



# UPSC MONTHLY CURRENT AFFAIRS MAGAZINE

EDITION : October 2022

Now even more  
**COMPREHENSIVE  
& HOLISTIC**



Important Current Affairs.  
**Six Sources. One Place.**



# Outstanding performance by BYJU'S students in IAS 2021

Congratulations to our toppers

**03**

Ranks in  
Top 10

**12**

Ranks in  
Top 25

**25**

Ranks in  
Top 50



**RANK 01**

Shruti Sharma



**RANK 5**

Utkarsh Dwivedi



**RANK 6**

Yaksh Chaudhary



**RANK 12**

Yasharth Shekhar



**RANK 13**

Priyamvada  
Mhaddalkar



**RANK 14**

Abhinav Jain



**RANK 15**

Challapalle  
Yaswanthkumarreddy



**RANK 16**

Anshu Priya



**RANK 19**

Diksha Joshi



**RANK 20**

Arpit Chauhan



**RANK 21**

Dilip Kainikkara



**RANK 25**

Shruti Rajiakshmi



**RANK 29**

Bhavishya



**RANK 31**

Avinash V



**RANK 33**

Jaspinder Singh



**RANK 35**

Kartikeya Jaiswal



**RANK 37**

V Sanjana Simha



**RANK 40**

Kushal Jain



**RANK 44**

Anjali Shrotriya



**RANK 47**

Naman Kumar  
Singla



**RANK 50**

Abhijit Ray



# Outstanding performance by BYJU'S students in IAS 2020

Congratulations to our toppers

**02**

Ranks in  
Top 10

**18**

Ranks in  
Top 50

**36**

Ranks in  
Top 100



**RANK 02**

Jagrati Awasthi



**RANK 8**

Kartik Jivani



**RANK 13**

Gaurav Budania



**RANK 14**

Karishma Nair



**RANK 17**

Sarthak Agarwal



**RANK 25**

Vaibhav Rawat



**RANK 26**

Pulkit Singh



**RANK 28**

Divya Mishra



**RANK 30**

Divyanshu  
Choudhary



**RANK 31**

Megha Swaroop



**RANK 32**

Rallapalli Jagat Sai



**RANK 35**

Aparna Ramesh



**RANK 37**

Narwade Vinayak



**RANK 38**

Varuna Agarwal



**RANK 41**

Aswathy Jiji



**RANK 42**

Pooja Gupta



**RANK 46**

Jubin Mohapatra



**RANK 50**

Abhishek Shukla

# Incredible Results

## CSE 2019

4 Ranks  
in top 10

13 Ranks  
in top 50

22 Ranks  
in top 100



Rank 3  
Pratibha Verma



Rank 6  
Vishakha Yadav



Rank 8  
Abhishek Saraf



Rank 10  
Sanjita Mohapatra

## CSE 2018

11 Ranks  
in top 50

28 Ranks  
in top 100

183 Ranks  
in the final list



Rank 11  
Pujya Priyadarshni



Rank 16  
Dhodmise Trupti Ankush



Rank 21  
Rahul Jain



Rank 24  
Anuraj Jain



Rank 31  
Mainak Ghosh

## CSE 2017

5 Ranks  
in top 50

34 Ranks  
in top 100

236 Ranks  
in the final list



Rank 3  
Sachin Gupta



Rank 6  
Koya Sree Harsha



Rank 8  
Anubhav Singh



Rank 9  
Soumya Sharma



Rank 10  
Abhishek Surana

## CSE 2016

8 Ranks  
in top 50

18 Ranks  
in top 100

215 Ranks  
in the final list



Rank 2  
Anmol Sher Singh Bedi



Rank 5  
Abhilash Mishra



Rank 12  
Tejaswi Rana



Rank 30  
Prabhesh 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

<p><b>1. POLITY ..... 12-18</b></p> <ul style="list-style-type: none"> <li>● Issues related to Governor's powers</li> <li>● What is the doctrine of pleasure?</li> <li>● Election Symbols</li> <li>● Section 66A of IT Act</li> <li>● Competition Commission penalty on Google</li> <li>● Death Penalty and Criminal Justice</li> <li>● Collegium system</li> <li>● No seats for opposition at important Parliamentary Committees</li> </ul> <p><b>2. ECONOMY ..... 19-28</b></p> <ul style="list-style-type: none"> <li>● Gig Economy and Moonlighting</li> <li>● World Bank Projection</li> <li>● Primary Agricultural Credit Society</li> <li>● Policy Repo Rates</li> <li>● Rupee under pressure</li> <li>● Direct tax receipts</li> <li>● Building resilient mineral supply chains</li> <li>● Digital Banking Units</li> <li>● World Bank Report- "Correcting Course"</li> <li>● A renewable energy revolution, rooted in agriculture</li> <li>● Pilot launch of e-rupee</li> <li>● Rythu Bharosa Kendras</li> <li>● Scale Based Regulations of NBFCs</li> <li>● Indian bond inclusion in Global Bond Indices</li> </ul> <p><b>3. INTERNATIONAL RELATIONS ..... 29-35</b></p> <ul style="list-style-type: none"> <li>● China's "wolf warrior" era</li> <li>● Why is Pakistan off FATF 'grey list'?</li> <li>● National security strategy of the U.S.</li> <li>● The Interpol General Assembly meeting</li> <li>● Iranian Kurds</li> <li>● OPEC+ oil production cut</li> <li>● Children's death in Gambia</li> <li>● UK Tax Cut Plan</li> </ul> <p><b>4. ART AND CULTURE ..... 36-36</b></p> <ul style="list-style-type: none"> <li>● National Maritime heritage complex and Lothal</li> </ul> <p><b>5. SCIENCE AND TECHNOLOGY ..... 37-42</b></p> <ul style="list-style-type: none"> <li>● Satellite broadband services in India</li> <li>● Space observatories</li> <li>● Meat and milk from plants</li> <li>● Nobel Prize for Medicine 2022</li> <li>● Super App</li> <li>● Integrated Cryogenic Engine Manufacturing Facility</li> <li>● Silphion</li> <li>● Next-Gen Launch Vehicle</li> <li>● WEB 3.0 and Metaverse</li> </ul> <p><b>6. DEFENCE AND INTERNAL SECURITY ..... 43-45</b></p> <ul style="list-style-type: none"> <li>● Induction of artillery guns into the Army</li> <li>● LCH Prachand</li> <li>● C-295 aircraft</li> <li>● Mission Defence Space</li> </ul>	<p><b>7. ENVIRONMENT AND ECOLOGY ..... 46-55</b></p> <ul style="list-style-type: none"> <li>● COP27</li> <li>● World Sloth Bear Day</li> <li>● Slender Loris</li> <li>● Snow Leopard</li> <li>● A new lease of LIFE for climate action</li> <li>● Vultures of Tamil Nadu</li> <li>● Great Indian Bustards</li> <li>● Health concerns with the use of fossil fuels</li> <li>● Rotterdam Convention</li> <li>● NeelaKurinji Blooms</li> <li>● Stubble Burning</li> <li>● Living Planet Report</li> <li>● Battery Waste Management Rules, 2022</li> </ul> <p><b>8. HEALTH ISSUES ..... 56-57</b></p> <ul style="list-style-type: none"> <li>● Tele-MANAS</li> <li>● Lead Poisoning</li> </ul> <p><b>9. HISTORY ..... 58-58</b></p> <ul style="list-style-type: none"> <li>● Jalal-ud-din Akbar</li> </ul> <p><b>10. SOCIAL JUSTICE ..... 59-62</b></p> <ul style="list-style-type: none"> <li>● Supreme Court verdict on abortion rights</li> <li>● Issue of Child abandonment</li> <li>● Global Hunger Index 2022</li> <li>● Food day as a reminder to 'leave no one behind'</li> </ul> <p><b>12. GOVERNANCE ..... 63-68</b></p> <ul style="list-style-type: none"> <li>● Swachh Survekshan 2022</li> <li>● Unfilled vacancies, stagnant workforce delay RTI replies</li> <li>● Amended IT Rules</li> <li>● Babus to Karmayogis</li> <li>● Star rating of packaged food</li> <li>● United Nations World Geospatial Information Congress &amp; SVAMITVA Scheme</li> <li>● Taxing Online Games</li> </ul> <p><b>13. DISASTER MANAGEMENT ..... 69-70</b></p> <ul style="list-style-type: none"> <li>● Challenge of urban floods</li> <li>● Early warning system for heat waves</li> </ul> <p><b>14. GEOGRAPHY ..... 71-71</b></p> <ul style="list-style-type: none"> <li>● Crisis in Coffee Industry</li> </ul> <p><b>15. INDIAN SOCIETY &amp; SOCIAL ISSUES ..... 72-74</b></p> <ul style="list-style-type: none"> <li>● As India ages, keeping an eye on the elderly</li> <li>● Hindi imposition and its discontents</li> <li>● Language issue</li> </ul> <p><b>16. MISCELLANEOUS ..... 75-76</b></p> <ul style="list-style-type: none"> <li>● Nobel Prize 2022</li> <li>● Nobel Award for Literature</li> <li>● Nobel Peace Prize</li> <li>● Nobel Prize for Economic Sciences 2022</li> <li>● Dada Saheb Phalke award</li> <li>● Booker prize</li> </ul>
--	---

**17. YOJANA ..... 77-81**

- Zoological Diversity
- Safeguarding Oceans
- Wonder in the West
- Water Governance
- Indigenous Bioresources of NER

**18. KURUKSHETRA ..... 82-86**

- AatmaNirbharta through Agripreneurship
- Economic Development
- Agri Start-ups: Transforming Agripreneurship
- Artificial Intelligence in Agripreneurship
- Agripreneurship and farm prosperity

**19. SCIENCE REPORTER ..... 87-90**

- Council of Scientific and Industrial Research  
Legacy and the Path Forward
- CSIR Contribution

**20. DOWN TO EARTH ..... 91-92**

- Only together can we win
- Power of Evidence
- Hidden Costs
- Translation between change in weather and  
damages is not linear
- What the science says
- Deny, distract and delay





BYJU'S IAS present another comprehensive learning program for UPSC aspirants.

The **BYJU'S Home Learning Program (BHLP)** provides you with the opportunity to attend live classes conducted by India's best IAS faculty, from the comfort of your homes, assuring you uninterrupted learning so that you can clear the IAS exam with ease. Check the program details below.

### Here's how you can get started:

- Attend Live Classes by India's Leading IAS Trainers
- Choose a slot that works best for you

Morning Batch	Evening Batch	Weekend Batch	
Monday to Friday 06:30 AM to 09:00 AM	Monday to Friday 05:30 PM to 08:00 PM	Saturday 02:00 PM to 08:00 PM	Sunday 10:00 AM to 06:00 PM

- Participate in the 'Doubt Destroyer' session

### How will **BYJU'S Home Learning Program** help you in your preparation?



**Test Yourself:** Evaluate your performance by attending weekly MCQ-based and descriptive tests.



**IAS Tab:** Get a complimentary IAS learning tab with pre-recorded video lectures for revising important concepts and topics.



