in decoding the order of these base pairs and the genetic fingerprint of a human being is known as “genome sequencing”.

### Human Genome Project

- Since 1990, as a part of the Human Genome Project, scientists and researchers have been working to determine the entire sequence of the human genome.
- The project was started in October 1990 and was completed in April 2003 and it helped to read nature's complete genetic blueprint for building a human being for the first time.
  - The latest version of the data of the Human Genome Project was released in 2023, with an error margin of 0.3%.
- The Human Genome Project is described as one of the great feats of exploration in history.
- This indicates that genomic sequencing has now evolved to a stage where large sequencers can process thousands of samples simultaneously.
- The whole-genome sequencing approach which is one among various approaches to genome sequencing was made possible by the Human Genome Project.

### Key applications of genome sequencing

- Genome sequencing has helped evaluate and analyse rare disorders and disorders such as cancer from the viewpoint of genetics.
  - This gains significance, as over 10,000 diseases such as cystic fibrosis and thalassemia are due to the malfunctioning of a single gene.
- Genome sequencing has also been used in public health, to read and decode various viruses.
  - In 2014, scientists from M.I.T and Harvard sequenced samples of Ebola from infected African patients and this indicated how genomic data of viruses could reveal hidden ways of transmission.
- Genome sequencing has also played a key role in the fight against the novel coronavirus during the recent COVID pandemic.
  - In January 2020, during the initial phases of the pandemic, a Chinese scientist sequenced the genome of a novel pathogen causing infections in the city of Wuhan which were shared with a virologist in Australia, who published the genomic code online.
  - The sequence was studied by researchers across the world who then tried to find out remedies to combat the virus, track mutations and the development of vaccines.
  - Genomic sequencing became one of the most crucial steps in all of these processes.
  - India also set up the Indian SARS-COV-2 Genomics Consortia (INSACOG) which was entrusted with the task of scanning coronavirus samples from patients and flagging the presence of variants.

### About Genome India Project

- Inspired by the Human Genome Project, the Department of Biotechnology started its ambitious "Genome India Project" (GIP) on 3rd January 2020.
- The Centre-backed Genome India Project envisages sequencing 10,000 Indian human genomes and creating a database.
- The project is funded by the Department of Biotechnology and is being spearheaded by the Centre for Brain Research at Bengaluru-based Indian Institute of Science (IISc).
  - The Centre for Brain Research at IISc is the nodal point of the 20 institutions that are part of this project across the country.
- The key aim of the project is to develop a grid of the Indian "reference genome", to understand the type and nature of diseases and traits that comprise the diverse Indian population.

### Significance of the Genome India Project

- India's population consists of more than 4,600 population groups and many of these population groups are endogamous in nature.
  - The endogamous nature of population groups in India facilitates distinct variations and disease-causing mutations which are common among certain groups.
- Thus a database of Indian genomes will provide scientists the much needed data on genetic variants unique to India's population groups that can be used to come up with remedies for various diseases.
- GIP aims to vastly add to the available information on the human species and advance the cause, both because of the scale of the Indian population and the diversity here. This diversity can be depicted by:
  - **Horizontal Diversity:** The Indian subcontinent has been the site of huge migrations, where the first migrations were from Africa. Also, there have been periodic migrations by various populations from all around the world, making this a very special case of almost all races and types intermingling genetically.
  - **Vertical Diversity:** There has been endogamy or inter-marriage practised among distinct groups, resulting in some diseases passed on strictly within some groups and some other traits inherited by just some groups.

**Nut graf:** *The Department of Biotechnology has said that the exercise to sequence Indian human genomes and create a database under the Genome India Project is about two-thirds complete. This exercise will play a crucial role in creating a comprehensive catalogue of genetic variations among diverse Indian population groups.*

## 11. Omicron variants evolve strategies to evade T cell immunity

**Syllabus:** Awareness in the field of biotechnology.

**Mains:** Research analysis of the Omicron variant.

**Prelims:** Omicron.

**Details:**

- The SARS-CoV-2 virus has developed the ability to evade the CD8 T cells.
  - CD8 T cells reduce the viral load and clear the infection by detecting and killing infected cells.
  - They cannot prevent infection. The infection can be prevented by neutralizing antibodies.
- A study highlighted that the SARS-CoV-2 virus encodes multiple viral factors that modulate major histocompatibility complex class I (MHC I) expression in the host cells.
  - MHC I molecules are expressed on the surface of all infected cells.
  - They alert the immune system about the virally infected cells.

### Omicron variants can survive better in a human host

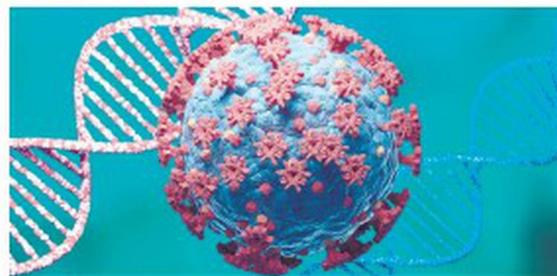
The ancestral strain was already equipped to escape from T cell-mediated immunity by reducing the MHC-I expression by infected cells

■ Neutralising antibodies help prevent infection, while T cells reduce the viral load and clear the infection by detecting and killing infected cells

■ When a virus infects a cell, the immune system attaches a part of the virus (antigen) to MHC I molecules, thus presenting the antigen on the outside of the infected cell

■ One of the common tricks that viruses use to avoid killing is to inhibit MHC I expression and presentation. SARS-CoV-2 is no exception

■ The ancestral strain and a few other SARS-CoV-2 variants had the ability to escape from T cell-mediated immunity by reducing the expression of MHC I



**Signal:** The MHC I molecules expressed on the surface of all infected cells play an important role in alerting the immune system

■ Some of the Omicron subvariants have greater capacity to suppress MHC I levels compared with the ancestral strain and other variants

■ Immune evasion from CD8 T cells could allow the virus survive better in the infected cells

■ To what extent the reduction of MHC I expression impairs the recognition of infected cells by T cells is not known

■ Consequences of enhanced MHC I inhibition by Omicron variants on disease is unknown

**Source:** The Hindu

**Findings of the Study:**

- The virus uses many redundant strategies to suppress MHC-I expression.
- MHC-I downregulation impairs the priming of T cells. It also impairs the recognition of cytotoxic T lymphocytes (CTL).
- It also proved the inhibition of MHC I upregulation in SARS-CoV-2-infected cells in both in vitro and in vivo settings.

**Nut Graf:** A study found that Omicron variants have evolved the strategy to evade T cell immunity. Thus, the potential of the virus to survive in a human host has increased.

## 12. Magnetoresistance: one more thing graphene does differently

**Syllabus:** Development in the field of science and technology and their application.

**Mains:** Magnetoresistance.

**Prelims:** Magnetoresistance.

### Details:

- Graphene is a single-atom-thick layer of carbon atoms bonded in a honeycomb pattern.
- It is found by Researchers in the U.K. that graphene displays an anomalous giant magnetoresistance (GMR) at room temperature.

### Giant magnetoresistance (GMR):

- GMR is the consequence of the electrical resistance of a conductor being influenced by magnetic fields in adjacent materials.
- GMR is utilized in hard disk drives and magnetoresistive RAM in computers, sensors, and medical imagers.
- Graphene-based devices would not require to be cooled to a very low temperature to sense these fields and can be used to sense magnetic fields.
- Notably, a conductor is sandwiched between two ferromagnetic materials.
  - If the material is magnetized in the same direction, the electrical resistance in the conductor is low.
  - Whereas, if the directions are opposite the resistance increases. It is then called GMR.
- It is observed that magneto-resistance in graphene-based devices is 100 times greater than those observed in the semimetal of such magnetic range.

### Details of the Study on Graphene:

- The experiment used plasma that consisted of equal numbers of thermally excited electrons and holes.
- “Extremely clean setup” and Graphene without any defects were used. The electrons in the neutral plasma were not scattered by vibrations and had high mobility at room temperature.
- It was found that the magnetoresistance in monolayer graphene (at 27° C) held between two layers of boron nitride increased by 110% under a field of 0.1 tesla. This can be due to the presence of a ‘neutral’ plasma and the electrons’ mobility.

### Conclusion:

- The graphene-based device cannot replace the existing devices, because they have several other properties which are missing in graphene devices.
- These devices can be used in other applications that require magnetic-field sensing in extreme conditions.

**Nut Graf:** Researchers from the U.K. have found another feature of Graphene that displays giant magnetoresistance (GMR) at room temperature. This can be used in various applications in the future.

## 13. The ambiguities in the nuclear liability law

**Syllabus:** Awareness in the fields nuclear technology

**Prelims:** About Convention on Supplementary Compensation and Civil Liability for Nuclear Damage Act 2010

**Mains:** Issues surrounding the nuclear liability law in India and its implications on nuclear energy projects

**Context:** The issues surrounding nuclear liability law in India continue to cause delays in the plan to build six nuclear power reactors in Maharashtra’s Jaitapur.

### Background

- The French energy company Electricite de France (EDF) submitted its techno-commercial offer for the construction of six nuclear power reactors in Maharashtra’s Jaitapur in April 2021.
- The proposed project at Jaitapur is estimated to be a 9,900-MW project and is regarded as the world’s biggest nuclear power generation site under consideration at present.
- However, the discussions between Indian and French officials over issues like nuclear liability and the high cost of power per unit have still not resulted in any breakthrough.

### Laws governing nuclear liability in India

- Civil nuclear liability laws play a crucial role in ensuring that timely compensation is extended to the victims of nuclear catastrophes or disasters.
  - These laws also set out who will be liable for those damages.
- The international nuclear liability regime which was strengthened post the Chernobyl nuclear disaster (1986) consists of several treaties and an umbrella **Convention on Supplementary Compensation (CSC)** was adopted in 1997.
  - Despite being adopted in 1997, CSC could only enter into force after it had been ratified by at least five states with

a minimum of 400 GW (thermal) of installed nuclear capacity.

- Japan became the fifth such state to ratify the convention in January 2015, and hence CSC came into force on 15 April 2015.
- CSC aims to establish a minimum national compensation amount that can be further increased via public funds if in case the national amount is insufficient to compensate for the damage caused by a nuclear accident.
- India signed CSC in October 2010 and ratified the convention in 2016.
- In line with the international convention, India introduced the **Civil Liability for Nuclear Damage Act (CLNDA) in 2010**.

#### Civil Liability for Nuclear Damage Act (CLNDA), 2010

- CLNDA was enacted with the aim to establish a speedy compensation mechanism for victims of a nuclear disaster.
- The CLNDA provides for stringent and no-fault liability on the operator of the nuclear plant.
- As per the legislation, nuclear plant operators can be held liable for damage regardless of any fault on their part.
- The act mentions that the operator must pay ₹1,500 crores in case of damage caused by a nuclear accident and also mandates the operator to cover liability through insurance or any such financial security mechanisms.
- If the damage caused by an incident exceeds ₹1,500 crores, the CLNDA expects the government to step in.
  - CLNDA has limited the government liability amount to the equivalent of 300 million Special Drawing Rights (SDRs) which is about ₹2,100 to ₹2,300 crores.

#### CLNDA on supplier liability

- Various legal frameworks on civil nuclear liability available globally, including the CSC are formulated based on the principle of exclusive liability of the operator of a nuclear installation and no other person.
- During the incipient stage of the nuclear industry's development, it was widely accepted by the industry as well as foreign governments that excessive liability claims against suppliers of nuclear equipment would make the business unviable and affect the growth of the nuclear energy industry.
  - Other key reasons for putting in place exclusive liabilities for the operator are to avoid legal complications by having separate liabilities and to simplify the insurance process by having only one entity in the chain.
- Further, **Section 10 of the annex of the CSC** mentions two conditions under which a national law can provide the operator with the "right of recourse" i.e. operators can extract liability from the supplier. The two conditions are:
  - If the clause is expressly agreed upon in the contract.
  - If the nuclear accident is caused due to an act or omission done with intent to cause damage.
- However, India in its CLNDA, introduced the concept of supplier liability over and above that of the operators for the first time.
  - The framers of the legislation, by acknowledging that such defective parts were partly responsible for disasters like the Bhopal gas tragedy, came up with a clause on supplier liability.
  - According to **Section 17 (b) of the CLNDA**, after paying their share of compensation for damages as per the provisions of the Act, the operator of the nuclear plant will have the "right of recourse" in case the nuclear accident has "resulted as a consequence of an act of supplier which includes the supply of equipment or material with patent or latent defects or sub-standard services".

#### Issues surrounding supplier liability clause

- Foreign as well as domestic suppliers of nuclear equipment have expressed concerns over the supplier liability clause and have been cautious while signing nuclear deals with India.
- The CLNDA has further limited or capped the liability for operators but exposes suppliers to unlimited amounts of liability.
- Apart from the concerns over being subjected to unlimited liability, suppliers have also flagged the existing ambiguity over how much insurance to set aside in case of damage.
- Suppliers of nuclear equipment have expressed concerns over Section 17(b) and Section 46 of CLNDA.
  - Section 46 of CLNDA states that nothing would prevent proceedings other than those which can be brought under the Act, to be brought against the operator.
  - According to industry experts, this clause offsets the key purpose of the legislation which is acting as a mechanism enforcing the channelling of liability to the operator to ensure prompt compensation for victims.
- Furthermore, with a lack of a comprehensive definition of the types of "nuclear damage" by the Government, Section 46 allows civil liability claims to be initiated against the operator as well as the suppliers through other civil laws such as the Law of Tort.
  - The Law of Torts is a body of legislation that addresses and provides remedies for non-contractual acts of civil wrongdoings.

#### Government's stand

- The Government has maintained that the existing Indian laws are in line with the CSC.
- The Government has also said that the provision of Section 17(b) permits but does not mandate an operator to include such clauses in the contract or exercise the right to recourse.

### Existing nuclear projects in India

- At present India has 22 nuclear reactors and over 12 more projects are being planned.
  - All the existing nuclear reactors in India are operated by the Nuclear Power Corporation of India Limited (NPCIL).
- The plans to develop the Jaitapur nuclear project have been delayed for over 10 years as the initial MoU was signed in 2009 with EDF's predecessor Areva.
- Other nuclear projects that have experienced roadblocks include the one proposed at Kovvada in Andhra Pradesh.
- Despite signing civil nuclear agreements with various countries such as the US, France and Japan, Kudankulam nuclear plant is the only plant built in collaboration with a foreign nation (Russia).

**Nut graf:** The supplier liability clauses mentioned under India's civil nuclear liability law, the CLNDA have continued to make foreign supplier companies wary of signing deals with India. Such issues and ambiguities must be addressed by the Government at the earliest in order to achieve India's vision of becoming a global leader in nuclear power technology.

## 14. ISRO's Reusable Launch Vehicle

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

**Prelims:** About Reusable Launch Vehicle

**Context:** The Indian Space Research Organisation (ISRO) carried out the landing experiment of the Reusable Launch Vehicle-Technology Demonstration (RLV-TD) programme successfully in Chitradurga, Karnataka.

### ISRO's Reusable Launch Vehicle



Source: The Hindu

- According to ISRO, the Reusable Launch Vehicle-Technology Demonstration (RLV-TD) programme is part of a series of experiments to develop essential technologies for a fully reusable launch vehicle to enable low-cost access to space.
- The RLV-TD experiments are used to develop technologies such as hypersonic flight (HEX), autonomous landing (LEX), return flight experiment (REX), powered cruise flight, and Scramjet Propulsion Experiment (SPEX).
- ISRO aims to develop this vehicle to become India's reusable two-stage orbital (TSTO) launch vehicle.
- ISRO's RLV-TD looks similar to an aircraft with a fuselage, a nose cap, double delta wings, and twin vertical tails.
- In 2016, an experiment was conducted that involved sending a winged spacecraft on a rocket powered by a conventional solid booster (HS9) engine used by ISRO into space.
  - The spacecraft had traveled at a speed of Mach 5 when re-entering the earth's orbit.
- **Advantages of Reusable Launch Vehicle:** a reusable launch vehicle is a low-cost, reliable, and on-demand mode of accessing space.

### About Chinook Helicopters

- A Chinook Helicopter of the Indian Air Force (IAF) was used to lift the Reusable Launch Vehicle Autonomous Landing Mission (RLV LEX) to a height of 4.5 km and release the RLV.
- Chinook is an advanced multi-mission helicopter of the IAF.
- Chinook Helicopters are developed by the US-based Boeing company.
  - In 2020, Boeing completed the delivery of 15 Chinook Helicopters to the IAF.
- Chinook Helicopters are being used for various strategic, combat and humanitarian missions.

## 15. PSLV-C55 mission and TeLEOS-2

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

**Prelims:** About PSLV-C55 mission and TeLEOS-2

**Context:** The Indian Space Research Organisation (ISRO) is looking to launch the Polar Satellite Launch Vehicle C55 (PSLV-C55) mission on the 22nd of April 2023.

### Polar Satellite Launch Vehicle C55 Mission

- The PSLV-C55 is a dedicated commercial mission that carries TeLEOS-2 as the primary satellite and Lumelite-4 as a co-passenger satellite.
- The PSLV-C55 mission consists of the PSLV Orbital Experimental Module (POEM), where the spent PS4 stage of the launch vehicle will be used as an orbital platform to undertake scientific experiments with the help of non-separating payloads.
- The TeLEOS-2 and Lumelite-4 satellites are to be launched into an eastward low-inclination orbit.
  - The TeLEOS-2 satellite has been developed under a partnership between DSTA (representing the government of Singapore) and ST Engineering.
  - Lumelite-4 satellite is co-developed by the Institute for Infocomm Research (I<sup>2</sup>R) of A\*STAR and by the Satellite Technology and Research Centre (STAR) of the National University of Singapore.
    - This satellite is an advanced 12U satellite developed for the technology demonstration of the high-performance space-borne VHF Data Exchange System (VDES) and it aims to enhance Singapore's maritime safety and support the global shipping community.
- PSLV has proven to be one of ISRO's most reliable and trusted launch vehicles.
- PSLVs have launched several hundred satellites with only three failures or partial failures since 1993.
- PSLV has and will also be part of India's landmark and historic missions such as Chandrayaan-1, Mangalyaan, and AstroSat.

### TeLEOS-2 satellite

- TeLEOS-02 is a Singaporean Earth Observation satellite.
- TeLEOS-02 is a 750kg satellite built by ST Electronics (Satellite Systems).
- The satellite consists of a Synthetic Aperture Radar (SAR) capable of providing 1 m resolution data made in Singapore, a 500 GB onboard recorder for recording the data captured and a high speed 800 Mbps downlink.
- In 2015, ISRO launched TeLEOS-1, the first Singapore commercial Earth Observation Satellite into a low Earth orbit for remote sensing applications.
- ISRO has so far launched nine satellites of Singapore and is planning to launch the TeLEOS-02 satellite using its workhorse Polar Satellite Launch Vehicle (PSLV)

## 16. Jupiter Icy Moons Explorer (Juice)

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

**Prelims:** Jupiter Icy Moons Explorer (Juice) mission

**Context:** The European Space Agency recently announced the Jupiter Icy Moons Explorer (Juice) mission, which will explore Jupiter and its icy moons, Ganymede, Callisto, and Europa.

### What is the JUICE Mission?

- JUICE is the first large-class mission in the ESA Cosmic Vision 2015-2025 programme.
- The spacecraft was launched by Ariane 5 in April 2023 on an eight-year journey including gravity assist flybys of Earth and Venus before arriving in the Jupiter system in 2031.

### Objectives:

- The mission's major goal is to make precise maps of the moon's surfaces and to delve under them to investigate potential livable conditions by analysing the water bodies beneath.
- To build a complete picture of Jupiter by attempting to comprehend its origin, history, and evolution.
- The focus will be on Ganymede (the Solar System's largest moon, which creates its magnetic field).
- The three moons, Ganymede, Callisto, and Europa, are thought to have vast amounts of water, making them potentially livable.
- Juice is not suited to detect life, but it can determine whether there are areas surrounding Jupiter, inside the frozen moons, where the basic requirements for life, like water, biological vital elements, energy, and stability, exist.

## 17. YZ Ceti b

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

**Prelims:** YZ Ceti b

**Context:** Astronomers have detected a repeating radio signal from the “YZ Ceti b” exoplanet which indicates the presence of a magnetic field. The presence of a magnetic field around the planet is one of the prerequisites for a habitable planet.

### About YZ Ceti b

- YZ Ceti b is a rocky and earth-sized exoplanet.
- The YZ Ceti b is a terrestrial exoplanet that rotates around a small red dwarf star (M-type star) named “YZ Ceti” which is only about 12 light-years away from the Earth.
- YZ Ceti b has a small orbit and researchers have found that the planet takes just a couple of earth-days to circle its star.
- Since the mid-1990s, astronomers have found hundreds of planets orbiting stars similar to the sun.
  - In order to be a habitable planet, the planet must have an atmosphere and sustain water.
  - This requires the planet to be at a certain distance from its star which is regarded as the star’s “Goldilocks zone”.
  - The “Goldilocks Zone” refers to the range of distance from a star with the right temperatures for water to remain liquid.
  - According to Astronomers, close to 30% of all star systems discovered could potentially have Goldilocks zones.
- The presence of a magnetic field is important as a strong magnetic field protects its atmosphere from being eroded by the charged particles blowing in from its star.

## 18. Zero Shadow Day

**Syllabus:** Science and Technology

**Prelims:** About Zero Shadow Day

**Context:** Science enthusiasts gathered to observe Zero Shadow Day across Bengaluru.

### Zero Shadow Day

- On the 25th of April, 2023 Bengaluru experienced a “Zero Shadow Day”.
- Zero Shadow Day refers to a celestial phenomenon when the vertical objects appear to cast no shadow as the Sun reaches exactly overhead.
- Every point on Earth between the Tropic of Cancer and the Tropic of Capricorn would experience two Zero Shadow Days a year.
  - One occurs during the Uttarayan i.e. when the Sun appears to move northwards, and the other occurs during Dakshinayan when the Sun appears to move southwards.
  - Uttarayan and Dakshinayan take place because Earth’s rotation axis is tilted at an angle of roughly 23.5° to the axis of revolution around the Sun and Ramanujam explained that the Sun’s location moves from 23.5°N to 23.5°S of Earth’s equator and back.
- All the places whose latitude equals the angle between the Sun’s location and the equator on a specific day experience zero shadow day.
- Since Zero Shadow Day is restricted to locations between the tropics, the places north of Ranchi in India do not experience this phenomenon.
- Bengaluru will experience another Zero Shadow Day on August 18, 2023.

## 19. Evolution of Dengue Virus

**Syllabus:** Awareness about various diseases

**Prelims:** Genome sequencing; Vaccines; Vector Borne Diseases

**Context:** This article discusses the concerns around the evolution of Dengue Virus in India.

### Key Details:

- A team of researchers from the Indian Institute of Science has analysed the evolution and diversity of dengue virus in India by studying 184 whole-genome dengue sequences and 408 E gene sequences spanning over 60 years.
- Researchers have found that the cross-protection offered by the first infection with any of the four dengue serotypes starts to wane after two to three years, and the virus that is similar to the serotype that caused the first infection has a greater ability to cause severe disease than the other serotypes.
  - This is because while the antibodies are not able to neutralise the virus belonging to different serotypes, the virus is better able to bind to the antibodies leading to higher cell infection and thus enhanced severity and viral load. This is called the antibody-dependent enhancement mediated by cross-reactive antibodies.

- The dominant immune selection pressure has led to the emergence of a unique Indian dengue lineage (DENV-4-Id) belonging to serotype 4 (DENV-4).
- They identified a unique Indian dengue lineage (DENV-4-Id) belonging to serotype 4 (DENV-4) that is dominant in South India, and about 50% of infections in South India are due to this lineage.
- The researchers also found that the evolution of the viruses across serotypes has implications in vaccine efficacy as the current Indian lineages are highly divergent from those used in all major vaccines.

## Dengue virus evolution and vaccine efficacy

The analysis was based on 184 whole-genome dengue sequences and 408 E gene sequences from India spanning more than 60 years.

**1** People with prior infection are protected from reinfection by the same serotype. But a different serotype can cause a second infection

**2** The second infection generally causes more severe disease

**3** Protection against the virus that is identical to the one that caused the first infection lasts for a long time. But viruses that are a bit look-alike of the serotype that caused the first infection have greater ability to cause severe disease

**4** The dominant immune selection pressure has led to the emergence of a unique Indian dengue lineage (DENV-4-Id) belonging to serotype 4

**5** The DENV-4-Id lineage is dominant in South India and is responsible for about 50% of infections

**Vector:** *Aedes aegypti* mosquitoes can carry any of the four dengue virus serotypes. SPECIAL ARRANGEMENT

**6** Most of dengue virus evolution happens in the E gene, and evolution is driven primarily due to interaction with the host immune system

**7** As the current Indian lineages are highly divergent from those used in all major vaccines, there can be significant reduction in vaccine efficacy



Source: The Hindu

## 20. The XBB.1.16 subvariant of Omicron

**Syllabus:** Awareness about various diseases

**Prelims:** About XBB.1.16 subvariant of Omicron

**Context:** The XBB.1.16 subvariant of Omicron is seen as a cause for the latest surge in COVID-19 cases in the country.

### XBB.1.16 subvariant of Omicron

- XBB.1.16 also known as “Arcturus” is currently fueling a surge of COVID cases in India.
- XBB.1.16 variant has been identified in about 22 countries so far.
- The World Health Organization (WHO) is monitoring XBB.1.16 and has said that it is “one to watch”.
- XBB.1.16 is one of more than 600 omicron sub-variants that the WHO is tracking.
- XBB.1.16 is a recombinant of BA.2.10.1 and BA.2.75 and has three additional mutations in the SARS-CoV-2 spike protein (E180V, F486P and K478R) compared to its parent lineage XBB.
- Experts believe that these mutations have decreased antibody neutralization, and increased infectivity (transmissibility) and pathogenicity.
- However, there have been no reports which show a rise in hospitalizations, deaths or an increase in disease severity due to the variant.

## 21. Bioluminescence

**Syllabus:** Science and Technology

**Prelims:** About Bioluminescence

**Context:** A stretch of the beach at Bheemili near Visakhapatnam glows due to bioluminescence.

### Bioluminescence



**Source:** National Maritime Foundation

- Bioluminescence occurs mainly due to the presence of single-celled organisms called dinoflagellates that produce light when disturbed.
- Various other marine species such as sponges, jellyfish, worms, species of fish, arthropods, echinoderms and unicellular alga also exhibit bioluminescence.
- Bioluminescence is a type of chemiluminescence, i.e. it involves a chemical reaction which produces light.
- Such chemical reactions involve two unique chemicals namely luciferin and luciferase.
  - **Luciferin** is the compound that produces light and it acts as the substrate.
  - **Luciferase** is an enzyme or a catalyst that interacts with a substrate to affect the rate of a chemical reaction.
    - **Photoprotein** can also act as a catalyst in such reactions.
- The phenomenon of bioluminescence on beaches is seen to be a natural phenomenon.
- Bioluminescence is a “cold light”.
  - Cold light means less than 20% of the light generates thermal radiation or heat.
- In the case of Visakhapatnam, bioluminescence is said to be a result of an algal bloom of the dinoflagellate species of noctiluca and ceratium.
- Bioluminescence has been witnessed on some other beaches in India including Havelock Island in the Andamans, Thiruvanniyur Beach in Chennai, Mattu Beach in Karnataka, Bangaram Island in Lakshadweep and Kerala’s Kumbalangi.
- Bioluminescence may not be harmful to humans but it can have significant implications on the marine ecosystem as phytoplanktons are consumed by fish and the harmful algal blooms have led to mass mortality of fish species in the past.
- Further, the rapid algal growth of noctiluca is attributed to environmental changes such as sudden low salinity or disturbance by pollutants.

# DEFENCE AND INTERNAL SECURITY

## 1. CERT-In RTI exemption

**Syllabus:** Basics of cyber security

**Prelims:** About CERT-In and RTI exempted organisations in India

**Context:** The Department of Personnel and Training has reviewed a proposal from the Ministry of Electronics and Information Technology to include CERT-In in the Second Schedule to the RTI Act, which deals with exempted organisations like the CBI and BSF.

**Details:**

- The exemption would allow CERT-In to reject any application for information, even on policy related matters. This is significant in light of the April 2022 directions the body issued to require Virtual Private Network (VPN) providers and cryptocurrency firms to preserve user requests.
- CERT-in coordinates with public and private organisations in India when cyber incidents like data breaches and ransomware attacks are reported. It also issues advisories for software vulnerabilities as guidance for organisations.

**About Computer Emergency Response Team (CERT-In):**

- CERT-In is the national nodal agency for responding to computer security incidents as and when they occur.
- The constituency of CERT-In is the Indian Cyber Community. CERT-In was established in 2004 as a functional organization of the Ministry of Electronics and Information Technology.
- **Functions:** The Information Technology (Amendment) Act 2008 designated CERT-In to serve as the national agency to perform the following functions in the area of cyber security.
- **Functions of Cert-In:**
  - Collection, analysis and dissemination of information on cyber incidents.
  - Forecast and alerts of cyber security incidents.
  - Emergency measures for handling cyber security incidents.
  - Coordination of cyber incident response activities.
  - Issue guidelines, advisories, vulnerability notes and white papers relating to information security practices, procedures, prevention, response and reporting of cyber incidents.

Cyber Attacks - Levels of concern

Threat Level	Condition
<b>Level 1</b> Guarded Scope: Individual Organisation	Large scale attacks on the IT infrastructure of an organisation
<b>Level 2</b> Elevated Scope: Multiple Organisations	Simultaneous large scale attacks onto IT infrastructure of multiple organisations
<b>Level 3</b> Heightened Scope: State/Multiple States	Cyber attacks on infrastructure of critical sector and Government across a state or multiple states
<b>Level 4</b> Serious Scope: Entire Nation	Cyber attacks on infrastructure of critical sector and Government across the nation.

**RTI exempted organizations:**

Second schedule of the RTI Act has a list of organizations which are exempt from the application of this Act. These organizations include:-

1. Intelligence Bureau
2. Research and Analysis Wing of the Cabinet Secretariat
3. Directorate of Revenue Intelligence
4. Central Economic Intelligence Bureau
5. Directorate of Enforcement
6. Narcotics Control Bureau
7. Aviation Research Centre
8. Special Frontier Force
9. Border Security Force
10. Central Reserve Police Force
11. Indo-Tibetan Border Police
12. Central Industrial Security Force
13. National Security Guards
14. Assam Rifles
15. Sashastra Seema Bal
16. Directorate General of Income Tax(Investigation)
17. National Technical Research Organization
18. Financial Intelligence Unit India
19. Special Protection Group
20. Defense Research and Development Organization
21. Border Road Development Board, and
22. National Security Council Secretariat.

## 2. What is LockBit ransomware and how is it specifically targeting Apple computers?

**Syllabus:** Cyber security

**Prelims:** About LockBit Ransomware.

**Context:**

- It is found that LockBit ransomware is targeting Mac devices.
- It is the first major ransomware operation to specifically target Apple computers.
- There are reports that the same gang is responsible for a cyber-attack on U.K. postal services that caused international shipping to a halt.

**LockBit ransomware:**

- It is designed to infiltrate victims' systems and encrypt important files.
- It was first found in September 2019 and was called "abcd" virus.
- LockBit is categorized as a "crypto virus" because it demands payment in cryptocurrency to decrypt the victim's file.
- It is the first time that encryptors are targeting Mac devices instead of Windows, Linux, and VMware ESXi servers.
- It is a self-spreading malware.
- It also hides executable encryption files by disguising them in the .png format. This prevents them from detection by system defences.
- The goal of the malware is to ensure that data recovery without assistance from the LockBit gang is impossible.
- LockBit operates on the ransomware-as-a-service (Raas) model.

**Ways to protect systems against the LockBit ransomware:**

- Use strong passwords with multi-factor authentication.
- Organizations should conduct training programmes for employees to identify cyber-attacks.
- Old and unused accounts should be deactivated
- Organizations and even individuals should be aware of vulnerable points and cybersecurity threats.

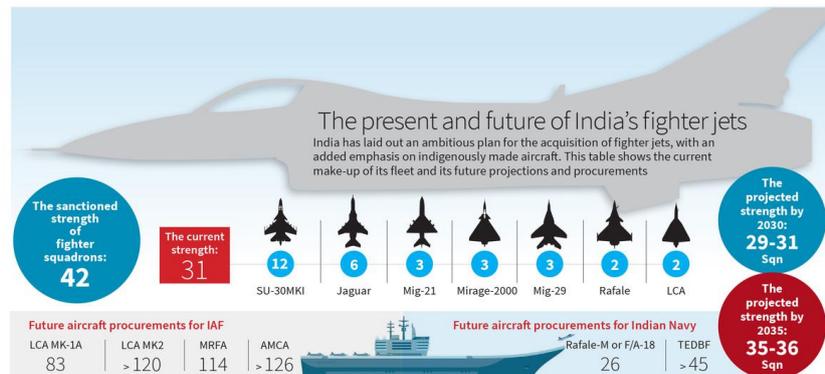
### 3. India's fighter jet conundrum

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

**Mains:** Issues associated with the decline in the Indian Air Force (IAF)'s fighter jet fleet and the possible way forward.

**Context:** A representative of the Indian Air Force (IAF) informed the Parliamentary Standing Committee on Defence that the IAF at present has 31 fighter squadrons against the sanctioned strength of 42 squadrons and the numbers are not expected to increase in the next 10 years.

#### Phase-outs and orders



Source: The Hindu

- Various existing squadrons out of the 31 squadrons present also are expected to be phased out in the coming years, which include three Mig-21 squadrons (to be phased by 2025) and also the Jaguars, Mirage-2000s and MIG-29s (phase-out will be started by the end of the decade).
- By the early 2040s, when most of the above-mentioned squadrons would be phased out, a few of the earlier batches of SU-30s will also start their phase-out exercise.
- An agreement to procure 12 additional SU-30MKIs in order to replace the ones lost in accidents and a deal to procure 21 additional MIG-29s from Russia have been delayed due to the Russia-Ukraine war.
- India has an ambitious plan for the acquisition of over 500 fighter jets which majorly consists of indigenously designed and manufactured aircraft.
  - However, these are still at various stages of development and their timely progress and delivery are crucial for IAF.
- Further, the progress and timely delivery of 114 Multi-Role Fighter Aircraft (MRFA) and 83 Light Combat Aircraft (LCA)-MK1A and LCA-MK2 will ensure that the IAF would have 35 to 36 squadrons by the middle of the next decade and arrest the fall in the number of squadrons on account of various phase-out exercises.

#### The status of IAF's indigenous fighter ecosystem

- Highlighting the importance of indigenisation, the IAF has stated that if we keep procuring from the open market in the world, we will never become self-reliant and thus there exists a need to provide impetus to our domestic industry which requires support and the IAF is committed towards that.
- The progress and deliveries of LCA, which was seen as a replacement for Mig-21s, have been witnessing a series of delays.
  - The LCA got its Initial Operation Clearance (IOC) in December 2013 whereas the Final Operational Clearance (FOC) was given only in February 2019.
- In February 2020, the Defence Ministry finalised a ₹48,000 crore agreement with HAL for the procurement of 83 LCA-MK1A, 20 years after their first flight. According to HAL officials, these aircraft will be delivered starting in February 2024.
  - HAL has also set up a third LCA assembly line in order to increase the production rate.
- Additionally, LCA-MK2 which is a larger aircraft with better capabilities also was ordered by the Cabinet Committee on Security (CCS) in September 2022 at a total cost of ₹9000 crores.
  - The LCA-MK2 is similar to the Mirage-2000 with respect to its capabilities and is expected to be ready for production by 2027.
- Another key procurement programme is that of the Multi-Role Fighter Aircraft (MRFA), which is a reincarnation of the older Medium Multi-Role Combat Aircraft (MMRCA).
  - The Request for Information (RFI) was provided in 2007. However, the emergency procurement of 36 Rafale jets under a €7.87 billion deal with France, sidelined the procurement plans of MRFA.
  - The RFI for 114 MRFA was finally issued in April 2019 to global aircraft manufacturers but there has been no progress and the project is yet to receive the Acceptance of Necessity (AoN).
- Further, the fifth generation Advanced Medium Combat Aircraft (AMCA) is wasting the sanctions of the CSS.
  - The estimated project cost of the development of AMCA would be around ₹15,000 crores and would take 10 years for the development post sanction.

- There are also discussions over the inclusion of the Twin Engine Deck Based Fighter (TEDBF) for the Indian Navy's aircraft carriers.
  - The TEDBF is expected to take its first flight by 2026 and be ready for production by 2031.

**Nut graf:** The Indian Air Force which is one of the world's largest Air Forces is currently struggling to keep up its strength of fighter squadrons due to the gradual phase-out exercise of the existing jets and the delays in the procurement of new jets. The IAF has been trying to arrest this drawdown through the timely deliveries of indigenously manufactured aircraft.

#### 4. Khalistan Movement in Punjab

**Syllabus:** Challenges to Internal Security.

**Mains:** Khalistan Movement.

**Context:** The emergence of the extremist tendency among certain sections of Sikhs.

##### Details:

- In areas of the world where a sizeable concentration of Sikh diaspora exists, signs of radicalist threats have started appearing.
- The emergence of self-styled Sikh extremist preacher, Amritpal Singh, points to something that has deeper roots.
- The resemblance of the preacher to that of Bhindranwale is currently limited to style and lacks substance. However, his actions are attracting extremist fringe among the Sikh youth including the Sikh diaspora in countries like Canada, Australia, the U.K., and the U.S.
- It should be noted that the inner circle of the Bhindranwale coterie has clarified that "there is no successor to Bhindranwale as yet".
- It is found that the 'core group' of Amritpal Singh has established links with pro-Khalistan groups like the Babbar Khalsa, Sikhs for Justice (SFJ), and the Khalistan Liberation Force (KLF).