**Comprehensive Study Material:** Study material provided is complete and includes well-known books like Indian Polity by M Laxmikanth, Ancient History by R S Sharma, etc.



**Current Affairs Webinars:** Be a part of the two-hour live sessions every Tuesday and Thursday for Current Affairs analysis of major newspapers, magazines, and RSTV debates.



**Exclusive access to BYJU'S IAS Student Portal:** This provides you with unlimited access to Prelims and Mains based questions, Monthly Magazines covering Current Affairs, 'Issues In News', and recorded webinar sessions.



**Mentor Support:** You will be assigned a mentor who will guide you throughout your preparation process.

For more information about the program contact us at [iaslive@byjus.com](mailto:iaslive@byjus.com) or call us on +91 9241333666.

Stay safe and Keep Learning!

Team BYJU'S











# Learn From Home

## YEAR LONG TIMETABLE

(Weekend Batch)

Saturday - 12:00 PM to 8:00 PM

Sunday - 10:00 AM to 8:00 PM

Slots	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5
February (05, 06, 12, 13, 19, 20, 26 & 27) + March (05, 06 & 12)	Polity				
March (13, 19, 20, 26 & 27) + April (02, 03, 09, 10, 16 & 17)	Economics	Economics			
April (23, 24 & 30) + May (01, 07, 08, 14, 15, 21, 22 & 28)	Modern History + Post Independent	Modern History + Post Independent	Modern History + Post Independent		
May (29) + June (04, 05, 11, 12, 18, 19, 25 & 26) + July (02 & 03)	Geography	Geography	Geography	Geography	
July (10, 16, 17, 23, 24, 30 & 31) + August (06, 07, 13 & 14)	Ancient India + Medieval India + Art & Culture	Polity	Polity	Polity	Polity
August (20, 21, 27 & 28) + September (03, 04, 10, 11, 17, 18 & 24)	International Relations + World History	International Relations + World History	Economics	Economics	Economics
September (25) + October (01, 02, 08, 09, 15, 16, 22, 23, 29 & 30)	Environment & Ecology + Science & Technology + Disaster Management	Environment & Ecology + Science & Technology + Disaster Management	Environment & Ecology + Science & Technology + Disaster Management	Modern History + Post Independent	Modern History + Post Independent
November (05, 06, 12, 13, 19, 20, 26, 27) + December (03, 04 & 10)	Social Issues & Social Justice + Essay + Compulsory Language Paper	Social Issues & Social Justice + Essay + Compulsory Language Paper	Social Issues & Social Justice + Essay + Compulsory Language Paper	Social Issues & Social Justice + Essay + Compulsory Language Paper	Geography
December (11, 17, 18, 24 & 31) + January '23 (07, 08, 14, 15, 21 & 22)	Ethics + Governance	Internal Security + CSAT	Internal Security + CSAT	Internal Security + CSAT	Internal Security + CSAT
January '23 (28 & 29) + February '23 (04, 05, 11, 12, 18, 19, 25 & 26) + March '23 (04)	Internal Security + CSAT	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture	Ancient India + Medieval India + Art & Culture
March '23 (05, 11, 12, 18, 19, 25 & 26) + April '23 (01, 02, 08 & 09)	Focus Prelims	Focus Prelims	International Relations + World History	International Relations + World History	International Relations + World History
April '23 (15,16,23,29 & 30) + May '23 (06,07,13,14,20 & 21)		Focus Prelims	Focus Prelims	Environment & Ecology + Science & Technology + Disaster Management	Environment & Ecology + Science & Technology + Disaster Management
May '23 (27 & 28) + June '23 (17, 18, 24 & 25) + July (01, 02, 08, 09 & 15)		Ethics + Governance	Ethics + Governance	Ethics + Governance	Ethics + Governance
31st May to 11th June, 2023	PRELIMS 2023	PRELIMS 2023	PRELIMS 2023	PRELIMS 2023	PRELIMS 2023
July '23 (16, 22, 23, 29 & 30) + Aug '23 (05, 06, 12, 13, 19 & 20)					Social Issues & Social Justice + Essay + Compulsory Language Paper
1st September to 30th September, 2023	MAIN 2023	MAIN 2023	MAIN 2023	MAIN 2023	MAIN 2023



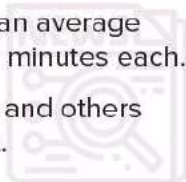


# YouTube Channel



### The Hindu News Analysis

- Analysis of "The Hindu" in a crisp and well-explained format.
- The videos are short, with an average length of not more than 25 minutes each.
- Ideal for working aspirants and others who have a time constraint.



[Click Here](#)

### Economy This Week

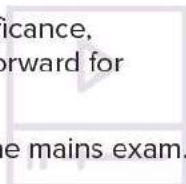
- Round-up of all the important topics in Economics every week.
- Watch video analysis of the weekly business news.
- Notes provided in an easily downloadable PDF format.



[Click Here](#)

### Explained: Issues In News

- Short and crisp videos to explain the issues in news relevant for UPSC.
- Covers: Background, significance, current updates and way forward for each issue.
- Helps to cover topics for the mains exam.



[Click Here](#)

### Strategy & Analysis

- How to prepare for Civil Services Exam.
- Important sources and strategy.
- Previous year question paper analysis.



[Click Here](#)



# POLITY

## 1. Issues related to Governor's powers

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

**Prelims: About the office of Governor**

**Mains: Significance of the legislative powers of the Governor and various challenges associated with it.**

**Governor's assent in the law-making process in India:**

- The office of the Governor is a crucial part of the State legislature as the process of law-making is incomplete without his sign or assent.
  - That is any Bill passed by a State's Legislative Assembly becomes a law only after it is assented to by the Governor.
- As the Bill once passed becomes a law only with the Governor's assent, the Governor's assent is said to be one of the most crucial acts in the entire process of law-making.
  - Such a provision finds its place not just in the Constitution of India but also in various other democratic countries.
- As per **Article 200** of the Constitution, once a Bill is passed in the Legislative Assembly and reaches the Governor, he/she can either:
  - Give his assent or
  - Withhold his assent or
  - Return the bill for reconsideration or
  - Reserve the bill for the President's consideration
- However, this power of the Governor has often been a controversial issue.

**Case study of Kerala and Tamil Nadu:**

- Recently in Tamil Nadu, the Governor had reserved a Bill that aimed for exemption from the National Eligibility cum Entrance Test (NEET) for the President's consideration after being delayed.
- Further, in Kerala, a controversy emerged after the Governor publicly announced that he would not give assent to the State's Lokayukta Amendment Bill and the Kerala University Amendment Bill.

**Key issues and challenges associated with the legislative power of the Governor:**

- Experts feel that such actions by governors which create uncertainty around the assent of the Bill significantly disrupt the legislative programmes of the State Governments.
- As per the provisions of **Article 200** of the Constitution, after sending a Bill for the reconsideration of the Assembly, even if the Assembly passes the Bill without making any change and sends it back to the Governor, the **Governor is bound to give assent**.
  - This provision clearly affirms the **primacy of the legislature in the legislative process** as the legislature reflects the will of the people and is constitutionally entrusted to make laws and any attempts by the Governor to disrupt this are to be considered a violation of constitutional principles.
- The option to reserve the Bill for the consideration of the President has also been controversial. As per the provisions in the Constitution, the Bill can be reserved for President's consideration only if the Governor feels that the Bill would endanger the position of the High Court by diluting its powers.

- The Constitution does not mention any other type of Bill. However, the courts have provided a certain degree of discretion to the Governors in this matter and such discretionary powers have been misused multiple times in the past.
- Also, the option of withholding the assent to the Bill has been controversial as the act of refusal to assent by the Governor is considered to be against the spirit of the Constitution as the Governor does not reflect the aspirations of the people of the State as he is not elected directly by the people of the State.
  - As the Constitution does not mention the grounds on which a Governor may withhold assent to a Bill, it is to be acknowledged that power should be exercised by the Governor extremely sparingly and only after careful deliberation of the consequences of such moves.
- Further, as per the provisions of **Article 361** of the Constitution, the courts are barred from initiating proceedings against a Governor or the President for any act done in the exercise of their powers. They enjoy complete immunity from court proceedings.
  - However, it is to be acknowledged that the Governor while withholding assent will have to reveal the reason for such refusal as the Governor cannot act in an arbitrary manner.
  - As per the Supreme Court bench in **Rameshwar Prasad and Ors. v/s Union Of India and Anr.** case, the "the immunity granted by Article 361(1) does not, however, take away the power of the Court to examine the validity of the action including on the ground of malafides" and that the grounds for refusal can be struck down as unconstitutional if they are found to be mala fide or ultra vires.
- Additionally, the **Constitution does not fix any timeline for the Governor** to decide the question of assent. This has led to significant delays in the law-making process and is against constitutional principles.

**Practices in other countries:**

- The practice in the United Kingdom is that royal assent is mandatory for a Bill to be transformed into law and the crown has the power to withhold assent.
  - However, this provision is said to be a dead letter as in practice and usage there is no power of veto exercised by the crown in England.
  - Further, the refusal of royal assent on the ground that the monarchy disapproves of the Bill is very controversial and is treated as unconstitutional.
- In the United States, the President has the power to refuse assent and return a Bill to the House. However, if the Houses again pass it with two-thirds of each House the Bill becomes law.
- The practices of refusal of assent and withholding assent are not followed in many democratic countries and in some countries, it is unconstitutional or the constitution provides a remedy so that the Bill passed by the legislature could become law even after the refusal of assent.

**Nut Graf:**

*The Constitution of India accords significant powers to the governors with respect to the law-making process. However, such powers are to be exercised in a reasonable manner without any malafide intentions as unreasonable actions disrupt the law-making process and are against the spirit of the Constitution.*



## 2. What is the doctrine of pleasure?

**Syllabus:** Power, functions, and responsibilities of various constitutional posts.

**Mains:** Doctrine of Pleasure.

**Context:**

- Recent controversy between the Governor and the state government of Kerala.

**Background Details:**

- The Governor and the State government of Kerala are facing major differences over multiple issues.
- The latest controversy has flared up because Governor has demanded the resignation of various vice-chancellors (V-C) post the Supreme Court order setting aside the appointment of the Vice-Chancellor of a technology university.
  - In a case challenging the appointment of the Vice Chancellor of a Technological University, the Supreme Court ruled that the appointment was not in accordance with the regulations of the University Grants Commission (UGC).
  - It was observed that the Search Committee identified only one candidate and recommended it to the Chancellor for the appointment. Whereas as per UGC regulations, a panel of 3 to 5 names should be recommended to the Chancellor.
  - The Governor responded to the SC's direction by demanding the resignation of the V-Cs of nine universities. However, when this order was challenged in the Kerala High Court, the Governor converted the directive into a show-cause notice asking V-Cs to explain the legality of their appointments.
- Moreover, Governor has also sought the dismissal of the State Finance Minister after his comments. He declared that he has withdrawn the pleasure of having him in the Council of Ministers.
  - Finance Minister of Kerala made comments against the Governor's action saying that someone who had seen universities in Uttar Pradesh could not understand the system of universities in Kerala.
  - The Governor considered the statements lowered the dignity of the office of the Governor and undermined national unity and stoked regionalism. It was also likened to sedition.
  - However, the Chief Minister of Kerala reacted by saying that considering the democratic conventions and traditions of India, the statement does not warrant a ground for cessation of pleasure doctrine.

**Concept of Doctrine of Pleasure:**

- The concept of the Doctrine of pleasure is derived from the English common law, under which the crown can waive off the services of anyone employed under it at any time.
- According to Article 310 of the Indian Constitution, every member in the civil service or defence of the Union holds office at the pleasure of the President, and every person of the civil service in the States holds office during the pleasure of the Governor.
- It should be remembered that Article 311 restricts the removal of civil servants. It provides civil servants with the reasonable opportunity of hearing.
- There is also a provision for dispensing the inquiry if it is not practical or not in the interest of national security.

- It should be noted that the pleasure of the President actually refers to the pleasure of the Union government, and the Governor's pleasure is that of the State government.
- According to Article 164, the Chief Minister is appointed by the Governor, and the other Ministers are appointed by the Governor on the advice of the Chief Minister. The article further adds that Ministers hold office during the pleasure of the Governor. The 'pleasure' also means the right of the Chief Minister to dismiss a Minister and not specifically the Governor.

**Nut Graf:**

*The recent controversy between the Governor and State Government in Kerala has once again shown the difference of opinion between the two. However, on the basis of the constitution, it should be noted that the doctrine of pleasure is not the sole domain Governor and he is bound to act on the aid and advice of the Council of Ministers.*

## 3. Election Symbols

**Syllabus:** Election Commission and Political Parties

**Mains:** Powers of Election Commission

**Context:**

- The Election Commission of India (EC) recently gave an interim order on use of party symbol and name by two factions of the Shiv Sena.

**Introduction:**

- The Election Commission of India decided that the two divided factions of the Shiv Sena, would not be allowed to use the party name and its election symbol for the upcoming byelection on November 3 and till it passed a final order on the dispute between them.
- In an interim order, the EC said both groups would be known by different names of their choosing and would be allotted alternative symbols from the list of free symbols notified by the EC for the current byelection.

**Background:**

- There is an ongoing factional feud for poll symbol "bow & arrow" and party name between the Uddhav Thackeray-led camp and the Maharashtra CM Eknath Shinde group after the recent split in the Shiv Sena party.
- The EC order has been passed while considering a petition filed by Maharashtra CM Eknath Shinde group for official recognition of his faction as the official Shiv Sena under the Election Symbols (Reservation and Allotment) Order, 1968.

**What is an Election Symbol?**

- An election symbol is a standardised symbol allocated to a political party.
- They are used by the parties during their campaigning and are shown on Electronic Voting Machines (EVMs), where the voter chooses the symbol and votes for the associated party.
- When a prominent party splits, a tussle often ensues for its election symbol, which is frequently the embodiment of its very identity, and its fundamental connection with voters.



### How does the ECI decide who gets the symbol?

- The Election Symbols (Reservation and Allotment) Order, 1968 empowers the Election Commission to recognise political parties and allot symbols.
  - Before 1968, the EC issued notifications and executive orders under the Conduct of Election Rules, 1961.
- Under Paragraph 15 of the Order, the EC can decide disputes among rival sections of a recognised political party staking claim to its name and symbol.
  - The EC is the only authority to decide issues on a dispute or a merger under the order. The Supreme Court (SC) upheld its validity in Sadiq Ali and another vs. ECI in 1971.
- The Election Commission gives its ruling after taking into account all the available facts and circumstances of the case and hearing representatives of the factions and the decision of the Commission is binding on all such rival sections or groups.
- The ECI primarily ascertains the support enjoyed by a claimant within a political party in its organisational wing and in its legislative wing
- This applies to disputes in recognised national and state parties.
- For splits in registered but unrecognised parties, the ECI usually advises the warring factions to resolve their differences internally or to approach the court.
- The splinter group of the party — other than the group that got the party symbol — has to register itself as a separate party, and could lay claim to national or state party status only on the basis of its performance in state or central elections after registration.
- The EC is also empowered to recognise mergers of groups into one entity. It may restore the symbol and name of the original party.

#### Nut Graf:

*Election Commission is empowered to grant recognition to political parties & allot election symbols to them along with settling disputes related to it. The Election Symbols (Reservation and Allotment) Order, 1968 empowers EC to recognise political parties and allot symbols.*

## 4. Section 66A of IT Act

### Syllabus: Fundamental rights

### Mains: Freedom of Speech and Expression

#### Context:

- The Supreme Court recently ordered States and their police forces to stop prosecuting free speech on social media under Section 66A of the Information Technology Act.

#### Details:

- Taking note of law enforcement agencies continuing to book people under Section 66A of the Information Technology Act, 2000, which has been struck down, the Supreme Court recently directed that no person should be prosecuted under it anymore.
- A three-judge bench presided over by the Chief Justice of India U.U. Lalit directed “all Directors General of Police as well as Home Secretaries of the States and competent officers in Union Territories to instruct their entire police force in their respective States/Union Territories not to register any complaint of crime with respect to alleged violation of Section 66A”.
- The Supreme Court said that in all cases where citizens are facing prosecution for violations of Section 66A, the

reference and reliance upon 66A shall stand deleted.

- However, the court also clarified that this direction would apply only to a charge under Section 66A and not extend to other offences in a case.

#### Background:

- In 2015, the two-judge bench of the Supreme Court in the Shreya Singhal case declared Section 66A of the Information Technology Act unconstitutional and a violation of free speech.
- The court observed that the weakness of Section 66A lay in the fact that it had created an offence on the basis of undefined actions: such as causing “inconvenience, danger, obstruction and insult”, which do not fall among the exceptions granted under Article 19 of the Constitution, which guarantees the freedom of speech.
- The Information Technology Act, 2000 was amended in 2009, to include Section 66 A. With the advent of the internet and technology, Section 66A was included with the objective of addressing cases related to Cyber Crimes.
- Over the years there was a rise in the incidents of attracting criminal penalties under Section 66(A) due to the expression of thoughts by individuals, and sharing of information to a wider audience on the internet.
- The above actions led to serious debates and discussions about the application, powers and constitutionality of Section 66 A of the IT Act.
- The court examined the abusive powers of the police, suppression of the Freedom of Speech and Expression, and ambiguity pertaining to the issue of “grossly offensive” as there were no guidelines about it.
- The Supreme Court of India observed that Section 66-A was over-broad and vague, hence it violated Article 19(1)(a).
- As this Section 66A IT Act violated the fundamental right of free speech, this law was struck down by the Supreme Court.

#### Nut Graf:

*Section 66A of the IT Act arbitrarily invades the right of free speech under Article 19(1) (a) of the Constitution. The Supreme Court expressed “serious concern” over states continuing to register FIRs for offences under the unconstitutional provisions of the Act and issued certain guidelines to the administration on remedial measures.*

## 5. Competition Commission penalty on Google

### Syllabus: Statutory, Regulatory & Quasi-Judicial Bodies

### Mains: Role of Competition Commission of India

#### Context:

- The Competition Commission of India (CCI) recently imposed a ₹ 1,337.76-crore penalty on Google.

#### Introduction:

- The Competition Commission of India (CCI) imposed a ₹ 1,337.76-crore penalty on Google for “abusing its dominant position in multiple markets in the Android mobile device ecosystem”.
- CCI also issued a “cease and desist” order and directed Google to modify its conduct within a timeline.
- It added that original equipment manufacturers (OEMs) should not be forced to pre-install a bouquet of applications.
- It also ordered Google not to offer any incentives to smartphone makers for exclusively carrying its search services.



- CCI is also looking into Google's business conduct in the smart TVs market and its in-app payments system.
- Google's Android operating system powers 97% of India's 600 million smartphones.

#### What is the issue?

- Google is facing a series of antitrust cases in India and stricter tech-sector regulations.
- The ongoing issue is related to the Android operating system (OS) acquired by Google in 2005.
  - Android is an open-source, mobile operating system installed by Original Equipment Manufacturers (OEMs) of smartphones and tablets.
- In April 2019, the CCI ordered a detailed investigation into the matter following complaints by consumers of Android-based smartphones in the country.
- A two-year probe ordered by the CCI found that Google India was guilty of stifling competition and innovation in the market to maintain its dominance in search, music, browser, app library and other key services, according to reports.
- The CCI examined several practices of Google with respect to its licensing and various proprietary mobile applications, including Play Store, Google Search, Google Chrome, YouTube, etc.
- According to CCI, Google's business was found to be driven by the ultimate intent of increasing users on its platforms so that they interact with its revenue-earning service i.e., online search which directly affects the sale of online advertising services by Google.
- The CCI said the Mobile Application Distribution Agreement (MADA) ensured that the most prominent search entry points i.e. search app, widget and chrome search browser were installed on Android devices. It also allegedly secured a significant competitive edge over its competitors, in relation to another revenue-earning app, YouTube.
- The CCI concluded that the mandatory pre-installation of the entire Google Mobile Suite under MADA and their prominent placement amounted to the imposition of unfair conditions on the device manufacturers and thereby contravenes competition law.

#### Previous issues with Google:

- Google was fined Rs 135.86-crore for "search bias" and abusing its "dominant position" by CCI back in 2018.
  - The order came on complaints filed back in 2012 by Bharat Matrimony.com and Consumer Unity & Trust Society (CUTS).
  - Google has been found "search biased" by displaying search results which were harmful to competitors and, indirectly, to users, thereby abusing its dominant market position.
- In 2013, the US Federal Trade Commission, keeping a watch on Google's business practices, shut its antitrust review following an assurance by Google to make two changes to its search and AdWords business.
- In February 2014, Google reached an agreement with the European Commission, inquiring Google's unfair trade practices, that Google will show results from at least 3 competitors each time Google shows its own results for searches related to shopping and travel.

#### Nut Graf:

*As part of the latest move in CCI crackdown on tech companies as the antitrust watchdog to rein in anti-competitive practices in the sector, CCI has imposed a penalty on Google for abusing its dominant position in multiple markets in the Android mobile device ecosystem which results in anti-competitive and unfair trade practices.*

## 6. Death Penalty and Criminal Justice

### Syllabus: Important cases

### Mains: Capital Punishment in India

#### Context:

- The Supreme Court in September 2022 referred to a five-judge constitution bench a suo motu plea on framing guidelines on imposing capital sentence.

#### Introduction:

- The Supreme Court referred to a five-judge constitution bench a suo motu plea on framing guidelines on how and when potential mitigating circumstances should be considered by courts during a trial in cases which entail the death penalty as the maximum punishment.
- The case was titled "Framing Guidelines Regarding Potential Mitigating Circumstances to be Considered While Imposing Death Sentences".
- The three-judge bench hearing the suo moto plea noted that there were "conflicting judgments" regarding the grant of hearing to an accused before imposing the death penalty.
- The bench observed that "A death sentence is irreversible and every opportunity should be given to the accused for consideration of mitigating circumstances so that the court concludes that capital punishment is not warranted."