##### Khalistan Movement:

- The Khalistan movement is a separatist movement that emerged in the late 1970s in the Indian state of Punjab.
- The movement seeks to create a separate Sikh homeland called Khalistan, which would comprise Punjab and other parts of northern India.
- The 1980s were a period of intense violence and political unrest in Punjab, as the Khalistan movement led by Jarnail Singh Bhindranwale gained momentum.
- Bhindranwale and his followers occupied the Golden Temple in Amritsar, which is the holiest Sikh shrine, in 1984. The Indian government responded by launching Operation Blue Star, a military operation to flush out the militants from the temple.
- The Khalistan movement continued to gain strength in the late 1980s, with militant groups carrying out a series of bombings and assassinations.
- The Indian government responded with a heavy-handed crackdown, leading to a cycle of violence and counter-violence.

##### The Decline of the Khalistan Movement:

- By the early 1990s, the Khalistan movement had lost much of its momentum. The Indian government had largely succeeded in suppressing the militant groups, and public support for the movement had waned.
- The decline of the Khalistan movement can be attributed to several factors. One of the main factors was the lack of international support for the movement. Most countries did not recognize the Khalistan movement as a legitimate separatist movement, and the movement was largely isolated from the international community.
- Another factor was the fracturing of the movement into several competing factions. The movement lacked a cohesive leadership structure and was plagued by infighting and factionalism.
- In addition, the Indian government launched a series of economic and political reforms in the 1990s, which helped to address many of the grievances that had fueled the Khalistan movement. Punjab saw significant economic growth during this period, and the state became more integrated into the Indian economy.

##### Associated Concerns:

- India is one of the most populous countries with different religions and almost all segments have felt neglected or discriminated against at some point.
- It is argued that the existing security dispensation has not learned lessons from previous experience. For instance, in 1984, the development of the Bhindranwale phenomenon was not sudden and incidents like damage to Akal Takht and Operation Blue Star could have been avoided.
- It should be noted that the arrest of Amritpal Singh would just be the first step. The major challenge would be to deal with his coterie.
- The linkage of all happenings with 'foreign conspiracy' results in ignoring the deeper underpinnings.
- Another concern is that intelligence analysis is given low priority.
- The farmers' protests (January 2021) despite being an agrarian protest, carried signs of self-determination.
- The police force was not alerted despite an attack at a police station (Ajnala, near the Pakistan border).

**Way Ahead:**

- The information should be carefully assessed and analyzed before being projected to policymakers.
- The central and state intelligence agencies should not miss signs of growing insecurity among the Sikh population and discontent among the Sikh peasantry due to deteriorating economic conditions.
- The information should also be shared with friendly intelligence agencies abroad, particularly in countries with a larger Sikh population.
- The farmers' agitation against the farm laws (January 2021) should be revisited to determine the other factors that led to protest and violence.
- There is a need to introspect about the signs of the revival of the idea of Khalistan within the country.
- Instead of strong-arm methods, the government and its agencies should handle the matter tactfully.
- It should also address the issue of 'fake news' both within and outside the country.
- India should convince the world about the true nature of the radicalist Khalistan threat, and its close association with terrorist groups.
- Moreover, India should avoid criticizing foreign governments for violent events in their country.

**Conclusion:** India should steer between the extremes of right and left and ensure greater unity giving due respect to individual dignity and human progress.

**Nut Graf:** *The threat of radicalized forces in Punjab has increased in the past few months. India should learn from past experience and understand its true cause instead of resorting to strong-arm measures.*

## 5. Indian DefSpace Symposium

**Syllabus:** Security management

**Prelims:** About Indian DefSpace Symposium and Indian Space Association (ISpA)

**Context:** Indian Space Association (ISpA) has organised the "Indian DefSpace Symposium 2023" in association with Defence Research and Development Organisation (DRDO).

**Details**

- Chief of Defence Staff (CDS) General Anil Chauhan during the Indian DefSpace Symposium 2023 said that the nature of warfare is changing and we are witnessing the militarisation of space and steady progress towards weaponisation.
- He further added that "the aim should be towards developing dual-use platforms with a special focus towards incorporating cutting-edge technology and expanding NAVIC constellation to provide agile space-based Intelligence, Surveillance and Reconnaissance (ISR) and ensure secure satellite-assisted communications".

**Indian DefSpace Symposium**

- Indian DefSpace Symposium is organised by the Indian Space Association (ISpA) in association with the DRDO.
- The Symposium aims to create a platform for all stakeholders who have a keen interest in boosting India's military space capability and plans.
- The Symposium would provide a platform to bring together experts from multiple domains from the defence, DRDO, government sectors and industry professionals to discuss the latest trends and challenges in the field of defence.
- The key focus of the Symposium would be on delivering space domain awareness and satellite communications to enhance military operations, address related issues and develop a Defence Space Strategy in line with the National Space Strategy.
- Indian DefSpace Symposium 2023 is organised as a part of deliberations under "Mission Def-Space", under which 75 challenges have been identified for development by the industry.

**About Indian Space Association (ISpA)**

- The Indian Space Association (ISpA) was set up in 2021.
- The Indian Space Association (ISpA) is an apex, non-profit industry body working towards the successful exploration, collaboration, and development of the private and public space industry in the country.
- ISpA undertakes policy advocacy, engages and operates with all stakeholders and acts as a catalyst for accelerating the exchange of knowledge on space-related domains.

## 6. Cope India Exercise

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

**Prelims:** Cope India exercise

**Context:** The Cope India exercise is expected to be conducted from April 10 to 21 at the Kalaikunda airbase in West Bengal.

### Cope India Exercise

- The Air Forces of India and the U.S. are set to conduct the Cope India exercise at the Kalaikunda airbase in West Bengal, with Japan as an observer.
- The Cope India exercise began in 2004 as a fighter training exercise held at Air Station Gwalior, India.
- The Cope India exercise has evolved to incorporate subject matter expert exchanges, air mobility training, airdrop training and large-force exercises and fighter-training exercises.
- The exercise witnesses intense air manoeuvres aimed at improving interoperability.
- The exercise highlights the efforts and commitment of the U.S. and India to a free and open Indo-Pacific region.
- In the 2023 edition, the Indian Air Force (IAF) would be deploying its frontline fighters SU-30MKI, Rafale and the indigenous Light Combat Aircraft along with force multipliers, while the U.S. Air Force would be deploying its F-15 fighter jets.
- The India-U.S. bilateral Malabar naval exercise became trilateral with the addition of Japan in 2015 and further all the Quad partners participated together in the exercise with the inclusion of Australia in 2020.
- Further, in January 2023, India and Japan conducted their maiden air exercise Veer Guardian hosted by the JASDF.

## 7. Pralay missiles

**Syllabus:** Defence and security

**Prelims:** Pralay missiles

**Context:** India is going to buy 250 more Pralay ballistic missiles for the services to strengthen them on the northern borders, further boosting the firepower of the defence forces.

### More Details:

- The move comes soon after the defence ministry cleared 120 of these weapon systems for the Air Force which cannot be intercepted by any enemy air defence system.
- The use of Pralay tactical ballistic missile will be the first time in the history of the service, as ballistic missiles have been cleared by the government for use in tactical operations.

### About Pralay Missile:

#### PRALAY: Surface-to-Surface Missile

Pralay is a canisterised tactical, surface-to-surface, and short-range ballistic missile for battlefield use developed by the Defence Research and Development Organisation of India

**ENGINE:** Two stage rocket motor with third stage MaRV

**SPEED:** Mach 1 to 1.6

**RANGE:** 150-500 km

**TRAJECTORY:** low

**GUIDANCE SYSTEM:** Inertial navigation system

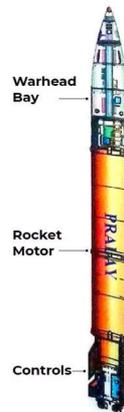
**LAUNCH PLATFORM:** 8x8 BEML-Tatra transporter erector launcher

**MASS:** 5 tonnes (4.9 long tons; 5.5 short tons)

**OPERATIONAL RANGE:** 150-500 km (93-311 mi)

Can change its path after covering certain range mid-air and is difficult to be tracked

It is capable of being launched from a mobile launcher and has latest navigation system and integrated avionics



It has the capability to defeat interceptor missiles

**Source:** Times of India

- Pralay, which has a range of 150 to 500 kilometres, is propelled by a solid-propellant rocket motor and other novel technologies.
- It is an indigenous short-range ballistic surface-to-surface (SRBM) missile.
- The missile will be India's first tactical quasi-ballistic missile and will give the armed forces the capability to hit enemy positions and key installations in actual battlefield areas.
- It is capable of carrying a conventional warhead of about 350 kg to 700 kg, which gives it a deadly punitive capability.
- It can carry a high explosive preformed fragmentation warhead, penetration-cum-blast (PCB) and runaway denial penetration submunition (RDPS).

## 8. INS Tarkash, INS Sumedha and INS Teg

**Syllabus:** Defence and Security

**Prelims:** About INS Tarkash, INS Sumedha and INS Teg

**Context:**

- The Indian Navy's INS Tarkash has been deployed to evacuate stranded Indians from Sudan as a part of Operation Kaveri.
- INS Tarkash is the third ship to join the evacuation after INS Sumedha and INS Teg.

**INS Tarkash**

- INS Tarkash is the second Talwar-class of guided missile frigates constructed for the Indian Navy.
- Talwar class of frigates are modified Krivak III-class frigates built by Russia.
- INS Tarkash was built at the Yantar shipyard in Kaliningrad, Russia.
- INS Tarkash uses BrahMos missiles in place of the Klub-N missiles which were used in the earlier ships.
- INS Tarkas was commissioned into the Indian Navy in November 2012.
- This ship uses stealth technologies and a special hull design to ensure a reduced radar cross-section.

**INS Sumedha**

- INS Sumedha is the third ship of the Saryu-class Naval Offshore Patrol Vessels (NOPV) of the Indian Navy.
- INS Sumedha was designed and constructed indigenously by Goa Shipyard Limited.
- It is fitted with a state-of-the-art weapon and sensor package.
- This ship is designed to undertake support operations, coastal and offshore patrolling, ocean surveillance, search and rescue (SAR) operations, and humanitarian assistance and disaster relief (HADR).
- INS Sumedha consists of an array of weapons and sensors and can also carry an Advanced Light Combat Helicopter.
- INS Sumedha was commissioned into the Indian Navy in March 2014.

**INS Teg**

- INS Teg is the fourth Talwar-class frigate constructed for the Indian Navy.
- Just like the other Talwar-class frigates, INS Teg was built by the Yantar shipyard in Kaliningrad, Russia.
- The ship is named after "Teg", which is a short single-edged curved sword, traditionally used by Sikhs.
- INS Teg also uses BrahMos missiles.
- INS Teg was commissioned into the Indian Navy in April 2012.
- The motto of the ship is "Towards Eternal Glory".
- INS Teg has been deployed in numerous missions including anti-piracy operations in the Gulf of Aden, providing maritime security in the seas of India's maritime partners, SAR missions, and exercises with other navies.

## 9. Germany may offer sale of advanced submarines to India

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

**Prelims:** Project-75I

**Context:** Germany is looking to sell its advanced conventional submarines to India through the government-to-government route.

**Details**

- The Indian Navy is looking to further strengthen its sub-surface fleet, by procuring six advanced diesel-electric submarines under Project-75I which is estimated to cost over ₹45,000 crores.
- In January 2020, the Defence Acquisition Council (DAC) shortlisted Mazgaon Docks Ltd. (MDL) and Larsen & Toubro (L&T) as the Indian partners for the P-75 agreement.
- The Indian Navy currently has 16 conventional submarines in service, which include:
  - Seven Russian Kilo-class submarines
  - Four German-origin HDW submarines
  - Five French Scorpene-class submarines with the sixth Scorpene expected to join service soon
- As the Kilos and the HDWs submarines are ageing, a Medium Refit-cum-Life Certification (MRLC) programme is underway to increase their life.

# ENVIRONMENT AND ECOLOGY

## 1. Bandipur completes 50 years as Project Tiger reserve

**Syllabus:** Biodiversity Conservation

**Prelims:** About Bandipur Tiger reserve

**Mains:** Critical evaluation of the implementation of Project Tiger and the way forward

**Context:** Bandipur completes 50 years as Project Tiger reserve.

### About Bandipur Tiger reserve:

- The reserve is located in the Indian state of Karnataka and is spread over an area of 912.04 sq. km.
- It is recognized as one of the prime tiger habitats in the world and is an important component of the country's first biosphere reserve – Nilgiri Biosphere Reserve.
- When Project Tiger was launched in 1973, there were 12 tigers in Bandipur, according to Ramesh Kumar, director of Bandipur Tiger Reserve.
- Today, the number of tigers utilizing the park is 173 while the number of tigers within the reserve has been pegged at 126 as per the Status of Tigers Co-predators and Prey in India, 2018.

### Conservation efforts at Bandipur:

- Much before the Wildlife Conservation Act, 1972, was passed, the erstwhile rulers of Mysore had realized the importance of conserving flora and fauna.
- The Mysore Game and Fish Preservation Act was passed in 1901, and several forest areas were preserved as Game Reserves, and Tiger Blocks were identified with shooting restrictions imposed.
- Initially, an area spread over 35 sq miles was declared as a Game Sanctuary in Chamarajanagar State Forest of Mysore district in 1931 and was protected for 10 years.

### Bandipur as a part of Project Tiger:

- When Project Tiger was launched in 1973, Bandipur was among the first nine reserves to be brought under the flagship program, and it included most areas that were already protected under the Venugopal Wildlife Park.
- The park was upgraded to a national park and renamed Bandipur, and the adjacent reserve forests were included under it to extend its area to 874.20 sq km.

### Significance:

- The landscape spanning Bandipur, Nagarahole, Mudumalai, and Wayanad complex is home not only to the highest number of tigers in the country – about 724 – but also to the largest Asian Elephant population.
- The Bandipur Tiger Reserve is an important component of the country's first biosphere reserve – Nilgiri Biosphere Reserve.

Project Tiger



Source: Natural Safari

- Project Tiger was launched by the Union government on April 1, 1973, in a bid to promote conservation of the tiger. The programme came at a time when the population of tigers in India was rapidly dwindling.
- The Indira Gandhi government initiated Project Tiger in 1973 from the Jim Corbett National Park in Uttarakhand with the ambitious goal of boosting the country's tiger population.
- Project Tiger's first reserves included Jim Corbett, Manas, Ranthambore, Simlipal, Bandipur, Palamau, Sundarbans, Melghata, and Kanha.
- The number of tigers in India has increased by 6.74 percent from 2,967 in 2018 to 3,167 in 2022, according to the 5th cycle of India's Tiger Census, which was released to mark 50 years of 'Project Tiger' on April 09, 2023.
- Since its inception, Project Tiger has expanded its coverage to 54 tiger reserves scattered across 18 of our tiger area states.
- India's tiger conservation success is attributed to the Wild Life (Protection) Act (WLPA) and Project Tiger, which helped bring back the national animal from the brink of extinction.

Conservation Amnesia and other concerns associated with Project Tiger



- The 50-year celebration of the Act brings attention to the need to reflect on conservation practices for the next 50 years.

- Conservation amnesia is a syndrome of shifting baselines where, despite political support, funds, and a strong legal framework, the numbers do not reflect significant success in tiger conservation.
- There have been some unintended consequences of Project Tiger, including the displacement of indigenous people living in protected areas, increased human-tiger conflicts, and the diversion of resources away from other conservation efforts.
- Additionally, the focus on tigers has led to the neglect of other species and their habitats, resulting in the decline of some wildlife populations.
- The 2023 preliminary report on Project Tiger shows that tiger populations are declining in certain regions, resulting in a loss of genetic diversity unique to those areas.
- To combat this, tigers are being reintroduced from central Indian forests, but this may homogenise tiger genetic structure across the country.
- The umbrella species concept of saving the tiger to save the ecosystem resulted in the manipulation of ecosystems to boost tiger numbers rather than their habitat and species.
- Excessive provisioning of water to enhance the cheetal (Prey for Tiger) habitat, led to reduced natural, climate-driven variations in populations of wildlife.
  - This also led to the transformation of tiger reserves into habitats dominated by cheetals, a phenomenon referred to as “cheetalification.”
  - For example, in the Kanha Tiger Reserve, the explosion in the cheetal population resulted in the habitat becoming unsuitable for the endangered hard ground barasingha, which depends on tall grass.

### Decentralising Conservation

- Conservation in India depends entirely on a network of Protected Areas (PAs). This is an exclusive conservation model which entirely depends on the government to protect and conserve the environment, wildlife, and natural resources.
- One way to decentralise conservation efforts is to involve local communities in decision-making processes related to conservation.
- This can be done by creating community-based natural resource management systems, where local communities are given the authority to manage their own natural resources in a sustainable way.
- This approach can help to reduce conflicts between local people and conservation authorities and can also promote greater accountability and transparency in conservation efforts.
- The WLPA must be amended to provide a policy framework and incentive for ordinary citizens to aid in conservation.
- In many countries, natural lands are owned or managed by a variety of stakeholders, including individuals, communities, farmers.
  - To incentivize conservation efforts, each group has different models and approaches to conservation that are tailored to their specific interests and needs.
  - As a result, multiple conservation models operate simultaneously, each with its unique strengths and challenges.
- This diverse range of conservation models can help ensure that natural lands are conserved in a way that works for all stakeholders, while also promoting sustainable use and management of natural resources.
- In India, ‘Reserved Forests’ can be co-managed with an inclusive approach which also provides economic benefits for local communities.

**Nut Graf:** India recently celebrated the successful completion of 50 years of Project Tiger. However, the focus on boosting tiger numbers has overshadowed the importance of preserving their habitats and other species, leading to unintended consequences.

## 2. Tiger Census Report 2022-23

**Syllabus:** Biodiversity Conservation

**Prelims:** About Tiger Census and International Big Cats Alliance(IBC)

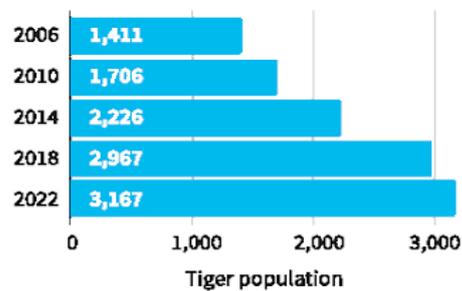
**Mains:** Important findings of the latest Tiger Census report 2022-23

**Context:** The Prime Minister of India released the latest Tiger census data.

## Key findings of the latest Tiger Census report

### Big cat count

According to the data released by the PM, the number of tigers in India increased by 200 in the past four years. A look at the tiger population



**Steady rise:** A tiger at Van Vihar National Park in Bhopal on Sunday. PTI

Source: The Hindu

- The 5th cycle of India's Tiger Census has revealed that the Tiger population stands at 3,167 in the wild as of 2022.
- The National Tiger Conservation Authority (NTCA) in collaboration with the State Forest Departments, Conservation NGOs and coordinated by the Wildlife Institute of India (WII), conducts a National assessment for the "Status of Tigers, Co-predators, Prey and their Habitat" every four years since 2006.
- The main objective of reviewing the status of Tigers in the country every four years was to ensure that the balance between forest and wildlife is not disrupted. If Tigers were to extinguish it would severely affect the forest and cycle of nature
- The latest report indicates that the Tiger population in the country has increased by close to 6.7% in the last four years.
  - As per Tiger Census 2018, there were 2,967 Tigers in India.
- The data from the latest census report was announced by the Prime Minister at an event to mark the International Big Cat Alliance Conference and the 50th anniversary of Project Tiger.
  - The International Big Cat Alliance Conference focuses mainly on the protection of seven major big cats of the world namely Lions, Tigers, Cheetahs, Jaguars, Leopards, Snow Leopards, and Pumas.
- According to the latest census report, the Tiger population has increased significantly in the Shivalik hills and the Gangetic flood plains, followed by central India, the northeastern hills, the Brahmaputra flood plains, and the Sundarbans.
  - However, the Tiger population has declined in the Western Ghats region.

### Key threats to Tiger Population

- As per the latest census report, all of the five major tiger zones in India are facing challenges to conserve and increase the Tiger populations because of the increasing demands from infrastructure development.
- The report also notes that the wildlife habitats in regions such as Central Indian highlands and Eastern Ghats are facing several threats which include habitat encroachment, illegal hunting of Tigers and their prey, man-animal conflicts, excessive harvesting of non-timber forest produce, unregulated cattle grazing, human-induced forest fires, expanding linear infrastructure and large scale mining.
- Further, the increase in the Tiger population outside the Tiger Reserves in the landscapes such as Shivalik hills and Gangetic plains in the states of Uttarakhand and Uttar Pradesh has led to an increase in the instances of conflict between Tigers and mega herbivores.

### Path ahead

- Mitigation measures such as lower mining impact techniques and rehabilitation of mining sites must be taken up as a priority in areas such as Central Indian highlands and Eastern Ghats which have a significant number of mining sites.
- There exists a need to invest in mitigating conflict between the Tigers and mega herbivores.
- Experts believe that most of the Tiger populations in India are focused within a handful of reserves that are reaching their peak carrying capacity.
  - This highlights the need to develop new regions as reserves, as there might be a challenge to ensure further growth in numbers in the coming years.
- There should be extra care to maintain the balance between making the ground fertile for conservation and keeping the rights of forest-dwelling communities intact.
- Conservation efforts should not come at the expense of the right to livelihood and dignified living of forest-dwelling communities.
- Post the translocation of Cheetahs from Africa, India is looking at Tiger translocation programmes as India now accounts for nearly 75% of the world's total Tiger population.
  - India is in talks with Cambodia to translocate a few Tigers from India as the Tigers have gone extinct due in the country.

### International Big Cats Alliance(IBCA)

- In the mega international event held at Mysuru to commemorate 50 years of Project Tiger, the Prime Minister launched the International Big Cat Alliance (IBCA).
- The International Big Cat Alliance focuses mainly on the protection of seven major big cats of the world namely Lions, Tigers, Cheetahs, Jaguars, Leopards, Snow Leopards, and Pumas.
- In collaboration with countries that host these species, IBCA will focus on the protection and conservation of the world's seven primary big cats, including the tiger, lion, leopard, snow leopard, puma, jaguar, and cheetah.
- **Members:** The alliance's membership will be open to 97 "range" countries, which include the big cats' natural habitat, as well as other interested governments, international organisations, and so on.
- **Working:** The IBCA will participate in advocacy, partnership, knowledge e-portal, capacity building, eco-tourism, expert group collaboration, and fund mobilisation.
- The alliance will also communicate information to its members on benchmarked practices, capacity building, a resource library, research and development, and awareness creation.

**Nut graf:** India's Tiger conservation efforts which have led to the increase of Tiger numbers from 1,411 in 2006 to about 3,167 by 2022 are seen as a global model worth emulating as the Tiger numbers in other parts of the world are on the decline.

### 3. Aravali green wall project

**Syllabus:** Conservation

**Prelims:** About Aravali Mountain Range and Great Green Wall of Africa

**Mains:** Aravali green wall project and its significance

**Context:** On the occasion of World Day of Forests, the Union Minister for Environment, Forest and Climate Change launched the Aravali Green Wall Project and announced the National Action Plan to Fight Desertification and Land Degradation Through Forestry Interventions.

#### What is the Aravali Green Wall Project?

- It is an ambitious plan to create a green belt buffer 1,400km long and 5km wide around the Aravali Mountain range, encompassing the states of Haryana, Rajasthan, Gujarat, and Delhi.
- In the first phase, 75 water bodies will be revitalised, beginning with five water bodies in each district of the Aravalli landscape.
  - It would encompass degraded land in the Haryana districts of Gurgaon, Faridabad, Bhiwani, Mahendergarh, and Rewari.
- The idea is modelled after Africa's 'Big Green Wall,' which runs from Senegal (west) to Djibouti (east) and was completed in 2007.

#### What is the Great Green Wall of Africa (GGW)?

- GGW is an African Union project that aims to rehabilitate the continent's devastated landscapes and alter millions of lives in the Sahel.
- The concept envisions an 8km wide belt of trees extending across Africa for 8,000 kilometres.

#### Objectives:

- It intends to repair 100 million hectares of deteriorated land.
- In addition, by 2030, the project aims to sequester 250 million tonnes of carbon and create 10 million green employment.
- Eleven Sahel-Saharan countries—Djibouti, Eritrea, Ethiopia, Sudan, Chad, Niger, Nigeria, Mali, Burkina Faso, Mauritania, and Senegal—have joined forces to battle soil degradation and restore native plant life to the area.

#### Objectives of India's Green Wall Project:

- The overall goal of India's Green Wall will be to combat escalating rates of land degradation as well as the eastward spread of the Thar desert.
- The projected green belt from Porbandar to Panipat will aid in the restoration of degraded land along the Aravali hill range by afforestation. It will also serve as a filter for dust from the deserts of western India and Pakistan.
- It intends to increase the Aravalli range's biodiversity and ecosystem services by planting native trees, which will aid in carbon sequestration, offer home for wildlife, and improve water quality and quantity.
  - Local community involvement in afforestation, agroforestry, and water conservation efforts can enhance long-term development.
  - Furthermore, it will contribute to the generation of income and employment possibilities, the improvement of food security, and the provision of social benefits.

**Background:**

- According to the Indian Space Research Organisation's (ISRO) Desertification and Land Degradation Atlas, land degradation affected 97.85 million hectares (29.7%) of India's total geographical area (TGA) of 328.72 mha in 2018-19.
- The Aravali has been chosen as one of the important degraded zones to be greened as part of India's goal of restoring 26 million hectares (mha) of land.
- According to an ISRO assessment from 2016, Delhi, Gujarat, and Rajasthan had already deteriorated more than 50% of their land.

**What is the Aravali Mountain Range?**

- The Aravallis is the world's oldest folded mountain.
- It stretches over 800 kilometres from Gujarat to Delhi (through Rajasthan and Haryana).
- Guru Peak atop Mount Abu is the highest point in the Aravalli Range.
- The Aravallis have an impact on the climate of northwest India and further afield.
- During the monsoon season, the mountain range gently leads the monsoon clouds eastwards towards Shimla and Nainital, nourishing the sub-Himalayan rivers and feeding the northern Indian plains.
- It shields the fertile alluvial river valleys (the Para-Indus and Gangetic) from the cold westerly winds of Central Asia during the winter months.

**4. United Nations 2023 Water Conference**

**Syllabus:** Conservation

**Prelims:** About United Nations 2023 Water Conference

**Mains:** Key outcomes of United Nations 2023 Water Conference, current challenges in water management and possible solutions.

**Context:** Recently, the United Nations 2023 Water Conference was held in New York.

**What is a UN water conference 2023?**

- The UN 2023 Water Conference which is formally known as the "2023 Conference for the Midterm Comprehensive Review of Implementation of the UN Decade for Action on Water and Sanitation (2018-2028)" took place at the UN Headquarters in New York.
- The 2023 Conference was co-hosted by the Government of Tajikistan and the Kingdom of the Netherlands.
- The Conference was held after a 46-year hiatus. It coincided with the evaluation of the UN Decade of Action for Water and Sanitation (2018-2028).
- The evaluation was prompted by the realisation that we are not on track to fulfil the 2030 Sustainable Development Goal (SDG) no. 6 for water, which states that we must "ensure the availability and sustainable management of water and sanitation for all."
- "Our watershed moment: uniting the globe for water," was the subject.
- In 1977, the first water conference was conducted in Mar de Plata, Argentina. It led in the first worldwide 'Action Plan,' which stated that "all peoples have the right to drinking water in amounts and of sufficient quality to meet their fundamental needs."

**Initiatives taken at the Conference:**

- **The Water Action Agenda** comprises 700 voluntary commitments.
- **Climate resilient water and sanitation infrastructure** - The United States made an investment commitment of up to \$49 billion to promote climate resilient water and sanitation infrastructure and services.
- **Quality Infrastructure** - Japan declared that it will donate 500 billion yen to the solution of the Asia-Pacific region's water-related socioeconomic challenges by constructing quality infrastructure.
- **River basin management and clean running water** – Vietnam has committed to developing policies for major river basin management by 2025 and clean running water by 2030.
- **The African Union Commission and the Continental Africa Investment Plan (AIP)** hope to eliminate Africa's water investment gap by mobilising at least \$30 billion per year by 2030.
- **European Union (EU)** - By 2030, the EU hopes to provide improved drinking water and sanitation to 70 million people.
- Switzerland submitted five commitments in the domains of the Water Convention and transboundary cooperation.

**Challenges and the path ahead**

- The commitments are not legally binding, and today's problems are more complex than they were 50 years ago.
- The water industry is especially prone to fragmentation since water problems and solutions are typically local. In comparison to other disciplines, such worldwide mobilisations are ineffective.
- Because today's water problems are no longer about access, infrastructure spending no longer directly translates to long-term access to water and sanitation.
- The meeting did not address the violence and threats that communities suffer when attempting to protect depleting water sources.

- Extending services to underserved sections of society has been a complex task.
  - In India, there have been programmes such as the Swachh Bharat Mission and the Jal Jeevan Mission in this regard.
  - However, the major challenge with respect to extending access to water and sanitation is that it does not translate into sustained access to water and sanitation.
- Over-exploitation of the groundwater which is mostly driven by agricultural pumping is another key challenge.
  - The key to addressing this problem would require policy change and cooperation between various agencies and ministries.
- Other SDG goals pertaining to sustainable agriculture, industry, and natural ecosystems are also harder to achieve in the current context.
  - Achieving these intended goals or targets mandates political choices and a stronger democracy.

**Nut graf:** *The United Nations Water Conference 2023 which was held after 46 years has gained significance as the UN and the international community have now realised that we are not on track to meet the 2030 Sustainable Development Goal (SDG) for water. There is an urgent need for global actions and binding commitments to ensure sustainable management of water and sanitation.*

## 5. Climate Change and Human Health

**Syllabus:** Climate change, environmental pollution and degradation

**Mains:** Impact of Climate Change on Human Health and various initiatives undertaken

**Context:** According to the Lancet Countdown report on Health and Climate Change: Health at the Mercy of Fossil Fuels, reliance on fossil fuels is increasing the risk of disease, food insecurity and other illnesses related to heat.

### Impact of Climate Change on Human Health

- **Water Problem and Risk of Waterborne Diseases**
  - Water-borne illnesses are climate-sensitive and vary seasonally. Diarrheal diseases are more common during the rainy season.
  - The highly varied rainfall patterns caused by climate change are likely to have an influence on freshwater supply. Four out of every ten people worldwide are already affected by water scarcity.
  - Water pollution can be exacerbated by household water storage. In extreme circumstances, water scarcity can lead to drought and starvation.
  - Droughts are anticipated to become more frequent and intense on a regional and worldwide scale by the late twenty-first century as a result of climate change.
  - Flooding is getting more frequent and intense. Flooding contaminates freshwater supplies and increases the danger of water-borne illness transmission.
- **Changes in Vector Ecology and Vector Borne Diseases**
  - The most frequent vector-borne diseases (VBDs) in India include malaria, dengue fever, chikungunya, filariasis, Japanese encephalitis, and leishmaniasis.
  - A vector is any organism that can transmit a pathogen, or infectious agent, from one host to another, such as fleas, ticks, or mosquitoes.
  - Warmer temperatures and humidity enhance insect vector development and alter the geographic range of current vectors, extending the transmission season and broadening the geographical dispersion of vector-borne diseases (such as dengue and malaria).
  - Warmer average temperatures can lead to prolonged warm seasons, earlier spring seasons, shorter and milder winters, and hotter summers, all of which make conditions more suitable for many vector-borne disease carriers.
  - Climate change may also have an impact on other South Asian vector-borne diseases. These include tick-borne infections as well as parasitic diseases such as leishmaniasis, lymphatic filariasis, and onchocerciasis.
  - Human plague, a bacterial disease borne by rodents and transmitted by fleas, may also be affected by climate change.
- **Effect of Extreme Temperatures**
  - Climate change will result in new and emerging health risks such as heat waves, cold spells, and other extreme weather occurrences.
  - Heat stress can worsen working conditions and raise the risk of cardiovascular disease, pulmonary disease, and kidney disease, as well as heat-related disorders.
  - Extreme heat also raises levels of air pollution and aeroallergens, which can exacerbate asthma and other respiratory disorders.
  - Ground-level ozone (a main component of smog) has been related to a number of health problems, including impaired lung function, an increase in asthma hospitalisations and emergency department visits, and an increase in premature deaths.
- **Food Supply Problems**
  - Rising temperatures and erratic precipitation are expected to impair staple food production in many of the world's poorest countries. As a result, malnutrition and undernutrition will become increasingly common.
  - Several developing countries in Africa, Asia, and Latin America have expressed concern about the effects of climate change on food security, notably flooding and drought.

- Meat and dairy businesses contribute about 15% of greenhouse gas emissions, while meat and dairy-rich diets raise the risk of cancer and cardiovascular disease.
- **Forced Migration and Human Cost**
  - Climate or weather-related calamities are anticipated to evict 22.5 million people per year, with these numbers expected to climb in the future.
  - Climate change-induced human movement has a monetary cost, as well as mental and social concerns for people and communities.
  - Weather and climate affect human life in both direct and indirect ways.
  - Climate change is expected to disproportionately affect the most vulnerable, disadvantaged, and poor populations, resulting in increased food and water insecurity, higher food prices, income and livelihood opportunities loss, negative health effects, and population displacement (including forced migration).

#### Initiative for protecting Health from Climate Change

- Climate change is a worldwide problem that demands everyone's assistance. At the 21st session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris in late 2015, more than 190 countries approved the Paris Agreement to combat climate change.
- To accomplish the SDGs, all countries promised to collaborate to keep global temperature rise well below 2 degrees Celsius and to make every effort to keep it below 1.5 degrees Celsius.
- Simply lowering air pollution might save roughly a million lives per year by 2050 if the Paris Agreement's goals are met.
- In 2017, the WHO started a Special Initiative on Climate Change and Health in Small Island Developing States.
- While these countries contribute very little to the causes of climate change, they are among the most vulnerable to its consequences.
- India lay the framework for stronger global collaboration on climate change with its commitment to the Paris Agreement. By 2030, India has pledged to reduce its GDP emission intensity by 33-35 percent from 2005 levels.
- The Indian government's development of renewable energy demonstrates its seriousness about tackling climate change.
- There are numerous things we can do in our daily lives to help prevent climate change, such as adopting environmentally friendly transportation, conserving energy, going solar, harvesting rainwater, minimising waste, and supporting urban green spaces.

## 6. Can countries be sued over climate change?

**Syllabus:** Environmental pollution and degradation

**Prelims:** ICJ advisory opinion.

**Mains:** UNGA resolution on climate change and its implication.

**Context:** The United Nations General Assembly (UNGA) has passed a resolution about the obligation of countries regarding climate change.

#### Details:

- The United Nations General Assembly passed a resolution on 29th March 2023 asking the International Court of Justice to (ICJ) provide an opinion about obligations countries have towards climate change reduction, based on the commitments made to the UN Framework Convention for Climate Change (UNFCCC).
- The resolution was moved by the Pacific Island of Vanuatu.
  - It is a small island country in the Pacific ocean.
  - In 2015, cyclone Pam (spurred by climate change) wiped out 95% of its crops and impacted two-thirds of its population.

#### Details about Resolution:

- The draft resolution called A/77/L.58 has invoked article 96 of the UN Charter to ask the ICJ to address two questions:
  - What are the obligations of states under the international protocol to ensure the protection of the climate system for present and future generations?
  - What are the legal consequences under these obligations for states where they, by their acts and omissions, have caused significant harm to the climate system, particularly for Small Island Developing States (SIDS) and for people who are harmed?
- The resolution also refers to various international protocols like Paris Agreement, UNCLOS, and Human Rights.
- ICJ would take at least 18 months to deliberate and discuss the matter.
- The idea of taking the matter to the highest court was proposed by a group of 27 Pacific Island law students. The issue was raised in the Pacific Islands Forum.
- The draft resolution was co-sponsored by 132 countries at the UNGA and was passed through consensus.
- Despite some reservations by the U.S., not a single country opposed the resolution.
- A legal decision by the ICJ would ensure all the countries work towards mitigating climate change and global warming to the suggested 1.5-2°C limit.

- The decision of the ICJ on contentious matters like climate reparations by the developed world and legal actions against countries that don't achieve their Nationally Determined Contributions (NDC) targets will be closely watched.
- The action to raise a resolution is more inclusive and better than the two earlier attempts by the Small Island States to the International Tribunal for the Law of the Sea (December 2022) and Columbia and Chile at the Inter-American Court of Human Rights (IACHR) (January 2023).

#### India's Stand:

- Despite being a supporter of climate justice and holding the developed world accountable for climate change, India remained silent about the resolution.
- India did not join the majority of countries that co-sponsored the resolution. It should be noted that neighboring countries like Bangladesh, Nepal, Sri Lanka, and Maldives were co-sponsors.
- New Delhi is closely watching the response of global powers like the U.S. and China.

#### Advisory Opinion of ICJ:

- The Advisory Opinion of ICJ is not legally binding.
- However, the ICJ judgment would make the environmental laws more streamlined, specifically on issues like climate justice, climate finance, and "loss and damages" agreed in COP 27.
- It should be noted that ICJ's advisory opinion on matters like the Palestinian issue (Construction of the Wall) and nuclear threats was respected.

**Nut Graf:** *The United Nations General Assembly has passed a resolution asking International Court of Justice to provide an advisory opinion on the obligations that countries have towards climate change reduction. The resolution was moved by a small island of Vanuatu. The decision is expected to streamline various international environmental laws.*

## 7. Time to put a price on carbon emissions

**Syllabus:** Environmental Degradation.

**Mains:** Carbon pricing and Carbon emission reduction.

**Prelims:** Carbon pricing.

#### Details:

- The utilization of natural resources without having to pay the price has resulted in significant environmental destruction.
- Consequently, there are relentless carbon emissions causing runaway climate change.
- It is suggested that big economies like the G20 countries should start pricing carbon effluents. India holding the G20 presidency for the year 2023 can take the lead in this regard.