#### Validity of Capital Punishment:

- In 1980, the Supreme Court upheld the constitutionality of capital punishment in 'Bachan Singh v State of Punjab' on the condition that the punishment will be awarded in the "rarest of the rare" cases.
  - The ruling also stressed that a separate sentencing hearing would be held, where a judge would be persuaded on why the death sentence need not be awarded.

#### What are the Issues?

- According to Section 235 of the Code of Criminal Procedure (CrPC), a court must hear the accused after a conviction regarding the issue of sentencing before imposing the appropriate punishment.
- As per Section 354(3) of CrPC, when there is death punishment or imprisonment for life, the judgement will have to state the reasons why the sentence was awarded.
  - There are differing judgments regarding when and how the sentencing hearing must take place, particularly regarding whether it is necessary to have the hearing on a day other than the day of the conviction.
- This position was reiterated in several subsequent rulings of the court, including in 'Mithu v State of Punjab', a 1982 ruling by a five-judge Bench that struck down the mandatory death sentence as it falls foul of the right of an accused to be heard before sentencing.
  - However, there are conflicting rulings on when that separate hearing is supposed to take place.
  - At least three smaller Bench rulings have held that while a separate sentencing hearing is inviolable, they can be allowed on the same day as the conviction.
- The Supreme Court through its various judgments had held that "sufficient time must be given to the accused on the question of sentence".
- The common thread that runs through all these decisions is the express acknowledgement that meaningful, real



and effective hearing must be afforded to the accused, with the opportunity to adduce material relevant to the question of sentencing.

#### What does this ruling imply?

- The decision stands out because of the thrust on the trial court's death sentencing policies and the practice and desire to elicit, from a larger Bench, directions to ensure some kind of uniformity in the matter.
- The 5 judge Constitution Bench may lay down comprehensive guidelines on the manner in which sentencing decisions can be arrived at.
- This constitutes another step in the direction of death penalty sentencing justice reform such as the legislative limitation flowing from Section 354(3) in the CrPC, judicial limitation flowing from the 'rarest of rare' case and 'oral hearing' after all the remedies to the condemned are exhausted.
- An extensive study on psychological aspects by experts may mean that trial courts will be better informed than now, when only basic data such as educational and economic status are ascertained before a sentence is imposed.
- This has made a positive mark to humanise criminal justice in India.

#### Way Forward:

- These steps by the Supreme Court are a reflection of the transition of the principles of jurisprudence from retributive to reformative.
  - This offers a check on the trial courts and prevents them from handing down death penalties as a rule.
- It is suggested by the experts that the mitigating circumstances shall be considered at the trial stage.
- Therefore, death penalties shall be awarded to a convict as an exception on the grounds of constitutional validity.

#### Nut Graf:

The Supreme Court of India referred to a Constitution bench a suo motu plea on framing of guidelines on the death penalty to have clarity and uniform approach. The intervention is seen as a major step in plugging gaps in the way in which trial courts award the death sentence.

## 7. Collegium system

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

**Prelims:** Supreme Court Collegium system

**Mains:** Structure, functioning and evolution of the collegium system and the criticism associated with it.

#### Context:

As Justice D Y Chandrachud takes over as the next Chief Justice of India (CJI) on November 9th, the collegium will consist of six members unlike the usual five-membered collegium.

#### Supreme Court Collegium system

- The collegium is responsible for making recommendations for the appointment of judges to the SC, Chief Justices of High Courts, and the transfers of HC judges to the government.
- The Supreme Court collegium consists of the Chief Justice of India as the head and the four other senior most judges of the Supreme Court.

- The Constitution of India does not mention the collegium system and the system has evolved through the verdicts of the apex court namely the First, Second, and Third Judges Cases.

#### Evolution of the Collegium system

##### ● First Judges case, 1981

- This case is also known as the S.P. Gupta v/s Union of India Case.
- In this judgment a seven-judge Bench interpreted Articles 124 and 217 of the Constitution, which deals with the appointments of judges to the SC and the HCs respectively.
- The Supreme Court Bench ruled that the concept of primacy of the CJI was not to be found in the Constitution.
- The Constitution Bench also held that the term "consultation" used in Articles 124 and 217 was not "concurrence".

##### ● Second Judges case, 1993

- In the Supreme Court Advocates-on-Record Association (SCARA) v/s Union of India case, a nine-judge Constitution Bench overruled its decision in the First Judges case.
- The Supreme Court Bench held that the word "consultation" actually meant "concurrence" of the CJI.
- This judgement also gave rise to a "Collegium System" for the appointment and transfer of judges in the higher judiciary. This Collegium would consist of the CJI along with two senior-most judges of the court.

##### ● Third Judges case, 1998

- In 1998, a reference was made by then President K R Narayanan seeking the SC's opinion in its advisory jurisdiction on whether the primacy given to the CJI on appointments was legally sound.
- In response, the Supreme Court held that the CJI won't be the only one as a part of the consultation process. Consultation would include a collegium of 4 senior-most judges of the Supreme Court along with the CJI.
  - Even if 2 of the judges are against the opinion, the CJI will not recommend it to the government.

#### 5+1 collegium

- The Supreme Court collegium is normally headed by the CJI and four other senior-most judges of the court.
- Further, one of these four senior-most Judges of the Supreme Court would succeed the CJI.
- However, if the situation should be such that the successor CJI is not one of the four senior-most Judges, he must invariably be made part of the collegium. Hence a '5+1' collegium arises when a potential CJI candidate is not a part of the 5-member collegium.

#### Criticism of the functioning of the Collegium

- Critics have often questioned and criticised the delays in the recommendations for the appointment of judges due to various operational and structural problems in the Collegium.
- There have also been questions about the non-utilisation of the online technologies or platforms which the court has used extensively since the outbreak of the COVID pandemic to conduct collegium meetings if physical meetings cannot be convened.
- Further, the collegium system of appointments has been criticised as extra-constitutional and non-constitutional as it was introduced through the judgments of the SC



and virtually rests the power of appointment of judges with the SC itself.

- The Constitution of India provided the President of India with the last say in the appointment of judges but mandated consultation with the Court. However, the collegium system provided the Court with the last say and mandated consultation with the government.
- Also, the collegium consists of only judges and there is no place for any non-judges from the executive or the Bar or anywhere else. Thus there is no provision for individuals to raise questions or provide suggestions.
- Experts opine that the National Judicial Appointments Commission (NJAC) which was struck down by the SC was a more constitutional mechanism to appoint judges.

#### Way forward

- The Government has stopped pursuing the establishment of a commission for judicial appointments as the successive collegiums have not proposed names of those judges who are anathema to the Government. However, this is not an ideal solution.
- There is an urgent need to revisit the existing system and establish a broad-based and transparent model to appoint senior judges to the High Courts and the Supreme Court.
- Further, there should be appointments made from the category of distinguished jurists which is provided under Article 124 of the Constitution as no appointment has been made under this category to date.

#### Nut graf:

Acknowledging the key challenges and the shortcomings in the performance of the collegium system in the appointment of judges, there is an immediate need for reforms in the appointment process to ensure accountability and transparency.

### 8. No seats for opposition at important Parliamentary Committees

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

**Prelims:** Parliamentary Committees

**Mains:** Significance of Parliamentary committees:

#### In the news:

Recently the opposition criticized the Government as neither of the two opposition parties were given chairmanship of important panels like Home, Finance, IT, Defense, External Affairs.

#### Background: what are parliamentary committees?

- The origin of Parliamentary Committees can be traced to the British Parliament.
- A Parliamentary Committee consists of a panel of MPs which is appointed or elected by the House or nominated by the Speaker, and which works under the direction of the Speaker. It submits its report to the House or to the Speaker.
- They draw their authority from two articles of India constitution: Article 105 and 118. Article 105, deals with the privileges of MPs, and Article 118, gives Parliament authority to make rules to regulate its procedure and conduct of business.

#### Importance of Heads of the Parliamentary committees:

- **Preparing the agenda:** The heads of the panels schedule their meetings and prepare the agenda and the annual report and can take decisions in the interest of the efficient management of the Committee.
- **Power to Summon:** The chairperson presides over the meetings and has the power to decide who should be summoned before the panel. However, the chairman should have the support of the majority of the members to summon a witness.
- **Equivalent to a court:** An invitation to appear before a Parliamentary Committee is equivalent to a summons from a court. If one cannot appear, he or she has to give reasons, which the panel may or may not accept.

#### Types of Parliamentary Committees:

There are two types of Parliamentary committees based on their purpose and continuity. They are as follows:

- **Standing Committees:** The Standing Committees are permanent committees. They are formed according to Acts of Parliament. They work **continuously and regularly**.
- **Ad hoc Committees:** The Ad hoc parliamentary committees on the other hand are appointed only to look into particular issues and they are dissolved when the purpose is fulfilled. They submit a report to the House. There are two types of ad-hoc committees such as Inquiry and Advisory Committee.

**Standing Committees:** The Standing Committees are further divided into six categories based on the functions:

#### 1. Departmental Related Standing Committees

- At present, the number of Department-related Parliamentary Standing Committees is 24 out of which 16 are under the jurisdiction of the Speaker of the Lok Sabha and the rest 8 within the jurisdiction of the Chairman of the Rajya Sabha.
- Each Standing Committee has 31 members, 21 from Lok Sabha and 10 from the Rajya Sabha nominated by the Speaker and Chairman of the respective Houses.
- Their term of office shall not exceed a year. Key committees such as **Finance, Defence, Home are usually chaired by Opposition MP's**. These committees consider the Demands for Grants.

#### 2. Financial Committees

- It is the most important parliamentary committee in India. It includes the Public Accounts Committee (PAC), Estimate Committee, and the Committee on Public Undertakings.

#### 3. Committees to Inquire

- This committee can be divided into **three** categories such as Committee on Petitions, Committee of Privilege, Committee on Ethics.

#### 4. Committee to scrutinize and control

- Six types of committees are placed under this category such as Committee on government assurances, Committee on subordinate Legislation, Committee on Papers laid on the table, Committee on the welfare of SC's and ST's, Committee on Empowerment of Women and Joint Committee on Offices of Profit.

#### 5. Committees relating to the day-to-day business of the house

- There are four categories of committees such as Business Advisory Committee, Committee on Private Members' Bills and Resolutions, Rules Committee, Committee on the absence of members.



## 6. Service Committees or Housekeeping Committees

- These committees are concerned with the Provision of Facilities and Services to the members. Such as- General Purposes Committee, House Committee, Library Committee, Joint Committee on Salaries and Allowances of Members.