#### Carbon Pricing Mechanisms:

- **Three major carbon pricing mechanisms are as follows:**
  - A **carbon tax** can be established domestically, like in Singapore and Korea.
  - The European Union (EU) and China use **emissions trading system (ETS)**.
  - The EU has also proposed the application of an **import tariff on carbon content**.
- Around 46 countries price carbon. However, it covers only 30% of global greenhouse gas (GHG) emissions at an average price of only \$6 per ton of carbon.
- The International Monetary Fund has proposed price floors of \$75, \$50, and \$25 a ton of carbon for the United States, China, and India, respectively. It can help in achieving a 23% reduction in global emissions by 2030.
- It should be noted that carbon pricing encourages investment in renewable energy like solar and wind energy.

#### Impact on India:

- **Benefits of a carbon tax in India:**
  - It is more appealing as it discourages fossil fuels.
  - It will raise revenue which can be further invested in cleaner sources of energy.
  - It would replace the inefficient scheme of petroleum taxes which are not directly aimed at emissions.
- Many countries including India have established the basic structure needed to implement a carbon tax in their fiscal policy. However, policymakers should choose the tax rate which can range from \$2.65 a ton of CO<sub>2</sub> (in Japan) to \$165 a ton (set by Denmark for 2030).
  - India can start with the IMF-prescribed figure of \$25 a ton.

#### Associated Concerns:

- It should be noted that carbon pricing faces stiff political opposition. For instance:
  - Australia repealed the 2012 tax just two years after it was introduced.
  - Rising energy prices in the EU led to the selling of millions of emission permits. It caused a 10% fall in carbon prices.
- One of the major issues in this regard is that industrial firms might lose their competitive advantage to exporters from countries with lower carbon prices.

**Way Ahead:**

- A uniform rate should be set for countries in the same bracket (high, middle, and low-income).
- Moreover, companies should be allowed to use high-quality international carbon credits to offset up to a certain percentage of their taxable emissions.
- **Best practices from countries across the world:**
  - The EU excludes transport if the higher costs are directly passed on to consumers.
  - In Singapore, vouchers are provided to consumers hit by utility price rises.
  - California uses proceeds from the sales of carbon permits partly to subsidize purchases of electric cars.
  - Sweden addressed the political constraints by presenting carbon tax as a part of a fiscal package that reduces other taxes and includes new social safety nets.
- Output-based rebates can also be provided.
- The idea of wins at the societal level should be adequately communicated.
- It should be noted that as the concept of carbon tax gains acceptance, the first movers will become most competitive. Thus, India should promote the idea and play a lead role to fight against climate change.

**Nut Graf:** A high carbon tax can have a notable impact on reducing carbon emissions and global warming. It will consequently address the climate crisis. It could pave the way for making decarbonization a winning development formula. India should play a proactive role in this context to become globally competitive.

## 8. India's solar push augurs a looming waste challenge

**Syllabus:** Environmental pollution and degradation

**Mains:** Heatwaves - its definition, criteria, causes and impacts

**Context:** Increased push towards solar energy also generates photovoltaic waste. It consists of many hazardous materials, including heavy metals such as cadmium, copper, lead, antimony, and selenium.

**Waste management in the solar photovoltaic (PV) sector**

- India has the fourth-highest solar PV deployment in the world.
  - The total installed solar capacity was close to 62GW in November 2022.
- This level of solar PV deployment has resulted in a colossal amount of waste.
- As per a 2016 report by the International Renewable Energy Agency, India could generate about 50,000-3,25,000 tonnes of PV waste by 2030 and more than 40 lakh tonnes by 2050.
- Further, solar PV deployments in India are dominated by crystalline silicon (c-Si) technology.
  - In such technology, a PV panel is usually made of c-Si modules (93%) and cadmium telluride thin-film modules (7%).
  - c-Si modules are further made of glass sheets, aluminium frames, encapsulants, backsheets, copper wires, and silicon wafers thereby contributing to the waste.

**Recycling solar PV waste**

- As per a report published in 2021, close to about 50% of the total materials including the silicon and silver content can be recovered from solar PV panels.
  - However, only about 20% of the waste is recovered in India currently.
- As the solar PV panels move towards expiration, a few portions of the frame are extracted and sold as scrap, junctions and cables are recycled as per the e-waste guidelines, the glass lamination is also recycled to an extent and the rest is disposed of as general waste.
- Due to the large-scale dumping of these materials as general waste, the waste is accumulating at landfills at a rapid rate polluting the surroundings.
  - Burning of such PV components and materials also releases harmful sulphur dioxide, hydrogen fluoride, and hydrogen cyanide into the atmosphere.

**EPR Rules as per E - Waste (Management) rules 2022**

- Management of solar PV modules /panels/ cells added in new rules.
- The E-Waste (Management) Rules also provide for recognition and registration, skill development, monitoring and ensuring safety and health, of workers involved in dismantling and recycling of e-waste.
- Annual E-Waste Recycling targets based on the generation from the previously sold EEE or based on sales of EEE as the case may be.
- Target may be made stable for 2 years and starting from
  - 60% for the year 2023-2024 and 2024-25;
  - 70% for the year 2025-26 and 2026-27 and
  - 80% for the year 2027-28 and 2028-29 and onwards.

### Key challenges

- The clubbing of PV waste with general e-waste has led to confusion and has posed managerial challenges.
- India also is witnessing significant collection, storage, recycling, and repurposing challenges.
- Further, the market to reuse recycled PV waste is minuscule in India which lacks the required incentives and schemes.

### Way forward

- India should come up with provisions specific to PV waste treatment within the ambit of the e-waste guidelines.
- A central insurance body could be established to extend protection in case of financial losses incurred in waste collection and treatment.
- All India-level sensitisation and awareness drives can be conducted on PV waste management.
- The focus must be on domestic R&D efforts to design and develop innovative recycling and recovery mechanisms and technologies.

**Nut graf:** *Despite there being a push towards a circular economy in the recent few years, waste management in the solar photovoltaic (PV) sector in India still lacks clear directives. With India expected to become one of the top photovoltaic waste producers worldwide by 2050, clear policy directives, well-established recycling strategies, and greater collaborations are the need of the hour.*

## 9. Dealing with extreme heat

**Syllabus:** Climate Change.

**Mains:** Weather variability and Urban Heat Island Effect.

**Prelims:** Urban Heat Island Effect.

### Details:

- It is highlighted that approximately 350 million people in India were exposed to extreme heat between April and May 2022.
- During the period from 1990 to 2019, the average summer temperatures increased by 0.5-0.9°C in the states of Rajasthan, Haryana, Punjab, Uttar Pradesh, and Bihar.
- It is estimated that between 2021 and 2050 the maximum temperature will increase by 2-3.5°C in 100 districts and by 1.5– 2°C in nearly 455 districts.
- A similar pattern will also be observed in winter temperatures of approximately 485 districts.
- As an effect of climate change, April-May temperatures will reach record highs every three years.

### Impact of Climate Change on Weather Variability:

- Indian cities are experiencing the urban heat island effect.
- Moreover, humidity has exacerbated the felt temperature, with wet bulb temperatures reaching above 32°C in many cities.
- In an instance of weather variability in Northern India, January 2023 (Winters) was followed by a heat wave in February and early March. Moreover, hailstorms and heavy rain were experienced in early April 2023.

### Impact of Weather Variability:

- It impacts agriculture. For example, the weather variability in the past few months in Gujarat and Rajasthan (90% production area of cumin) has destroyed most cumin crops.
- It leads to drought.
- It is responsible for higher mortality.
- The rising temperatures make the cities increasingly unliveable.
- It impacts labour productivity. According to a study, heat exposure for labourers can result in the loss of 162 hours per year.
- The marginal farmers, labourers at construction sites, street vendors, and even the gig-economy workers are affected.

### Way Ahead:

- Every urban citizen should have at least seven trees in the urban landscape to mitigate the problem of extreme heat.
- Development plans for Tier 2 and Tier 3 cities should focus on increasing the density and area of urban forests.
- The wetlands should be expanded and the dead and decaying water bodies should be restored.
- In order to reduce the urban heat island effect, permeable materials can be used in civic infrastructure and residential construction.
- Anthropogenic heat emissions from vehicles and factories should be reduced.
- Other measures include the use of brick jalis for ventilation and terracotta tiles to allow hot air to escape.
- Urban building standards should be upgraded to restrict the usage of heat-absorbent galvanized iron and metal roof sheets.
- Cleaner cooking fuels will reduce indoor air pollution.
- **Some more methods include:**
  - Embracing public transportation and reducing personal vehicle usage.
  - Reducing the size of landfills.

- Waste segregation along with solid waste management at source.
- Forecasting ability should be improved.
- Detailed policies and guidelines on weather variability and urban heat management at the State, district, city, and municipality ward levels should be prepared.
- Policymakers should take mitigatory measures and institute structural infrastructure to help India adapt to such situations.

### Case Study of Chandigarh

- The urban design of Chandigarh considered climate responsiveness as a major factor.
- It is situated at the foothills of the Shivaliks, between two river beds.
- A large green belt of mango trees was also planted around the city as a buffer between the residential area and the industrial suburbs.
- Local architecture included mud houses.
- To help in cooling the city, a small rivulet was dammed to create the Sukhna Lake. Several small water bodies were also developed near large buildings.
- Parks were established in every sector and forest areas were also reserved.
- However, over the years modern construction has been overlaid and has impacted the region.
- Consequently, it has affected the climate of the region

**Nut Graf:** Climate change has greatly impacted the weather variability in India. The urban areas are the most affected regions. Thus, measures should be taken to deal with issues like Urban Heat Island effect and consequently climate change.

## 10. Understanding temperature anomalies

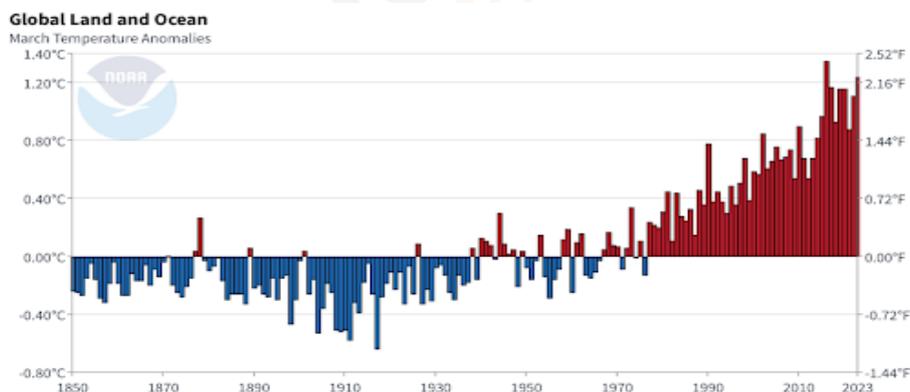
**Syllabus:** Conservation, environmental pollution and degradation

**Prelims:** El Niño and La Niña

**Mains:** Key reasons for the increasing temperature anomalies and possible solutions

**Context:** Latest reports suggest that March 2023 was the second warmest March on record.

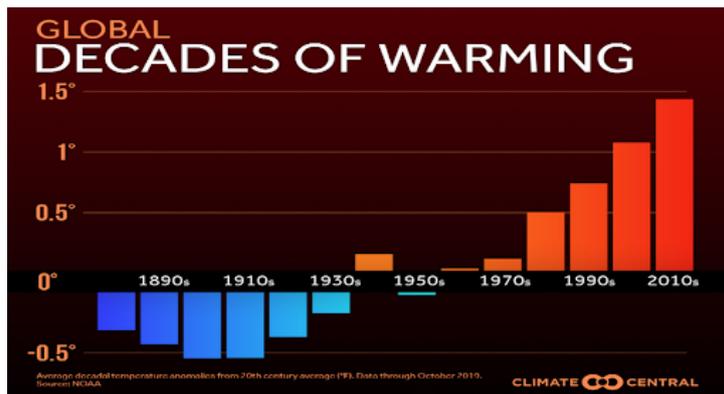
**Key Details:**



Source: The Hindu

- March 2023 is said to be the second warmest in the instrumental record; the warmest March had occurred in 2016 when the biggest El Niño of the current century caused mini-global warming.
- In India, March is the beginning of the summer season. However, the temperatures during March month can be warmer or cooler depending upon natural climate variabilities such as events like El Niño and La Niña.
  - During an El Niño year, warmer water spreads in a band from west to east over the equatorial Pacific Ocean which can temporarily spike temperatures.
  - During a La Niña year, cooler water spreads east to west in the equatorial Pacific Ocean. La Niña is usually associated with cooler temperatures.
- The extreme warming to the west to north of India resulted in a cooler March over Mumbai, excess pre-monsoon rains over the northwestern regions, and scorching heat waves in places such as Kerala and Odisha.
  - Further, the Arabian Sea has also warmed more than expected during March 2023. While this event can favour a stronger monsoon, it can also enhance cyclogenesis i.e. birth of cyclonic circulation over the Arabian Sea.
- The variation in the global distribution of temperature is mainly on account of land-ocean-atmosphere processes that dynamically determine the weather and climate.
- The analysis of the decade-to-decade average of weather conditions reveals that the planet is experiencing a warmer temperature in the current decade as compared to the one before.

- The precipitation anomalies for March 2023 reflect the impact of a warm March over Eurasia in the form of below-normal precipitation.
  - A below-normal precipitation in the Eurasian region has traditionally favoured a stronger monsoon in India and is also expected to offset the El Niño effect.



Source: The Hindu

**Nut graf:** In the wake of increasing temperature anomalies on account of global warming, it has become crucial for climate scientists to help local people understand global warming and its cascading effects on the weather in order to engage them in climate action.

## 11. How coastal species are living on plastic debris in the ocean

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

**Prelims:** About the Great Pacific Garbage Patch

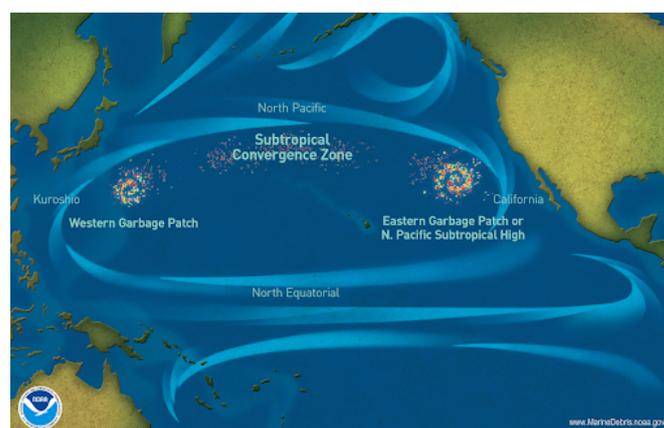
**Mains:** Key challenges associated with marine plastic pollution

**Context:** Linsey E. Haram, et al. 'Extent and reproduction of coastal species on plastic debris in the North Pacific Subtropical Gyre', Nature Ecology & Evolution, published in April 2023.

### Key Details

- Various scientists have proposed the name "The Anthropocene epoch" for a new period in the history of Earth which has been characterised by the influence of one species (i.e. Homo sapiens) on the planet's geology and its ecosystems.
  - Experts are trying to figure out when actually the Anthropocene epoch really began as some believe that it was when the first nuclear weapon was tested while others feel that it was during the rapid industrialisation phase post the Second World War.
- A few researchers and environmentalists opine that the creation of plastic trash can also be considered the start of the epoch.
  - Plastic waste or trash has now become abundant in urban areas, rivers, and also forests.
  - Plastic wastes are seen from the slopes of the highest peaks to the depths of abyssal trenches.
- In a recent study conducted by researchers from Canada, the Netherlands, and the U.S., it was found that coastal lifeforms have colonised plastic items in the Great Pacific Garbage Patch.

### The Great Pacific Garbage Patch



Source: Image Source: National Geographic

- The Great Pacific Garbage Patch is a collection of marine debris in the North Pacific Ocean.
- The Great Pacific Garbage Patch is also known as the Pacific trash vortex.
- The garbage patch seen in this region or location consists of two distinct collections of debris inside the North Pacific Subtropical Gyre.
  - There are water currents in the ocean that form loops mainly due to winds and the Coriolis force. These are called gyres.
  - The North Pacific Subtropical Gyre is a gyre situated immediately to the north of the equator in the Pacific Ocean.
  - The gyre consists of the ocean currents such as Kuroshio, North Pacific, California, and North Equatorial currents and moves in a clockwise direction.
- Inside the North Pacific Subtropical Gyre, just north of Hawai'i, lies a long east-west strip of debris that has been collected by the ocean currents over the years.
- As per estimates, the Great Pacific Garbage Patch consists of about 45,000 to 1,29,000 metric tonnes of plastic, mainly in the form of microplastics.

#### Key findings of a latest study

- According to researchers, the Japanese tsunami in 2011 contributed significantly to the pile of debris.
  - Researchers until 2017 had seen debris washing ashore on the West coast of North America containing live lifeforms that were originally found in Japan.
- Between November 2018 to January 2019, researchers found about 105 pieces of plastic debris from the eastern part of the patch and studies were conducted on this debris.
  - Studies revealed that close to 98% of the items found in the debris had invertebrate organisms.
  - Researchers also reported that pelagic species (i.e. species of the open ocean) were found on 94.3% of items and coastal species were found on 70.5% of the items.
- Further, the number of coastal species like the arthropods and molluscs seen rafting on such human-made plastic islands of waste was three times more than that of pelagic species.
- Overall organisms belonging to about 46 taxa were found, out of which 37 of them were coastal and the rest were pelagic.
  - The coastal species were most seen on fishing nets while the pelagic species were found on crates.
  - Among all the species, crustaceans (i.e. animals usually with a hard covering such as crabs, lobsters, shrimps, etc.) were the most common species found.

#### Relevance of the findings

- The report notes that the creation of a vast sea of relatively permanent anthropogenic plastic patches since the 1950s has led to the development of a new kind of standing coastal community in the open ocean which has been named the "neopelagic community".
- According to the researchers, the neopelagic community is not misplaced like the coastal species which were seen on human-made objects in the past, as neopelagic species now thrive on the plastic items in the garbage patch, including reproducing there.
  - The researchers have noted that 68% of the coastal taxa and 33% of the pelagic taxa on such garbage patches reproduced asexually.
- Researchers also found that polyethylene films had chemically bonded with rocks in China. This helps us understand the formation of other instances such as:
  - The "anthropoquinas" of Brazil where sedimentary rocks were found embedded with plastic earrings.
  - The "plastiglomerates" of Hawai'i where beach sediments were found embedded with organic debris, basaltic lava and melted plastic.

**Nut graf:** *It is now a known fact that plastic wastes are found everywhere from the slopes of the highest peaks to the depths of deep trenches. Studies are finding new evidence that plastic waste is becoming one of the biggest challenges for nature as one such study has found that coastal lifeforms have colonised plastic items in the Great Pacific Garbage Patch.*

## 12. Botanical gardens and life on earth

**Syllabus:** Biodiversity Conservation.

**Mains:** Botanical Garden and its significance.

**Prelims:** Earth Day.

**Context:** Earth Day is celebrated on 22nd April.

**Details:**

- Earth Day is celebrated on 22nd April every year.
- The Tamil Nadu Government has taken a decision to establish a botanical garden called the Chengalpattu Botanical Garden.
  - It will be built in an area of 138 hectares with an investment of ₹300 crores, thus becoming the largest botanical garden in India.
  - The Royal Botanic Gardens in Kew (London) will be the key partner for technical expertise.
- There are references to home gardens in ancient texts. Moreover, cave paintings also depict gardening.
- A garden is an important metric of one's prosperity and eclectic administration. It is also significant for enjoyment and modern-day research.

**Gardens in India:**

- The botanical gardens in India range from 10 to 35 (the exact number is not known).
- The oldest academic garden in India is the Acharya Jagadish Chandra (AJC) Bose Indian Botanic Garden.
  - It was established in 1787 (under a different name).
  - It is spread over 109 hectares.
- The headquarters of the Botanical Survey of India is located in Kolkata.

**Associated Concerns:**

- India has a high diversity of plants and animals, with around 18,000 to 20,000 plant species.
- However, India hosts a very less number of botanical gardens. Moreover, these gardens lack a wider perspective of plant exploration, discovery, research, and biodiversity outreach.
- India's educational and scientific research has neglected various aspects of plant biology like taxonomy, evolution, plant mycorrhizal interactions, population ecology, and stress biology.

**Way Ahead:**

- Collaborations with botanical gardens in Thailand, Singapore, and Indonesia can be highly beneficial as they have set new standards in research and have also provided recreational and ecotourism features.
- In order to deal with the declining biodiversity and climate change, every inch of the land should be used to nurture native plants and associated living organisms.

**Nut Graf:** Botanical gardens are extremely significant as they represent the richness of life on Earth. They are also a metric of national success in science and outreach. Thus, efforts should be made to establish new botanical gardens in the country and collaborate with successful countries in this regard.

### 13. Sarus crane

**Syllabus:** Biodiversity Conservation

**Prelims:** About Sarus crane

**Context:** The Forest Department has lodged a case against an Uttar Pradesh man who rescued and cared for a Sarus crane for a year.

**Characteristics:**



**Source:** International Crane Foundation

- The Sarus crane is the world's tallest flying bird.
- It is mostly grey in colour, with a bare red head and upper neck and pale red legs.
- It is a gregarious creature that is usually seen in couples or small groups of three or four.
- It is known to mate for life with a single partner, and its breeding season corresponds with heavy rains during the monsoon season.
- Nests are built on the water in natural wetlands or flooded paddy fields.
- Typically, a clutch contains only one or two eggs, which are incubated by both parents for 26 to 35 days. From the moment they are born, the children follow their parents.

**Conservation status:**

- The International Union for Conservation of Nature (IUCN) red list classifies it as **vulnerable**.
- According to the World Wildlife Fund (WWF), its number is now declining, with about 15,000-20,000 remaining in India (a majority of which are in UP).
- The Sarus is categorised in **Schedule IV** of the Wildlife (Protection) Act of 1972.
  - Category IV species are protected, although the penalties are substantially lower.

**Distribution:**

- Continents : Oceania, Asia.
- Subcontinents: Southeast Asia, East Asia, South Asia.
- It is found in northern and central India, Terai Nepal, and Pakistan in the Indian subcontinent.
- It was once common in Uttar Pradesh, Bihar, Rajasthan, West Bengal, Gujarat, Madhya Pradesh, and Assam paddy fields. Their number is now declining in India, with the majority of them residing in Uttar Pradesh.

**Possession of Wildlife in India**

- Section 39 of the Wildlife (Protection) Act of 1972 states that no one shall acquire or keep in his possession, custody, or control any wildlife that is state property.
- Anyone who does so must report it to the nearest police station or authorised official within 48 hours of obtaining such possession.
- Burden of proof - Under Section 57 of the Act, if a person is found in possession, custody, or control of any wildlife, the individual bears the burden of proving that it is not illegal.

## 14. Spot Billed Pelican

**Syllabus:** Biodiversity Conservation

**Prelims:** About Spot Billed Pelican

**Spot Billed Pelican:**



Source: ebird

- The Spot-billed Pelican is a large water bird found in India and other parts of Southeast Asia.
- It is the only pelican species that is known to breed in India, and it is listed as Near Threatened on the IUCN Red List due to habitat loss and hunting.
- The Spot-billed Pelican can be found in wetlands, lakes, rivers, and estuaries, where it feeds on fish, frogs, and other aquatic prey.
- They have weak leg muscles which is not ideal for, therefore they catch fish near the surface of the water.
- This species sometimes goes fishing in groups, forming a semi-circle that pushes the fish towards shallow water. It also forms a foraging partnership with the little cormorant.
  - Cormorants are divers, and their dives cause the fish present in deeper regions to scatter towards the surface, where the pelican awaits them.
- Adult spot-billed pelicans weigh 4.5-5 kg. The pouch, which is called the gular, is for catching fish.
- Spot-billed pelicans form stable colonies along with other water birds. Nests are built on trees, and two-three eggs are laid. When they are about a month old, the chicks destroy the nests.
- Breeding colonies occur very close to, or even within villages. Villagers use the droppings of the spot-billed pelican as a fertiliser.
- After the breeding season, pelican populations scatter over a very large area as they forage for food.
- The best places to spot the Spot-billed Pelican in India are the Keoladeo National Park in Rajasthan, Pulicat Lake, Andhra Pradesh, the Vedanthangal Bird Sanctuary in Tamil Nadu, Chilika Lake in Odisha, Kokkare Bellur and Karanji Lake in Karnataka.

## 15. Flamingos in Mumbai

**Syllabus:** Biodiversity Conservation

**Prelims:** About Flamingos

**Context:**

- Every winter, thousands of greater and lesser flamingos migrate into Mumbai from Kutch in Gujarat and the Sambhar Lake in Rajasthan to Mumbai, but due to prolonged rain and other climate factors, their arrivals can be delayed.
- They stay in Mumbai till the start of the monsoon in mid-June.
- The Bombay Natural History Society (BNHS) conducted a survey in 2022 and observed approximately 1,33,000 flamingos across the Thane Creek Flamingo Sanctuary, Sewri, Nhava and adjacent zones.
- Flamingos feed on the algae that dwell in the mudflats at Navi Mumbai, Airoli and Thane Creek.

### About Flamingo:



Source: Discover wildlife

- There are six species of flamingos. Four species are distributed throughout the Americas and two species are native to Africa, Asia, and Europe.
  - They include the greater flamingo, Chilean flamingo, lesser flamingo, Caribbean flamingo, Andean flamingo and puna flamingo.
- Flamingoes aren't born pink. The bright colour of flamingo feathers is caused by the presence of carotenoid pigments found in the algae and crustaceans that make up the diet of a flamingo.
- The heaviest and tallest flamingo is the greater flamingo. The shortest and lightest flamingo is the lesser flamingo,
  - The lesser flamingo, found in East Africa and parts of South Africa, Madagascar, and India, is the most abundant. It is also the smallest and the deepest in colour.
  - Greater flamingos are the state bird of Gujarat.
- Flamingos are very social birds. They live in groups called colonies or flamboyance.
- They communicate with each other through vocalisations and displays.
- According to IUCN's Red List, the lesser flamingo, the Chilean flamingo, and the Puna flamingo are listed as "Near Threatened."
  - The Andean flamingo is listed as "Vulnerable."
  - The Greater flamingo is listed as "Least Concerned"
- The species is also listed in the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) Action Plan, Appendix II of the Bonn Convention (CMS) and Appendix II of the CITES Convention.

## 16. Mangrove Pitta

**Syllabus:** Biodiversity Conservation

**Prelims:** About Mangrove Pitta

**Context:** The first-ever census of Mangrove Pitta birds was undertaken in two coastal districts of Odisha and about 179 such birds were sighted.

### Mangrove Pitta



Source: eBird.org

- Mangrove Pitta (*Pitta megharencha*) is a small bird species belonging to the family Pittidae which is native to the eastern Indian Subcontinent and western Southeast Asia.
- The Mangrove Pitta species is distributed in India, Bangladesh, Myanmar, Thailand, Malaysia, Singapore and Indonesia.
- This bird species is found in coastal mangrove forests of India such as Bhitarkanika in Odisha and the Sundarbans in West Bengal.

- Mangrove Pitta is brightly coloured with a black mask, green-and-black wings, and a yellow belly.
- Mangrove Pitta generally feeds on crustaceans, molluscs and insects.
- IUCN Red List status: **Near Threatened**
- WPA Schedule: Pittas belonging to the family Pittidae are listed under **Schedule IV**.

## 17. Toque Macaques

**Syllabus:** Biodiversity Conservation

**Prelims:** About Toque Macaques

**Context:** Zoologists and conservationists in Sri Lanka have opposed the government's proposal to explore opportunities to export monkeys to China.

### Details

- The Minister of Agriculture of Sri Lanka has said that the government was analysing a proposal from a Chinese company to purchase Sri Lankan Toque Macaques.
- The Chinese animal breeding company had expressed interest to buy a large number of Monkeys from Sri Lanka, as the country was looking to get rid of certain crop-destroying species.
- However, various environmental groups in Sri Lanka raised concerns over the move and have regarded it as an ad-hoc, illegal, and short-sighted response to a long-standing human-animal conflict.
- The conservationists fear that the monkeys could end up in testing laboratories abroad.

### Toque Macaques



Source: WION

- Toque Macaque is a golden brown-coloured, Old World monkey endemic to Sri Lanka.
- Locally in Sri Lanka, these monkeys are known as 'rilewa' or 'rilawa'.
- The Sri Lankan Toque Macaques (*Macaca sinica*) are the smallest species of the genus *Macaca*.
- There are three recognised subspecies of Toque Macaque namely:
  - Fry zone Toque Macaque
  - Wet zone Toque Macaque
  - Highland Toque Macaque
- Toque macaques are diurnal animals i.e. animals that are active during daylight hours.
- They are both arboreal as well as terrestrial in nature.
- Toque Macaque is known to live in troops and have a structured social status.
- These monkeys are mostly frugivorous i.e. they eat lots of fruits.
  - Sri Lanka's farmers have been expressing concern over crop damage and consequent financial losses, owing to frequent attacks by these monkeys.
- IUCN Red List status: **Endangered**.
- Convention on International Trade in Endangered Species (CITES): **Appendix II**.

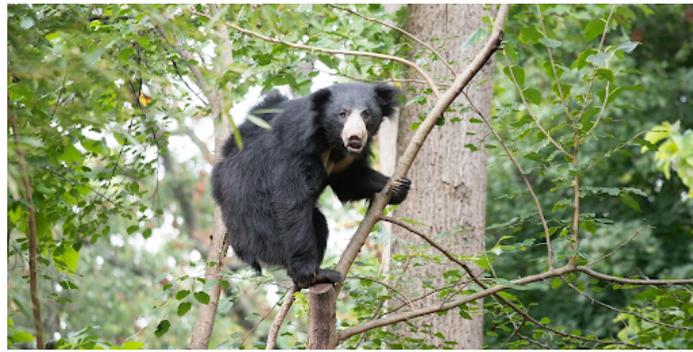
## 18. Sloth Bear

**Syllabus:** Biodiversity Conservation

**Prelims:** About Sloth Bears

**Context:** A Sloth Bear drowned during the rescue mission after falling into a well at Vellanad in Thiruvananthapuram.

## Sloth Bear



Source: nationalzoo.si.edu

- The Sloth Bear (*Melursus ursinus*) is a shaggy-coated bear species native to India, Sri Lanka, Nepal and Bangladesh.
  - **Indian Sloth Bear (*Melursus ursinus ursinus*):** These are bigger, well-known and widespread and are seen in the bordering range of the Himalayas from Punjab to Arunachal Pradesh.
  - **Sri Lankan Sloth Bear: (*Melursus ursinus inornatus*):** These are smaller compared to the Indian subspecies and are found in the northern and eastern lowlands of Sri Lanka.
- Sloth Bears are one of the eight bear species found across the world.
- Sloth Bears mainly feed on fruits, ants and termites.
- Unlike other bear species, Sloth Bears are often seen carrying their cubs on their backs.
- Sloth Bears have long, hard and curved claws that are used for penetrating nest mounds.
- These animals prefer to live in a variety of dry and moist forests as well as tall grasslands.
- IUCN Red List status: **Vulnerable**
- Wildlife Protection Act: **Schedule 1 protection**
- CITES listing: **Appendix I**

### 19. Army may build Bailey bridges in Kaziranga to protect Rhino's domain

**Syllabus:** Environment Conservation

**Prelims:** Bailey Bridges and Kaziranga National Park

**Context:** The Indian Army is looking to build Bailey bridges in Kaziranga National Park and Tiger Reserve for faster movement of forest guards.

#### Details

- The Army has received a request from the authorities to build three Bailey bridges in Kaziranga Park which is a strategic and vulnerable area known for One-horned Rhinos.
- Bailey bridges would replace the existing wooden structures in flood-prone vulnerable pockets of the park and these bridges are seen as a permanent solution to a communication problem during floods.
  - The bridges ensure better connectivity, especially in inaccessible areas where wooden structures are often washed away during the floods.
- These bridges also shorten the routes to the vulnerable pockets and facilitate better coordination among the forest guards manning the anti-poaching camps.

#### About Bailey bridges

- Bailey bridges are portable, pre-fabricated, truss types of bridges.
- The Bailey bridge was invented by Sir Donald Coleman Bailey, a British engineer, during the Second World War.
- A Bailey bridge does not require the use of special tools or heavy equipment to assemble.

#### Kaziranga National Park

- Kaziranga National Park is located in Golaghat and Nagaon, in the Karbi Anglong district of Assam in northeast India.
- It is one of India's oldest reserve areas.
- Apart from being the most famous National Parks of India and known for its One-horned Rhinos, it is also an important Bird Sanctuary.
- The park also has elephants, swamp deer, wild water buffalo, etc. and a wide range of flora.
- The Kaziranga National Park has 250 plus seasonal water bodies, besides the Diphlu River running through it.
- Kaziranga National Park is also a UNESCO World Heritage Site.
- It is designated as an 'Important Bird Area' by Birdlife International.

## 20. In a first, Eravikulam National Park gets a fernarium

**Syllabus:** Conservation

**Prelims:** About Eravikulam National Park

**Context:** The Eravikulam National Park will have a fernarium set up inside the park.

### Details

- The Eravikulam National Park is located along the Western Ghats in the Idukki and Ernakulam districts of Kerala.
- The Eravikulam National Park is known as the natural habitat of the Nilgiri tahr in Munnar.
- The national park will now have a fernarium set up inside the park.
  - As per the reports, this is the first time a fern collection is being set up in the hill station.
- Close to 52 varieties of ferns have already been planted in the new fernarium.
- Ferns are a part of the Epiphytic family.
  - i.e. Ferns grow naturally in soilless conditions and such plants get water and other nutrients through leaching from trees.
  - A large number of ferns are found on the trees inside the national park
- The Eravikulam National Park is said to be one of the rich biodiversity areas in the country, and the new initiative aims to provide visitors with awareness of the park's biodiversity.

## 21. Over ₹6,800 crore spent in 5 years on cleaning Yamuna

- According to the Environment Department, Delhi, about ₹6,856.91 crores was spent between 2017 to 2021, to clean the Delhi stretch of river Yamuna.
- Despite the efforts, the Delhi Pollution Control Committee (DPCC) reports note that most of this stretch remains polluted for nearly the entire year and is not even fit for bathing.
  - According to DPCC's February report, the faecal coliform (microbes from human and animal excreta) found in the river was beyond the "desirable level" at all points except for Palla, where the river enters Delhi.
  - Further, the faecal coliform level was seen to be as high as 500 times the desirable level at the point where the river exits the city.
- Although only about 2% of the 1,400-km-long Yamuna flows between Wazirabad and Okhla in Delhi, it accounts for over 76% of the pollution load of the river.
- In 2020, in the run up to the Assembly election, the Chief Minister of Delhi had announced a 10-point guarantee card and said that the Yamuna river will be cleaned and made pollution-free.
- According to the convener of the Yamuna Jiye Abhiyaan, a civil society initiative for the river's rejuvenation, the rejuvenation of the Yamuna depends on three things namely:
  - A single agency must be responsible for the rejuvenation to ensure accountability.
  - Prioritising efforts to increase the natural flow of the river.
  - Protecting and cleaning the floodplains of the river and not allowing any developmental work.

# HEALTH ISSUES

## 1. Global Report on Sodium Intake Reduction

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Mains:** Curbing salt intake in the diet.

**Context:** The report was developed by the World Health Organization (WHO) to track progress and highlight areas for improvement in the implementation of salt reduction policies and other measures.

### Major Highlights of the Report

- The globe is falling short of its global goal of lowering sodium intake by 30% in the next two years (by 2025).
- Lowering sodium intake is one of the most cost-effective approaches to improve health and lessen the burden of noncommunicable illnesses, as it can prevent a substantial number of cardiovascular events and deaths while requiring relatively little overall programme expenditure.
- The global burden of poor diets is a huge public health and development concern on a global scale. Immediate action is required to change the production and use of foods and beverages, including those made by industry (pre-packaged).
- Just 5% of WHO Member States have required and comprehensive salt reduction strategies in place, while 73% lack complete implementation of such policies.

### What is Sodium?

- Sodium (Na) is a chemical element in the periodic table's alkali metal group (Group 1).
- It is a silvery-white metal that is incredibly soft.
- It is the most common alkali metal and the sixth most plentiful element on Earth, accounting for 2.8% of the planet's crust.
- It depicts an explosive reaction with water.
- It is plentiful in nature in compounds, particularly common salt—sodium chloride (NaCl)—which forms the mineral halite and accounts for approximately 80% of the dissolved elements of seawater.

### Need for Limiting Salt Intake

- High salt consumption can lead to hazardous conditions such as hypertension, heart disease, and stroke.
- Reduced sodium consumption is significant since it is strongly linked to decreased blood pressure, which can lead to a reduction in Cardiovascular Diseases.
- Cardiovascular disease is the main cause of death worldwide, with severe economic consequences for low- and middle-income countries (LMICs) like India.
- Cardiovascular disease and hypertension are major concerns in India due to a variety of variables, including increased death rates, a higher prevalence in men, particularly in southern regions, and a large pre-hypertensive population.
- According to the 2020 Report on Medical Certification of the Cause of Death, circulatory system disorders account for 32.1% of all reported fatalities in India, with hypertension playing a significant role.
- According to the Global Economic Forum, cardiovascular illness will cost the Indian economy more than USD 2 trillion between 2012 and 2030.

### Challenges for India:

#### Hypertension and cardiovascular disease pose considerable challenges to India, because:

- According to NFHS-5, hypertension is more prevalent among men aged 15 and above in comparison to women of the same age group. It is more common in Southern India and Punjab and Uttarakhand in the North.
- Approximately 38.5% of women and 49.2% of men at the national level are pre-hypertensive. It has a higher prevalence in the northern States.
  - It should be noted that pre-hypertensive people have a relatively higher risk of cardiovascular disease, stroke, and premature mortality.
  - Many pre-hypertensive Indians are included in the newly defined stage-I hypertension category by the American guidelines.
- According to the Report on Medical Certification of the Cause of Death (2020), circulatory system diseases accounted for 32.1% of all documented deaths, with hypertension being a major risk factor.

#### Measures taken by the Government:

- **Eat Right India Movement:** The Food Safety and Standards Authority of India (FSSAI) is implementing the movement to transform the country's food system to ensure secure, healthy, and sustainable nutrition for all.
- **Aaj Se Thoda Kam:** It is a social media campaign (launched by FSSAI) that focuses on preventive healthcare through changes in eating safe and healthy food.

### Recommendations by WHO

- The World Health Organization recommends lowering sodium content in food products, implementing front-of-pack labelling to assist consumers in selecting food products with lower sodium content, conducting mass media campaigns to change consumer behaviour around sodium, and implementing public food procurement and service policies to reduce sodium content in food served or sold.
- According to modelling, the anticipated global potential impact of policy implementation on sodium intake is a 23% reduction and a 3% reduction in cardiovascular death by 2030.
- Although the projected worldwide sodium reduction is less than the 30% target by 2030, it is still possible with the rapid adoption of government-led and comprehensive obligatory salt reduction policies and other measures.

**Nut Graf:** *Excessive salt intake has serious repercussions on human health which significantly increases the risks of hypertension and cardiovascular diseases. All the stakeholders should come forward and collaborate to address the potential health menace by taking preventive and corrective measures like eating safe and healthy food.*

## 2. Cannabis Cultivation

**Syllabus:** Issues Relating to Development & Management of Social Sector/Services relating to Health

**Mains:** Regulation of cannabis in India

**Context:** Himachal Pradesh is considering legalising cultivation of cannabis.

### Introduction:

- Himachal Pradesh government is considering legalising the cultivation of cannabis. It has formed a five-member committee of MLAs to study the potential increase in drug use and other possible implications.
- The state wants to legalise commercial cultivation of the plant for non-recreational uses such as making medicines and fabrics.

### Case made by Himachal Pradesh:

- Legislators in the state have been advocating the use of hemp for years in order to strengthen the state's economy.
- Industrial and agricultural expansions in Himachal are bound by geographical constraints, and the tourism sector has been hit hard by the Covid-19 pandemic.
- The state government is facing a debt burden and is heavily dependent on the union government for funds.
- Legalising cannabis cultivation in India for medicinal and industrial purposes could generate significant revenue and create new job opportunities.

### Uses of hemp/cannabis:

- The fibre obtained from hemp is used in a variety of industrial applications, including the production of textiles, paper, and building materials.
- Hemp seeds are used as a source of protein and oil for human and animal consumption.
- In parts of Himachal such as Kullu and Mandi, hemp had traditionally been used for making footwear, ropes, mats, food items, etc.

### Cannabis cultivation in India:

- Cannabis cultivation in India is illegal under the Narcotic Drugs and Psychotropic Substances (NDPS) Act of 1985, which criminalises the production, sale, and consumption of cannabis and other drugs.
- However, despite the prohibition, cannabis is widely grown and used in India for medicinal and recreational purposes.
- However, NDPS Act, 1985 allows state governments to allow controlled and regulated cultivation of hemp for obtaining its fibre and seed for industrial or horticultural purposes.
- In 2018, Uttarakhand became the first state in the country to do so, allowing the cultivation of only those strains of cannabis plant which have a low concentration of tetrahydrocannabinol (THC) — the primary psychoactive constituent of cannabis that produces a high sensation.
- Uttar Pradesh followed a similar policy, while Madhya Pradesh and Manipur are reportedly considering it as well.

## THE HIGH

Cannabis has over 400 compounds. THC or tetrahydrocannabinol is an active compound of cannabis which is responsible for producing psychoactive sensations. CBD or cannabidiol is another compound which counters the effect of THC. For greater highs, products are often altered to have higher levels of THC and lower levels of CBD.

## THE LAW

The Narcotic Drugs and Psychotropic Substances Act, 1985, defines cannabis as the flower or fruit of the cannabis plant out of which the resin has not been extracted. Seeds and leaves are not included. The act deems 'production, manufacture, possession, sale, purchase, transport, inter-state import or export or use' of cannabis as illegal and punishable depending upon quantity and product.

### CANNABIS: ITS MOST POPULAR FORMS IN INDIA AND WHAT THE LAW SAYS ABOUT THEM

## Ganja or Weed

**THE PRODUCT:** Also known as marijuana, pot, grass, Mary Jane, it is a mix of the dried flowers, stems, seeds and leaves of the cannabis plant

**THE PRICE:** Weed dust can cost as little as Rs 50, otherwise prices vary with quality. Ten grams of average quality weed costs Rs 100-250 in Delhi.

**THE LAW:** Six-month prison term for 1 kg ganja; up to 10 years for 1-20 kg, 10-20 years for over 20 kg. Fines vary from Rs 10,000 to Rs 2 lakh.



## Charas or Hashish

**THE PRODUCT:** A potent form of cannabis, hashish is made by collecting and compressing the fine growth on cannabis plants, that have a sticky resin

**THE PRICE:** In Delhi, 10 grams of homemade hash can cost upward of Rs 1,000

**THE LAW:** Possession of quantity less than 1 kg carries six-month jail term. Anything above invites a jail term of 10-20 years.

## Bhang

**THE PRODUCT:** A paste of cannabis leaves and seeds often consumed in a milk-based drink. The fat in the milk improves absorption of THC, leading to an instant, often stronger, high.

**THE PRICE:** Rs 150 upwards for a glass in Delhi

**THE LAW:** Since bhang does not use the flowers or resin of cannabis, it is not within the NDPS Act's purview. But laws to regulate consumption vary in each state. In most states, it is legally sold only at government-licensed shops.



## Marijuana Meals

**THE PRODUCTS:** Hash brownies, cheese, coffee, salt, pizza sauce and even dried noodles are popular cannabis-laced products. Usually made with oil extracted from weed and available at various cafes in marijuana-growing regions.

**THE PRICE:** Different for different items

**THE LAW:** Since it is not easy to detect marijuana in food products, prosecution too is difficult

## The Cannabis Connoisseur's Collection

### MALANA CREAM:

A hash made from heirloom cannabis grown in this remote area of the Parvati Valley, THC levels range between 30 and 40 per cent, making it a prized product. It costs upwards of Rs 3,000 in Delhi for a packet of 10 grams.



**IDUKKI GOLD:** Also known as Kerala Gold, the grass is obtained from hybrid Indian and Amsterdam strains of the cannabis plant. Locals say the original strain has vanished and products sold today are new variations. It usually has 8 per cent THC level. While this may seem low, the product also has almost no CBD, resulting in a stronger high. It costs upwards of Rs 2,500 for 10 grams in Delhi.

**MYSORE MANGO:** Grown in Karnataka, the weed gives off the aroma of mangoes. It is rich in cannabis resin with a THC level of 18 per cent, and costs upwards of Rs 3,000 for 10 grams.

**SUPER CREAM:** The first rub of resin from a fully cultivated cannabis plant. The THC level and price depend on where the hash is obtained from. But it is usually more potent and more expensive.

**GOLDEN WEED:** Sourced from Bhutan, often via Assam, this is one of the cheapest varieties available—Rs 100 for 10 grams and a THC level of 16 to 23 per cent

**MANIPURI WEED:** With a THC level of around 20-23 per cent, this strain costs Rs 250 upwards for 10 grams

Source: India Today

**Nut Graf:** The government of Himachal Pradesh is considering legalising cannabis cultivation for non-recreational purposes, forming a committee to study potential drug use and economic benefits. The state hopes to use hemp for textiles and medicine to bolster its economy, which is constrained by geography and tourism setbacks.

### 3. National Rabies Control Programme (NRCP)

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About Rabies disease and World Rabies Day

**Mains:** Status of Rabies in India and National Rabies Control Programme (NRCP)

**Context:** The Central Government has launched the National Rabies Control Programme (NRCP) for prevention and control of Rabies.

#### Details:

- **According to National Centre for Disease Control (NCDC), the strategies adopted include:**
  - Provision of rabies vaccine and rabies immunoglobulin through initiatives like the national free drug programme.
  - Training on animal bite management, prevention and control of rabies, surveillance and intersectoral coordination.
  - Strengthening surveillance of animal bites and rabies deaths. Awareness generation.
- In order to control the population of dogs, the Animal Welfare Board of India (AWBI) has emphasized the effective implementation of the Animal Birth Control (Dogs) Rules, 2023.
- The Ministry of Health and Family Welfare and the Ministry of Fisheries Animal Husbandry & Dairying have jointly launched the **National Action Plan For Dog Mediated Rabies Elimination (NAPRE) from India by 2030.**
- As per the directions of the Supreme Court (in 2009, 2015, 2016), State Governments should adequately implement the ABC (Dogs) Rules, 2001 to control the population of stray dogs.
- AWBI has also issued various guidelines and advisories from time to time.

### About Rabies disease:

- It is a zoonotic viral disease. Rabies is 100% fatal but 100% vaccine preventable. 33% of global rabies deaths are recorded in India.
- It is caused by the Rabies virus, of the Lyssavirus genus, within the family Rhabdoviridae.
- It is an Ribonucleic Acid (RNA) virus that is present in the saliva of a rabid animal (dog, cat, monkey, etc).
- **Common Vectors/ Reservoirs of Virus:** The most common reservoir of the virus is the domestic/street dog especially in South Asia and Africa.
- More than 99% of human deaths due to rabies are caused by dog-mediated rabies.
- In developed nations like the USA, animals that transmit rabies are bats, foxes, raccoons, and skunks.
- Most mammals can carry the virus and hence can cause the disease.
- It spreads by bite of a rabid animal that leads to deposition of the saliva and the virus in the wound. The incubation period varies from 4 days to 2 years or sometimes even more. Incubation period means the time interval between the bite and occurrence of symptoms/signs of the disease.
- **Symptoms:** Fever, Headache, Nausea, Vomiting Anxiety, Confusion, Hyperactivity, Hallucinations, Insomnia Difficulty swallowing, Excessive salivation, Partial paralysis, Fear brought on by attempts to drink fluids because of difficulty swallowing water, etc.
- The death invariably occurs in 4 days to 2 weeks due to cardio-respiratory failure.

### World Rabies Day:

- It is celebrated on 28 September which marks the anniversary of Louis Pasteur's death.
- Louis Pasteur was a French chemist and microbiologist, who developed the first rabies vaccine.
- He also discovered Pasteurisation, Vaccines for Anthrax and Cholera and Chamberland filters.

### Status of Rabies in India:

- India is endemic for rabies, and accounts for 36% of the world's rabies deaths.
- It causes 18 000-20 000 deaths every year. About 30-60% of reported rabies cases and deaths in India occur in children under the age of 15 years as bites that occur in children often go unrecognized and unreported.
- In India, dogs are responsible for about 97% of human rabies, followed by cats (2%), jackals, mongooses and others (1%). The disease is endemic throughout the country.

## 4. FSSAI's Star Rating System

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About FSSAI's Star Rating System

**Context:** A social media influencer flagged the high sugar content in Bournvita and triggered a controversy and debate on regulations in packaged and processed food.

### FSSAI's Star Rating System

- FSSAI proposed the draft regulations for front-of-package labelling (FOPL), the "health-star rating system" which assigns a product a rating of 1/2 to 5 stars.
- The food safety authority first proposed these norms in 2018 for **high-fat, sugar and salt (HFSS)** products.
- The Health Star Rating is a simple, straightforward method of comparing similar packaged foods.
- The objective of the star rating is to help consumers to make more informed and healthier decisions by making it simple to compare the nutritional profiles of similar packaged foods.
- The HSR system intends to assist consumers in reducing their consumption of unhealthy foods such as HFSS and UPFs (ultra-processed) food products.

### Food Safety and Standards Authority of India (FSSAI)

- The Food Safety and Standards Authority of India (FSSAI) was set up in 2008.
- It was functional from 2011 and ever since has been responsible for managing food safety in our country.
- FSSAI is an autonomous statutory body that has been set up under the provisions of the Food Safety and Standards Act, 2006.
- FSSAI is administered by the Ministry of Health & Family Welfare.
- Headquarters: New Delhi.
- Regional offices: Delhi, Guwahati, Mumbai, Kolkata, Cochin, and Chennai.
- FSSAI consists of a Chairman (Appointed by the Government of India) and 22 other members out of which one-third are women.
- It also consists of a strong team of scientists and researchers for the testing of food quality.

### FSSAI Star Rating System Effectiveness

- The draft regulations have received mixed and divergent views from different people.
- Health activists and NGOs are in favour of the star rating of packaged foods and are demanding more robust warning labels for HFSS products.
- Nutrition Advocacy in Public Interest (NAPi), a nutritional think-tank, demanded intervention with a policy framework to restrict aggressive marketing of HFSS and UPFs (ultra-processed) food products along with mandatory warning FOPL (front-of-the-pack).
- However many local food companies, such as MSMEs, are reluctant about implementing new regulations since they believe the health star rating (HSR) in its proposed form will adversely impact India's traditional and ethnic food sector.
- A study released in 2022 by the Indian Sellers Collective pointed out that the health star ratings in their current form will "discredit" Indian ethnic food.
- According to the report, products such as **Mysore Pak, Peanut Chikki, Instant Poha and Mathura Peda will get a rating of only 0.5 stars (least healthy)**. Patisa and Soan Papdi will only get 1 star.
- In certain countries such as Australia health star rating implementation is in a voluntary format while in Chile, health star ratings are mandatory.
- FSSAI officials opined that they will have a discussion with all stakeholders before finalizing the decision.
- As per the FSSAI proposal once regulations are finalized star rating norms will be voluntary in nature for a period of four years.

## 5. Eat right food streets project

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About Eat right food streets initiative

**Context:** The Health Ministry along with the Ministry of Housing and Urban Affairs has asked States and UTs to develop 100 eat-right food streets in 100 districts across the country.

### What is the Eat Right Food Streets Project?

- The Ministry of Health, in partnership with the Ministry of Housing and Urban Affairs, has encouraged states and union territories to create 100 food streets in 100 districts around the country as part of this project.
- This project's goal is to promote safe and healthy practices in order to prevent food-borne infections and enhance overall health outcomes.
- The National Health Mission (NHM) will carry out the initiative in collaboration with the Ministry of Housing and Urban Affairs, with technical assistance from the Food Safety and Standards Authority of India (FSSAI).
- States and union territories will receive financial assistance of one crore every food street/district.
- The NHM will give assistance in the ratios of 60:40 or 90:10, under the condition that standard branding of these food streets be done in accordance with FSSAI requirements.

### Significance of this project?

- Street foods have long been a part of Indian culture and can be found all around the country. They represent the rich local culinary tradition.
- They not only supply millions of people with a daily diet at low prices, but they also provide direct employment to a huge number of people while supporting the tourism industry.
- However, safety and hygiene remain issues at street food establishments and hubs.
- This project can be used as a model for future similar streets to be built across the country to ensure clean and safe food practices.

## 6. National Health Accounts (NHA) Estimates for India (2019-20)

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health.

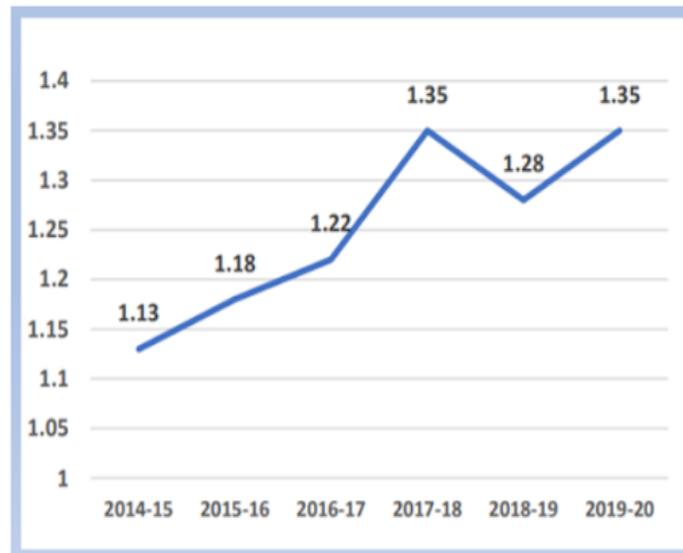
**Prelims:** National Health Accounts Estimates for India (2019-20)

**Context:** The Health Ministry released the National Health Accounts Estimates for India, 2019-2020. NHA provides a systemic description of the financial flows in India's health system.

### Key Highlights of the Report

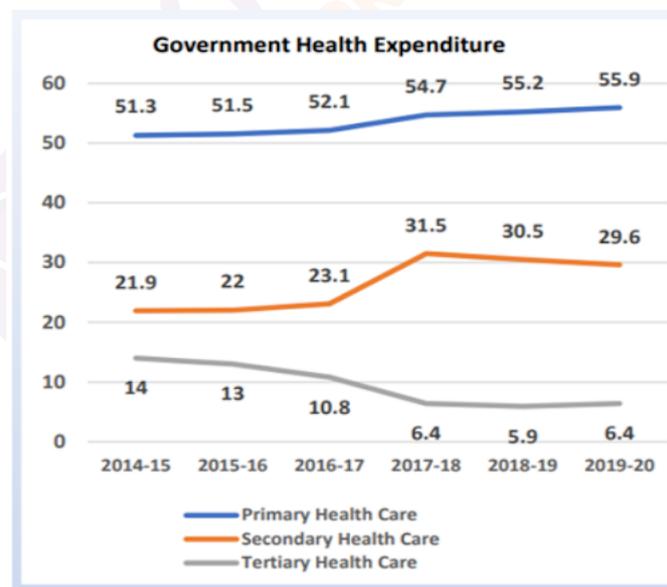
- NHA provides a systemic description of the financial flows in India's health system
- Out-of-pocket expenditure
  - The Health Ministry released the National Health Accounts Estimates for India (2019-20) and noted that the share of out-of-pocket expenditure (OOPE) in total health expenditure has declined from 62.6% in 2014-15 to 47.1% in 2019-20.
  - Reduction in OOPE going hand in hand with increased public spending in healthcare showcases the right trajectory towards achieving the milestones of universal health coverage.

- Increased Government Share in the Total GDP
  - Government health expenditure's share in the country's total GDP increased from 1.13% (2014-15) to 1.35% (2019-20). NHA provides a systemic description of the financial flows in India's health system.
- Government Health Expenditure as % of GDP



Source: PIB

- Increased Government Spending on Per-Capita Terms
  - In per capita terms, in 2014-15, the government used to spend almost ₹1100 per capita and in 2019-20, it has increased to ₹2014, which is almost double.
- Share of GHE
  - In the Total Health Expenditure (THE) of the country between 2014-15 and 2019-20, the share of GHE (Government Health Expenditure) has increased from 29% to 41.4%.
- Share of primary health care
  - The share of primary healthcare in Current Government Health Expenditure (CGHE) has increased from 51.3% in 2014-15 to 55.9% in 2019-20.
- Share of Primary, Secondary & Tertiary Health Care in Current Government Health Expenditure



Source: PIB

- The government's investment in strengthening primary health care, where people are being provided free drugs and diagnostics and screening has a lot to contribute to reducing out-of-pocket expenditure in health care. The report shows the government's efforts in the direction of achieving the target of increasing public health spending to 2.5% of the GDP by 2025.
- Social Security Expenditure (SSE)
  - The Social Security Expenditure (SSE), which includes the social health insurance program, government-financed health insurance schemes and medical reimbursements made to government employees, has increased significantly from 5% to 9.3%. This reduces the financial burden on an individual or family due to health issues.

### About National Health Accounts (NHA) Estimates

- The NHA Estimates for 2019-20 is the seventh consecutive NHA Estimates report.
- This report was produced by the National Health Systems Resource Centre (NHSRC), designated as the National Health Accounts (NHA) Technical Secretariat in 2014 by the Health Ministry.
- 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).
- The NHA Estimates are comparable internationally and also help policymakers to monitor the progress in different health financing indicators of the country.

## 7. Malaria and Notifiable diseases in India

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Health

**Prelims:** About Malaria disease and notifiable disease

**Context:** Malaria is all set to become a notifiable disease across India despite there being a decline in the number of cases.

### Details

- At present, malaria is a notifiable disease in 33 States and UTs in India.
- The latest move is in line with India's vision to be malaria-free by 2027 and to eliminate the disease by 2030.
- India was the only high-burden, high-impact country in the Southeast Asian region to experience a decline in malaria cases in 2020 as compared to 2019.
- India experienced an 85.1% decrease in malaria cases and an 83.36% decrease in deaths during 2015-2022.

### About Malaria

- Malaria is a serious mosquito-borne infectious disease caused by various species of parasitic protozoan microorganisms called Plasmodium.
- The malarial parasite was discovered by Dr Alphonse Laveran, a military doctor, in 1880.
- Malaria is transmitted by an infected female Anopheles mosquito.
- The plasmodium parasites multiply and develop inside the liver cells and red blood cells of human beings.
- **Symptoms:** Fever, chills, and headaches are considered mild symptoms, while fatigue, convulsions, and breathing difficulties are among the severe symptoms.
- Effective Vector Control is a vital component for the elimination of malaria. Insecticide-treated nets and indoor residual spraying (IRS) are also effective to reduce the transmission of the disease.
- April 25 of every year has been commemorated as World Malaria Day since 2007.

### Notifiable diseases in India

- Notifiable diseases are those diseases that are required by law to be reported to government authorities.
- This is in line with the World Health Organization's International Health Regulations, 1969 that mandate disease reporting to the organization to help its global surveillance and advisory role.
- The collation of information helps the government authorities to monitor the disease and provides early warning of possible outbreaks.
- Declaring diseases as legally notifiable by doctors and health professionals facilitates timely interventions to control the spread of highly infectious diseases.
- The responsibility of notifying such diseases and the implementation lies with the State government.
- The government has declared several diseases as notifiable diseases including diseases like cholera, encephalitis, leprosy, meningitis, plague, tuberculosis, AIDS, hepatitis, measles, yellow fever, dengue, etc.

# HISTORY

## 1. Maulana Abul Kalam Azad

**Syllabus:** Significant Personalities

**Prelims:** Facts about Maulana Abul Kalam Azad

**Context:** Reference to Maulana Abul Kalam Azad has been deleted from a revised political science textbook published by the National Council for Educational Research and Training (NCERT).

### Maulana Abul Kalam Azad

- Maulana Abul Kalam Azad was born on 11th November, 1888 in Mecca and he belonged to the lineage of learned Muslim scholars.
  - The family had moved to Saudi Arabia after the Revolt of 1857 and in 1890 they returned to Calcutta.
- Maulana Abul Kalam Azad was one of the most influential independence activists during India's freedom struggle.
- In 1923, he became the youngest president of the Congress Party at the age of 35.
- He was also for Hindu-Muslim unity. He was vehemently against the Muslim League's idea that Muslims were a separate nation and so was against the partition of India.
- M A Jinnah was antagonistic to Azad and famously referred to him as 'Congress Showboy'.
- He also took part in the Quit India movement for which he, along with most other Congress leaders was arrested.
- Maulana Abul Kalam Azad's journals include Al-Hilal and Al-Balagh.
- He served as the first education minister of the country from 1948 to 1958.
  - Under his stint as education minister, the University Grants Commission (UGC) and the Indian Institute of Technology (IIT) were set up.
- His birth anniversary is celebrated as National Education Day in India. He was awarded the Bharat Ratna posthumously in 1992.



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# SOCIAL JUSTICE

## 1. Daylight saving Time (DST)

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Human Resources.

**Prelims:** About Daylight saving Time

**Mains:** Details about Daylight saving Time and various issues associated with it

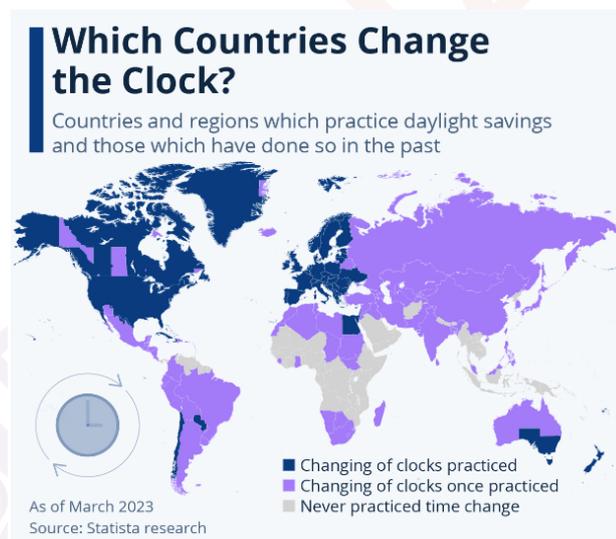
**Context:** The Lebanese Government recently delayed the start of Daylight Saving Time (DST) by one month. Meanwhile, Greenland has decided to continue using DST indefinitely.

- On the last Sunday of March, Lebanon traditionally changes its clocks forward 1 hour.
- The Lebanese Prime Minister stated this year that the clocks would be reset on April 21, without providing any explanation.

### What is Daylight Saving Time?

- DST is the practice of putting the clocks forward one hour from standard time during the summer and back again in the autumn, according to Time and Date in Norway.
- This is done to maximise the utilisation of natural light.
- Since countries close to the Equator do not experience large fluctuations in daytime hours across seasons, they do not follow Daylight Saving Time.
  - India does not observe daylight saving time.

### Significance of DST



Source: Statista

- Some in favour of DST believe that it results in extended evening daylight hours.
  - Individuals will finish their daily work routines an hour earlier, and the extra hour of daylight implies less energy use.
- During World War I, Germany and Austria implemented DST in April 1916 to reduce the usage of artificial illumination. Many countries gradually adopted it.
- The clocks in the EU's 28 member countries advance on the last Sunday in March and fall back on the last Sunday in October.

### What are the Disadvantages of DST?

- According to a study published in Popular Science magazine in the United States, one hour of lost sleep raises the fatal crash rate by 5.4% to 7.6% for the six days after the switch.
- Additional studies discovered a higher prevalence of occupational injuries following the move, resulting in lost days of work; a minor reduction in stock market performance; and health problems as a result of Circadian Rhythm disruption.

## 2. How can a juvenile be tried as an adult in Court?

**Syllabus:** Welfare schemes for vulnerable sections of the population by the Centre and the performance of these schemes, mechanisms and laws

**Prelims:** Juvenile Justice Act 2015 or JJ Act

**Mains:** Key provisions of JJ Act

**Context:** NCPCR has issued a guideline to conduct a preliminary assessment of the Juvenile Justice Board.

### Details:

- A set of guidelines were issued by National Commission for Protection of Children (NCPCR) for conducting a preliminary assessment under Section 15 of the Juvenile Justice Act, 2015 (JJ Act, 2015).
- The assessment will be conducted by the Juvenile Justice Board (JJB) to find out whether a juvenile can be tried as an adult.
- Notably, the JJ Act, 2015 allowed trying juveniles in the age group of 16-18 as adults in cases of heinous offences.
  - Section 15 of the act says that in case of a heinous offence committed by a child of age 16 or above, the board should conduct a preliminary assessment of the child's physical or mental capacity, circumstances, and ability to understand the consequences of offence.
  - Under Section 18(3), the case should be transferred to another court (having jurisdiction to try such cases) if the Board suggests the trial of the child as an adult.
- Responsibilities of the Board as per the Guidelines:
  - The JJB is made responsible for the preliminary assessment and providing the child, his/her family, and their counsel a copy of the order.
  - The board should also take the assistance of psychologists or experts in child psychology or child psychiatry.
  - The child should be provided with legal aid counsel.
  - It also mandates experts having the required qualification to undergo training concerning Section 15 of the JJ Act, 2015.
  - The Board and experts should also take into consideration the Social Investigation Report (SIR).
    - SIR will be prepared by the Probation officer or Child Welfare Officer or social worker after interaction with the child or the child's family.
- The guidelines are formed to clarify the preliminary assessment procedure and remove any ambiguity.
- It should be noted that as per Section 109 of the JJ Act, 2015, NCPCR is under a statutory obligation to monitor the implementation of the provisions of the Act.
- However, it is argued that many principles of the act have not been given due prominence by the Board or the Children's Court.

### About Juvenile Justice (Care and Protection of Children) Act

- The Juvenile Justice (Care and Protection of Children) Act or JJ Act was enacted in 2015.
- The Juvenile Justice Act (JJA) pertains to provisions for children found in conflict with the law in India.
- The law mentions procedures to conduct criminal trials of minors or children in conflict with the law (CCLs) who are accused of petty or serious offences before the Juvenile Justice Boards (JJBs).
- The Act defines orphaned, surrendered and abandoned children.
- The JJ Act mentions provisions for children in need of care and protection and gave the Central Adoption Resource Authority (CARA) statutory status.
- The Act also provides for an efficient and organized system for the adoption of orphaned, surrendered and abandoned children.
- The Act gives more clarity on the functions and powers of the Juvenile Justice Board and the Child Welfare Commission.

### Juvenile Justice Board:

- This is a judiciary body before which children detained or accused of a crime are brought.
- This acts as a separate court for juveniles since they are not to be taken to a regular criminal court.
- The Board comprises a judicial magistrate of the first class and two social workers, one of whom at least should be a woman.
- The Board is meant to be a child-friendly place and not intimidating for the child.

### Child Welfare Committee:

- The State Governments set up these committees in districts in accordance with the provisions of the Act.
- The Committees have the power to dispose of cases for the care, protection, treatment, development and rehabilitation of the children in need of care and protection, as well as to provide for their basic needs and protection.

**Nut Graf:** The National Commission for Protection of Children has issued new guidelines for trying a juvenile as an adult in case of heinous crimes. The move aims to remove ambiguity and clarify the procedure of preliminary assessment.

# EDUCATION

## 1. New India literacy Project

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Education

**Prelims:** About New India literacy Project

**Mains:** Salient features of New India literacy Project

**Context:** In a written reply to the Rajya Sabha, the Minister of State for Education recently presented details about the New India Literacy Project (NILP).

### What is the New India Literacy Programme?

- The government has started the Centrally Sponsored Scheme “New India Literacy Programme” (NILP) for five years, from FY 2022-23 to FY 2026-27, with a budget of Rs.1037.90 crore.
- The project intends to reach a target of 5.00 crore non-literates between the ages of 15 and.
- To impart not only foundational literacy and numeracy but also to cover other components which are necessary for a citizen of the 21st century.

### Other components include:

- Important life skills (including financial literacy, digital literacy, commercial skills, health care and awareness, child care and education, and family welfare).
- Development of vocational skills (with a view towards obtaining local employment).
- Basic education (including preparatory, middle, and secondary stage equivalency).
- Education that is ongoing (including engaging holistic adult education courses in arts, sciences, technology, culture, sports, and recreation, as well as other topics of interest or use to local learners, such as more advanced material on critical life skills).

### How will the Scheme be Implemented?

- The scheme would be conducted through online volunteers.
- Face-to-face training, orientation, and workshops for volunteers are possible. All materials and resources must be delivered digitally.
- The school will serve as the scheme’s implementation unit.
- Schools will be used to conduct beneficiary and volunteer teacher surveys.

### Who will be Covered under the Scheme?

- Non-literates aged 15 and up in all states/UTs across the country.
- The goal is to reach 5 (five) crore learners at a cost of 1.00 crore per year by collaborating with the National Informatics Centre, NCERT, and NIOS on the “Online Teaching, Learning, and Assessment System (OTLAS).”

### Why is such a Scheme Needed?

- According to the 2011 Census, the total number of non-literates in the country aged 15 and up is 25.76 crore (Male 9.08 crore, Female 16.68 crore).
- Furthermore, despite the fact that 7.64 crore people were certified as literates under the Saakshar Bharat initiative, which ran from 2009-10 to 2017-18, it is projected that 18.12 crore adults in India are still illiterate.

## 2. Removal of Darwin’s theory of evolution from textbooks

**Syllabus:** Issues relating to development and management of Social Sector/Services relating to Education

**Prelims:** Darwin’s theory

**Mains:** Controversies surrounding science education in India

**Context:** Removal of Darwin’s theory of evolution from the science textbooks for classes 9 and 10.

### Background:

- In May 2022, the National Council of Educational Research and Training (NCERT) suggested a significant “rationalisation” of high school science textbook content, to alleviate the “content load” on students due to the Covid-19 pandemic.
- Based on the above suggestion, NCERT recently removed nearly all references to concepts and methods for the study of biological evolution, and renamed the chapter on “Heredity and Evolution” as “Heredity.”
- Over 1,800 scientists, teachers, educators and science popularizers across the country have written an open letter criticising the NCERT’s latest move.
- Previously historians had objected to the removal of several important events like the Mughal rule, and the Gujarat Riots of 2002, from history textbooks.

### Controversy on the subject:

- There have been several controversies surrounding science education in Indian textbooks, with politicians often at the centre of the debates. These controversies have arisen due to disagreements over the content of textbooks, especially in the areas of history, social studies, and science.
- One of the most prominent controversies in recent years involved the inclusion of a chapter on genetics in a science textbook published by NCERT in 2017. The chapter, titled “Understanding Genetic Basis of Inheritance,” drew criticism from several politicians, who argued that it promoted eugenics and a bias towards certain castes.
  - They also claimed that the chapter ignored the contributions of ancient Indian science and technology.
- In 2018, the then Union Minister of Human Resource Development, Satyapal Singh, called Darwin’s theory of evolution “scientifically wrong” and asked that it be removed from Indian school and college curricula.
- In 2019, the Vice-Chancellor of Andhra University, Nageswara Rao Gollapalli, made a claim at the 106th Indian Science Congress, that the “theory of Dashavatara” explains evolution better than Darwin’s theory.

### Need for Darwin’s Theory:

- Darwin’s theory of evolution is one of the most firmly established theories in science that explains the origin of human beings and all other forms of life in the world.
  - It rescues this explanation from the belief that an ‘intelligent designer’ built them the way they are and put them in their place.
- Removing the concept from textbooks is a disservice to children as it denies them the opportunity to learn that change is an opportunity.
- Students and teachers in schools must concern themselves with the social and cultural beliefs of Darwin’s time and the messy nature of science to gain crucial insights about science in both historical and contemporary contexts.
- In order to practise science effectively, it is important to balance caution with curiosity, creativity, and imagination. Science classrooms should encourage a culture of embracing critique to foster growth and progress.

### Influences on Darwin:

- The influences on Darwin’s theory of evolution are often ignored in classrooms.
- Our approach to teaching Darwin’s theory must change to include the influence of Lyell’s theories and other earlier thinkers like Jean-Baptiste Lamarck who proposed their own theories of evolution.
- Geologist Charles Lyell in his book ‘Principles of Geology’ proposed the concept of “gradual geological change”: that geological phenomena and objects today result from minute changes accumulating over a period of time, much like how random mutations that confer advantages to certain organisms accumulate over time, giving rise to their present-day species.
  - Darwin himself acknowledged the strong influence of Lyell’s theories on his work.
- Jean-Baptiste Lamarck, the French naturalist who proposed his own theory of evolution portrayed evolution as a process that included the accumulation of changes over time and did not involve an ‘intelligent designer’.
- Darwin was influenced by the social beliefs of his time, specifically the laissez-faire economics of Adam Smith and Thomas Malthus.
- Malthus’s theory of population and competition for limited resources influenced Darwin’s concept of natural selection.
  - Darwin acknowledged the influence of Malthus’s ideas in his autobiography.

### Use of Darwin’s theory:

- Another serious oversight in the teaching of the theory of evolution is the resulting application of his theory by both Darwin himself and others.
- Herbert Spencer’s “survival of the fittest” idea led to social Darwinism and eugenics.
- Darwin’s later book, ‘The Descent of Man’, and ‘Selection in Relation to Sex’, suggested that men evolved to be more intelligent because they had to use their mental faculties to hunt and defend their offspring.
  - Darwin’s invocation of the Lamarckian theory of use and disuse in this book contradicted his theory of natural selection in ‘The Origin of Species’.

**Nut Graf:** *Understanding Darwin’s theory of evolution and its influences is crucial to learning about the origin of life and the importance of scientific inquiry. The recent move to remove content on Darwin’s theory of evolution from school textbooks needs to be reconsidered.*

# GOVERNANCE

## 1. Competition Commission - Amendments

**Syllabus:** Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

**Prelims:** Competition Act, 2002

**Mains:** Analysis of the Competition (Amendment) Bill, 2022

**Context:** The Competition (Amendment) Bill, 2022, which attempts to modify the Competition Act, 2002, was recently passed in the Lower House despite protest from opposition.

### What is the Competition Act, 2002?

- The Competition Act of 2002 governs competition in the Indian market and forbids anti-competitive practices such as cartels, abuse of dominant market position, and mergers and acquisitions that could harm competition. The Competition (Amendment) Act of 2007 revised the Act.
- The Act is implemented and enforced by the Competition Commission of India (CCI).
  - The Competition Appellate Tribunal is a statutory entity established under the Competition Act, 2002 to hear and rule on appeals from the Competition Commission of India's rules, decisions, or orders.
  - In 2017, the government abolished the Competition Appellate Tribunal and replaced it with the National Company Law Appellate Tribunal (NCLAT).