### Significance of Parliamentary committees:

- Parliamentary Committees are an essential component of the Indian parliamentary system.
- They provide better analysis and scrutiny of important issues thus improving Effectiveness.
- It has an important role in influencing policy making. These committees also act as an interface between people and government.
- These Parliamentary Committees play an important role in influencing the policies of the government and also act as an interface between the government and the people.
- Most importantly, it makes the executive accountable to the legislature, an essential element of parliamentary form of government.
- It facilitates coordination among different ministries.
- The Committees look into the demands for grants of Ministries/departments, examine Bills pertaining to them, consider their annual reports, and look into their long-term plans and report to Parliament.
- It carries out legislative business. Law making process is complex and due to limited time in parliament, discussions are also short on various issues. Parliamentary committees help in filling the gap by having expert and detailed discussions on matters referred to it and submit its findings in its report. This increases the efficiency and quality of the law making process.
- It develops a consensus among the members through inviting various subject experts, stakeholders by incorporating their ideas and by addressing their concerns.
- Again in a parliamentary democracy the opposition plays a very constructive role at committee level to have a check on any arbitrary laws made by the government.

### Conclusion

The committees provide a better insight into the issues in discussion and conduct detailed scrutiny and analysis. They aid the Parliament in performing their duty. They work in the background so that time at parliamentary sessions can be utilized efficiently and productively.



**BYJU'S IAS**  
EXAM PREP

Current Affairs Webinar

180+ hours of engaging current affairs sessions followed by doubt clearing sessions every **TUESDAY and THURSDAY**

- ✓ Comprehensive coverage and n-depth analysis of issues in news
- ✓ Special lectures on Economic Survey, the Union Budget and India Yearbook
- ✓ CSAT lectures



# ECONOMY

## 1. Gig Economy and Moonlighting

### Syllabus: Employment

### Mains: Significance of Gig Economy

#### Context:

- Recently, WIPRO fired 300 employees after finding out that they were working with one of its competitors at the same time.

#### Introduction:

- Moonlighting refers to the practice of working a second job outside normal business hours. An employee may work a normal 9-to-5 job as a primary source of income but work nights at a different job in order to earn extra money.
  - A Kotak Institutional Equities survey of 400 people across the IT&ITES space in July 2022, revealed that 65% knew of people pursuing part-time opportunities or moonlighting while working from home.
  - One of the first cases of moonlighting in India came to light when Human Resources (HR) tracked multiple active provident fund accounts of a Bengaluru-based person and it was found he was working seven jobs.
- During the pandemic, those with desk jobs had more time on their hands and thus it was easier to take on a few projects outside of work.
- HR experts have attributed moonlighting as one of the factors that makes many reluctant to come back to office. In fact, 42% of the participants said they would consider changing their jobs or even quitting if they were not allowed to work from home.
- In the last two years, moonlighting has become a big concern in the IT industry due to the loss of skilled employees and reduced productivity levels.

#### Gig Economy:

- Gig economy is a system that is based on flexible, short-term, or freelance work.
- It might involve contacting clients or customers on online platforms.
- Individuals who are part of the gig economy are called gig workers, who are frequently employed by businesses on a contractual basis but are not regarded as employees.

#### How are companies reacting to moonlighting?

- In August, Wipro Chairman Rishad Premji called moonlighting 'cheating' and the company sacked 300 employees following the discovery that they were working for rival firms on the side, leading to a conflict of interest.
- Infosys has warned staff against moonlighting, saying it could lead to termination.
- Swiggy announced a 'moonlighting policy' that allows employees "to pursue their passion for economic interests alongside their full-time employment."

#### What does the law say?

- Moonlighting is not defined in any of the statutes in India and no constitutional court has rendered a decision on the subject.

- However, there are enactments that deal with double employment.
  - Section 60 of the Factories Act deals with restrictions on double employment. However, this enactment is applicable only to employees working in factories.
- There are State specific enactments which deal with the employment of persons working in offices, banks, shops, etc.
  - In Tamil Nadu, it is termed "The Tamil Nadu Shops & Establishments Act, 1947". However, there is no provision that deals with dual employment.
- However, moonlighting is subject to the law of the land.
- The Supreme Court of India in the case of Glaxo Laboratories (I) Limited vs Labour Court, Meerut and others held that the sphere of employment cannot be extended by the employer beyond working hours and outside his place of employment. In other words, the employee can choose to arrange his affairs as he pleases beyond the working hours of the employer.

#### Does the law lay out punitive action against moonlighting?

- Writ Courts and Labour Courts deal with employment in India. These Courts exercise jurisdiction based on equity or fairness.
- Unless an employer is able to prove that an employee acted against the interest of the company, Courts may not uphold severe punishment of termination of employment.
- Unless the employee's violation caused the company severe harm and financial loss, the courts may rule in favour of the employee based on equity or fairness.

#### Is it ethical?

- IT sector employers who have full-time employment tend to restrict their employees from any form of moonlighting, irrespective of whether it is a second job or a side hustle. In full-time employment, the employee is expected and required to spend his entire working time, effort and energy for the employer's interests.
- It is unethical if the moonlighting is against the company policy, moonlighting is shifting towards daylighting and if it is affecting the employee's productivity, poses a risk of data and confidential information leakage.

#### Nut Graf:

*In today's world, every company ought to have a gig economy strategy to deal with moonlighting. Employers should not suppress employees who want to monetise, develop and demonstrate. At the same time, employees should not violate their agreements with employers.*



## 2. World Bank Projection

**Syllabus:** Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment.

**Prelims:** World Bank reports and projections

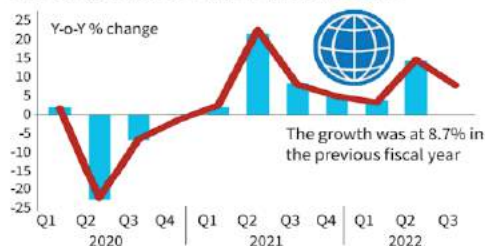
**Context:**

- The World Bank downgrades India's FY23 growth projection to 6.5%.

**Introduction:**

- The World Bank has trimmed its estimate for India's growth in the current fiscal year (FY 22-23) to 6.5%, one percentage point lower than its previous projection in June and compared with the last fiscal year's 8.7% pace.

The chart shows the World Bank's nowcast for quarterly GDP growth. It estimates that India's GDP will grow 6.5% in FY22-23, 1 percentage point lower than the previous estimate



Source: The Hindu

- The Indian economy is expected to speed up to 7% in the next fiscal year, before settling back down to 6.1% in FY 24-25.
- The Indian economy grew by 8.7 per cent in the previous year.
- However, it also noted that India is recovering from the pandemic-induced slowdown stronger than the rest of the world.
- The estimates were released as part of its latest 'South Asia Economic Focus' released ahead of the annual meeting of the International Monetary Fund and the World Bank.

**Reasons for downgrading growth projection in India:**

- According to the report, the majority of the COVID recovery occurred last year, which is why India's growth slowed this fiscal year compared to last.
- As per the report, India's private investment will be dampened by heightened global uncertainty due to the Russia-Ukraine war, elevated input prices and rising borrowing costs.
- Growth in private consumption will be undermined by high inflation and persisting weakness in parts of the country's labour market.
- The expected headwinds brought by lower growth and higher inflation are likely to lead to slow income growth.
- Nevertheless, the World Bank has taken due cognisance of India's robust macroeconomic fundamentals. Although the rising merchandise trade deficit will more than double the current account deficit to 3.2% of GDP in FY23 from a year before, stable portfolio capital inflows, buoyant FDI and high foreign exchange reserves provide buffers against the external financing risks.

**Other findings of the report:**

- The World Bank projected uneven recovery in the region due to continuous pressure from events such as Sri Lanka's economic crisis, floods in Pakistan, and the Russia-Ukraine conflict.
- Afghanistan, Sri Lanka and Pakistan are more at risk and will see poverty increase in 2022.
- The economies that are more services-led are expected to "maintain a reasonable recovery trend despite headwinds".
  - Manufacturing and services have been expanding in India since January and growing at a rate faster than the rest of the world.

## 3. Primary Agricultural Credit Society

**Syllabus:** Inclusive Growth

**Mains:** Financial inclusion and strengthening service delivery to farmers

**Context:**

- Union Home and Cooperation Minister Amit Shah pitched for primary agricultural credit societies (PACS) in every panchayat of the country.

**Key Details:**

- Union Home and Cooperation Minister Amit Shah recently conveyed the union government's intention to set up primary agricultural credit societies (PACS) in every panchayat of the country to boost various agriculture-related activities over the next five years.
- The minister noted that there are only 65,000 active PACS in the country at present, and it is imperative that all panchayats must have one such body by 2027 to promote farming and dairy activities at the grassroots level.
- Such PACS will carry out activities like the sale of gas and petrol and storage and marketing of dairy and farm products with an aim to alleviate poverty and empower women.
- The union minister also pointed out that the eastern and northeastern states will benefit the most from the establishment of the PACS as its farm and dairy products will be efficiently marketed, thus generating optimum financial benefits for people engaged in animal husbandry and allied sectors.

**Primary Agriculture Credit Societies:**

- PACS are ground-level cooperative credit institutions that provide short-term and medium-term agricultural loans to farmers for various agricultural and farming activities.
- PACS generally provide the following facilities to their members:
  1. Input facilities in the form of cash or kind component
  2. Agriculture implements on a hiring basis
  3. Storage facility
- It works at the grassroots gram panchayat and village levels.
- The first **Primary Agricultural Credit Society** was formed in 1904.
- In June 2022, the Cabinet Committee on Economic Affairs approved to digitise around 63,000 PACS at a cost of RS 2,516 crore.
  - Each PACS will get around Rs 4 lakh to upgrade its capacity and even old accounting records will be digitised and linked to a cloud-based software.
  - Digitisation of PACS is aimed at increasing their efficiency, bringing transparency and accountability



in their operations and facilitating them to diversify their business and undertake multiple services.

- Digitisation software will be in vernacular language having the flexibility of customisation as per the needs of the States.



Source: Medium.com

#### Nut Graf:

PACS as financial institutions play a very important role at the grassroots level in the development of local areas. They are multifunctional organisations that dispense a host of activities like banking (short and medium-term credit), marketing produce and trading in consumer goods. Hence the effective performance of primary agriculture cooperative credit societies is crucial.

## 4. Policy Repo Rates

### Syllabus: Fiscal & Monetary Policy

**Mains: Significance of inflation targeting to economic growth**

#### Context:

- Reserve Bank raises policy repo rates by 50 bps and brings down growth outlook to 7%.

#### Introduction:

- The Reserve Bank of India's **Monetary Policy Committee (MPC)** raised the policy repo rate by 50 basis points (bps) to 5.9%.
- This is the fourth rate hike since May 2022.
- The RBI also lowered the growth forecast to 7% for the current financial year from 7.2 per cent in August 2022 on concerns over a 'bleak' global economic outlook.
- However, RBI retained its retail inflation forecast at 6.7 percent.
- The MPC has effected a 190-bps increase in the last five months since May 2022.
- The MPC also voted by a 5:1 majority to "remain focused on withdrawal of accommodation to ensure that inflation remains within the target going forward".

#### Steady rise

The repo rate — the rate at which RBI lends to commercial banks — raised to 5.9%. The graph shows repo rates since September 2017



Source: The Hindu

#### Reason behind the steady rise in policy rate:

- The sustained high inflation could destabilise inflation expectations and harm growth in the medium term.
- Withdrawal of monetary accommodation is warranted to keep inflation expectations anchored and contain the second-round effects.
- Inflationary pressures are broad-based and core inflation remains at elevated levels.
- The volatility in global financial markets is impinging upon domestic financial markets, including the currency market, thereby leading to imported inflation.
- The MPC's actions are in line with the current global inflation scenario and have leaned in favour of anchoring inflationary expectations to work out solutions to free the growth potential of the economy.