### What are the Amendments to the Competition Act Proposed?

- **Penalties for Violations of Competition Law:** The Bill expands the definition of "turnover" to include global turnover resulting from all products and services provided by a person or company.
  - The change provides for penalties for violations of competition law to be imposed based on a company's global revenue rather than merely its turnover in India.
- **Timelines for Combination Approval:** The Bill reduces the CCI's time restriction for forming a prima facie opinion on a combination from 30 working days to 30 days.
  - The measure is intended to expedite the approval of mergers and acquisitions in India.
- **Regulations:** The Bill proposes to alter the Competition Act of 2002 to regulate mergers and acquisitions based on transaction value. Transactions worth more than Rs 2,000 crore will require CCI approval.
  - The Bill proposes to shorten the 210-day period for the CCI to issue an order on such transactions to 150 days.
- **The Bill decriminalises certain** offences by shifting the basis of punishment from fines to civil penalties.
  - These violations include failing to comply with CCI orders and Director General directives regarding anti-competitive agreements and misuse of dominant position.

### What is the significance of the amendment?

- **Combination regulation-** It would strengthen the Commission's review process, especially in the digital and infrastructure sectors.
- **Accelerating the approval process-** This would shorten the time it takes to clear combinations and emphasise the necessity of pre-filing consultations with the Commission.
- **Notifying in advance-** The current Bill proposes, similar to the European Union merger legislation, to exempt open market purchases and stock market transactions from the requirement to notify the Commission in advance.
- **The Problem of Hub-and-Spoke Cartels-** A Hub-and-Spoke arrangement is a type of cartel in which vertically related firms operate as the hub and impose horizontal limitations on suppliers/retailers (spokes).
- **The change expands the definition** of 'anti-competitive agreements' to include businesses that assist cartelization even if they do not participate in comparable trade practices.
- **Dealing with the new age market-** By enacting these changes, the Commission should be better prepared to deal with certain features of the new-age market and adapt its functioning to be more resilient.

### Industries' response:

- The industry has welcomed the bill. The major players have accepted the two-pronged approach of ease of doing business and a strong regulatory framework.
- It is accepted as it has the potential to put India on the list of most attractive destinations for Foreign Direct Investment.
- However, some provisions might be challenged once the bill becomes an act and the rules are laid out by the CCI.

### Associated concerns:

- It is argued that the reduction in the time limit from 210 to 150 days would put pressure on CCI.
- One of the major concerns is about the clause of global turnover, which might be opposed by many big tech companies.
- The CCI suffers from vacancies.
- Many CCI orders are appealed at NCLT and even go up to the Supreme Court level. These concerns should be addressed.

**Way Ahead:**

- It is important to focus on the capacity of CCI staff for the smooth implementation of the bill (Act after Presidential Assent).
- The rules should be made in a manner that reduces the number of litigations and appeals.

**2. Humane Policing**

**Syllabus:** Important aspects of governance, transparency and accountability,

**Mains:** Various reforms needed in the police force

**Context:** Tamil Nadu IPS officer removed over torture charges.

**Introduction:**

- An IPS officer in Tamil Nadu has been removed from his position after he was accused of torturing suspects in police custody.
- The government removed Ambasamudram assistant SP Balveer Singh, a 2020-batch IPS officer hailing from Tonk in Rajasthan, after photos and videos of the men with their teeth missing circulated on social media.
- The State Human Rights Commission, which has taken suo moto notice to probe the incident, have summoned the officer for investigation.

**Police excesses in India:**

- Police excesses in India have been a long-standing issue, with incidents of police brutality, corruption, and misuse of power being reported regularly.
- Some of the common instances of police excesses include custodial deaths, fake encounters, arbitrary arrests, and torture.
- One of the main reasons for police excesses in India is the lack of accountability and transparency in the system. The police force is often influenced by political and other powerful interests, which can compromise their integrity and impartiality.
- Another contributing factor is the lack of proper training and resources for the police force. This can lead to a lack of professionalism and adherence to human rights standards.
- There have been many instances of police excesses in India that have sparked public outrage and protests. Some of the recent incidents include the custodial deaths of Jayaraj and Bennix in Tamil Nadu in 2020, the police shooting of farmers during protests against the new farm laws in 2021, and the police brutality against students during the anti-CAA protests in 2019.

**Global Scenario:**

- Police excesses, including excessive use of force and systemic racism, have been a significant issue in the U.S. and other Western countries in recent years.
- Incidents of police brutality and discrimination have sparked protests and calls for reform, particularly in relation to the treatment of Black and minority ethnic communities.
- In the U.S., high-profile cases such as the killing of George Floyd and Breonna Taylor by police officers have brought attention to the issue of police brutality and systemic racism. In addition, studies have shown that Black Americans are disproportionately likely to be stopped, searched, and arrested by police compared to White Americans, despite similar rates of drug use and other criminal activity.
- Similar issues have also been raised in other Western countries, such as the UK and Canada.
- In the UK, the disproportionate use of force against Black people by police has been highlighted by groups such as Black Lives Matter UK, while in Canada, there have been calls for reform in the wake of the killing of indigenous people by police.

**Way Forward:**

- To address the issue of police excesses, there is a need for systemic reforms in the police force.
- Police reforms have been debated in India for over three decades. However, little has changed in the past many decades in the country.
- Judicial inquiry for custodial rape, death, hurt, and deaths in case of police firing.
- Setting up police complaints authorities at the state and district levels to enquire into complaints of the public against police officers of and above the DSP rank for serious misconduct including custodial rape and death.
- The National Police Commission (NPC) suggested a few measures to limit the political influence on police work to broad policies and ensuring that police performance is in accordance with the law.

**Nut Graf:** *The serious complaint of human rights violation recently against an IPS officer in Ambasamudram in south Tamil Nadu has embarrassed the State government and the police hierarchy. The officer has been suspended from service and his alleged misconduct is being probed. This incident once again brings to the fore the issue of long overdue police reforms in India.*

### 3. Representation in India's police forces

**Syllabus:** Important aspects of governance

**Mains:** General issues concerning the police forces

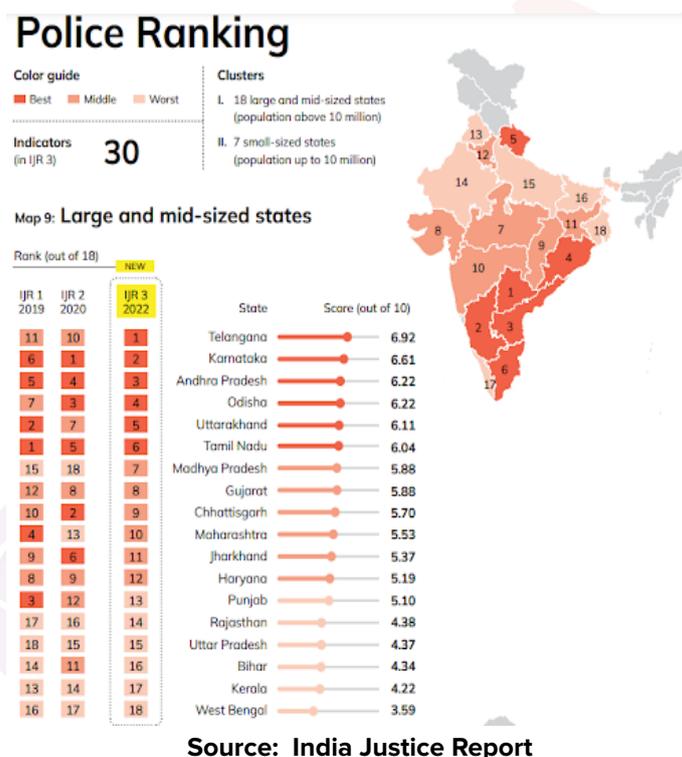
**Context:** India Justice Report on representation in police forces.

#### Introduction:

- The India Justice Report 2022, released by Tata Trusts ranks police forces of States based on various indicators such as the number of vacancies against the sanctioned strength of personnel, and representation of women and SC/ST communities.
- The report is based on overall data of 4 pillars of justice delivery namely Police, Judiciary, Prisons, and Legal Aid.
- The report's findings are crucial for governments, civil society and the business community as it provides them with objective data which allows for participatory dialogues between governments and active citizens of disparate ideologies for reforms through consensus building.

#### Highlights of the report:

- It ranks police forces of States based on various indicators such as vacancies as against the sanctioned strength of personnel, representation of women and Scheduled Caste/Scheduled Tribe communities.
- Overall, the Telangana police have bagged the top rank among States with populations over 10 million, while West Bengal has been ranked last.
- Over the past decade, the total sanctioned strength of police across the country increased from 22.84 to 26.89 lakh (18 per cent) while actual police numbers grew from 17.23 lakh to 20.94 lakhs ( 22 per cent).
- The per capita spend on police grew from Rs. 445 to Rs. 1,151.



#### State of police vacancies:

- The report notes that the gap between the sanctioned and actual strength in police forces, at a national level, remains “worryingly large”.
- As per the report's findings, between January 2020 and January 2022, the overall vacancies in police rose from 20.3% of the sanctioned strength to 22.1%.
- In the case of police constables, as of January 2022, while West Bengal was the worst performer among large and mid-size States with vacancies amounting to 44.1% of the sanctioned strength, Kerala was at the top with constable vacancies making up 4.6% of the sanctioned strength.
- As for police officers (in civil and District Armed Reserve police), Bihar has the highest percentage of vacancies at 53.8% as against the sanctioned strength.
- Teeth-to-tail ratio is considered an important determinant for the proper composition of a police force. It is the ratio between the strength of officers and the constabulary.
  - The Padmanabhaiah Committee on Police Reforms recommends a teeth-to-tail ratio of 1:4.
- Several States have brought down their sanctioned strength, which resulted in reduced vacancy levels.
  - For instance, between 2020 and 2022, Kerala reduced the sanctioned strength of civil police by 239 personnel, resulting in a reduction of vacancies while the workload increased.

- As of January 2022, there was one police person available (with civil and district armed police taken together) to serve 831 people nationwide.

#### Quotas for SC/ST communities:

- As of January 2022, Scheduled Castes make up 15.99 percent of the total working police strength (against 16 per cent share in population), Scheduled Tribes 11.77 per cent, Other Backward Classes 30.79 per cent and women 11.75 per cent.
- Karnataka is the only State to meet its SC, ST, and Other backward classes quotas, with no other State/UT managing to meet all three of their reservation targets.
- Among large and mid-sized States, Gujarat, at 131%, performed the best in terms of the percentage of actual SC police officers to its reservation quota, while Uttar Pradesh came in last, with just 43% SC officers against its quota.
- As for the constabulary workforce, Karnataka had 116% of SC constables against its quota, while Haryana had the lowest at 63%.
- As for small States, Goa and Sikkim were the best performers for the percentage of SC officers and constables, respectively.
- In terms of fulfilling reservations for STs, Karnataka, at 176%, was the best performer on the police officer level, going beyond its reserved ratio.
- For ST constables, Bihar fulfilled its quota by 278%, while Punjab came in last amid large and medium States at 0.01%.

#### Representation of Women:

- Most States have their own specific quotas for women in the police force. For instance, six UTs and nine States have a target of 33% reservation for women.
  - Targets range from Bihar's 35% to 10% in Arunachal Pradesh, Meghalaya and Tripura.
  - Five States/UTs, including Kerala and Mizoram, have no reservations.
- No State which had the 33% criteria, managed to meet it.
- However, among large and medium States, Andhra Pradesh which reserves 33% of overall police posts for women, performed the best with a 21.8% share of women in police.
- Jharkhand was the worst performer with its share of women in police being just 6.2%.
- In small States, Himachal Pradesh was at the top with 14% of police personnel being women, while Tripura came in last with just 5.3%.
- Among Union Territories, Ladakh had 28.3% women in police, while Jammu and Kashmir had just 3.3%.

**Nut Graf:** *The India Justice Report 2022 ranks police forces based on indicators such as vacancies, SC/ST representation, and women. Telangana tops the list, while West Bengal ranks last. The report reveals worrying gaps between sanctioned and actual police strength and emphasises the importance of a proper teeth-to-tail ratio.*

## 4. Institutional Arbitration

**Syllabus:** Government policies and interventions for development in various sectors

**Mains:** Prospects of online dispute resolution to the Indian judiciary

**Context:** This article discusses the potential of institutional arbitration in India.

#### Introduction:

- Institutional arbitration in India refers to the use of specialised institutions to administer the arbitration process between two or more parties.
- These institutions provide a framework for the conduct of arbitration proceedings and offer a range of services, including appointing arbitrators, managing the process, and enforcing awards.
- India has acquired a reputation of being 'arbitration-unfriendly', for several reasons — lack of preference for institutional arbitration over ad hoc arbitration, frequent interference from the judiciary from the appointment of arbitrators to the enforcement of awards, and setting aside of arbitral awards on grounds of 'public policy'.
  - India is ranked 163rd, in 'Enforcing Contracts' in the World Bank's Ease of Doing Business report. The report says it takes almost four years and 31% of the cost of the claim to enforce a contract in India.
- The use of institutional arbitration in India has gained significant momentum in recent years due to various reasons, including the rise of foreign investment in India and the need for a more efficient and reliable dispute resolution mechanism.
- Yet, India is not a preferred arbitration destination, even for disputes between Indian businesses.
  - Singapore has emerged as a global arbitration hub and is ranked first in terms of 'Enforcing Contracts'. Indian companies are among its top users.

### Online Dispute Resolution (ODR):

- Online dispute resolution (ODR) in India refers to the use of technology to facilitate the resolution of disputes between parties.
- The primary legislation governing Online Dispute Resolution in India is the Information Technology Act, 2000. Section 89 of the Code of Civil Procedure, 1908, also provides for the use of alternative dispute resolution mechanisms, including ODR, to resolve disputes.
- The widespread adoption of online technology during the COVID-19 pandemic, which was led by the judiciary through online hearings, has provided India with an opportunity to capitalise on its technological strengths and become a leading player in online dispute resolution (ODR).
- The Indian government has been actively promoting ODR as a means to increase access to justice, particularly for those who live in remote or rural areas.

### Advantages of ODR:

- The government has launched a number of initiatives to promote ODR in India. For example, the Ministry of Electronics and Information Technology (MeitY) has launched the Online Dispute Resolution (ODR) platform to provide an online platform for the resolution of disputes.
- It encompasses the integration of tools such as multi-channel communication, case management systems, automated case flows, digital signatures and stamping, and even the application of advanced technologies such as blockchain, natural language processing, artificial intelligence, and machine learning.
- The ODR platform provides a secure, easy-to-use platform for the resolution of disputes between parties. Parties can submit their dispute online and the platform facilitates the resolution of the dispute through mediation or arbitration.
- It can reduce the burden on the courts, save time and costs, and provide effective resolutions.
- The ODR platform is particularly useful for small disputes, such as those involving consumer complaints or disputes between small businesses. It is also useful for disputes that involve parties who are located in different parts of the country.

### Way Forward:

- Overall, the use of ODR in India is still in its early stages, but it is expected to grow in popularity as more people become aware of its benefits.
- Collaboration among the legislative, executive, and judicial branches is crucial to promote the widespread adoption of ODR in India.
- Some institutions such as the Reserve Bank of India, the National Payments Corporation of India, and the Open Network for Digital Commerce have already taken the lead by integrating ODR mechanisms into their initiatives.
  - However, it is necessary to extend these efforts to a broader audience to achieve mass adoption of ODR in India.
- The government can collaborate with the private sector to develop and promote ODR platforms. Private companies can invest in the development of ODR technology and platforms, and the government can provide incentives and support to encourage such investment.
- The use of ODR could be incentivised through legislative measures, such as establishing ODR as the default dispute resolution mechanism for specific categories of disputes that arise from online transactions.
- Government must work on solving infrastructural challenges, curb the digital divide, and catalyse ODR's growth by optimising existing setups such as Aadhaar kendras to also function as ODR kiosks.
  - On the lines of the Finance Minister allocating ₹7,000 crore for the third phase of the e-Courts project in the Union Budget 2023, a dedicated fund must be set up for furthering ODR.
- The use of ODR platforms should be accompanied by strong data protection measures to ensure the confidentiality and privacy of the parties involved. The government should develop guidelines and regulations to ensure that ODR platforms are secure and comply with data protection laws.

**Nut Graf:** Institutional arbitration in India involves specialised institutions administering the arbitration process. Despite gaining momentum, India's preference for ad hoc arbitration and judicial interference has made it an 'arbitration-unfriendly' destination. On the other hand, Online Dispute Resolution (ODR) in India is in its early stages but is expected to grow.

## 5. Regulation of Online Gaming in India

**Syllabus:** Government policies and interventions for development in various sectors and issues arising out of their design and implementation

**Prelims:** IT (Intermediary Guidelines & Digital Media Ethics Code) Rules 2021 and Information Technology Act, 2000

**Mains:** Regulating online gaming in India

**Context:** The Ministry of Electronics and IT (MeitY) recently published the Draft Rules for Online Gaming.

- The proposed regulations are an update to the 2021 Information Technology (Intermediary Guidelines and Digital Media Ethics Code) regulations.

### IT (Intermediary Guidelines & Digital Media Ethics Code) Rules 2021

- The Central Government enacted the Information Technology (Guidelines For Intermediaries And Digital Media Ethics Code) Rules, 2021 in February 2021.
- The Rules have been passed under Sections 69A(2), 79(2)(c) and 87 of the Information Technology Act, 2000 and they largely cover OTT platforms and social media.
- The rules classify social media intermediaries into two categories:
  - Social media intermediaries
  - Significant social media intermediaries
- The Rules aim to provide a robust complaint mechanism for the users of social media and over-the-top (OTT) platforms to address their grievances.
- With these rules, India joined other international regimes that have provisions for digital media regulation and provides a comprehensive mechanism for the protection of digital media consumers.

### Information Technology Act, 2000

- The Information Technology Act, 2000 is the primary law in India for matters related to cybercrime and e-commerce.
- The act was enacted to give legal sanction to electronic commerce and electronic transactions, to enable e-governance, and also to prevent cybercrime.
- The act also gave legal recognition to digital signatures
- **Section 66A:** This controversial section was added to the IT Act, 2000 through an amendment in 2008.
  - Section 66A gave authorities the power to arrest anyone accused of posting content on social media that could be deemed 'offensive'.
  - The Supreme Court through its judgement in the **Shreya Singhal v Union of India case (2015)** struck down this Section 66A of the IT Act saying it was unconstitutional as it violated **Article 19(1)(a)** of the Constitution.
- **Section 69A:** Section 69A empowers the authorities to intercept, monitor or decrypt any information generated, transmitted, received or stored in any computer resource in the interest of the sovereignty or integrity of India, defense of India, the security of the State, friendly relations with foreign states or public order or for preventing incitement to the commission of any cognizable offence or for investigation of any offence.
  - It also empowers the government to block internet sites in the interests of the nation.

### What are the Draft Rules?

- **A separate law should** be enacted by the central government to control internet gambling in the country.
- **Legalisation:** Any online gaming platform (domestic or international) that offers real money online games to Indian customers must be incorporated under Indian law.
  - These platforms will be classified as 'reporting entities' under the Prevention of Money Laundering Act of 2002, and will be required to report suspected transactions to the Financial Intelligence Unit-India.
- **Applicability:** The legal framework should apply to both real money and free skill games, such as online fantasy sports, casual gaming, and card games, where the stakes are high.
  - The laws would also apply to gaming companies that operate outside of India yet target Indian players.
- **Dispute resolution:** For online gaming, a three-tier conflict resolution procedure, similar to that mandated under the Information Technology Rules, 2021 for online streaming services, should be implemented.
  - It must include a grievance redressal system at the gaming platform level, an industry self-regulation agency, and an oversight committee directed by the government.
- **Self-Regulatory Body:** Online games would be required to register with a self-regulatory body, and only games approved by the body will be permitted to function lawfully in India.
  - The self-regulatory agency will have a board of directors comprised of five individuals from various professions such as online gaming, public policy, information technology, psychology, and medicine.
  - There may be more than one self-regulatory body, and all of them must notify the Centre about the games they have registered, as well as provide a report outlining the requirements for registration.
- **Due Diligence:** Online gambling companies will be obliged to perform additional due diligence, such as user KYC, transparent withdrawal and refund processes, and a fair distribution of wins.
  - They would have to follow the KYC requirements established for firms regulated by the Reserve Bank of India (RBI).
- **Random Number Generation Certificate:** Gaming companies must also obtain a Random Number Generation Certificate, which is commonly utilised by platforms that offer card games to assure that game outputs are statistically random and unexpected.
  - They will also be required to obtain a "no bot certificate" from a reputable certifying agency.
- **Betting Restrictions:** Online gaming businesses will be prohibited from betting on game outcomes.
- **Compliance:** Online gaming platforms, like social media and e-commerce companies, will be required to appoint a compliance officer to ensure that the platform is adhering to norms, a nodal officer to act as a liaison official with the government and assist law enforcement agencies, and a grievance officer to resolve user complaints.

### What is the Need for the Rules?

- Women account for 40 to 45% of gamers in India, making it all the more crucial to safeguard the gaming ecosystem.
- It is thought to be a wonderful first step towards complete regulation of online gambling and will eliminate state-by-state regulatory fragmentation, which has been a major barrier for the sector.
- The Indian mobile gaming industry's revenue is estimated to reach USD 5 billion by 2025.
- Between 2017 and 2020, the industry increased at a compound annual growth rate (CAGR) of 38% in India, compared to 8% in China and 10% in the United States.
- According to a report by VC firm Sequoia and management consulting firm BCG, it is predicted to grow at a CAGR of 15% to Rs 153 billion in revenue by 2024.

### Key concerns associated with the proposals

- A few experts feel that the amendment Rules still consider all gaming intermediaries under a broad category without recognising their size or risk.
- Further, all gaming intermediaries are mandated similar compliances such as mandating them to have India-based officers. This could discourage top global players to start their services in the country.

**Nut graf:** Recognising the rapid growth of the online gaming industry and the important role played by the industry in the Indian economy, the MeitY has come up with the draft amendments to the IT intermediary rules 2021 which ensure that online games are offered in conformity with Indian laws.

## 6. The future of India's civil society organisations

**Syllabus:** Role of civil services in a democracy.

**Mains:** Key role and future of Civil Society Organisations in India.

### Details:

- It is argued that most governments no longer consult civil society organizations (CSO) either at the pre-legislative stage or at the redressal stage after the implementation of policies.
- The ability of these organizations in shaping policy and public discourse has shrunk drastically as they are viewed as the new frontier for war and foreign interference.
- The CSO's access to resources has also been restricted through measures like cancelling Foreign Contribution (Regulation) Act clearances, revoking licences (12A/80-G), applying retrospective taxes, and forcing private companies and philanthropists to redirect funding.
- Vilifying CSO as disruptive and anti-national to India's growth trajectory is a serious threat as civil society is an indispensable safety valve for issues in Indian polity.

### Associated concerns:

- The author argues that the government is spearheading a structural change in India's civil society landscape by providing patronage to many institutions associated with a political group.
- These institutions are accused of having access to and influence over State government departments.
- Though several state actors are aware of the existential crisis, they are still using outdated tactics like protests at Jantar Mantar, speeches, petitions/open letters that are fast diminishing in their utility.
- Even lobbying legislators and raising the issue in parliament does not result in any substantive course correction.
- The progressive CSOs also fail to blend socio-cultural values with welfare/constructive work and fail to garner mass support.
- It is found that local communities secure benefits from CSOs/movements, but are ideologically aligned with the ruling government. This results in psychological fatigue among key activists.

### Implications on Civil Society Organizations:

- As a result of financial and structural restrictions, CSOs are losing conscientious youngsters that require some financial sustenance.
- CSOs cannot make a larger positive impact on the nation without sustained support.
- With the reduced spectrum of work, many activists will migrate to safer options and others will limit their scope of work and align with political parties.
- They will not be able to amplify the voices of the vulnerable, enrich policies, and work for the collective good of the nation.

### Way Ahead:

- The young activists can be inducted into political parties or aligned bodies.
  - This would create an institutionalized moral force within the parties.
  - They can balance electoral compulsions with ethical or human rights considerations, thereby benefiting the party also.
  - It would ensure that the party remains connected to the genuine problems of the community.
  - They can champion the causes of Dalits, women, minorities, etc.
- CSOs should collaborate with other progressive stakeholders.
- Private philanthropies and companies should support CSOs.

**Conclusion:** It should be realized that inaction today will result in the extinction of civil society, which is considered the fifth pillar of democracy.

**Nut Graf:** It is argued that Civil Society Organizations and Movements are losing their importance. In the prevailing political climate, these organizations should collaborate with progressive stakeholders and change their approach to influence policy decisions.

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# DISASTER MANAGEMENT

## 1. The threat of rising sea levels

**Syllabus:** Disaster and disaster management.

**Prelims:** About World Meteorological Organisation (WMO) and State of the Global Climate 2022 report

**Mains:** Key findings of the report and the issues associated with rising sea levels.

**Context:** The World Meteorological Organisation (WMO) has published its flagship “State of the Global Climate 2022” report.

### World Meteorological Organisation (WMO)

- The World Meteorological Organisation (WMO) was established in 1950.
- WMO became a specialised agency of the United Nations in 1951.
- WMO is an intergovernmental organisation that originated from the International Meteorological Organisation (IMO) which was established after the Vienna International Meteorological Congress in 1873.
- Headquarters: Geneva, Switzerland
- The World Meteorological Congress is the supreme body of the WMO.
- The World Meteorological Organisation publishes an annual report on the status of the World Climate. This report provided detailed information on temperatures at the local, national and global levels along with extreme weather events.
- India has been a member of the WMO since 1949.

### Key findings of the report

- The report notes that the global sea level is rising at an unprecedented and alarming rate.
- Apart from the increasing rate of global sea-level rise, the report also highlighted other issues like glacier loss, continued increase in global temperatures, record-breaking levels of greenhouse gases concentration, drought-like conditions in East Africa, unprecedented rainfall in Pakistan, and extreme heatwaves in Europe and China in 2022.
- According to the report, extreme weather conditions like droughts, floods and heat waves have adversely impacted lives on every continent and have significant economic implications.
- Further, it points out that the Antarctic sea ice dropped to its lowest extent in history and the rate of melting of a few of the glaciers in the European region was also significantly high.
- The report talks about the several compounding consequences of sea-level rise, especially its adverse impact on coastal areas and communities that depend on the sea.

### The extent of global sea-level rise

- Researchers and environmentalists since the 1990s have been following and measuring global sea-level rise with the help of satellite altimeters.
  - Satellite altimeters send radar pulses towards the sea surface and measure the time they take to reflect back as well as the changes in their intensity.
  - If the sea level is higher, then the signal coming back would be faster and stronger.
- Researchers are able to determine the change in global mean sea level by collecting such data from different points on earth and also determine the rate of sea-level change.
- The report suggests that “the rate of global mean sea-level rise has doubled between the first decade of the satellite record and the last”.
- Further, the report points out that the rate of sea-level rise which was 2.27 mm/year in 1993-2002 has increased to 4.62 mm/year in 2013-2022.

### Key reasons for the rapid increase in sea-level

**As per the latest WMO report, the key factors responsible for the rising global sea levels are:**

- **Ocean warming:** According to the report, the contribution of ocean warming to the rise in sea level was 55%.
  - The increase in the concentrations of carbon dioxide and other greenhouse gases has increased global warming and about 90% of the “extra heat” is stored in the oceans. This has led to ocean warming.
  - As the temperature in the ocean increases, the water undergoes thermal expansion, which in turn results in an increase in the global sea level.
- **Loss of ice from glaciers and ice sheets:** It has contributed about 36% to the global sea level rise.
  - The report highlights the fact that the earth’s cryosphere (ice cover) that includes the Arctic and Antarctic regions, ice sheets of Greenland and Antarctica, seasonal snow cover as well as permafrost has thinned.
- **Changes in land water storage:** The changes in the storage of land water contributed less than 10% to the rise in the global mean sea level.

### Challenges associated with global sea level rise

- **Land and sea cover:** The rapid rate of sea level rise will bring about drastic changes in land cover.
- **Shortage of land:** The rise in sea level implies that more land cover is swallowed by the seas. This will lead to an acute shortage of land for human use in the coming years and significantly impact communities living in the coastal areas.
- **Increased instances of cyclones:** Cyclones are known to originate in the open seas and the rise in the global mean sea level coupled with increased ocean warming would increase the chances of cyclones.
- **Water crises:** If the global sea level continues to rise at the current rate, there are high chances that seawater could seep into the ground. This causes the groundwater to turn more saline.
  - The groundwater, which is usually freshwater, turning saline will aggravate water crises and affect agriculture in the adjacent areas.
- **Changes in the coastal ecosystem:** Coastal ecosystems can be changed completely due to global sea level rise.
  - Rising sea levels have led to the loss of land and submergence of several islands in the Sundarbans Delta which is the world's largest mangrove area.
- **Impact on societies:** The rise in sea level would significantly affect coastal communities and lead to large economic liabilities for tropical countries such as India and other African nations.
  - It would cause the displacement of thousands of people endangering the socio-economic stability of these communities.

**Nut graf:** *The latest WMO report notes that the global sea level is rising at an unprecedented rate and if mitigation efforts are not undertaken at the earliest, the rising sea level could have disastrous implications on the weather patterns, agriculture, existing water crisis, and socio-economic disparities among communities.*

## 2. Rising Antarctic ice melt will slow global ocean flows

**Syllabus:** Disaster Management

**Prelims:** Atlantic Meridional Overturning Circulation (AMOC)

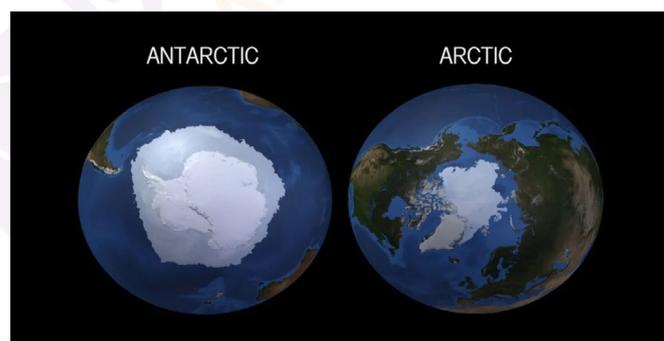
**Mains:** Key findings about the melting of Antarctic ice, its implications and concerns associated with it

**Context:** According to a study published recently in the journal Nature, deep ocean water flows from the Antarctic could decline by 40% by 2050.

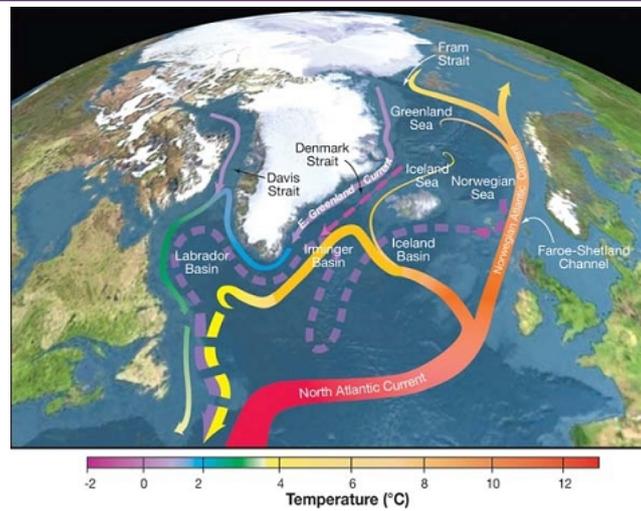
- Rapidly melting Antarctic ice is dramatically slowing down the flow of water through the world's oceans, and could have a disastrous impact on the global climate, the marine food chain and even the stability of ice shelves.

### What is the Antarctic ice sheet?

- The Antarctic ice sheet is one of the two polar ice caps of Earth. It covers about 98% of the Antarctic continent and is the largest single mass of ice on Earth, with an average thickness of over 2 kilometers.



### About Atlantic Meridional Overturning Circulation (AMOC)



- The AMOC is a large system of ocean currents, like a conveyor belt, driven by differences in temperature and salt content – the water's density
- It is one of the Earth's largest water circulation systems
- AMOC is characterized by a northward flow of warm, salty water in the upper layers of the Atlantic, and a southward flow of colder, deep waters that are part of the thermohaline circulation
- It aids in distributing heat and energy around the earth, as the warm water it carries releases heat into the atmosphere, and in absorbing and storing atmospheric carbon

#### What is Thermohaline Circulation?

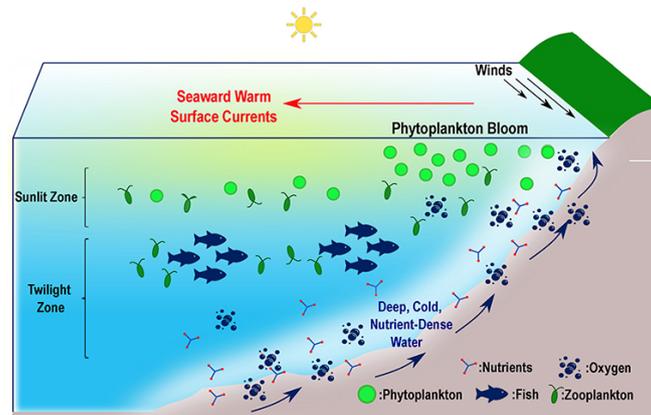
- Thermohaline Circulation (THC) is a part of the large-scale ocean circulation that is driven by global density gradients created by surface heat and freshwater fluxes.
- It is also called the Global Ocean Conveyor or Great Ocean Conveyor Belt, the component of a general oceanic circulation controlled by horizontal differences in temperature and salinity. It continually replaces seawater at depth with water from the surface and slowly replaces surface water elsewhere with water rising from deeper depths.

#### Slowing Down of AMOC – Causes and Impact

- Oceanographers have been measuring the AMOC continuously since 2004. Discussed below are the causes that have resulted in the slowing down of AMOC and the impact this slow down shall be leaving on the climate and the environment.
- Global warming caused by Greenhouse gases is one of the major reasons for the slowing down of Atlantic Meridional Overturning Circulation
- The Atlantic overturning is driven by what the scientists call deep convection, triggered by the differences in the density of the ocean water
  - Warm and salty water moves from the south to the north where it cools down and thus gets denser. When it is heavy enough the water sinks to deeper ocean layers and flows back to the south. It carries heat equivalent to a million nuclear power plants.
- Global warming has caused the Arctic to warm, Greenland to melt, rainfall to increase, and the flow of freshwater into the northern seas to intensify

#### Importance of Antarctic ocean current:

- Global heat exchange and maintaining heat balance
- Provides large area for carbon sequestration
- Nutrients exported from the Southern Ocean into other parts of the ocean support about three quarters of global phytoplankton production – the base of the food chain.



### Findings of the research

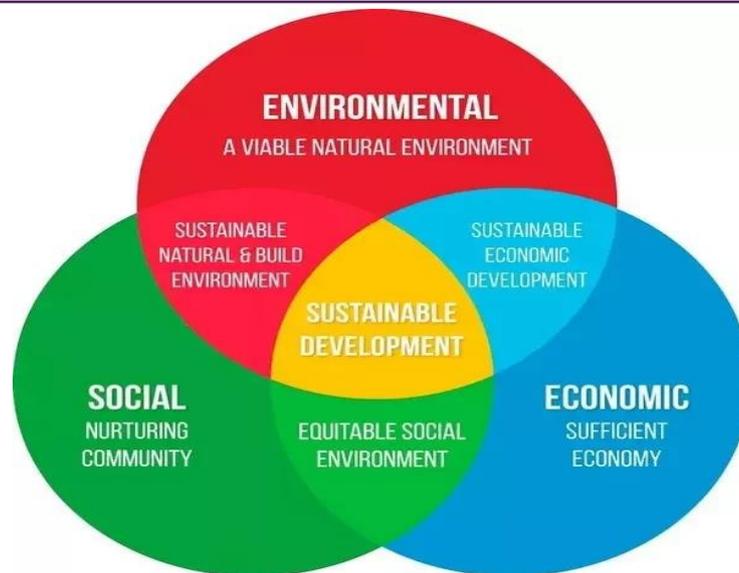
- Three years of computer modeling found **the Antarctic overturning circulation – also known as abyssal ocean overturning – is on track to slow 40% by 2050** if the world continues to burn fossil fuels and produce high levels of planet-heating pollution.
  - A slowdown is **expected to speed up ice melt and potentially end an ocean system** that has helped sustain life for thousands of years.
  - In the past, these overturning circulations **changed over the course of 1,000 years** or so, but now these changes are occurring within a few decades.
    - So it is **pretty dramatic and challenging**.
- The circulation of deep ocean water is **considered vital for the health of the sea – and plays an important role in sequestering carbon** absorbed from the atmosphere.
- According to the report, while a **slowdown of the AMOC would mean the deep Atlantic Ocean would get colder**, the slower circulation of dense water in the Antarctic means the deepest waters of the Southern Ocean will warm up.
- In certain areas, mostly south of Australia in the Southern Ocean and in the tropics, **this nutrient-rich cold water moves toward the surface in a process called upwelling**, distributing the nutrients to higher layers of the ocean.
  - However, the study found that as **global temperatures warm, melting sea ice “freshens” the water around Antarctica, diluting its salinity and raising its temperature**, meaning **it’s less dense and doesn’t sink to the bottom** as efficiently as it once did.
- Nutrients exported from the Southern Ocean in other current systems **support about three quarters of global phytoplankton production – the base of the food chain**.
- The study’s findings also suggest the **ocean would not be able to absorb as much carbon dioxide as its upper layers become more stratified**, leaving more CO<sub>2</sub> in the atmosphere.
- Sinking of dense water near Antarctica will decline by 40% by 2050, **sometime between 2050 and 2100**, impacts of this will start to be seen on surface productivity.

### What are the impacts as per research?

- Devastating effect on the world climate
- Impact on the world’s ocean current
- The melting ice → low salinity of surface water → low density of the surface water → reducing the downward flow to the seafloor.
- Impact stability of ice shelves
- Impact on marine food chain
- 3/4th of global phytoplankton production.

### Way ahead

- Sustainable development
- Clean energy.



### 3. Flash drought

**Syllabus:** Disaster Management

**Prelims:** Flash droughts

**Mains:** Challenges associated with flash droughts, its impact and possible solutions

**Context:** According to a new study, flash droughts are becoming more common and faster to develop around the world, and human-caused climate change is a major reason.

#### Highlights of the study:

- Flash droughts occurred more often than slower ones in tropical/humid places like India, Southeast Asia, sub-Saharan Africa and the Amazon basin.
- As global warming continues, more abrupt dry spells could have grave consequences for the livelihoods of people dependent on rain-fed agriculture.

#### Heat waves

- Unusually hot weather that lasts for several days and becomes fatal to human body when exposed.
- **Period:** March and June, and in some rare cases even extend till July.

#### Drought

- A drought is a prolonged period of abnormally dry weather that can lead to a scarcity of water.

#### What is a flash drought?

- A flash drought is a drought that develops rapidly, often over a period of weeks or even days and then ends abruptly.
- Flash droughts are those that occur very quickly, with soil moisture depleting rapidly.
- Normally, developing drought conditions take months, but the flash droughts happen within a week or two.
- This increases the vulnerability of human beings by lessening the time available to react to the developing drought.

#### ● Causes:

- Higher temperature increases evapotranspiration – the process by which water is transferred from the land to the atmosphere by evaporation from the soil and by transpiration from plants.
- Flash drought can also be tied to rhythmic climatic patterns, such as El Nino (in Asia) and La Nina (eastern Pacific) events.
- If not predicted early enough, changes in soil moisture can cause extensive damage to agriculture, economies, and ecosystems.
- Anthropogenic greenhouse gas emissions play an important role in the occurrence of flash droughts.

#### Impacts of flash Drought.

- **Agriculture:** The increased frequency of flash droughts can have deleterious implications for crop production
- **Water supply issues:** It also has adverse impacts on irrigation demands and groundwater abstraction in India.
- **Wildfires**
- **Health impacts:** Flash droughts can increase the risk of heat-related illnesses and death:

#### Way forward:

- **GHG mitigation:** By meeting the 'Paris Agreement' goals and limiting global warming to well below 2 degrees C, the numbers and frequency of the projected flash droughts may go down.
- **Predicting flash droughts:** Flash-drought prediction ahead of time using operational meteorological forecasts will help manage irrigation water demands and avoid considerable losses in agriculture.

# GEOGRAPHY

## 1. Zealandia

**Syllabus:** Salient features of world's physical geography

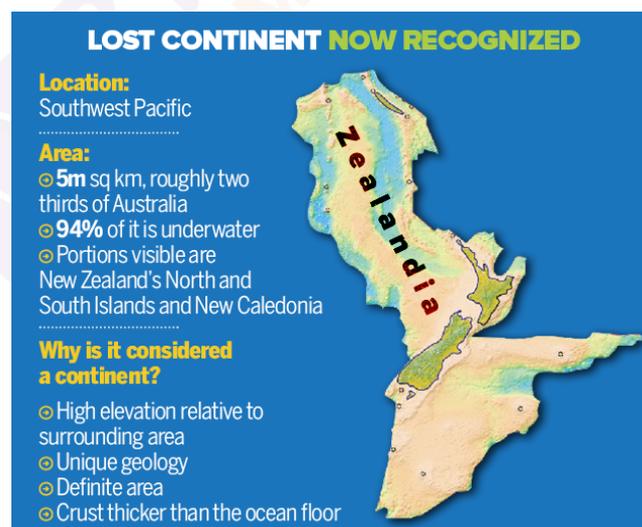
**Prelims:** About Zealandia

**Context:** Stunning New Maps Reveal What The Lost Continent Of Zealandia Looks Like

### IN SEARCH OF TOI THE 8<sup>TH</sup> CONTINENT



**About Zealandia:**



- Zealandia is a collection of partly submerged continental fragments. It also consists of a continent of approximately 1.89 million square miles in size.
- This is confirmed after 375 years of speculation and exploration.
- In the Māori language, Zealandia is also known as Riu-a-Māui.
- As per scientists, this continent was part of the supercontinent Gondwana around 500 million years ago. Gondwana also included Australia and Antarctica.
- Zealandia started to separate from Gondwana in the Late Cretaceous as a 4000-km-long ribbon continent. The reasons are unknown.
- It began to “pull away” from Gondwana, thus it gradually sank beneath the ocean.
- More than 94% of the landmass is still underwater at a level of 6,560 feet under the water.

- In 1642, for the first time, Dutch businessman and sailor Abel Tasman recorded the existence of Zealandia, when he was on a mission to find the Terra Australis also known as the “Great Southern Continent”.
- Tasman could not find this new land.
- The local Māori provided valuable information about the surrounding landmass, including the existence of a large landmass to the east.
- However, it took nearly 400 years for scientists to agree on the existence of Zealandia.
- In 2017, GNS geologists finally confirmed the existence of the hidden continent of Zealandia.

## 2. Excess rain impacting Wheat

**Syllabus:** Important Geophysical phenomena and Economic Geography - Agriculture

**Prelims:** About Wheat cultivation in India and Western Disturbances

**Mains:** Impact of untimely rains and winds on wheat cultivation

**Context:** Recent inclement weather conditions, including an unusually high temperature in February and untimely spells of widespread rain, gusty winds, and hail during March in key wheat-producing states, have farmers concerned about a potential drop in wheat yield, output, and quality.

### What is the Impact of Untimely Rains and Winds on Wheat Crops in India?

- **Impact of Untimely Rains and gusty winds:**
  - According to the India Meteorological Department (IMD), the rains, along with stormy gusts of 40-50 kilometres per hour, could be harmful to crop health, especially if they occur around the ripening and harvesting stages.
  - Unfortunately, crop flattening and waterlogging in fields have occurred, perhaps causing severe damage to the ready-to-harvest wheat crop.
- **Production Impact:**
  - With the recent untimely rains, the experts anticipate that India’s wheat production in the agricultural year 2022-23 will be 102.9 MT, which is fewer than the Union government’s estimate of 112 MT.
  - Despite a minor output loss due to recent bad weather conditions, the Centre remains hopeful that wheat production will be close to 112 MT this season due to expanded acreage and higher yield.
- **Price Impact and Foodgrain Security:**
  - If India’s wheat production falls short of the government’s forecast, local prices for wheat and wheat-based products may rise.
  - Furthermore, any decrease in wheat production could result in a foodgrain security crisis.

#### Important facts about Wheat cultivation in India

- After rice, Wheat is India’s second most important cereal crop.
- It is the principal food crop in the country’s north and northwestern regions.
- Wheat is a rabi crop that demands a cool growing season as well as intense sunlight during ripening.
- The success of the Green Revolution aided the growth of Rabi crops, particularly wheat.
- **Temperatures:** 10-15°C (sowing) to 21-26°C (ripening and harvesting) in broad sunlight.
- **Rainfall** is expected to be 75-100 cm.
- **Soil Type:** Well-drained fertile loamy and clayey loamy (Ganga-Satluj plains and Deccan black soil region).
- Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Rajasthan, Bihar, and Gujarat are the top wheat producing states.

### What are Western Disturbances?

- According to the India Meteorological Department (IMD), western disturbances are storms that originate in the Caspian or Mediterranean Sea and bring non-monsoonal rainfall to northwest India.
- They are classified as an extra-tropical cyclone that originated in the Mediterranean and is characterised by an area of low pressure that sends heavy rain, snow, and fog to northwest India.
- It arrives in Pakistan and northern India with rain and snow. The moisture carried by WDs originates in the Mediterranean Sea and/or the Atlantic Ocean.
- Winter and pre-monsoon rains are brought by WD, which is critical for the development of the Rabi crop in the Northern subcontinent.
- The WDs aren’t usually heralds of excellent weather. WDs can occasionally bring catastrophic weather events such as floods, flash floods, landslides, dust storms, hailstorms, and cold waves, which can kill people, ruin infrastructure, and disrupt livelihoods.

### 3. Heatwaves

**Syllabus:** Important Geophysical phenomena

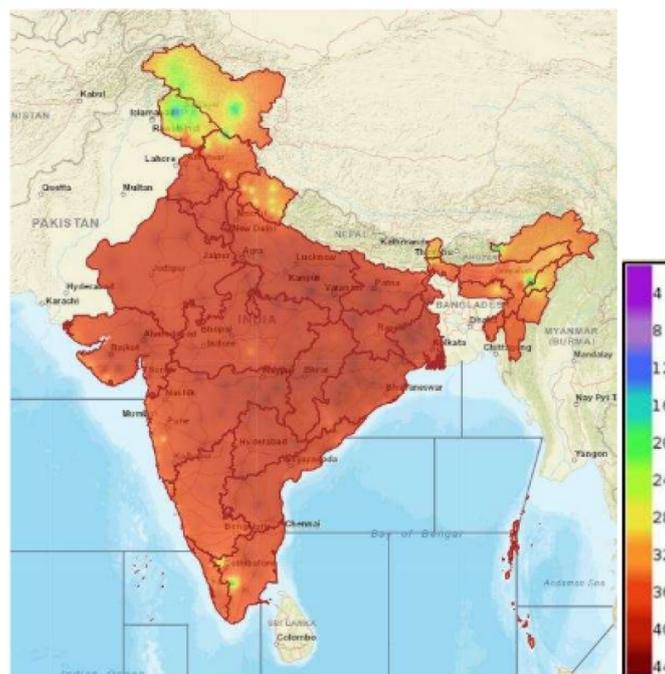
**Prelims:** About Heat Waves

**Mains:** Heatwaves - its definition, criteria, causes and impacts

**Context:** Recently, casualties were reported in Mumbai during a government function due to heatstroke

**About Heat Waves:**

- The impact of climate change and global warming have shown up early this year.
- Large parts of the country have reported temperatures higher than average and heatwaves began as early as March 3 this time.
- Over 60 per cent of India or 22 states and Union Territories recorded above-normal maximum temperature on April 18, 2023, according to India Meteorological Department released April 19, 2023.
- In India, 5,541 people died from heat waves between 2013 and 2022. In comparison, 4,134 deaths were recorded due to heatwaves between 2003 and 2012.
- However, the number of deaths due to heat waves have decreased since 2020.



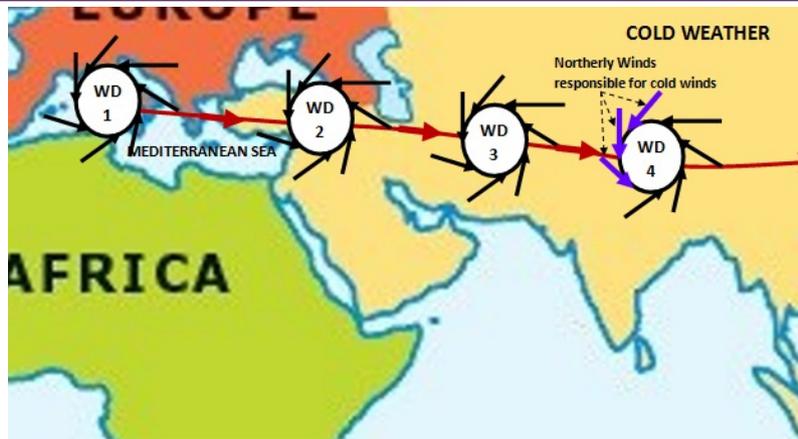
Source: Downtoearth

**Criteria for heatwave:**

- A heatwave is declared by IMD when the maximum temperature is above 40 degrees Celsius over plains and above 30 degrees in hills ; and 4.5 degrees above normal.
- A severe heat wave is declared when the temperature is above 40 degrees Celsius and 6.5 degrees above normal.
- When actual maximum temperature remains 45°C or more irrespective of normal maximum temperature, heat waves should be declared.
- Heat Waves usually occur in the period from March to June in central and north-western India (heatwave zone) and in the coastal areas of Andhra Pradesh and Odisha. In this region, the frequency of heat waves is slightly lower than in northern India.

**Reasons:**

- **A disturbed Western Disturbance:** The rains received in the months of February and May in the northern parts of the country is very essential to provide a moderation in temperature before the summers.



- **High pressure conditions created and aided by Jet Streams**
- Climate change and the drying soil
- **Deforestation** - Leading to a lack of regular rains
- El-Nino - Causes dry conditions
- Urban Heat Island Effect



### ANATOMY OF A HEATWAVE

#### What causes a heatwave?

Heatwaves are generally the result of trapped air. They occur when a system of high atmospheric pressure moves into an area and lasts two or more days



Heat waves form when high pressure aloft (3,000–7,600 metres) strengthens and remains over a region for several days up to several weeks



High-pressure systems force air downward



This force prevents air near the ground from rising

The sinking air acts like a cap. It traps warm ground air in place



#### Impacts:

- Heat strokes and health impact
- Droughts and Crop failures
- Energy Security
- Water Scarcity
- Impact on biodiversity
- Land Degradation

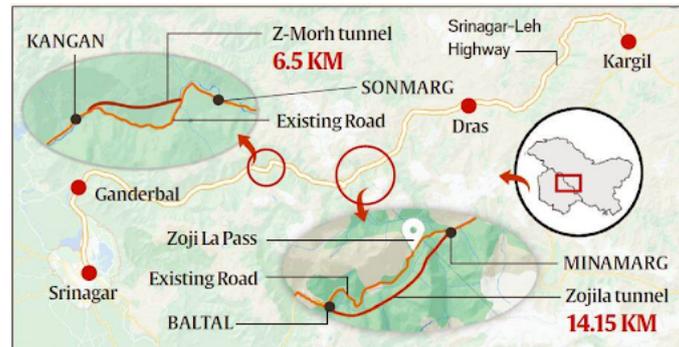
#### 4. Zojila Tunnel

**Syllabus:** Geographical features and their location

**Prelims:** About Zojila Tunnel

**Context:** The Union Minister for Transport and Roadways Minister inspected the construction works of the strategically important Zojila Tunnel.

#### Zojila Tunnel



Source: Indian Express

- The under-construction Zojila Tunnel connects Srinagar and the Kashmir Valley with the Union Territory of Ladakh.
- The Government is pushing to complete the Zojila tunnel before Republic Day, 2024.
- The completion of the tunnel will realise the dream of having an all-weather road from Kashmir to Kanyakumari.
- The Zojila tunnel which is 14.15 km long will become India's longest road tunnel and Asia's longest bi-directional tunnel.
- A connecting tunnel from Z-Morh on NH1 to the Zojila tunnel will be built in the Zojila Ghats between Sonmarg and Kargil.
- The construction of the Zojila Tunnel is also strategically important as the Sonamarg which is a key route for troops to reach Ladakh through the Zoji La Pass becomes inaccessible for over three months in winter as it is prone to accidents due to landslides.
  - Zojila Tunnel will facilitate round-the-year transportation of goods to Ladakh and better movement of the armed forces.
- The construction of the tunnel is expected to bring about an integrated development of Jammu and Kashmir and the Ladakh regions.

# INDIAN SOCIETY & SOCIAL ISSUES

## 1. India's population to edge ahead of China's by mid-2023, says UN

**Syllabus:** Population and associated issues

**Prelims:** About State of World Population Report

**Mains:** Trends in India's population prospect, the key findings of State of World Population Report 2023 and Population growth in India is a "dividend" or a "disaster"

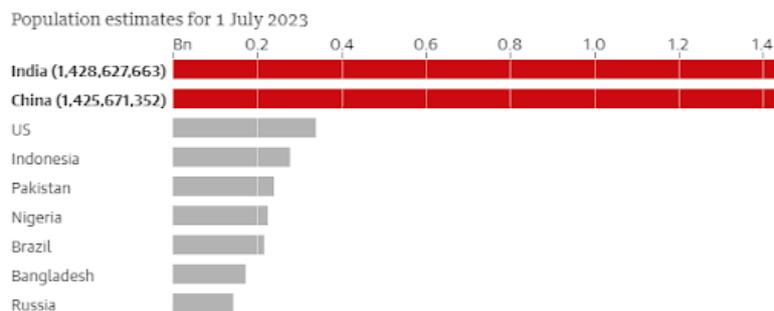
**Context:** The State of World Population Report 2023 has confirmed that India is expected to edge past China to become the world's most populous country by mid-2023.

### State of World Population Report

- The State of World Population Report is published by the United Nations Population Fund (UNFPA).
- Since 1978, the State of World Population Report report has been published every year.
- The State of World Population Report is produced by a group of external advisers, researchers and writers, working alongside UNFPA technical staff.
- The report analyses the trends in world population and demographics. It also throws light on specific regions, countries and population groups and the unique challenges they face.
- The report aims to broaden the understanding of the population and how it can lead to new solutions that build demographic resilience.

### Key findings of the report

#### The world's most populous countries in 2023

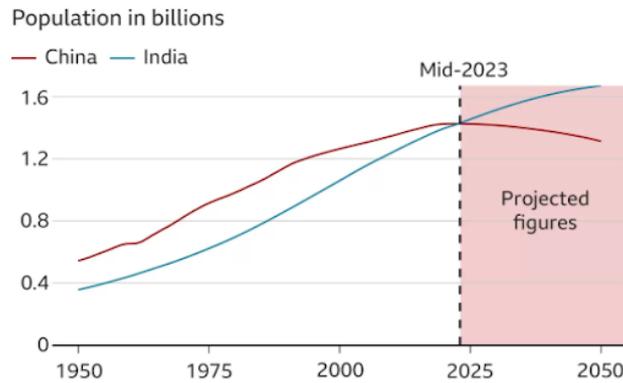


Source: The Guardian

- According to the latest report, India's population is estimated to be 1,428 million by mid-2023 which is marginally ahead of China's 1,425 million.
  - The U.S. is placed third on the list of most populous countries with an estimated population of 34 crores.
- The report notes that the global population has reached the 800-crore mark by November 2022.
- The report also highlights the fact that population trends across the world indicate slower growth and ageing societies contrary to the concerns about exploding numbers.
- Further, it reveals that only eight countries namely the Democratic Republic of Congo, Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines and the United Republic of Tanzania would account for half the projected growth in global population by 2050.
- As per the report, the countries with the highest fertility rates were: Niger (6.7), Chad (6.1), the Democratic Republic of Congo (6.1), Somalia (6.1), Mali (5.8) and the Central African Republic (5.8).
  - And, the territories with the lowest birth rates were Hong Kong (0.8), South Korea (0.9), Singapore (1.0), Macau and San Marino (1.1) and China (1.2).
- The report also suggests that two-thirds of the population live in a country where lifetime fertility corresponds with zero growth and this is considered a milestone and indicates advances in medicine, science, health, agriculture and education.

## India is set to become the most populous country

### India's population predicted to overtake China's in mid-2023



Source: BBC

- The 2022 edition of the State of World Population Report had estimated China's population to be 1,448 million by mid-2022 which was more than that of India's 1,406 million population.
- Experts believe that the emergence of India as the world's most populous country in 2023 is mainly attributed to a sharp decline in China's population.
  - China witnessed a reduction of 23 million (i.e. 2.3 crores) in just one year.
- Although the numbers released by the reports are only estimates, the UNFPA reports are considered reliable indicators of global population trends.
  - The Decennial Census numbers are considered to be the most reliable in India and the 2021 Census exercise was postponed due to the COVID pandemic.
  - However, the Census office released population projections for the years 2012 to 2036, according to which, India's population in 2023 was estimated to be only 1,388 million which is significantly less than the numbers projected by the State of World Population report.
- According to the latest State of World Population report, if India's population continues to increase at the current pace which is close to 1% every year, then the population would double from the present value in the next 75 years.

### Population growth, size, composition

- Experts believe that the population in itself is not a burden and instead, it is the nature of the population growth, size and its composition that determines if it is a "resource" or a "burden".
- The population is considered to be a "resource" if the carrying capacity of the country is intact.
  - Carrying capacity not only refers to the capital availability of natural resources but is also a dynamic concept that changes as per the change in technology, consumption systems of a country and the efficiency of production.
- **Population growth in India:** India has achieved replacement level fertility as a total fertility rate of 2.0 in 2023 i.e. two children replacing their parents.
  - This suggests that the population in India is stabilising.
  - India's population growth is expected to increase in a decelerated mode until 2064, after which the growth is predicted to become negative
  - India's peak population size is estimated to be about 169.6 crores in 2063.
- **Population size:** The total population size is usually assumed to be the number of mouths to feed.
  - Experts believe that huge reliance on total population size can be grossly misleading.
  - They say that there is a need to take into account the "age composition" of the population as it indicates the available "support ratios" that provide an idea about the number of the working age population (i.e. individuals aged 15 to 64) as compared to the number of dependent population (i.e. Children below 14 years and adults aged 65 and above).
- **Population composition of India:** A deeper analysis of India's Population composition reveals that 68% of the total population in 2023 are working age populations in India.
  - This ensures that India would continue to have a demographic window of opportunity for the next 35 years to reap economic dividends.

## Mechanisms that translate demographic bonus into economic benefits

It is believed that there are four key mechanisms that help translate a demographic bonus into economic dividends, namely:

- **Employment opportunities:** Creating job opportunities for its population is one of the most crucial mechanisms to convert the demographic bonus to economic dividend.
  - India must ensure that it creates sufficient and quality jobs for its growing working age population to unlock the actual potential of the demographic dividend.
- **Healthcare facilities:** Setting up and developing healthcare facilities also plays a key role in achieving economic gains with the help of demographic opportunity.
  - Advanced healthcare facilities not only ensure a healthy lifespan by preventing diseases and disabilities but also reduce out-of-pocket spending by the public thereby enabling greater capital creation.
- **Education and skill development:** Efforts to improve education and skill development facilities in the country ensures better productivity of economic activity.
- **Good governance:** Good governance in the form of conscientious policies also helps in promoting a healthy environment for increasing efficiency and productivity.

### Population growth in India is a “dividend” or a “disaster”?

- A younger population in India ensures higher support ratios which also implies that there is a lesser disease, disability and caring burden.
- Further, India’s population growth should be looked at in terms of the opportunities that it provides as compared to the implications of population decline and ageing populations which are witnessed in countries like Japan, China, and the US.
  - It is important to note that despite the adoption of various policies and strategies, these countries have failed to improve birth rates as once fertility declines, it is usually very difficult to reverse it.
- The population and the demographic dividend in India provide an opportunity to become a global market for both production and consumption as manufacturing costs and the costs of labour are relatively low in India.
- The demographic opportunity in the form of a greater percentage of the working age population further provides India a chance to boost its per capita GDP by about 43% by 2061 by ensuring a conducive socio-economic and political environment.
- Experts opine that a total fertility rate of less than 1.8 would not be economically beneficial for India and thus various population control policies that threaten to induce population ageing must be checked.
- India should adopt key mechanisms such as policies to provide high-quality education, improved health care, employment opportunities, better infrastructure, and ensure gender equality in order to translate a demographic bonus into economic dividend.
- However, issues such as unsustainable production, consumption and unequal distribution more than visible population size continue to be key challenges to reaping benefits out of the demographic opportunities in India.
- Furthermore, the report has called for a radical rethink of the policies adopted by the countries to address changing demographics and cautioned against the use of family planning as a tool for achieving fertility targets.
  - At a time when various states such as Assam are looking at imposing two-child norms, the report says that such type of family planning targets could result in gender-based discrimination and increased instances of prenatal sex determination leading to sex-selective abortion.
  - Additionally, the imposition of such targets could cause an imbalance in sex ratios, denial of the paternity of girl children, violence against women for giving birth to girl children, etc.

**Nut graf:** The latest UN report has noted that India is on its way to becoming the world’s most populous country by overtaking China. However, these population numbers must not trigger anxiety and instead, India must look to maximise the opportunities presented by the demographic dividend and be seen as a symbol of progress, development, and aspirations.

## 2. Dalits as a social and political force

**Syllabus:** Salient features of Indian Society

**Mains:** Dr. B.R. Ambedkar’s Vision for Social Justice

**Context:** Dr Ambedkar’s birth anniversary is celebrated across the world on April 14.

### Introduction:

- Dalits are a historically oppressed and marginalized community in India. They belong to the lowest rung of the caste system and have faced discrimination and exclusion for centuries.
- However, in recent years, Dalits have emerged as a significant social and political force in India, demanding equal rights and opportunities and challenging the status quo, mainly due to modern liberal ideas, capitalist development, and democratic processes.
- However, the vision of Dr B.R. Ambedkar, a leader who fought for the rights of Dalits, to elevate them as an independent religious community or the dominating political force in the democratic battles has not been realized yet.
- The present day’s adoption of neoliberal economic policies undermines social justice safeguards meant for the emancipation of historically marginalized communities.

**Ambedkar's Vision for Social Justice:**

- Ambedkar's vision for social justice was to elevate Dalits as an independent religious community and to improve their lot as the dominating political force in democratic battles.
- Ambedkar acknowledged that under colonial rule, modern institutions had become accessible to several marginalized social groups, enabling them to participate in democratic processes.
- Ambedkar believed that job reservation or ensuring Dalit representation in legislative bodies would lead to the substantial democratization of political power and enable Dalits to become influential stakeholders in modern institutions.
- He also envisioned non-political public spaces such as educational institutions, media, culture, and art industries to be democratized, allowing Dalits to play an effective role as entitled citizens.
- He advocated for modernity not just to uplift the untouchables as a special category dependent on perpetual state assistance, but to create a society where all individuals could thrive independently.
- Ambedkar imagined Dalits to be the natural leaders of historically deprived groups. He hoped that the state would take effective measures to cultivate a sensitive public culture and punish offenders who practised caste or community-based discrimination.
- His vision for social justice was to create a society where people of all castes and communities could live in harmony, without discrimination or exploitation.

**Dalit Assertion:**

- Post-Independence, Dalit assertion aimed to bring about social and political change and end the social exclusion and marginalization of Dalits.
- One of the key drivers of Dalit assertion was the Indian Constitution, which provided for affirmative action and reserved seats in government jobs and educational institutions for Dalits and other marginalized communities.
- This policy of reservation helped to increase Dalit representation in government, administration, and other fields, giving them greater visibility and a stronger voice in the decision-making process.
- One of the most significant factors that have contributed to the rise of Dalit activism is the growth of the Dalit middle class.
- Education and economic empowerment have enabled many Dalits to break out of their traditional occupations and enter new fields. This has given them greater visibility and influence in society and politics.
- In addition to political representation, the Dalit assertion also took the form of cultural and social movements, which sought to challenge the dominant caste-based norms and hierarchies and create a more inclusive and equal society.
- These movements focused on issues such as land reform, access to education and healthcare, and the eradication of caste-based discrimination and violence.
- However, according to the author of this editorial, various sections within the Dalits have not shown sincere attachment to the social justice movement and remained hegemonized by conventional cultural values, even drifting towards political options considered antithetical to the politics of Dalit emancipation.
- In electoral battles, Dalits have witnessed growing marginalization, with the periodic decline of the Dalit-based political parties as commendable mainstream parties.

**Post-Ambedkar Dalit activism:**

- Post-Ambedkar Dalit activism has taken a range of forms and has been influenced by various social, political, and economic factors.
- However, the overarching goal of Dalit activism has remained the same: to fight against caste-based oppression and discrimination and to secure equal rights and opportunities for all Dalits in India.
- The traditional hierarchies based on class and caste have seen little reform, and the increasing incidents of caste-based violence, oppression, and attacks have left Dalits feeling discouraged about the prospects of achieving social liberation.
- Additionally, there exists a marginalization of Dalit representation in modern institutions such as universities, the judiciary, media, and cultural industries.
- A reassessment is required to construct a widespread Dalit program that rallies the disadvantaged and marginalized groups towards a more comprehensive liberation effort.

**Nut Graf:** *Dalits have emerged as a significant social and political force in recent years. However, B.R. Ambedkar's vision of their elevation as an independent religious community or a dominating political force has not been realized yet. Despite the policies of affirmative action and reservation, Dalits continue to face discrimination and violence.*

### 3. Hakki Pikki

**Syllabus:** Salient features of Indian Society, Diversity of India.

**Prelims:** Hakki Pikki Tribe.

**Context:** Thirty-one tribals from 'Hakki-Pikki' are stranded in Sudan, where deadly clashes are taking place between a formidable paramilitary outfit and the country's armed forces.

**About Hakki-Pikki tribe:**

### The Hakki Pikki tribe

**IN KANNADA, HAKKI IS 'BIRD' AND PIKKI 'CATCHER'**

- A nomadic tribe, the Hakki Pikki people go by other names such as Mel Shikari in northern Karnataka and Maharashtra
- Members of the tribe speak Vaghri (an unclassified tribal Indo-Aryan language of south India), Kannada and Hindi.
- Before wildlife laws came into existence, the tribe lived inside forests and hunted animals

They are mostly based in Shivamogga, Hassan, Davangere and Mysuru districts of Karnataka. There were **11,892** Hakki Pikki people in Karnataka according to the 2011 Census.

**Rehabilitated around the 1950s, the tribe shifted to the outskirts of cities in Karnataka**

- Its members are largely engaged in manufacturing and selling plant extracts and alternative medicines in India and abroad

**Prabhu S (far right), one of the members of the Hakki Pikki tribe, with other members at their rented house in Sudan, where they are stuck**

**Source: Indian express**

- They are a semi-nomadic tribal community from the Karnataka state.
- 'Hakki' means 'bird' in Kannada, and 'Pikki' means 'to catch'.
- The community is known as the 'bird catcher,' because their traditional occupation is bird catching.
- The population is concentrated in the Karnataka districts of Shivamogga, Davanagere, and Mysuru.
- Scholars dubbed their mother tongue "Vaagri."
- UNESCO has designated 'Vaagri' as an endangered language.
- They possess traditional medical knowledge that is in high demand in a number of African countries.
- Monogamy is the norm in this matriarchal society.
- In Karnataka, Hakki Pikkis follow Hindu traditions and celebrate all Hindu holidays.
- The Hakki Pikkis' education levels remain poor.
- They do not feature in the list of Particularly Vulnerable Tribal Groups (PVTGs).
- For a long time, the group lived in deep forests and developed its own plant and herb-based medicinal systems.
- However, with the loss of dense forests, it became difficult for them to survive. They also lack education and vocational training. As a result, they migrated to Africa to use their native wisdom to earn a living.

# MISCELLANEOUS

## 1. International Prize in Statistics

**Syllabus:** Miscellaneous

**Prelims:** About the International Prize in Statistics 2023

**Context:** Calyampudi Radhakrishna Rao (C.R. Rao), an Indian-American statistician has been awarded the International Prize in Statistics for the year 2023.

### International Prize in Statistics

- The International Prize in Statistics is the equivalent of the Nobel Prize for Statistics.
- The International Prize is awarded to an individual or a team to recognise their achievements using statistics to advance science, technology and human welfare.
  - The award recognizes a single work or body of work, representing a powerful and original idea that had an impact on other disciplines or a practical effect on the world.
- The prize is awarded biennially i.e. once every two years at the International Statistical Institute (ISI) World Statistics Congress.
  - The International Prize was first awarded in 2016.
- The award is managed by a foundation that consists of representatives of the five major statistical organisations namely the American Statistical Association, the Institute of Mathematical Statistics, the International Biometric Society, the International Statistical Institute, and the Royal Statistical Society.
- The key goal of the award is to enhance public understanding of the depth and scope of statistics.
- Furthermore, the recipient must be alive when the prize is awarded.
- Eminent Statistician C.R. Rao has been Awarded the 2023 International Prize in Statistics.
  - The award recognises the monumental work by C.R. Rao that revolutionised statistical thinking and still continues to influence human understanding across a wide spectrum of scientific disciplines.
  - C R Rao's 1945 paper published in the Bulletin of the Calcutta Mathematical Society, demonstrated three fundamental results that paved the way for the modern field of statistics and provided statistical tools heavily used in science.

## 2. One Indian Audit & Accounts Department One System (OIOS)

**Syllabus:** Miscellaneous

**Prelims:** About One Indian Audit & Accounts Department One System (OIOS)

**Context:** Activation of the One Indian Audit & Accounts Department One System (OIOS).

### Key Details:

- The Comptroller and Auditor General of India (CAG), Girish Chandra Murmu, on March 31, 2023, announced the full activation of the One Indian Audit & Accounts Department One System (OIOS).
- It is a web-enabled IT application with support for multiple languages, offline functionality and a mobile app, for the complete digitalisation of the audit process from April 1, 2023.
- It was first envisaged in late 2019-early 2020.
- It is the primary system of record for the entire chain of audit activities, from audit planning and design through audit execution to issue and follow-up of inspection reports to processing and finalisation of the CAG's audit reports and follow-up.
  - It covers all types of audit – compliance, financial and performance.
- All audit work across India will become paperless and will only be carried out digitally from April 1, 2023.
  - The only exception would be the Defence Audit offices as it requires more time because of security issues.
- About 90 audit reports are prepared through CAG's 130 offices across India and approved every year for submission to Parliament, state legislature or union territory legislature, containing findings on government business transacted during the preceding financial year (or earlier years).
- This will ensure accountability along with accuracy in the audit process.

## 3. Pushkaralu festival returns to the Ganga after a gap of 12 years

- The Pushkaralu festival began in Varanasi on 22nd April 2023.
- It is a twelve-day festival celebrated by Telugus in which pilgrims worship the Ganga and their ancestors.
- It is being organized after a gap of 12 years.
- A large number of Telugus will visit Varanasi.
- Special trains have been arranged for the easy conveyance of the pilgrims from South India.

# YOJANA APRIL 2023 - STARTUP INDIA

## 1. Opportunities for Youth in the Startup Ecosystem

### New India: Opportunities for Youth:

- The Union government has launched several initiatives to promote entrepreneurship and innovation in the country.
- The 'Startup India' initiative, launched in 2016, aims to create a conducive environment for startups to thrive in India.
  - The initiative provides several benefits to startups, including tax exemptions, access to funding, and simplified regulations.
- Out of the \$950 billion in FDI received since independence, \$532 billion came since 2015 from 162 countries in 61 sectors to the 31 states & UTs.
- With the initiatives like Digital India, broadband connectivity in villages drove the growth of the startup ecosystem.
- 'MAARG' portal is helping innovators and startups from remote areas to get access to crucial opportunities and funding ecosystems.



Source: Yojana

### Knowledge based Digital Economy:

- In the Union Budget 2023-24, the Union Finance Minister talked of making India a knowledge-based digital economy.
- The Government of India is moving towards 100 percent digitisation of government processes to make them more citizen-centric.
- Under this, a Digital Public Infrastructure will be developed for the farmers of the country.
- ICMR labs will also be made available to private medical colleges and private sector R&D companies to promote health-based research.
- A new programme will be started through the Centre of Excellence to promote research and innovation in pharmaceuticals.

### National logistics policy and startups in India:

- India recently launched its National Logistics Policy in 2022, which aims to create an integrated and efficient logistics ecosystem in the country.
- The policy has several provisions that could benefit startups in the logistics sector.
- For instance, it encourages the development of logistics parks and multimodal logistics hubs, which could provide startups with access to better infrastructure and facilities.

### Startups in Defense and Space Sectors:

- India's defence and space sector is a critical area of national importance, and the government has been actively promoting entrepreneurship in this field through various initiatives.
- Startups in the defence and space sector can play a significant role in innovation, technology development, and job creation.
- One of the key initiatives is the Defense India Startup Challenge (DISC), which aims to encourage startups to come up with innovative solutions to meet the requirements of the defence sector.
  - Under the DISC program, startups can get funding, mentoring, and other support from the government to develop their products and services.
- The government has also launched the Space Entrepreneurship and Enterprise Development (SEED) program to support startups in the space sector.

- The program provides funding and other support to startups working on space-related technologies and applications.
- In addition, the government has established a Defense Innovation Fund (DIF) to provide funding and other support to startups working on innovative solutions in the defence sector.
  - The fund aims to promote research and development in critical technology areas such as artificial intelligence, robotics, and autonomous systems.
- Several startups have already made significant progress in the defence and space sector in India.
  - For instance, AgniKul Cosmos, a Chennai-based startup, is working on developing low-cost launch vehicles for small satellites.
  - Another startup, Tonbo Imaging, is working on developing advanced imaging and sensing technologies for defence and security applications.

## 2. Startup India Action Plan

### Differentiated approach:

- Recognising the potential and importance of the startup ecosystem in the economic growth of the country, the Hon'ble Prime Minister on 16 January 2016 unveiled the Startup India Action Plan 2016.
- Accordingly, the key pillars of Startup India Action Plan were envisaged to be executed in a phased manner with differentiated approaches.
- The Action Plan comprises 19 action items. Key features of the action plan includes:
  - **Simplification and Handholding:** The government pledged to simplify the regulatory environment for startups, reducing the time and cost of compliance with a startup hub to provide a single-point contact for startups to access information on various schemes and services.
  - **Funding Support and Incentives:** A fund with an initial corpus of INR 2,500 crore was set up to provide funding support for startups.
  - **Industry-Academia Partnership and Incubation:** The government promoted industry-academia partnerships to foster innovation and support the creation of incubation centres to provide physical infrastructure, mentorship, and other support services for startups.
  - **Innovation and Entrepreneurship Development Programs:** The government created entrepreneurship development programs to help entrepreneurs build the skills and knowledge they need to succeed.
  - **Intellectual Property Rights (IPR) Protection:** The government provides a legal support system to help startups protect their intellectual property rights, including patents, trademarks, and copyrights.