#### How will it impact borrowers and depositors?

- An increase in the policy rate will result in a hike in lending rates which will impact existing home loan customers and prospective borrowers.
- Conservative investors who like to park their funds in bank fixed deposits will benefit as banks are expected to raise their deposit rates following the rate hike.
- The immediate impact will be for borrowers with loans linked to the external benchmark linked lending rate (EBLR). For customers in the marginal cost of funds-based lending rate (MCLR) regime, the resetting of rates will happen with a lag.
- Banks and housing finance companies (HFC) have already raised their lending rates between 70 to 90 basis points following the 90 basis point hike in repo rate by RBI in May 2022 and June. Now banks and HFCs are expected to raise the rates again.
- The lending rates are increased by 190 basis points which will have a significant impact on EMLs.

#### View on Growth:

- The MPC also lowered the real gross domestic product (GDP) for fiscal 2022-23 to 7%, from a projection of 7.2% announced in August 2022.
- Extended geopolitical tensions, tightening global financial conditions and a possible decline in the external component of aggregate demand can pose a downside risk to growth.

#### Nut Graf:

The MPC's decision to increase policy repo rates are based on the twin objective, with primacy given to price stability driven by the necessity to keep growth in mind. The underlying fundamentals of India are resilient and the buffers built over the years have helped in dealing with any external shock.

## 5. Rupee under pressure

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

**Mains: Rupee depreciation and its impact on the economy.**

**Prelims: Factors that determine the value of the currency.**

#### Context:

- Depreciating rupee in the global economic market.

#### Details:

- Indian Rupee has depreciated nearly 10% in the span of one year. It has crossed the mark of ₹ 80 to a dollar. Moreover, foreign exchange reserves have been reduced by approximately \$100 billion.



- The factors responsible for the falling of the rupee are:
  - The widening current account deficit (CAD): It is driven by the rising oil prices attributed to the Russia-Ukraine war.
  - The capital outflows: This is because of the rising dollar owing to the aggressive rate hikes by the U.S. Federal Reserve.

#### Difference between the Crisis of 2013 and the present times:

- There are major differences between the economic situation of India in 2013 and 2022. They are:
  - There was more pressure on the exchange rate in 2013 than the current exchange rate which is more closely tracking the fundamentals.
  - The macroeconomic situation of India was fragile in 2013 because of the high year-on-year fiscal deficits apart from the current account deficit.
  - Moreover, India's present reserves attract confidence in the Indian economy, which was a major missing in 2013.
- Apart from the above conditions, the pressure on the rupee has reduced considerably due to the oil prices softening. The oil prices which were \$100 per barrel six months ago have reduced to \$88 per barrel.
- The monthly trade deficit has also passed its peak and the capital flows are stabilizing.

#### Associated concerns:

- The current account deficit is the most vulnerable parameter because it is a broader term than the trade deficit and incorporates trade in invisibles like travel and tourism. The CAD is expected to stretch beyond 3% of GDP which is higher than RBI's safe limit of 2.5%. This is further compounded by United States' decision to continue the interest rate hike until inflation is tamed in the U.S. economy and the Ukraine conflict.
- The economic vulnerability of India is further accentuated by the Fiscal Deficit. The aggregate fiscal deficit of the Centre and States is above 10% of GDP. It should be noted that the Balance of Payment (BoP) crisis of 1991 and the economic crisis of 2013 in India were spillover effects of fiscal deficit on the external sector.
- It is also observed that India's fiscal deficit situation is far more outstretched than other economies. India is also facing the twin deficit issue.
- Moreover, market perceptions are shaped more by the rapidly changing reserves often called the 'burn rate' when it is falling instead of the absolute level of reserves.
- One of the approaches to looking at foreign exchange reserves is in terms of the ratio of GDP. The ratio which was 21% (as a proportion to FY22 GDP) in March 2022 has decreased to around 17% of the estimated FY23 GDP. This is very close to the ratio of 15% which was observed in 2013.
- The depth and duration of recession in advanced countries like the U.S. and Europe will also impact the Indian economy.
- India's exports which are already under pressure will also have some implications.

#### Remedial Measures:

- Reserve Bank of India allowed Indian traders to settle their export and import bills in rupees in August 2022. This was considered to be a bold move to internationalize the rupee, but it was actually an effort to enable payments for the crude brought from Russia.
- However, the above arrangement has not yet been formalized. Once the Rupee-Rouble trade is implemented, it has the potential to save \$4 billion per month which can be a substantial relief to India's trade deficit (currently pegged at \$20 billion-\$25 billion).
- The RBI has adopted various remedial measures like selling dollars from foreign exchange reserves to prevent volatility without targeting any specific exchange rate.
- RBI should proactively engineer the trajectory of the falling rupee. It can allow depreciation to a certain extent as **Real Effective Exchange Rate (REER)** is overvalued.
  - The real effective exchange rate (REER) of the rupee is a broader measure of its value against the currencies of India's trading partners.
  - If some amount of rupee depreciation is allowed towards equilibrium, it can be beneficial for exports, restrict non-oil imports, and can help in reducing the current account balance.
- The above measure might have some inflationary impact, which should be dealt with through monetary policy action. The RBI is already working on this aspect.

#### Nut Graf:

*The rupee is under pressure in the international market making India vulnerable on many counts. The Reserve Bank of India is proactively looking at the matter and taking remedial actions. It is also observed that the economic condition is not as bad as the economic crisis of 2013, but still, a lot needs to be done to stabilize the Indian economy.*

## 6. Direct tax receipts

### Syllabus: Mobilisation of Resources

#### Mains: Taxation reforms in India

#### Context:

- India's net direct tax collections till October 8 in the financial year 2022-23 have risen to ₹ 7.45 lakh crore, more than half of the Budget targets.

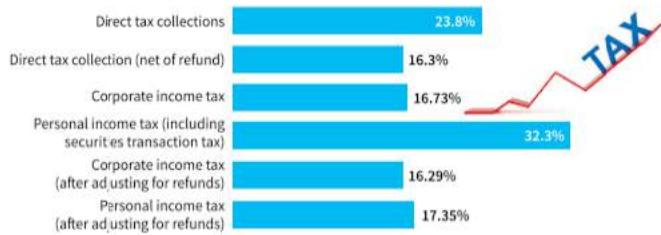
#### Key Details:

- Gross direct tax collections including corporate and personal income tax rose nearly 24 per cent so far in the financial year 2022-23 to Rs 8.98 lakh crore.
  - After adjusting for refunds, the net direct tax collections between April 1-October 8 stood at Rs 7.45 lakh crore, which is 52.46 per cent of the Budget estimates (BE) for the full year tax collection target.
  - Tax on corporate and individual income makes up for direct taxes.
- The Budget had estimated direct tax collection at Rs 14.20 lakh crore this fiscal, higher than Rs 14.10 lakh crore collected last fiscal (2021-22).
- This includes a 32.3 percent growth in personal income tax (including Securities Transaction Tax) mop up and 16.73 percent increase in corporate tax revenues over the same period last year.
- Tax refunds had jumped 81% over the preceding year to touch ₹ 1.53 lakh crore.



## Revenue rises

The graph shows the increase in tax collections this fiscal year up to October 8, 2022 compared with the figures for the corresponding period last year. Net personal income tax collections grew at 17.35%, faster than corporate income tax collections that were up 16.29%, net of refunds



Source: The Hindu

### Significance of this rise in direct tax collection:

- Tax collection is an indicator of economic activity in any country.
- In India, the robust tax collection is witnessed despite a slowdown in industrial production and exports.
  - Merchandise exports have lost on the momentum of last year's surge and shrunk by 3.5 per cent in September 2022.
- Trade deficit has nearly doubled in the first six months. Collection from levy of tax on goods and services sold (GST) has flattened at around Rs 1.45-1.46 lakh crore per month.
- The Reserve Bank of India last month cut its production of India's GDP growth in the current fiscal to 7 percent from 7.2 percent previously estimated.
- The rise in direct tax collections can be attributed to tightened enforcement and compliance using technology including the use of the Annual Information Statement (AIS).
  - The AIS provides comprehensive information to taxpayers on their financial transactions. The purpose of the new AIS is to make it easier for taxpayers to file their returns.
- Direct taxes like income tax, wealth tax, etc. are based on the principle of ability to pay, so the equity or justice in the allocation of tax burden is well secured by these taxes.
- Usually direct taxation is progressive in effect. Since direct taxes can be designed with fine gradation and progressiveness, they can serve as an important fiscal weapon of reducing the gap of inequalities in income and wealth. Direct taxes thus lead to the objective of social equality.

### Recent taxation related reforms:

- By removing the interface between the Assessing Officer and the Assessee, maximising resource use through functional specialisation, and introducing team-based assessment, the E-assessment Scheme, 2019 offers a new system for making assessments.
- The Finance Act, 2020 empowered the Union Government to notify the Faceless Appeal Scheme in the appellate function of the department between the appellant and the Commissioner of Income-tax (Appeals).
- Under 'Vivad se Vishwas' scheme, declarations for settling pending tax disputes are currently being filed.
  - This will benefit the Government by generating timely revenue and to the taxpayers by bringing down mounting litigation costs.
- The Finance Act, 2020 removed the Dividend Distribution Tax under which the companies are not required to pay DDT with effect from 01.04.2020. The dividend income shall be taxed only in the hands of the recipients at their applicable rate.

- This increased the attractiveness of the Indian Equity Market and provided relief to a large class of investors in whose case dividend income is taxable at the rate lower than the rate of DDT.
- The Finance Act, 2020 has provided an option to individuals and co-operatives for paying income tax at concessional rates if they do not avail of specified exemption and incentive.

### Nut Graf:

Various efforts were taken by tax administration on direct as well indirect taxes to nudge higher compliance through use of technology and artificial intelligence. These taxation reforms resulted in better direct tax collection despite various challenges and loss of momentum in the economy.

## 7. Building resilient mineral supply chains

**Syllabus: Indian industries and mineral reserves.**

**Mains: Mineral supply chains.**

### Context:

- Building resilient supply chains of mineral reserves for clean energy supply and technologies.

### Details:

- There are widespread concerns regarding the availability and price of oil and gas in the backdrop of the Ukraine crisis. Moreover, the nascent and fragile clean energy supply chains also restrict the countries' intentions to reduce fossil fuel dependence.
- There is rising inflation due to the volatile oil and gas prices, which further hampers the macroeconomic stability and growth of India.
- It has thus become important to secure key minerals like cobalt, nickel, lithium, and rare earth metals for building a resilient clean energy technology supply chain.

### Associated Challenges:

- The mineral reserves are usually concentrated in geopolitically sensitive regions or poor-performing regions in terms of ease of doing business.
- Considerable production regions are controlled by geostrategic competitors. For instance, China controls cobalt-rich regions in the Democratic Republic of Congo through direct equity investments and **Belt and Road Initiative (BRI)**.
- Moreover, future mine production is usually tied up in advance offtake agreements by buyers from other nations.

### Remedial Measures:

**The government of India has set up Khanij Bidesh India Limited (KABIL) in 2019 to source and secure strategic minerals for the Indian market. CEEW study has provided the following suggestions in this regard:**

- Estimate the mineral requirements of the domestic industry. For this, a task force should be constituted consisting of members from the ministries of power, new and renewable energy, science and technology, and heavy industry.
- Five-year plans with specific targets for indigenous manufacturing and deployment of clean energy technology should be created to provide a vision to the investors.
- Additionally, mineral quantities required for indigenous manufacturing should also be determined.



- KABIL should collaborate with the domestic industry to leverage its market intelligence capabilities to track global supply-side developments. It is also important to coordinate with the industry for determining the strategic interventions of the government in this direction.
- Developing a detailed blueprint of available and committed production capacities and economy-wide and sector-specific policy interventions is a crucial step for having an informed perspective on mineral supply.
- The involvement of the private sector should also be encouraged in case of conducive geography and adequate availability.
- KABIL can pre-emptively sign offtake agreements with global mineral suppliers in case of inadequate investment opportunities. This would help in securing future production. Back-to-back sales agreements should also be signed with the domestic industry under preferential terms for large-scale centralized procurement.
- Indian government should also explore the possibility of jointly investing in mining assets with geostrategic partners. Government-to-government partnerships can be leveraged to mitigate investment risks. The Ministry of External Affairs can initiate conversations with partner countries like the Quad countries for building resilient clean energy supply chains.
- It is also important to support technologies that use domestically available minerals. For instance, sodium-ion batteries can reduce the requirements for importing minerals from other countries. Co-development of technologies using local materials can also be considered in collaboration with geostrategic partners.
- It is also crucial to formulate urban mining policies that are aimed to recycle minerals that have outlived their productive life.
- Commercial banks (other than regional rural banks, payment banks and local area banks) with past digital banking experience are permitted to open DBUs in tier 1 to tier 6 centres without having the need to take permission from the RBI in each case.
- As per the RBI, each DBU must offer certain minimum digital banking products and services. Such products should be on both liabilities and assets side of the balance sheet of the digital banking segment.
- The services include saving bank accounts under various schemes, current accounts, fixed deposit and recurring deposit accounts, digital kits for customers, mobile banking, Internet banking, debit cards, credit cards, and mass transit system cards, digital kits for merchants, UPI QR codes, BHIM, Aadhaar and point of sale (PoS).
- Other services include making applications for and onboarding customers for identified retail, MSME or schematic loans, end-to-end digital processing of such loans, starting from online application to disbursal and identified government-sponsored schemes that are covered under the national portal.
- Compared to conventional banks with online and mobile banking facilities, neobanks or digital banks excel at product innovation and offer far better digital solutions.

## 9. World Bank Report- "Correcting Course"

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

**Mains:** Economic Recovery post-COVID-19 pandemic.

**Context:**

- Release of World Bank Report – "Correcting Course".

**Details:**

- **"Correcting Course", a report released by World Bank analyses the impact of the COVID-19 pandemic on global poverty. The findings of the report are:**
  - The number of people living in extreme poverty increased by 90 million, as against the forecast. It thus implies that global poverty reached 9.3% in 2020 from the earlier 8.4% in 2019.
  - It should be noted that this is the first time in two decades that the poverty levels have increased.
  - Inequalities across the world have also widened. This is evident from the relative impacts felt on incomes in the richest and poorest countries.
  - Moreover, economic recovery has also remained uneven across the world.
- The report focused on the usage of fiscal policy tools in dealing with the pandemic. It was observed that poorer countries were unable to use it effectively, and thus felt the impact of the pandemic more in comparison to lesser degree impacts on richer nations.
- **The report identified three priority areas for fiscal policy to aid post-pandemic recovery. They are:**
  - Targeted subsidies benefitting the poor
  - Public investment for resilience in the long term
  - Revenue mobilization that relies on progressive direct taxation instead of indirect taxes
- **Similarly, a paper titled – "Fiscal policy and income inequality":** The role of taxes and social spending", also concludes that fiscal policy has various benefits in post-pandemic recovery.

**Nut Graf:**

*To secure and build a resilient supply chain for strategic minerals, India should consider various measures. This would ensure a robust and sustainable clean energy system for the future.*

## 8. Digital Banking Units

**Syllabus:** Banking Sector & NBFCs

**Prelims:** Digital Banking

**Context:**

- Prime Minister Narendra Modi recently dedicated 75 digital banking units to the country.

**Introduction:**

- 75 Digital Banking Units (DBUs) were launched in 75 districts with an objective to promote financial inclusion.
- This is in line with the announcement that was made in the 2022-23 Union Budget by Finance Minister Nirmala Sitharaman to commemorate the 75 years of independence of the country.

**What are these DBUs?**

- A digital banking unit is a specialised fixed point business unit with certain minimum digital infrastructure for providing digital banking products and services as well as servicing existing financial products and services digitally in self-service mode at any time.
- The Reserve Bank of India (RBI) announced the guidelines for DBUs in April 2022, following the report of a working group of the Indian Banks Association (IBA).



### India-specific findings in the report:

- Indian economy continues to be sluggish in 2022.
- The World Bank report used the Consumer Pyramids Household Survey (CPHS) by the Centre for Monitoring Indian Economy (CMIE) because the official poverty data is missing in India since 2011.
- According to the estimate of the report, 5.6 crore people in India have slipped into poverty as the GDP of India dropped by 7.5% in the year 2020-21.
- Moreover, the population below the poverty line was 10% in 2020.
- Initiatives taken by the government:
  - Indian Government provided a fiscal stimulus of ₹ 2 lakh crore which was 1% of GDP. But, incremental spending was reflected by a small fraction.
  - The minor increase in wages (by ₹ 20 per day) under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) was a long-pending decision but was inadequate to cope with the pandemic.
  - The majority of India's stimulus package was in the form of credit lines and refinancing schemes for private enterprises. These are considered to be inefficient ways to realize the goal of putting money in the hands of the general public and boosting household consumption.
  - Pradhan Mantri Garib Kalyan Ann Yojana (PMGKAY) which provided food assistance to 80 crore people in India was a good step. It was started in April 2020 and is currently estimated to cost approximately ₹ 3.90 lakh crore.
  - India continued the reduced corporate tax rate (announced in September 2019).
    - According to the Parliamentary Committee on Estimates, the decline in corporate tax from 30% to 22% cost the exchequer around ₹ 1.84 lakh crore loss in two fiscal years and the corporate profits increased (as per CMIE report).
- Despite the World Inequality Report terming India as a 'poor and very unequal country', Wealth Tax and Inheritance tax has not been reintroduced by India. Moreover, there have been repeated increases in the rates on a wide range of products (including fuel and cooking prices) which are under the ambit of Goods and Services Tax (GST). It should be noticed that indirect taxes put a disproportionate burden on the poor section of the population.

### Nut Graf:

*The fiscal policy measures prove to be the most important instrument in dealing with the post-pandemic economic recovery. India also has taken such policy measures but they seem to be inadequate to some extent as the share of poverty has increased. The need of the hour is a course correction in fiscal policy measures.*

## 10. A renewable energy revolution, rooted in agriculture

**Syllabus:** Issues related to agriculture; Energy.

**Mains:** Renewable energy from the paddy straw.

**Prelims:** First private companies Bio-energy plant.

### Context:

- Commercial operations of a private company's first bio-energy plant commenced in the Sangrur district of Punjab.

### Details:

- The renewable energy revolution based on agriculture has begun in India with the establishment of a bio-energy plant by a private company in Sangrur, Punjab. The plant will produce Compressed Bio Gas (CBG) from paddy straw. This implies that it will convert agricultural waste into wealth.
- In the past few years, farmers from states like Haryana, Punjab, and western Uttar Pradesh undertake the disposal of paddy stubble and biomass through burning. This is mainly because of the short window of 3-4 weeks between crops. Millions of hectares of land are set on fire for the preparation of fields for the next crop.
- The smoke that emanates from such activities engulfs the National Capital Territory of Delhi and the neighbouring areas for weeks from October to December. This hampers the environment and impacts the health of humans and livestock.

### Measures taken by the Government:

- The Government of India has adopted various measures to tackle the issue.
- The Commission for Air Quality Management (CAQM) in the National Capital Region (NCR) and adjoining areas has established an action plan and a framework to prevent and control stubble burning. The action plan/framework consists of both in-situ and ex-situ management.
  - In-situ crop residue management incorporates paddy straw and stubble into the soil through the use of subsidized machines. This is complemented by the Crop Residue Management (CRM) Scheme of the Ministry of Agriculture and Farmers' Welfare.
  - Ex-situ CRM uses paddy straw for biomass power projects, thermal power plants, CBG plants, 2G ethanol plants, waste-to-energy (WTE) plants, industrial boilers, packaging materials, etc.
- Additional measures include monitoring and banning stubble burning, awareness generation drives, etc.
- However, despite these measures, stubble burning continues unabated and is even spreading to different parts of the country and rabi crops.

### Crop residue supply chain project:

- In 2019, NITI Aayog collaborated with Food and Agriculture Organization (FAO) India to find an effective solution to convert paddy straw/stubble into energy and explore ex-situ uses of such waste materials.
- On the basis of technical discussions with the public and private players, the FAO proposed establishing a crop residue supply chain. It will collect, store and utilize the rice straw for productive services, particularly in the field of renewable energy.
- The study suggested that to mobilize 30 percent of the rice straw produced in Punjab, an investment of approximately ₹ 2,201 crores would be required to collect, transport, and store it for a span of 20 days. This has the potential to lessen greenhouse gas (GHG) emissions by around 9.7 million tonnes of CO<sub>2</sub> equivalent and approximately 66,000 tonnes of PM<sub>2.5</sub>.
- Moreover, farmers can earn between ₹ 550 and ₹ 1,500 per ton of rice straw (on the basis of market conditions).
  - Furthermore, on the basis of a techno-economic assessment of energy technologies, it was found that rice straws produce CBG and pellets cost-efficiently.
    - Pellets have the potential to be used as a substitute for coal in thermal power plants.
    - And, CBG can be used as a transport fuel.



- A five percent CBG production target set under the Sustainable Alternative Towards Affordable Transportation (SATAT) scheme can be met with 30% of the rice straw produced in Punjab.
- It has multiple benefits like boosting local entrepreneurship, increasing farmers' income, and reducing stubble burning.
- Barnala, Ludhiana, and Sangrur are the most promising districts of Punjab for such projects.
- **Case Study:**
  - Verbio India Private Limited is a 100% subsidiary of the German company Verbio AG.
  - In 2018, the Punjab government approved the company to set up a bio-CNG plant in the Bhutal Kalan village of Lehragaga tehsil, Sangrur, Punjab. The plant will utilize nearly 2.1 lakh tonnes of a total of 18.32 million tonnes of paddy straw produced annually.
  - Currently, it will use around 1 lakh tonnes of paddy straw produced from about 16,000 hectares of paddy fields.
  - The residue will be collected and 33 tons of CBG and 600-650 tonnes of fermented organic manure/slurry per day will be produced. It can diminish approximately 1.5 lakh tonnes of CO<sub>2</sub> emissions annually.