## 3. Startup20 Empowerment Group

### Introduction:

- Startup20 aspires to create a global narrative for supporting startups and enabling synergies between start-ups, corporates, investors, innovation agencies and other key ecosystem stakeholders.
- Startup 20 is an important group of the G20 to generate more entrepreneurs from developing nations.
- The group will also bridge the knowledge gap between the startup ecosystems of G20 member countries and emerging economies through partnerships with enablers such as incubators and government agencies.
- The Startup 20 summit will be held in Gurugram in the month of July 2023.
- The opportunity comes at a time when India's startup ecosystem has grown to become the world's third largest, with over 92000 startups, 108 Unicorns, and more than USD 40 billion in investment in 2022.

### Objectives of Startup20:

- The overarching goal of the Startup20 is to propose a policy framework that achieves two objectives simultaneously:
  - Harmonisation of global startup ecosystems to facilitate their collaboration, and
  - Doing so without compromising the national ecosystems' freedom to grow in whatever way they see fit.
- To accomplish its goals, the Startup20 has formed three Task Forces that focus on critical areas vital to the development of a thriving startup ecosystem.
- The **Foundation and Alliances Task Force** seeks to foster a global community of knowledge sharing among startup ecosystems, as well as to bridge the knowledge gap between G20 member countries, startup ecosystems, and emerging economies.
- The **Finances Task Force** aims to increase access to capital for early-stage startups by providing financing and investment platforms tailored to their needs.
  - This Task Force is primarily responsible for bringing stability to startup investments at the global, regional, and national levels, identifying triggers that lead to investment fluctuations and minimising such risks for startups among others.
- The **Inclusion and Sustainability Task Force** seeks to create equal opportunities for startup founders regardless of gender, race, class, or creed, as well as to create a conducive environment for startups building inclusive communities to drive equality and global economic growth. Objectives of this task force includes,
  - Increase support for women led startups and organisations
  - Promote startups working on making communities more inclusive
  - Enable more investors to invest responsibly in startups built upon sustainable practices
  - Encourage mentorship support to the startup ecosystems of the G20 member countries and emerging economies
  - Promote startups working on SDGs in areas of global interest

**Conclusion:** As the world continues to face economic and technological challenges, startups and entrepreneurship have a crucial role to play in driving growth and innovation. India has a thriving startup ecosystem with a large pool of talented entrepreneurs and investors, therefore Startup20 is also looking at ways to showcase the most successful startups to the world and move in a direction where these startups could set an example around the globe.

#### 4. Agri Startups

##### Introduction:

- Agri-startups shall play a critical role in making India a knowledge-based and technology-driven economy.
- Due to a very unique agricultural ecosystem, there is vast potential and ample opportunities for the development of agri-startups.
- India's arable land area of 156,06 million hectares (2019) is the world's second-largest after the United States.
- It has an incredible diversity of climate and soil types (15 agro-climatic zones, 8 major soil types), making it suitable for growing a wide range of field crops, fruits, vegetables, and so on.
- India is currently the world's largest producer of milk, pulses, millets, and jute, as well as the world's second largest producer of rice, wheat, and fruits and vegetables.
- India has recently emerged as a leading exporter of agricultural and livestock products.
- However, the agricultural sector is also lacking several complex problems and challenges.
- Agri-startups strive to provide solutions through innovations, technology interventions or business models specific to the needs of farmers mostly on a real-time basis.
- As a result of the Government of India's ongoing efforts, our country now has 3,000 agri-startups operating in various agricultural fields and allied sectors.

##### Agri Startups:

- Startup India Action Plan 2016 resulted in a massive increase in the creation of startups across almost every industry, including agriculture.
- In terms of geographical distribution, nearly 60% of agri-startups are based primarily in Tier I and II cities in a few states.
- Agri-startups are further classified based on their focus areas, such as agri-tech, animal husbandry, precision farming, organic agriculture, mechanics, advisories, etc.
- Agri startups typically operate at one or more stages of the agricultural value chain, and on this basis have been classified into seven broad categories - providing output market linkages; facilitating input supply; enabling mechanisation and irrigation; offering a financial solution; helping quality maintenance and traceability; post-harvest management; logistic services ; and supporting animal husbandry activities.
- These startups provide solutions to farmers by utilising various types of innovations and technologies.
- In recent years, some notable business models in the agricultural space have emerged, including the 'farm to fork' supply chain model, IoT (Internet of Things) or big data-led innovation model, and the upstream market place model.

##### Policies and Promotions:

- The Agri-Business Incubator (ABIs) Centres were established in various parts of the country, primarily in R&D institutions, in 2015-16.
  - ABIs identify and mobilise emerging entrepreneurs, facilitating their growth through a variety of services including shared facilities and equipment.
- In India, there are over 100 agri-focused incubators, most of which are housed in academic and research institutions such as the Indian Council of Agricultural Research (ICAR) and agricultural universities, Startup India, the Atal Innovation Mission, the Department of Science and Technology (DST), and the Ministry of Agriculture and Farmers Welfare also support these incubators.
- In 2019-20, the Department of Agriculture, Cooperation, and Farmers Welfare has added a new component called the 'Innovation and Agri-Entrepreneurship Department' to its flagship scheme. the 'Rashtriya Krishi Vikas Yojana' (RKVY-RAFTAAR).
- As the apex body of agricultural R&D, ICAR has taken the lead by establishing 50 Agri-Business incubators in institutes across the country.
  - ICAR-ABIs, which were launched under the National Agriculture Innovation Fund project (2016-17).
- The Department of Science and Technology has set up 25 Technology Innovation Hubs (TIH) in premier institutes of national importance across the country.
  - Since 2016, the DST has been implementing an umbrella programme called NIDHI (National Initiative for Developing and Harnessing innovations) to promote S&T-based entrepreneurship and startup ecosystems in the country.
- Engagement of agri-tech startups and companies in public-private partnerships was announced for the Union Budget 2022-23 to deliver the latest technology education to farmers and aid in implementation.
- The Government announced an agricultural-focused accelerator fund in the current Budget (2023-24) to encourage agri-tech startups in rural areas of the country.

## 5. Women Entrepreneurship in MSME Sector

### Women in MSME Sector:

- The MSME sector offers multiple opportunities to empower women by promoting entrepreneurship and plays a crucial role in the process of economic and social development through value addition, employment generation, equitable distribution of income, and removal of regional disparities.
- Women-owned enterprises account for approximately 18.67% of the total MSMEs registered on Udyam Registration Portal, over the last three years.
- Similarly, the share of women employed by the MSMEs registered on Udyam portal, in around two and a half years, is 23.59% out of the total employment by the MSME registered units during this period.
- The Ministry of MSME is continuously making efforts to encourage women empowerment through various interventions.
  - The Public Procurement Policy for Micro and Small Entrepreneurs Order, 2012 (as amended in 2018), mandates that 3% of the total annual procurement by Central Ministries/ Departments/CPSEs shall be from women-led Micro and Small Enterprises (MSEs).
  - Under the Prime Minister's Employment Generation Programme (PMEGP), 2.59 lakh women entrepreneurs out of a total 8.37 lakh entrepreneurs have been provided credit support.
- Khadi and Village Industries Commission (KVIC), has engaged 3.99 lakh women artisans (80%), out of a total of 4.97 lakh artisans in the country, under its Khadi Programme.
  - During the last six years, a total of 1.81 lakh women have been skilled through these programmes.
- In the coastal states of the country, Coir Board, under different schemes, imparts training to women workers on manufacturing quality coir products, thereby creating employment opportunities.

### Credit Facilitation:

- **Initiatives for women led enterprises:** Under the Credit Guarantee Scheme Fund Trust for Micro & Small Enterprises (CGTMSE), to support Women Entrepreneurs, with effect from 1 December 2022, the concession of 10% in guarantee fee (over the normal rate) and enhanced guarantee coverage of 85% (against 75% in other cases) has been introduced in respect of loans given to women entrepreneurs.
- Through the **Credit Guarantee Scheme** for Micro & Small Enterprises, since its inception in 2000, an amount of Rs. 53,080 crore has been guaranteed in respect of loans availed by 13.29 lakh accounts of women-led MSMEs.
- **Artisan-Based Cluster Development:** Under the Scheme of Fund for Regeneration of Traditional Industries (SFURTI), a special focus has been given to providing sustainable livelihood to artisans through the formation of manufacturing collectives in the traditional sector.
- Apart from the above, Schemes of other Ministries, like Pradhan Mantri Mudra Yojana (PMMY) and Stand Up India, etc.

## 6. Opportunities for MSMEs in 'Amrit Kaal'

### Scope and Potential in Amrit Kaal:

- **Digital Transformation:** The Covid-19 Pandemic has accelerated the adoption of digital technologies across industries, and the MSMEs in India need to embrace this change to remain competitive.
- **Export Opportunities:** Export Promotion Capital Goods (EPCG) scheme and the Merchandise Exports from India Scheme (MEIS) are launched to support the MSMEs in exporting their products and services.
- **Infrastructure Development:** The Government of India has announced several initiatives, such as the National Infrastructure Pipeline and the Atmanirbhar Bharat Abhiyan, to boost infrastructure development in the country.
- **Healthcare Sector:** The Covid-19 pandemic has highlighted the importance of the healthcare sector, and the MSMEs in India can leverage this opportunity by providing goods and services to support the healthcare industry. The MSMEs can further explore opportunities in the areas such as medical devices, personal protective equipment (PPE), and healthcare IT solutions.
- **Green Energy:** The MSMEs can play a significant role in this sector by providing goods and services to support the renewable energy industry. MSMEs can explore opportunities in areas such as solar energy, wind energy, and energy storage solutions,

### Government schemes:

- **Prime Minister's Employment Generation Programme (PMEGP):** This is a credit-linked subsidy scheme that aims to promote self-employment and entrepreneurship by providing financial assistance to the startups and new enterprises in the MSME sector.
- **Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE):** This scheme provides collateral-free credit to the MSMEs up to a certain limit. Furthermore, the scheme aims to encourage banks and financial institutions to provide lending to the MSMEs, thereby increasing their access to credit.
- **Micro and Small Enterprises Cluster Development Programme (MSE-CDP):** This scheme aims to promote the development of the MSME clusters by providing support for infrastructure development, technology upgradation, and market access.
- **Technology Upgradation Fund Scheme (TUFS):** This scheme provides financial assistance for the technology upgradation and modernization of the MSMEs in the textile and jute sectors.
- **Digital MSME Scheme:** This scheme aims to encourage the adoption of digital technologies by the MSMEs by providing support for the development of digital infrastructure, capacity building, and digital marketing.

- **National Manufacturing Competitiveness Programme (NMCP):** This scheme aims to enhance the competitiveness of the manufacturing sector, including the MSMEs, by providing support for the technology upgradation, quality certification, marketing assistance, and skill development.
- **National Skill Development Corporation (NSDC):** This scheme aims to provide skill development training to the F1S/VIE workforce so as to enhance their employability and productivity.

#### MSME and Defence Manufacturing:

- The Government of India has been focusing on indigenization and self-reliance in the defence sector, and has launched several initiatives to promote the participation of MSMEs in defence manufacturing.
- **Offset Policy:** Under the Offset Policy, foreign firms that win defence contracts in India, must invest a certain percentage of the contract value in India's defence manufacturing sector.
- **Defence Procurement Procedure (DPP):** The DPP encourages the participation of the MSMEs in defence manufacturing by providing them with preference in procurement, setting aside certain categories of products for the MSMEs, and relaxing the eligibility criteria for participation in tenders.
- **Innovation for Defence Excellence (iDEX):** The iDEX initiative promotes innovation and indigenization in defence manufacturing by providing funding support, mentorship, and incubation facilities to MSMEs and startups working in the defence sector.
- **Defence Investor Cell (DIC):** The DIC is a dedicated cell under the Department of Defence Production that assists and supports the MSMEs interested in making investments in the defence manufacturing sector.
- **Defence Industrial Corridors (DICs):** The Government of India has identified six regions across the country as DICs, which are aimed at promoting the development of defence manufacturing clusters. The MSMEs can take advantage of these clusters to access infrastructure, technology, and market linkages.

#### FDI Advantages for Indian MSMEs:

- Access to Capital
- Technology Transfer
- Market Access
- Management Expertise
- Brand Building
- Employment Generation

#### Alternate Finance Opportunities:

- Non-Banking Financial Companies (NBFCs)
- Peer-to-Peer (P2P) Lending
- Trade Credit
- Angel Investors and Venture Capitalists.
- Crowdfunding

## 7. Startups-Reaching last mile

#### Impact on the Indian Economy:

- The Startup India initiative has had a significant impact on the Indian economy, particularly in terms of job creation and economic growth.
- According to a report by the National Association of Software and Services Companies (NASSCOM), the Indian startup ecosystem is expected to create over 500,000 new jobs by 2025.
- The initiative has also attracted significant foreign investment, with the total funding raised by Indian startups increasing from \$3.9 billion in 2014 to \$14.5 billion in 2019.
- The initiative has also encouraged the growth of innovation and entrepreneurship in India.
- According to the Global Innovation Index, India's rank in innovation has improved from 81st in 2015 to 48th in 2021.
- The initiative has also encouraged the growth of startups in various sectors, including technology, healthcare, and agriculture.

#### Challenges:

- Raising capital is a major challenge for startups in India. Investors are often cautious and tend to invest in established companies rather than startups.
- Startups in India struggle to attract and retain talent due to competition from established companies and the lack of skilled workers.
- Indian startups must navigate a complex regulatory environment, which can be time-consuming and costly.
- Poor infrastructure, such as inadequate transportation and power supply, can hinder the growth of startups in India.
- Indian society has traditionally placed a strong emphasis on job security and stability, which can make it challenging for startups to attract employees and customers.
- While India has a large population, the purchasing power of the majority of the population is low, limiting the potential market for many startups.
- Many startups in India lack access to experienced mentors who can provide guidance and support.

## 8. Antyodaya and Mass Media

### Antyodaya and Mass media:

- Antyodaya refers to the concept of uplifting the last person in the society.
  - Antyodaya was a concept that was based on the philosophy of integral humanism. While it was not coined by Deen Dayala Upadhyay, the proliferation of its popularity had him playing an integral role.
- Mass media refers to the means of communication that reaches a large number of people at the same time, it includes newspapers, radio, television, internet, etc.
  - The mass media plays an important role in shaping public opinion, educating the masses, and disseminating information to the masses.

### Significance of Mass Media:

- The relationship between Antyodaya and mass media is quite significant. The mass media can be an effective tool for promoting the concept of Antyodaya.
- The media can also bring to light the initiatives taken by the government and non-governmental organisations to promote the welfare of the poorest sections of society.
- One of the key roles of mass media in promoting Antyodaya is to create awareness among the masses.
- The media can highlight the need for social and economic development that benefits the poorest and most marginalised sections of society.
- The media can also play a crucial role in sensitising and educating people about the issues faced by the poor and marginalised sections of society.
- It can act as a watchdog and hold those in power accountable for their actions.

## 9. Incubators-The Growth enablers

### Incubators:

- Incubators are organisations that provide resources and support to startups to help them grow and succeed.
- They provide access to office space, mentorship, funding, and other resources that startups need to develop their ideas into successful businesses.
- Incubators are usually run by universities, governments, or private organisations and provide a range of services to startups.

### Role of Incubators in Promoting the Startup Ecosystem in India:

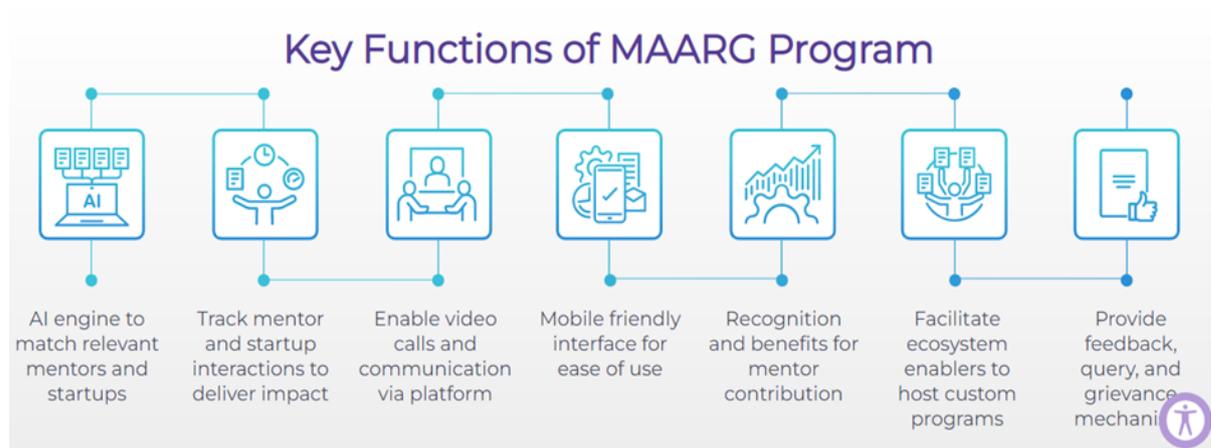
- Incubators play a crucial role in promoting the startup ecosystem in India. They provide startups with the support and resources they need to grow and succeed, which helps to create a vibrant and thriving startup ecosystem in the country.
- Incubators support innovation by providing startups with the resources they need to develop innovative solutions.
- Incubators help startups to attract investment from angel investors, venture capitalists, and other sources.
- Incubators provide startups with the opportunity to collaborate with each other, as well as with mentors and investors.
- Many incubators in India focus on supporting social entrepreneurship, which involves using business solutions to address social problems.

### Examples of Incubators for Startups in India:

- **T-Hub:** T-Hub is a startup incubator based in Hyderabad, India. It provides startups with access to office space, mentorship, funding, and other resources.
- **Startup Village:** Startup Village is a startup incubator based in Kochi, India. Startup Village focuses on startups in the areas of technology, healthcare, and agriculture.
- **IIM Bangalore NSRCEL:** IIM Bangalore NSRCEL is a startup incubator based in Bangalore, Karnataka. IIM Bangalore NSRCEL focuses on startups in the areas of social impact, healthcare, and sustainability.
- **Zone Startups India:** Zone Startups India is a startup incubator based in Mumbai, India. Zone Startups India focuses on startups in the areas of technology, healthcare, and fintech.

**MAARG Portal:**

- MAARG portal is the National Mentorship Platform by Startup India.
- MAARG Portal is being operationalized by the Department for Promotion of Industry and Internal Trade (DPIIT), under the Ministry of Commerce and Industry.
- It is a one-stop platform to facilitate mentorship for startups across diverse sectors, functions, stages, geographies, and backgrounds.
- The objectives of the MAARG portal are:
  - To provide sector focused guidance and support to start-ups.
  - To establish a formalised and structured platform that facilitates intelligent matchmaking between the mentors and their respective mentees.
  - To facilitate efficient mentorship for start-ups and build an outcome-oriented mechanism that allows timely tracking of the mentor-mentee engagements.



# KURUKSHETRA APRIL 2023 - PANCHAYATI RAJ

## 1. Empowering Panchayati Raj Institutions

### Panchayati Raj Institutions:

- Panchayati Raj Institutions (PRI) are pillars of democracy.
- One of the major steps taken by the Government of India to strengthen PRI is the Panchayats (Extension to the Scheduled Areas) Act, or PESA Act 1996.
- In order to empower Gram Panchayats, it is important to empower Gram Sabhas and ensure the effective and active participation of people in Gram Sabhas.
- The 73rd Constitutional Amendment empowered the Gram Panchayats in the field of 29 subjects.
- With 6.50 lakh villages and 65% of the population living in villages, rural development is crucial for India's growth.

### Capacity Building of Panchayati Raj Institutions

- MoPR is implementing the Centrally Sponsored Scheme of Rashtriya Gram Swaraj Abhiyan (RGSA).
- Almost 1.42 crore participants including Elected Representatives, Panchayat Functionaries, and others have been trained since 2018-19.
- Approximately Rs 2150 crore have been spent under RGSA from 2018-19 to 2021-22.

### Thematic Gram Panchayat Development Plan

THEMES	AIM
Poverty-Free and Enhanced Livelihoods Village	To create avenues of enhanced income levels for the poor and cover the beneficiaries under Social Protection Scheme.
Healthy Village	To ensure healthy lives through immunization, institutional delivery, and nutrition for children
Child-Friendly Village	To attain 100% education, child labour freedom, immunization, etc
Water Sufficient Village	To ensure access to potable drinking water, rainwater harvesting, groundwater recharge, etc
Clean and Green Village	For solid and liquid waste management
Village with Self-Sufficient Infrastructure	To provide basic infrastructure facilities in villages
Socially Just and Socially Secured Villages	To improve the living standards of socially disadvantaged groups
Village with Good Governance	To ensure better public service delivery
Women Friendly Village	To ensure reduced crime against women, their participation in socio-economic and political activities

### e-Governance and ICT Initiative

- On 24 April 2020, e-Gram SWARAJ was launched to strengthen e-Governance in PRIs.
- The Ministry integrated e-GramSwaraj with PFMS and created the e-GramSwaraj PFMS interface (eGSPI) to make real-time payments to vendors/service providers.
- e-Gram SWARAJ is also being integrated with Government e-Marketplace (GeM).
- Audit Online Application has also been developed to allow an online audit of Panchayat accounts and enhance transparency and accountability.

**Conclusion:** The Ministry of Panchayati Raj has made remarkable progress to empower and ensure the self-sustainability of Panchayati Raj Institutions by converging the plans of other Ministries and with the active participation of local communities.

## 2. e-GramSwaraj

### e-GramSwaraj:

- e-GramSwaraj is a work-based comprehensive application for Panchayati Raj Institutions.
- It was launched on National Panchayati Raj Day (24th April) in 2020.
- Objectives of e-GramSwaraj include strengthening digitalisation in panchayats, improving grass-root governance empowering rural citizens, and ensuring transparency and accountability
- Benefits of e-GramSwaraj:
  - It enables Gram Panchayats to upload Gram Panchayat Development Plans (GPDP) and financial and physical work reports.
  - It facilitates online payments to material vendors and service providers.
  - It covers all aspects of the Panchayat's functioning like planning, budgeting, asset management, etc.

### Challenges for e-GramSwaraj:

- A basic prerequisite is seamless internet connectivity, which is a major challenge in rural areas.
- Acceptance of digital means by the local people is another area of concern.
- Other issues are information security, data privacy, content availability, etc.
- The devolution of powers to panchayats across states is not uniform.
- Many panchayats lack the timely availability of funds and smooth resource flow.

### Future Course of Action

- Though Common Service Centres (CSC) have been started in the country to propel e-governance, more needs to be done.
- It is important to generate awareness and train all stakeholders.
- e-GramSwaraj should be integrated with GeM.
- Continuous feedback from all the stakeholders will help in making the system more robust and dynamic.
- Moreover, accurate identification of activities, community participation, and effective implementation is of utmost importance.

## 3. Good Governance at Grassroots Level

### Introduction

- In States or Union Territories with more than two million inhabitants there are three levels of PRIs:
  - Gram Panchayat at the village level
  - Mandal Parishad or Block Samiti or Panchayat Samiti at the block level
  - Zila parishad at the district level
- As per 2019 records, there are around 6614 Block Panchayats, 630 Zila Parishad, and approximately 253163 Gram Panchayats.

### Government Initiatives

- **Gram Panchayat Development Plans:** It is a special campaign that was launched to prepare Panchayat Development Plan for economic development and social justice utilizing the available resources.
- **Rashtriya Gram Swaraj Abhiyan (RGSA):** RGSA, the 'Transformation of Aspirational Districts' was launched to bring people-propelled development at ground level.
  - It enables the Panchayats to function effectively to achieve Sustainable Development Goals and development objectives.
- **e-Panchayat:** It provides a platform for online reporting, monitoring, and management of panchayat activities. It aims to bring transparency and accountability.
- **SWAMITVA:** It aims to revolutionize property record management in the country.
- **Deen Dayal Upadhyay Panchayat Sashaktikaran Yojana (DDUPSY):** It was launched in 2014 to strengthen PRIs by providing them with the required resources and capabilities to undertake constitutional duty and aims to empower PRIs to undertake planning, implementation, and development.

## 4. SVAMITVA Scheme for Providing Property Validation

### SVAMITVA Scheme

- The aim of the scheme is to provide an integrated property validation solution for rural India for demarcating inhabitant (Abadi) land in rural areas.
- It will engage the latest drone surveying technology.
- Clear ownership of rural land will be concluded by the SVAMITVA Scheme.

### Objectives of the Scheme



### Need for SVAMITVA Scheme

- According to the Census of 2011, there are approximately 6.4 lakh villages in India.
- Most villages were surveyed during the late 19th and early 20th centuries. Thus, there is a need to update the cadastral maps and link them to the Record of Rights (RoRs).
- India loses around 1.3% of its economic growth every year due to disputed land titles.
- Due to pending litigations, various infrastructure projects are delayed. For instance, an investment of Rs 19.7 trillion was affected (as per Land Conflict Watch 2020).
- Land disputes also create a heavy burden on Judiciary.
- The disputes impact capital availability and reduce productivity.
- The Panchayats in India lack revenue resources. If the ownership of the land is clear, then the Panchayats will be able to levy property taxes.

### Challenges and Recommendations:

- Providing legal validity to the property card is the biggest challenge of the scheme.
  - To give them legal validity, it is important to list the documents requiring stamp duty payment under State Revenue Act.
- The participation of the local population in the implementation of the scheme is crucial.
  - Government can take appropriate measures to ensure this aspect.
- The implementation of the scheme requires amendment in various other state government acts.
  - States should form proper committees to review and amend laws.
- The scheme is able to identify the disputed land. However, it does not have a specific mechanism to resolve property-related issues.
  - Measures like the Model Conclusive Land Titling Act and Rules can provide desired solutions.
- Many states have not rendered enough power to the Panchayats.
  - All states should empower Panchayats with convenience and cost-effectiveness.
- Several communities are historically excluded from land ownership.
  - The rights of weak and marginalized communities should be preserved while undertaking mapping exercises.

## 5. Women Empowerment

### Status of Women's Participation:

- At the national level, women as members and presidents of Panchayats are approximately around 46% of the total elected representatives. In some states like Chattisgarh, Maharashtra, Assam, Uttarakhand, etc their share is more than 50%.
- The majority of elected representatives did not have a long-standing political linkage.
- Reservation provided the first entry into politics for 83% of women elected representatives.
- However, 43% of the elected representatives did not get the opportunity to attend training.
- It is found that states with good performance of women representatives are Kerala, Karnataka, Tripura, Maharashtra, Sikkim, and West Bengal. The states with poor performance are Odisha, Madhya Pradesh, Bihar, Arunachal Pradesh, and Gujarat.

### Recommendations to improve women participation:

- Provisions of women component plan in PRI budgets.
- PRI of all levels should be linked with Self Help Groups (SHGs) at all levels.
- Adequate training and capacity building for elected women representatives.
- Horizontal and peer-to-peer learning of best practices.
- Exposure visits and meetings.
- Political parties should support women candidates.
- Women candidates should be given the opportunity to serve the full term.
- Mahila Sabhas should be encouraged to raise women's concerns.
- Women should be mobilized in their own collectives for better results. For example, the Kudumbashree network of Kerala.
- The Panchayats should be devolved with appropriate powers and authorities for smooth functioning.

## 6. 2030 Agenda for Sustainable Development

### Details:



Source: Ministry of Panchayati Raj

- Sustainable development refers to development that meets the needs of the present needs without compromising the ability of future generations to meet their own needs.
- Beginning in January 2016, countries are expected to frame their agendas and policies to end poverty, protect the planet, and ensure peace and prosperity for all by 2030.
- In India, almost 65% of the population lives in rural areas and thus PRI has a pivotal role in the localization of SDGs.
- MoPR and UNDP signed a joint statement of understanding on the localization of SDGs.
- The twin objectives of Panchayati Raj Systems are to ensure local economic development and social justice.
- The functions of Panchayati Raj Systems are enlisted in the Eleventh Schedule of the Constitution as 29 subjects. Many SDG targets fall within the purview of these subjects.
- Panchayats were advised to integrate Village Poverty Reduction Plan(VPRP) into Gram Panchayat Development Plan (GPDP) with a view to synchronize them with SDGs.

### Role of Panchayats in Attainment of SDGs

- Convergent implementation of flagship schemes like NRLM, MGNREGS, Swachh Bharat Mission, etc.
- Participatory outcome-based planning for local development plans on social, economic, and environmental aspects.
- Specific Governance Interventions in Panchayats through the effective functioning of Standing Committees and Functional Committees of Panchayats.
- Effective convergent planning between three tiers of Panchayati Raj.
- The smooth functioning of District Planning Committees which link rural and urban planning.

## 7. Water Management through Panchayats

### Introduction:

- The National Water Policy of 2012 emphasized the involvement of local bodies in the planning of water management for better impact and efficiency.
- In the first All India Annual State Minister's Conference on Water, Prime Minister Shri Narendra Modi emphasized the importance of Gram Panchayat in water management in villages.
- Panchayats are vehicles of program implementation and localized planning.
- Similarly, Water Users Association or 'Pani Panchayat' or 'Pani Samiti' have been created for local and participatory management of surface irrigation systems.
- Gram Panchayats own and manage water supply schemes and approve investment plans, annual budget, and user fee charges after discussions with Gram Sabha.
  - The Gram Sabha is a larger community that takes key decisions like the source of water, type, and nature of the water supply scheme, etc.
  - The Gram Sabha approves village plans after discussion and deliberation.
  - It also undertakes social audits as per mandate.
- Village Water and Sanitation Committee (VWSC) is the standing committee of the Gram Panchayat. It is responsible for the planning, operation, implementation, maintenance, and management of village drinking water security.
  - VWSC comprises 6 to 12 members of which 50% are women and the rest of the members are elected from Gram Panchayat.
  - It is the responsibility of VWSC to keep track of bacterial contamination in the regular water supply.

### Water Management on Ground

- According to Central Groundwater Board, 17% of the groundwater blocks are over-exploited, 5% are at a critical, and 14% are at a semi-critical stage.
- **Atal Bhujal Yojana:** The aim of the scheme launched in April 2020 is to improve groundwater management in critical areas.
  - The scheme is operational in almost 8500 Gram Panchayats in seven states (Gujarat, Karnataka, Madhya Pradesh, Haryana, Maharashtra, Rajasthan, and Uttar Pradesh)
  - It also tries to bring behavioural change at the community level.
- The World Bank has been collaborating with the Government of India to improve groundwater management in stressed areas.
- **Pradhan Mantri Krishi Sinchayi Yojana (PMKSY):** It was launched in 2015-16 with the aim to accelerate supply-side and demand-side management.
  - It takes specific measures like increasing on-farm water use efficiency, watershed development, and Repair, Renovation, and Restoration of water bodies, etc.
- **Jal Jeevan Mission- Har Ghar Jal:** Government of India in partnership with State Governments is implementing this programme.
  - The vision is to provide a tap water supply to every rural household in the country by 2024.
  - Mission is based on the community approach and also includes Information, Education, and Communication.

### Water Users' Association (WUA)

- WUA is a cooperative association of individual water users who wish to undertake irrigation-related activities for their mutual benefit.
- They ensure an efficient and equitable supply and distribution of water along with maintenance of the irrigation system on a scientific basis.
- They cooperate with each other to form federations and take-over large canal sub-systems.
- They have a Managing Committee (MC) to look after the day-to-day functioning and monitor the progress.
  - Each MC has a President and 4 to 10 elected members.
- WUA also plays a role in the recovery of water irrigation rates from the beneficiary farmers.

## 8. Human Development through Panchayati Raj Institutions

### Role of Panchayat in Human Development

- There are 29 subjects under the 11th Schedule of the Indian Constitution. Some of these subjects are Agriculture, Irrigation and Water Management, Animal husbandry, Rural Housing, Public Distribution Systems, Fuel and Fodder, Women and Child Development.
- According to the United Nations Development Programme, Human development is defined as the “process of enlarging people’s choices”, allowing them to “lead a long and healthy life, to be educated, to enjoy a decent standard of living”, as well as “political freedom, other guaranteed human rights and various ingredients of self-respect”.
- At the rural level, the PRI system is expected to work as an institute of self-governance and play an important role in education, health, and service delivery aspects.
- The efficient delivery of targeted public services has the potential to reduce economic inequalities.
- Rural development schemes like MGNREGS and National Rural Livelihood Mission have the potential to enhance livelihood opportunities and remove poverty.
- PRI not only engages in the implementation of schemes but also ensures public participation in the development process.
- The Gram Sabha meeting can be used by some of the most disadvantaged groups of the village to raise their voice.
- Panchayat helps in improving the targeting of resources towards the needy.
- PRI creates a conducive environment for collective action and makes people aware of the ongoing and proposed work.
- Panchayats have also played a crucial role in the field of education. For instance, enrolment of children in the age group of 6-14 has shown phenomenal growth.
- Despite registering great progress in the participation of local communities in school management, a good number of children remain out of school.

### Role of Panchayats in Climate Change and Disaster Risk Reduction

- Human activities have been the main driver of climate change. Additionally, rural people are highly dependent on natural resources and ecosystem services, thus making them highly vulnerable to climate change and natural disasters.
- The active commitment and leadership of Panchayati Raj Institutions are important for local disaster risk reduction.
- PRIs have a significant role as they are the immediate providers of public services and are situated amongst rural citizens.
- They can help in public awareness, community training, and disaster preparedness.

# SCIENCE REPORTER - APRIL 2023

## 1. Health Vision 2047: Towards a Healthy India

### Introduction:

- In the past, India struggled with diseases like plague, cholera, tuberculosis, malaria, kala-azar, filariasis and several nutritional disorders.
- There was no established health ecosystem in the country and neither any institute to carry out research and develop strategies.
- The only way such issues were addressed was through surveys or enquiry commissions like the Plague Commission, Kala-azar Commission, Beri Beri Enquiry, Deficiency Disease Enquiry, Malaria Enquiry, Kala-azar Ancillary Enquiry, etc.

### Health research institutes in India:

- In 1906 the Central Research Institute (CRI), was set up in Kasauli in Himachal Pradesh to do research on important health issues and develop vaccines.
- The Plague Research Laboratories were set up in Mumbai and Pasteur Institutes at Kasauli, Coonoor, and Shillong were also established. The King Institute of Preventive Medicine and Research at Guindy was also among them.
- Indian Research Fund Association (IRFA) was set up in 1911.
- After Independence, the mandate of the IRFA was changed and it was renamed as the Indian Council of Medical Research (ICMR).
- The Nutrition Research Laboratory was set up in Coonoor in 1918. Now known as the National Institute of Nutrition, the Institute did tremendous work in the area of nutrition, protein energy malnutrition and the nutritive value of Indian foods.

### How these institutes helped

- The country has been able to eliminate diseases like smallpox, polio, guinea worm and neonatal tetanus.
- Diseases like tuberculosis, leprosy, lymphatic filariasis, kala-azar and malaria have been brought to a significantly low level and are now being targeted for elimination.
- Significant progress has been made in the area of virology and managing outbreaks and epidemics.
- The country is equipped with a BSL-4 lab and a pan-India network of Viral Diagnostics Laboratories (VRDLs). This has helped in quick investigations including the isolation of viruses and the development of diagnostics and vaccines.

### Health Research - Vision 2047

- Over the coming decades, health research has the potential to greatly enhance global health outcomes.
- By 2047, we can anticipate significant gains in public health thanks to focused scientific efforts and technological advancements.
- This might entail a better comprehension of how various illnesses operate, improved therapies for current ailments, and creative preventative methods that might stop the spread of serious illnesses.
- With data-driven insights becoming more readily available, we might see a rise in personalised medicine techniques.

### Pandemic preparedness

- The primary area of research is pandemic preparedness.
- Research efforts will focus on finding new vaccinations, treatments, and techniques to effectively respond to any future outbreaks of illnesses.
- To stop the spread of infectious diseases, more public health measures including awareness campaigns and early warning systems need to be put in place.
- Finally, for healthcare professionals to deliver healthcare more effectively during times of crisis, investments in infrastructure upgrades are of prime importance.

### Measures needed

- Research needs to be done on applying artificial intelligence to model and predict pandemic outbreaks in order to be ready for upcoming pandemics.
- Provisions have also been made in the budget to decentralise the load on the National Institute of Virology, Pune through the establishment of four regional national institutes of virology in four regions of the country.
- Mission mode research on communicable & non-communicable diseases is another area that needs attention.
- For communicable diseases, the existing TB Research Consortium and Malaria Elimination Research Alliance (MERA) India are steering forward the elimination agenda

### Delivery gaps

- India's future vision is to eliminate TB, Malaria, Filariasis, Kala-azar, and Leprosy.
- Delivery of healthcare services towards Universal Health Coverage is another vital area that needs to be worked upon to realise the dream of a Healthy India by 2047.
- To further address the delivery gaps, innovations for better organisation of health service delivery, improved IT connectivity between sub-centres, health and wellness centres, PHCs, CHCs and District Hospitals, use of technology like telemedicine, Artificial Intelligence (AI), etc. are of prime importance.

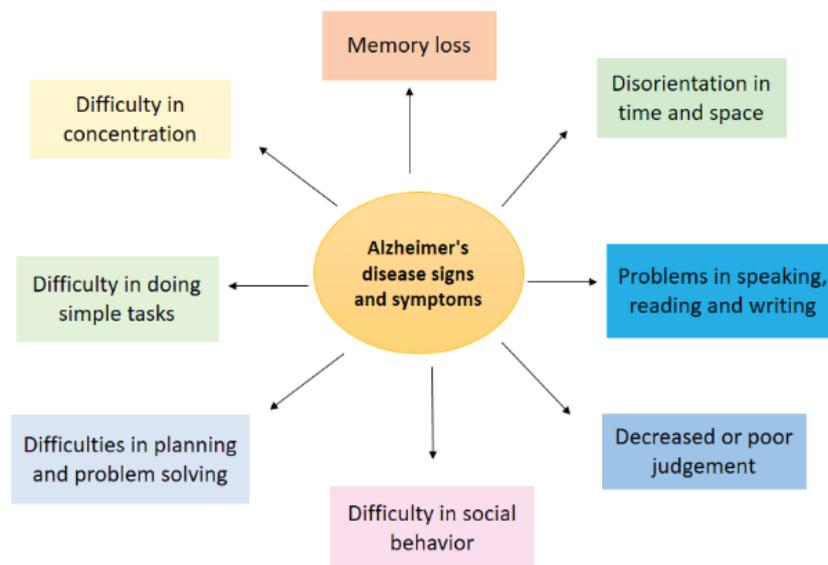
**Conclusion:** With technological advancements, treatments and diagnostics will become more specialised and precise, enabling better and more affordable care. The Health Vision 2047 aims to guarantee a healthy and prosperous future by cooperating and exchanging knowledge.

## 2. Spotlight on Alzheimer's and Dementia

**Introduction:** Alzheimer's disease is a neurological condition that gradually impairs an individual's ability to remember things, think rationally, and perform cognitive tasks.

### Alzheimer's disease

- It is a chronic condition that progresses and worsens over time eventually making the patient incapable of carrying out basic daily tasks.
- The destruction and damage of neurons (brain nerve cells) in the brain are what cause the weakening of memory and cognitive abilities.
- Memory-related regions of the brain (hippocampus entorhinal cortex), initially suffer damage.
- Subsequently, it impacts parts of the cerebral cortex that are involved in language, thinking, and socialising. Other parts of the brain eventually suffer harm as well

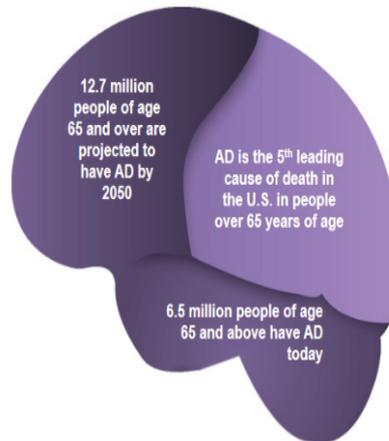


Source: Science Reporter

### Alzheimer's versus Dementia

- Despite being used interchangeably, Alzheimer's disease and Dementia are not the same.
- Dementia generally refers to a state of cognitive decline that is severe enough to limit one's daily life activities.
- At least two-thirds of dementia cases in people over 65 years old are brought on by AD, the most prevalent form of dementia.
- Someone with AD can exhibit dementia-like symptoms, which is known as Alzheimer's dementia. But not all dementia patients have AD.

## Prevalence



Source: Science Reporter

- Age is the major risk factor of Alzheimer's disease as the prevalence of the disease increases with age.
- A prevalence of 5% is seen among people in the age group of 65-74 years, a 13% incidence is observed among people aged between 75- 84 years, and a 33% incidence is observed in individuals over the age of 85 years.

### Causes of Alzheimer's Disease

- There is no conclusively determined cause of Alzheimer's disease till now. However, it is hypothesized that it may be due to genetic, environmental or lifestyle factors.
- Alzheimer's disease has also been linked to conditions including high blood pressure, heart disease, stroke, diabetes, obesity, etc.

### Diagnosis

#### Clinicians usually diagnose Alzheimer's disease using the following tools:

- Through medical history or present health state of the patient.
- Personality and behavioural changes in the patient.
- Cognitive tests that require memory, problem-solving, etc., for example, mini mental state examination (MMSE).
- Standard medical tests (urine and blood tests) to eliminate other reasons.
- Brain imaging techniques like Computed Tomography (CT), magnetic resonance imaging (MRI), or Positron Emission Tomography (PET).

#### What occurs within the brain?

- Beta-amyloid and tau protein are the two proteins involved. These proteins are normally found in a normal brain.
- However, with Alzheimer's disease, abnormal protein buildup causes brain inflammation, loss of cell signalling, and ultimately cell death.
- Another protein, tau, also plays a role in the disease. Normally, neurons have a lot of this tau protein, which helps to keep the axon stable. Tau protein clumps together inside neurons to produce neurofibrillary tangles or tau tangles in Alzheimer's disease.
- Alzheimer's disease is characterized by the development of tau tangles and amyloid plaques. Both of these aggregates can be seen in the brain autopsy of an Alzheimer's patient.

### Alzheimer's Disease Management

- Alzheimer's disease cannot be completely cured, although its symptoms can be managed.
- Herbal methods: Chemical components in herbal plants have been shown to help with depression, Alzheimer's disease symptoms, memory loss, and other cognitive decline.
- These include medicinal herbs such as Ashwagandha (*Withania somnifera*), Brahmi (*Bacopa monnieri*), Gotu Kola (*Centella asiatica*), Vacha (*Acorus calamus*), Shankhpushpi (*Evolvulus alsinoides*), Amalaki (*Phyllanthus emblica*), Guduchi (*Tinospora cordifolia*), Guggulu (*Commiphora wightii*), Yashtimadhu (Licorice).

### 3. Normalise Mental Health

#### Introduction:

- It is about time that we as a society started to normalise the expression of grief and to destigmatize the seeking of help
- We are dependent on random acts of kindness by many, many people. This means we should definitely allow people to ask for help.

#### Online resources available for mental health support for people in India

- **The National Institute of Mental Health and Neuro Sciences (NIMHANS)** provides a range of mental health services, including online consultations, through its website and telemedicine platform.
- **The Mpower Minds Foundation** is a non-profit organisation that provides mental health support and resources, including online counselling and therapy services.
- **The Manas Foundation** is a mental health organisation that provides a range of services, including online counselling and therapy, through its website and app.
- **The Indian Association for Child and Adolescent Mental Health** is a professional organisation that provides resources and support for child and adolescent mental health, including a directory of mental health professionals and information on various mental health conditions.
- **The Indian Psychiatry Society** is a professional organisation that provides resources and support for mental health professionals and individuals seeking mental health care.

#### Mental health helplines available in India

- **Manasthali helpline:** Run by the Manasthali organisation, provides support and counselling for women and girls experiencing mental health issues.
- **National Institute of Mental Health and Neurosciences (NIMHANS) helpline:** Run by NIMHANS in Bangalore, provides support and information for people experiencing mental health issues and is available 24/7.
- **Sneha Suicide Prevention Center:** Run by the Sneha organisation, provides support and counselling for people experiencing suicidal thoughts or in crisis.
- **AASRA:** Run by the AASRA organisation, provides support and counselling for people experiencing mental health issues and suicidal thoughts.

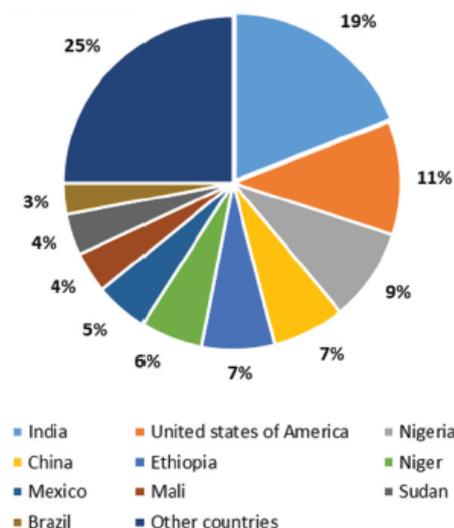
**Conclusion:** It is important to note, however, that these resources are provided for informational purposes only and are not a substitute for professional medical advice, diagnosis, or treatment. If you are in crisis or experiencing a mental health emergency, please seek help immediately.

### 4. Millets for the Future: CSIR-CFTRI's Trailblazing Research, Technologies & Products

#### Introduction:

- Millets are a diverse group of small, dryland cereals that include sorghum, pearl millet, finger, foxtail, little, kodo, barnyard, brown top millet, among others.
- Millets are primarily grown in Asia and Africa, with India being the top producer.
- Millets were among the first plants to be domesticated and still serve as a traditional staple crop and are thus named as ancient grains.

#### Millets in India



Source: Science Reporter

- India is the world's largest producer of millets accounting for around 19% of total worldwide output
- Rajasthan, Karnataka, Maharashtra, Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Tamil Nadu, Andhra Pradesh and Uttarakhand are the major millet-producing states in India. Today, these 10 states account for around 98 per cent of millets output in India.

### Millets as Nutri cereals

- Millets are gaining popularity due to their unique nutritional profile and their ability to control and ameliorate lifestyle diseases like diabetes, cardiovascular diseases, certain types of cancer, etc.
- As whole grains, millets are a good source of essential nutrients.
- Millets have superior nutritional value compared to cereals such as rice, wheat and maize, owing to their bio-macromolecules and phytochemicals.
- Millets along with a few more grains are aptly referred to as "Nutri cereals".

### Global Significance of Millets

- Millets can grow on arid lands with minimal inputs. These crops have demonstrated climate resilience and adaptability.
- As affordable foods that can contribute to healthy diets and a healthy environment, these climate-smart grains offer great opportunities for strengthening food security, nutrition security and bolstering economic growth.

### Bottlenecks limiting the widespread popularisation and consumption of millets:

- Non-availability of dedicated machinery for primary and
- secondary processing
- Limited shelf life
- Lack of convenience products – either all-millet or millet
- composites
- Storage/packaging solutions
- Scientific studies to prove the health benefits of millets
- Standard product specifications

### CSIR Promoting Millets

- The Mysuru-based CSIR-Central Food Technological Research Institute (CSIR-CFTRI) has for the last seven decades worked extensively on issues related to the value addition of millets, machinery for primary/secondary processing and basic studies supporting translational research.
- This has helped create a niche with a large number of technologies for the benefit of MSMEs.
- The Institute holds a portfolio of over 40 technologies in the area of millet processing and product development, which are transferred to the industries.

### Benefits of millets

- The favourable nutritional and functional properties of millet flours could be exploited for the development of gluten-free food products.
- Inhibitory activities observed in foxtail and little millet against enzymes associated with diabetes suggested that millets may have a clear benefit of lowering glucose to prevent or retard the progression of microvascular complications associated with diabetes.
- Finger, foxtail and little millet phenolics were shown to inhibit key enzymes relevant to hyperglycemia and hypertension.
- A novel fungal fermented food, termed Trilambija, made from a mixture of three proso, kodo and pearl millets, is a potential food supplement against inflammation and diabetes.

### Millet Technologies

- **Malted weaning food:** Weaning period (6 months to 2-3 years of age) is an important part of a child's life. The malted weaning food is a ready-to-cook ragi and green gram based product in powder form.
- **Decorticated ragi:** Finger millet or ragi has an outer seed coat which is coloured and fibrous in nature and affects the eating qualities of the product. These limitations have been overcome by adopting a process that removes the seed coat. The decorticated ragi cooks within 5 min. in boiling water and the grains retain their shape with soft texture even after cooking.
- **Ragi rusk:** A rusk is a hard, dry biscuit or twice-baked bread. It is sometimes used as a baby teething food.
- **Convenience Flour for Mudde:** The convenience flour is suitable for preparation of stiff porridge (mudde).
- **Instant Beverage from Ragi:** Beverages are a class of convenient foods, which are either in ready-to-drink form or in powder form, and can easily be reconstituted with milk or water before consumption.
- **Malted Ragi Flour-Enzyme Rich:** Malted ragi flour can be used in preparation of weaning food, infant food, geriatric food, medical foods and also as milk based as well as alcoholic beverage formulations.
- **Husk-free flour from small millets:** The present milling system for the dehusking of millet is not efficient to provide 100% dehusking, which results in the presence of unhusked grain in husked grain.

### Conclusion:

- Centre of Excellence (CoE) on Millets CSIR-CFTRI is also setting up a Centre of Excellence (CoE) under the Rashtriya Kisan Vikas Yojana (RKVY) dedicated to millet processing and product development.
- The Institute is collaborating with the Indian Institute of Millets Research (IIMR), Hyderabad for meeting the varied objectives intended to boost the export potential of millet-based products with funding from APEDA.

# DOWN TO EARTH - APRIL 2023

## 1. Deep unknown

### Introduction:

- The Earth's core works as an engine to generate heat for natural processes and produce the planet's magnetism.
- The innermost layer of the Earth is slowly turning solid, and as it does, it radiates heat that generates a magnetic field which rises to surround and protect the planet

### Why is it difficult to conduct physical studies of the core?

- The deepest hole drilled into the planet's surface is just 12.2 km (more on this later). Human bones could turn into dust at depths of 200 km.
- The base of the crust has a temperature of around 1,000°C, the bottom of the mantle is 3,000°C and the core is about 6,000°C.
- The pressure can range from 24-136 gigapascals (1 gigapascal or GPa is 1 billion pascals) in the lower mantle to 135-330 GPa in the outer core and 330-365 GPa in the inner core.
- Humans can only withstand up to a few thousand KPa (1 kilopascal or KPa is 0.012 GPa).

### Super-rotation of the core

- In a January 2023 study, researchers hypothesised that the inner core is spinning independent of the planet—it sometimes rotates faster and other times slower than the rest of the planet.
- From the late 1970s to the early 2000s, the inner, solidifying layer of the core spun 0.1 degree per year faster than the rest of the planet. This is called super-rotation.
- Further, in their study published in Nature Geosciences, they say the inner core slowed in the mid-2000s and then decelerated further; this is called sub-rotation.

### Innermost inner core

- The other study confirms the existence of another layer within the inner core, called the innermost inner core.
- the existence of the innermost inner core, which they estimate has a radius of around 650 km, after they observed that the waves slow in different directions here than the rest of the inner core.
- They suggest that this may be due to the varied arrangement of iron atoms near the centre of the core.
- The inner core's independent spin could be enabled by the liquid in the outer core. The core is largely made of iron and nickel, along with light elements like sulphur and oxygen.
- The metals are in solid form in the inner core and liquid in the outer layer. "The inner sphere experiences low friction against the surrounding fluid, generating a wobble or a spin,"

### The core is crucial for the study of the Earth's geodynamics because:

- The inner core was discovered in 1929, by Danish seismologist Inge Lehmann.
- Given its importance in the Earth's natural processes, scientists deem it crucial to understand the planet's evolution.
- The Earth has not always been in its current form. It was formed 4.5 billion years ago as an ocean of molten rocks with temperatures as high as 1,982 degrees C, according to the US National Oceanic and Atmospheric Administration.
- Over time, the Earth cooled, pushing heavy materials like iron to the bottom to form the core. Lighter silica-rich elements reached the surface, creating the crust. The remaining materials, such as magnesium and silicates, formed the mantle in between the crust and the core.
- Solidification of the inner core drives the Earth's dynamo, or the process by which the core's radiating heat gives rise to magnetism. The inner core is currently solidifying at a radius of roughly 1 mm each year.
- The outer core, composed of liquid iron, moves by sourcing heat released from solidification and generates electric currents. The motion of the currents coupled with the Earth's rotation converts the electric field to a magnetic field.
- Light elements such as hydrogen, silicon, oxygen, carbon and sulphur also act as energy sources when pushed into the outer liquid core during solidification.

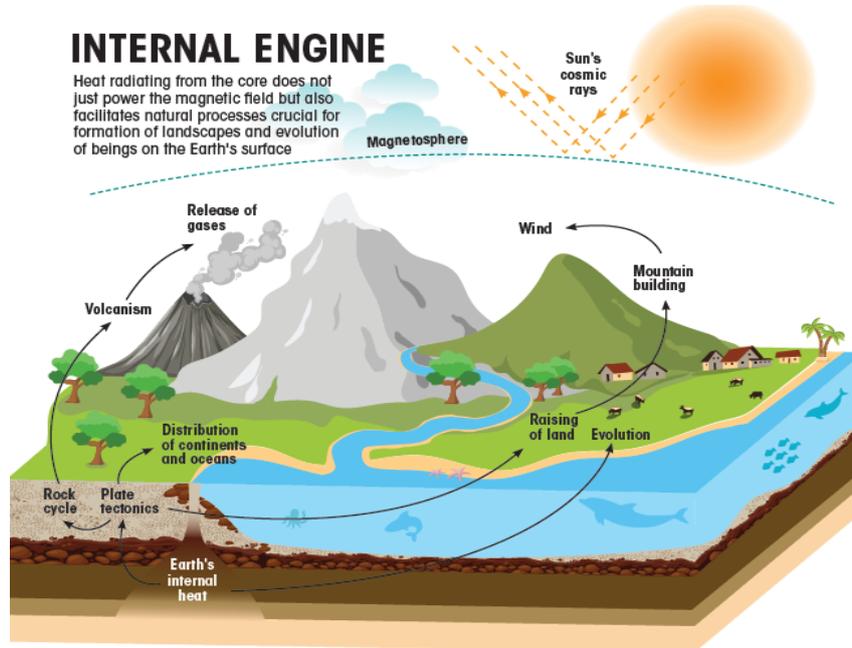
### Relevance of core:

- The core's heat also powers plate tectonics in the crust and the mantle, whose movements create and reshape landscapes, mountains and volcanoes.
- Volcanic eruptions release carbon dioxide, regulating atmospheric greenhouse gas concentrations and surface temperatures.
- The gas returns to the Earth's interior at subduction zones, where a tectonic plate sinks below an adjoining one. This cycle is believed to have created the atmosphere, oceans,
- continents and conditions for life. Also at subduction zones, surface-bound water moves to the interior, probably reaching the core-mantle boundary. It returns to the surface during volcanic activities.

### The weakening magnetic field of the earth

- Over the last 200 years, the Earth has lost around 9 per cent of its magnetic strength, as per the European Space Agency.
- A weakening magnetic field foreshadows a reversal event, where the magnetic north and south poles switch places. This can affect human and animal lives, and disrupt satellites and other mechanisms.
- The last reversal was 772,000-774,000 years ago. Since then, there were 15 instances when the magnetic field drastically dropped but did not reach the point of reversal.
- Some 40,000 years ago, a major dip in the field led to the Earth being battered by ultraviolet rays, says a 2021 paper in Science. This period erased Neanderthals and giant animals.

### Impact of Human Activities



Source: DownToEarth

- Earth is losing its heat. Along with the core, energy also escapes from the decay of radioactive elements like potassium and uranium in the mantle and crust.
- Human activities are accelerating the process. Fossil fuels below the Earth's surface like coal, gas and oil act as insulators and prevent heat in the interior from escaping.
- But when these are extracted, water, a less efficient insulator, takes its place. As a result, more heat reaches the surface.
- Regions with high extraction like Saudi Arabia, the Arabian Gulf, the Gulf of Mexico, the North Sea and Alaska, reported 3-6 times higher warming rates than the global average

**Conclusion:** It is evident that the layers of the Earth contain several such clues about the state of the planet. They help scientists study earthquakes, volcanic eruptions, microbial life, past climate, the planet's evolution and other processes.

## 2. Ganga Pollution

### Introduction:

- The Namami Gange Programme has been able to reduce the pollution load in the Ganga River.
- Since 2014, the Centre had taken up 409 projects with a budget outlay of ₹32,912.40 crore to clean up the river.
- Still, at least 71 per cent of the river's monitoring stations reported alarming levels of faecal coliform in January 2023.

### Faecal coliforms

- Faecal coliforms are a group of bacteria found in the gut and faeces of warm-blooded animals.
- Their presence indicates that the water has been contaminated with the faecal material of humans or other animals, which enters rivers through the discharge of untreated sewage.

### Progress

- In January, India tested water samples from 59 of the 97 monitoring stations of Ganga. At least 42 of them had high levels of faecal coliform, which shows untreated sewage.

### How pollution level is monitored

- CPCB currently carries out manual monitoring for five parameters, including faecal coliform.
- In 2022, the river had permissible levels for two of the parameters: dissolved oxygen and acidic or pH levels. Dissolved oxygen shows the amount of oxygen available to living aquatic organisms and pH levels determine which aquatic life can use the water.
- The five parameters monitored at present are part of the notified Environment (Protection) Amendment Rules, 2000.

### Challenges

- At a time when the Centre is focusing on cleaning up the Ganga, data collection and dissemination remain challenging.
- Due to software limitations, only monthly data is made public.

### Conclusion:

- The current monitoring mechanism needs to be more ambitious.
- The Centre released of two guidelines in 2007 and 2017 which recommended 25 parameters for perineal rivers. As the guidelines were never notified, they were partially implemented, leaving out the suggestion for more parameters that is crucial for understanding the true health of rivers

## 3. Banking on tradition

### Introduction:

- Odisha's Kondh tribe introduces a seed festival and bank to facilitate the use of indigenous varieties and traditional farming to overcome crop loss
- The festival is called Bihan Mela, literally the seed festival, the event is participated by farmers from as many as 40 villages in Dasapalla block, surrounded by hills and forests.

### Bihan Mela

- Preparations begin as soon as farmers have harvested Kharif crops, which include both hybrid and indigenous varieties of paddy, millets, maize and sorghum.
- Women are at the helm of this festival. They carefully collect seeds of the indigenous varieties and store them in earthen pots.
- Then, on a designated day in December, they decorate the pots with red and white motifs, place them in a bamboo basket and carry it on the head to the village where the fair is being organised.
- Along the way, they are accompanied by men beating drums and other traditional instruments.
- The fair mimics a traditional market where farmers used to exchange seeds.

### Relevance

- Farmers in the region are mostly marginal and depend on the monsoon rains.
- In recent years, they have seen repeated crop failures either due to erratic rainfall or pest attacks.
- Since the Green Revolution, farmers in the region have abandoned native crops and varieties that are naturally resistant to pests and better suited to the region's climate.
- Monoculture has not only affected their food and nutritional security but also degraded the soil and made the farmers more vulnerable to crop loss.
- The seed festival was thus introduced to help farmers return to their traditional ways of farming like mixed cropping,

### The seed bank

- The farmers have to return double the quantity of seeds or two different seed varieties within the first year of cultivation.
- The bank boasts 62 varieties of paddy, four varieties of millets, five varieties of pulses and eight vegetables.
- The bank is open to all Kondh farmers and has benefitted 750 families.

## 4. Rough Waters ahead

### Introduction:

- Rapid intensification and unpredictable movement of tropical cyclones in recent years may form a template for future storm systems.
- The UN Intergovernmental Panel on Climate Change (IPCC) warns of this in its Synthesis Report. The report notes "intensification of tropical cyclones and/or extratropical storms" due to global warming

### Recent cyclones

- Cyclone Freddy battered six African countries for over two weeks.
- The cyclone led to 400 deaths and mass displacement in Malawi, Madagascar and Mozambique and torrential rains in Zimbabwe, Mauritius and Réunion.

### Rapid intensification

- Freddy saw the highest ever accumulated cyclone energy including the most rapid intensifications (wind speed gains of over 55 km per hour in 24 hours) at seven and peak wind speeds of 65 km per hour for 22 days.
- Freddy's unique behaviour may be due to exposure to warmer waters in the southern Indian Ocean.
- Typically, a tropical cyclone passing over an ocean churns up the surface and brings the colder water from the sub-surface to the surface.
- Colder water is not as conducive to a storm's intensification and leads to its dissipation.
- But Freddy saw warm water at both the surface and sub-surface.

Other cyclones in the Indian Ocean region

### TURBULENT TREND

Cyclones in the northern Indian Ocean have also been exhibiting extreme behaviour and breaking records in the past few years

NAME	RAPID INTENSIFICATION	PEAK WIND SPEED	TOTAL ACCUMULATED CYCLONE ENERGY (ACE)*
Cyclone Ockhi (November 29-December 5, 2017)	From a depression (31-49 km/hr) to a cyclone (62-88 km/hr) in 9 hours and to a very severe cyclone in 24 hours	157 km/hr	9.29 (2.5 times higher than the average for Arabian Sea)
Cyclone Fani (April 25-May 5, 2019)	From a cyclone (84 km/hr) to an extremely severe cyclone (176 km/hr) in just over 24 hours	215 km/hr	16.72 (around 2 times the average for Bay of Bengal)
Cyclone Amphan (May 13-21, 2020)	From a severe cyclone (93 km/hr) to a super cyclone (240 km/hr) in some 24 hours	240-250 km/hr (IMD*), 270 km/hr (JTWC*)	15.45 (around 2 times the average for Bay of Bengal)
Cyclone Gulab/ Cyclone Shaheen (September 24-October 4, 2021)	Shaheen intensified from depression (46 km/hr) to severe cyclone (102 km/hr) in around 24 hours	112 km/hr	0.9325 (Gulab) 3.97 (Shaheen)

Source: DownToEarth

- In November 2017, the Lakshadweep Sea in the northern Indian Ocean region saw its first severe cyclone since 1925. Cyclone Ockhi, which rapidly intensified twice, moved in a circuitous path from southern India to areas along the western coast over seven days, s
- Cyclone Gulab, formed in September 2021. After hitting parts of Andhra Pradesh and Odisha, the cyclone tracked across central India and entered the Arabian Sea, where intensified into cyclone Shaheen and hit West Asia. This was the first time in 40 years such a track was seen in the region.
- In 2019, cyclone Fani in the Bay of Bengal had one of the longest tracks at 3,176 km and intensified from a cyclone to an extremely severe cyclone between the afternoon of April 29 and the evening of April 30.
- The strongest cyclone recorded in this region, Amphan, which formed in May 2020 had also intensified in just 24 hours.
- Rapid intensification of both Fani and Amphan was due to warmer-than-normal sea surface waters

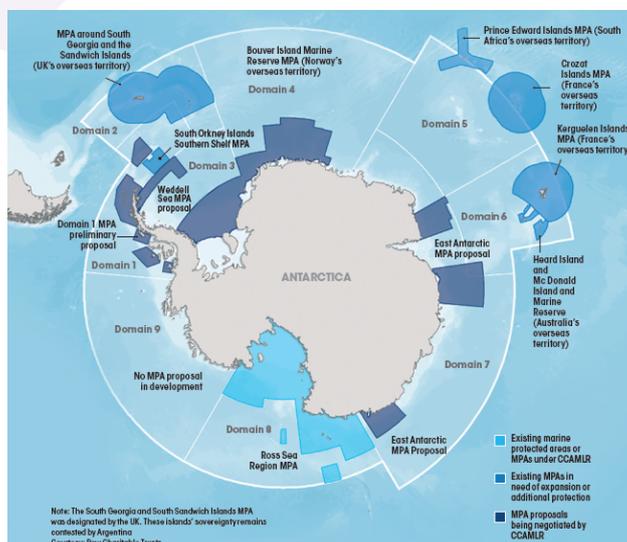
**Conclusion:**

- The global ocean heat content is at its maximum level, according to the WMO “State of the Global Climate in 2021” report.
- 90 per cent of warmth generated by anthropogenic emissions is absorbed by oceans.
- This warming will continue and would be irreversible for hundreds or even thousands of years.

**5. The last frontier**

**Introduction:**

- Growing commercial interest in the Southern Ocean’s resources thwarts protection efforts around Antarctica



Source: DownToEarth

### Global warming

- Since 1950, the Antarctic Peninsula has warmed by almost 3°C—the highest in Southern Hemisphere.
- The dwindling pack ice around Antarctica now poses a serious challenge for its delicate ecosystem where land and ocean are tightly linked.

### Conservation of Antarctic Marine Living Resources

- In 2009, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), an international treaty to manage fisheries, and preserve species diversity and stability of the region's marine ecosystem, pledged to designate a network of marine protected areas (MPA) by 2012.
- It divided the region's high seas into nine planning domains. Countries that wish to set up MPAs in these high seas, submit a proposal to CCAMLR, which then uses evidence-based science to identify areas that require additional protection and establishes it following consensus among its 27 member nations.
- CCAMLR which typically meets in October every year where its members hold discussions on MPAs, management and conservation measures

### Antarctic krill

- The Southern Ocean has the highest concentration of Antarctic krill, a tiny shrimplike crustacean that forms the base of the Antarctic food chain.
- From whales to seals and penguins, every animal species in Antarctica depends directly or indirectly on krill for survival.
- But this heavy reliance on a single species makes the Antarctic ecosystem fragile.

### Challenges:

- The differences among ccamlr's member nations stem from the fact that the region is home to abundant natural resources, from minerals to marine life
- commercial fishing of Antarctic krill has increased. Krills are highly prized as fish feed. Chile, South Korea and Ukraine are heavily involved in krill fishing.
- Not all countries are convinced about setting up MPAs in the Southern Ocean. At the annual meetings of CCAMLR, China and Russia have blocked the proposals questioning the need for the protection to organisms that are not threatened.
- Those opposing MPAs have also voiced concerns that countries proposing MPAs might use it as a front to secure sovereign control over Antarctic waters.

**Conclusion:** MPAs under CCAMLR may gain traction during the G20 meeting, which will be held between September 9-10, 2023, under the presidency of India.

## 6. Mined TO Destruction

### Introduction:

- Sand is the second most exploited resource after water and the most mined material globally, as per the UN Environment Programme.
- Its extraction from riverbeds is often done without regard to the adverse impact on natural river ecology. In India, sand mining grew as a large and, in many cases, illegal industry after the rapid urbanisation brought on by economic liberalisation in the 1990s.
- While the country has sand mining laws in place, a lack of proper implementation and monitoring means that the riverbeds are constantly threatened.

### Rivers across India with a massive scale of ecological degradation due to sand mining

#### KEN, BANDA DISTRICT, UTTAR PRADESH

- The Ken, which originates in Madhya Pradesh, also passes through Uttar Pradesh and merges with the Yamuna in the Banda district.
- Here sand mining is marked along a nearly 5 km stretch through the presence of trucks, earthmovers and bunds that disrupt the river's natural flow.
- The resultant ecological imbalance and environmental pollution, such as the release of toxins from the damaged river bed, are grounds for premature termination of mining leases, as per state law.

#### SON, ROHTAS DISTRICT, BIHAR

- Along with ecological impacts, unregulated sand mining can also threaten structures like bridges and railway tracks. Excessive excavation near them can lead to uncontrolled water that weakens the stability of the structures.

#### YAMUNA, YAMUNA NAGAR DISTRICT, HARYANA

- Haryana's mining laws say that no operations are allowed "up to a distance of five times the span of a bridge on the up-stream side and ten times the span of such bridge on the down-stream side".
- However, analysis of satellite images indicates artificial bunds along the region that is to be out of bounds.

### KATHAJODI, CUTTACK DISTRICT, ODISHA

- Banks of the Kathajodi River, a tributary of the Mahanadi, in Odisha's Cuttack, show signs of excessive mining
- Odisha's law says sand mining projects should take "structural parameters" into account when excavating near hydrological structures.
- The state, however, does not elaborate on what these parameters are, nor does it specify the distance that needs to be kept between mining projects and structures.

### NARMADA, SEHORE DISTRICT, MADHYA PRADESH

- Madhya Pradesh has banned mechanised sand mining operations, including the use of earthmovers, along the Narmada.
- The total mining area in this image spans over 50 hectares, which means clearance for projects here, must come from the Union Ministry of Environment, Forest and Climate Change, as per the Environmental Impact Assessment Notification, 2006.
- However, publicly available details of projects in this area show clearances were given by the state—a violation of central law.

### HOOGHLY, HOOGHLY DISTRICT, WEST BENGAL

- Sand mining disrupts the natural state of rivers in several ways. For instance, through the use of equipment such as suction pumps, which extract large amounts of sand from the riverbed, releasing toxins from under the riverbed into the aquatic food chain and potentially destroying the entire ecosystem.

### CHAMBAL, MORENA DISTRICT, MADHYA PRADESH

- The National Chambal Sanctuary is a protected area along the Chambal River, comprising parts of Rajasthan, Madhya Pradesh and Uttar Pradesh.
- Mining in the sanctuary has been in the news for creating ecological havoc for the gharials and turtles that live in the sanctuary

## 7. Fatal coincidence

### Introduction:

- Forest fire season in Uttarakhand coincides with the flowering and breeding months of several vulnerable species, many of them native to the Himalayas

### Forest fires in Uttarakhand

- Forest fires are becoming more frequent and fierce in Uttarakhand.
- Such regular burnings can be catastrophic for the state as well as the rich biodiversity it harbours.

### Threatened species in Uttarakhand

#### WILDFIRE V WILDLIFE

Animals that breed in forest fire season

Species	Breeding season	Degree of threat
Asian elephant	Year-round	Endangered, Schedule-I*
Tiger	April-November	
Common leopard	May	
Sloth bear	June	Vulnerable, Schedule-I
Cheer pheasant	April to June	
Bristled grassbird	May-September	Vulnerable
Great hornbill	January-April	Near threatened, Schedule-I
Laggar falcon	January-May	
Himalayan monal	April-June	
Kalij pheasant	April-June	Schedule-I
Indian peafowl	April-September	
Western tragopan	May-June	Vulnerable, Schedule-I
Satyr tragopan	May-June	Near Threatened, Schedule-I

\*Species protected under Schedule I of Wildlife Protection Act

Source: DownToEarth

- Uttarakhand is home to at least 102 species of mammals, 70 reptiles, 19 amphibians, and 124 species of fish. The state also boasts of 600 species of birds.
- The International Union for Conservation of Nature (IUCN) classifies 55 of the bird species as "threatened", of which six are critically endangered and four are endangered.

- Several mammalian fauna found in the state are also classified as endangered.
- The list includes the Asian elephant, tiger, Alpine musk deer, Himalayan musk deer, leopard, snow leopard, blue sheep, Himalayan Thar, leopard cat, Himalayan black bear, sloth bear and pangolin. With 7,000 species of plants, Uttarakhand contributes 31 per cent of the country's floral diversity.
- As many as 119 flowering plants are endemic to the state.
- The impact of recurrent forest fires in Uttarakhand is therefore not limited to the direct loss of trees and wildlife, their displacement and subsequent colonisation of unwanted species.

#### Impact of forest fires on Wildlife

- Forest fires can meddle with the life cycle of species and push many of the threatened and endemic species closer to extinction.
- A forest fire can significantly reduce the photosynthetic activity of surviving trees and thereby affect their growth. It can also damage the seed bank, both above and below the ground, and wipe out the seedlings and saplings growing on the forest floor.
- Species that are sparsely distributed and have small or patchy populations suffer the worst impacts as they lose their habitat, territories, shelter and food.
- The loss of keystone organisms in forest ecosystems, such as invertebrates, pollinators, and decomposers, can significantly slow the recovery rate of the forest.
- Forest fires can also interfere with the reproduction and propagation of certain plants and animals. Such recurrent events can be deadly to the species that are native or endemic to the region.
- A forest fire can damage its mature fruits and hinder fruiting. Researchers have already recorded scarce germination of the plant because of forest fires.
- Wildlife also has a specific breeding season and forest fires can influence the integrity of breeding pairs in the long run.

#### Measures to be taken:

- **Collect fuel load in time:** Pine needle and dry leaf litter are the common fire materials that occur on the forest floor. These should be cleared by collecting them before January when the fire season begins in Uttarakhand.
- **Fix fire line:** The creation of a fire line is often delayed in Uttarakhand. This pattern needs to be changed and a timely (before February) excavation of the fire line should be ensured. Since the forest department faces a shortage of human resources, local people can engage in this work.
- **Install fire watch towers:** There is an urgent need for these towers in this hilly state with undulating topography, especially in areas that have a history of a forest fire. They can help monitor forests during the fire season.
- **Compensatory fodder:** People who depend on livestock often ignite fires for better regeneration of grasses. The government can dissuade them from doing so by supplying compensatory fodder.
- **Ex-situ conservation:** The forests of Uttarakhand are home to several high-value and threatened plant species. They can be conserved by growing them outside forest areas such as mass seedling production sites and nurseries. People can also be encouraged to cultivate these plant species in their gardens.

**Conclusion:** There is also an urgent need to understand management techniques such as promoting habitat-specific research to limit burning, especially in biodiversity-rich and water supply areas; for long-term monitoring programmes covering more than two burns; and establish a well-equipped centre for unbiased dissemination of information

## 8. Revival of a tradition

**Introduction:** Rajasthan communities restore pastureland to ease impacts of fodder crisis in livestock farming

**Fodder crisis:** At a time when dairy farmers across the country are struggling to keep their businesses afloat in the face of steady inflation in fodder prices and severe shortage in fodder availability, animal husbandry continues to be a profitable proposition in the semi-arid region of Rajasthan

#### Measures done in Udaipur and Bhilwara districts

- Farmers overcome the fodder crisis by reviving and managing the shamlat or village common land
- The households in the village came together to set up a "pasture development and management committee"
- As a first step, the committee fenced the patch and planted 2,500 saplings of local tree species such as neem
- The next step was to build loose boulder check dams to harvest rainwater and to ensure that the hilly terrain retains moisture.
- In 2019, the committee allowed harvesting of the fodder grass, but only one person from each household was given the permit to check overharvesting.

## Benefits

## Profitable turnaround

Efforts to revive pastures on village common land helped Rajasthan residents significantly improve income and inspire others

	BEFORE PASTURE REVIVAL	AFTER PASTURE REVIVAL
<b>Boojh village</b>		
Fodder availability	Most households used to buy 700-1,000 bundles of fodder from market at ₹7 per bundle (1.5-2 kg)	By protecting 29 hectares (ha) of pastureland, households now buy only 120-150 bundles of fodder from the market at ₹10 per bundle. Households are fodder secure even in years of deficit rainfall
Livelihood and community	200 goats or sheep reared	300 goats or sheep reared; at least 25 villages around Boojh have replicated the model
<b>Tirol village</b>		
Fodder availability	52% of the 317 households had to purchase fodder from market in peak summers (March to June)	About 300 households fulfil their fodder needs from the pastureland. Only 10-15 households purchase some fodder from the market
Livelihood and community	300 goats or sheep and 350 cattle and buffaloes reared; milk was used for self-consumption	350 goats or sheep and 375 cattle and buffaloes reared; some households now sell milk to the local dairy; at least 35 villages around Tirol have replicated the model

Source: DownToEarth

- The development of pasture is gaining momentum in semi-arid areas like Rajasthan, where livestock is the most reliable source of income for farmers
- Each family receives free fodder worth Rupees 10,000 throughout the year.

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