#### Benefits:

- Compressed Bio Gas that is priced at ₹ 46 per kg according to the SATAT programme can be produced.
- Rice straw produced from one acre of land can yield an energy output of more than ₹ 17,000. This is a clear addition of around 30 percent to the original output of grain. It is an ideal example of a 'wealth from waste' approach and also promotes a circular economy.
- **Other benefits include:**
  - The organic manure/slurry produced from the CBG plant can be used as compost to replenish depleted soils. It can reduce the usage of harmful chemical fertilizers.
  - It will also boost employment opportunities among rural youth.
  - It will leverage the economy of the state. It should be noted that straw from various other crops contains more energy when compared to paddy straw.

#### Nut Graf:

*The supply chain model is a win-win initiative in the context of the environment, energy, farmers' incomes, economy, and sustainability. It should be replicated and scaled throughout India as stubble burning is spreading in different parts of the country.*

### 11. Pilot launch of e-rupee

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

**Prelims:** About e-Rupee or Central Bank Digital Currency (CBDC)

**Mains:** Critical evaluation of the introduction of the e-Rupee or CBDC in India.

#### Context

The Reserve Bank of India (RBI) recently announced that it will soon start the pilot launch of the e-Rupee (₹) for specific use cases as the tests for digital currency in India are underway.

#### Details

- The Union Finance Minister Nirmala during the 2022-23 budget speech announced the launch of the Digital Rupee which is a digital currency backed by the central bank.
  - This announcement reflected the government's view on cryptocurrencies and other virtual currencies.
- RBI recently released a concept note on the Central Bank Digital Currency (CBDC) and the key purpose behind the concept note is to create awareness about CBDCs in general and the planned features of the Digital Rupee.
  - This concept note also seeks to explain RBI's stand and approach towards the introduction of the CBDC.
- The concept note released by RBI discusses key considerations such as technology and design choices, possible uses of the Digital Rupee, issuance mechanisms, etc.

#### e-Rupee (₹) or Central Bank Digital Currency (CBDC)

- e-Rupee or Central Bank Digital Currency (CBDC) would be the same as a sovereign paper currency but only its form would be different i.e. it would be in digital form.
- e-Rupee or CBDC would be backed by blockchain technology, which is considered the safest and the most reliable form of technology.
- e-Rupee or CBDC can be exchangeable one-to-one with the fiat currency and can also be accepted as a medium of payment, legal tender and a safe store of value.
- The digital rupee would appear as a liability on a central bank's balance sheet.
- The RBI would be the sole issuer of the e-Rupee and its distribution will be handled by commercial banks.
- The RBI and commercial banks will have to maintain separate ledgers for CBDC transactions.

#### Types of CBDC

- CBDC can be categorised into two broad types as per the usage and the functions performed by the digital rupee and considering the different levels of accessibility, namely general purpose or Retail (CBDC-R) and Wholesale (CBDC-W).
- **Retail (CBDC-R):** is an electronic version of cash primarily meant for retail transactions.
  - CBDC-R will be potentially available for all users such as private sector or non-financial.
  - CBDC-R provides access to safe money for payment and settlement as it is a direct liability of the Central Bank.
- **Wholesale (CBDC-W):** is intended for the settlement of interbank transfers and related wholesale transactions.
  - CBDC-W can be used for financial transactions undertaken by banks in the government securities (G-Sec) segment, inter-bank market and capital market.
  - CBDC-W has the potential to transform settlement systems for financial transactions and make them more efficient and secure.

#### Forms of CBDC

- e-rupee or CBDC can be structured as token-based or account-based.
- **Token-based CBDC:** A token-based CBDC is a bearer instrument like banknote wherein whoever holds the tokens at a given point in time would be presumed to own them.



- o In a token-based CBDC, an individual receiving a token will verify that his ownership of the token is genuine
- **Account-based CBDC:** An account-based system requires maintenance of record of balances and transactions of all holders of the CBDC and indicates the ownership of the monetary balances.
  - o In an account-based CBDC, an intermediary verifies the identity of an account holder.
- Analysis of the features of both forms of CBDCs suggests that:
  - o The token-based form of CBDC would be a preferred choice for CBDC-R transactions as it would be closer to physical cash.
  - o The account-based CBDC would be considered for CBDC-W transactions.

#### Advantages of e-Rupee or CBDC

- The introduction of CBDC will help replace paper currency in a phased manner and thus it helps in reducing the operational costs involved in physical cash management.
- The digitisation of banking facilities will also help in reducing the cost of operation of the banking system as there would be less requirement for people to physically visit banks.
- The introduction of CBDC will foster financial inclusion as it caters to the needs of the people even in remote areas of the country.
- It will bring efficiency and resilience to the settlement system.
- Digital currencies will play a key role in providing momentum to innovations in the payments system.
- CBDC facilitates easy cross-border payments and provides the public with uses that any private virtual currencies can provide.

#### Challenges in the implementation of CBDC

- The lack of digital literacy in the country is a key impediment to the implementation of digital currency.
- Further, digital currency works efficiently with the internet. This is a major challenge in remote areas of the country where there is limited connectivity.
- Incidences of cybercrime have been increasing at an alarming rate in the country and in this context, the introduction of CBDC will make people more susceptible to cybercrime.
  - o Also, digitally illiterate and poor would be more susceptible to such risks.
- The introduction of CBDCs also pose a severe threat to the privacy of the citizens.
- Additionally, the existing limitations in the banking infrastructure and the skills of the employees can also act as a roadblock to the effective implementation of digital currency.

#### Nut graf:

The introduction of CBDC offers several advantages to the Indian economy such as reducing operational costs, fostering financial inclusion, and bringing resilience, efficiency and innovation to the payments system. However, its implications on the banking system, monetary policy, financial stability, and privacy must be thoroughly analysed before its implementation.

## 12. Rythu Bharosa Kendras

**Syllabus:** Transport and marketing of agricultural produce

**Prelims:** About Rythu Bharosa Kendras

**Mains:** Significance of Rythu Bharosa Kendras

#### Context

An Ethiopian delegation led by its Agricultural Minister recently visited the State of Andhra Pradesh to study the first-of-its-kind Rythu Bharosa Kendras (RBKs).

#### Rythu Bharosa Kendras (RBKs)

- The RBKs are regarded as one of the kind initiatives in the country where in seeds-to-sales, single-window service centres for farmers have been established across the state.
- The RBKs are a one-stop solution to all the needs and grievances of the farmers.
- The RBKs set up in the state also sell pre-tested quality seeds, certified fertilisers and animal feed for the farmers.
- Farmers can also buy or rent farm equipment, and sell their produce at the cost of MSP in these RBKs.
- The RBKs house agriculture and horticulture officials who help provide key services to the farmers such as soil testing and recommend on what type of crops can be sowed, and the type of fertiliser to be used.
- The government at the state level also pays crop insurance, procures and makes payments to farmers through these RBKs.

#### Significance of RBKs

- RBKs help create a platform for interaction between various farmer groups, agriculture scientists, and agriculture extension officers at the village level.
- RBKs help provide key services to the farmers and also help them learn about various farm equipment by extending training facilities.
- By considering the recommendations and suggestions provided by officials in a scientific manner after conducting soil studies and analysing weather conditions, farmers have altered their cropping patterns and have benefited significantly.
- The RBKs have also helped in the elimination of spurious seeds and uncertified and dangerous fertilisers.
- The RBKs have also helped the farmers in selling their produce at MSPs, provided supporting systems of e-cropping and geo-tagging
- The Union government has nominated the RBK concept for the Food and Agriculture Organisation's "Champion" award.
- Further, various agrarian nations across the world are expressing interest in understanding the RBK concept and wish to implement the same in their countries.

## 13. Scale Based Regulations of NBFCs:

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

**Prelims:** About Non-Banking Financial Companies (NBFCs)

**Mains:** Classification and Significance of the NBFCs

#### Introduction:

- Certain guidelines for loans and advances by the Non-Banking Financial Companies have been issued by the Reserve Bank of India, that is known as the scale-based regulations of the NBFCs.



**Objective:**

- The scale based regulations for NBFCs were introduced with an objective to reduce risks for the financial sector.

**Classification of NBFCs:**

Under scale-based regulation, the NBFCs have been classified into different layers on the basis of size of operations, activities, and risk perception. Following are the different layers of the NBFCs:

**Base Layer:**

- NBFCs who do not take deposits and the asset size of these NBFCs are below Rs. 1000 crore.
- The Net owned funds will be Rs. 20 crore.

**Middle Layer:**

- All deposit taking NBFCs irrespective of the size of the assets, and non-deposit NBFCs which have asset size of Rs. 1000 crore and above.

**Upper Layer:**

- A set of parameters and scoring methodology will be used for the identification of NBFCs in this category. However, top 10 NBFCs will be included in the category despite any other factor.

**Top Layer:**

- As of now, the top layer will remain empty and if the RBI recognizes any substantial risk in the potential systematic risk from any NBFC in the upper layer, then that particular NBFC will be transferred to the top layer.

**Key Highlights of the changes:**

- **NPA:** For all categories of NBFCs, the overdue of more than 90 days will be declared as NPAs.
- **Internal assessment:** NBFCs in middle and upper layers have to make a thorough internal assessment of the need for capital, commensurate with the risks in their business.
- **Common Equity Tier:** Upper Layer NBFCs have to maintain a common equity tier (CET) of at least 9%.

**Significance of the NBFCs:**

- Scale based regulations will ensure highly regulated environments for NBFCs, boost accountability and transparency, will increase the trust of the stakeholders, and also reduce regulatory arbitrage between banks and NBFCs.
- It will help in maintaining a balance between the financial stability of NBFCs and limiting systematic risk.
- It will bring better customer service, and ensure transparency.

**Conclusion:**

RBI has introduced the scale based regulatory framework for NBFCs to simplify the governance structure of NBFCs. Restructuring of the sector and modification of the compliance framework was the need of the hour because of the recent financial crisis faced by some of the NBFCs. It is expected that the changes will bring some positive results.

## 14. Indian bond inclusion in Global Bond Indices

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

**Mains:** Critical evaluation of inclusion of Indian bonds in global bond indices in 2022.

**Introduction:**

- Global Bond Indices includes the emerging debt markets which monitor the local currency bonds issued by the various developing countries.
- India will be included in the global bond indices in 2022 and it will open up the gates to a flood of foreign inflows.

**Advantages of the inclusion:****Increase in foreign inflows:**

- India's inclusion in the global bond indices will lead to an increase in the passive (such as ETFs, index funds, etc.) as well as the active foreign fund inflows.

**Strengthen Indian Currency:**

- Increasing foreign inflows will also strengthen the Indian Currency as the confidence of the investors will increase. This will also increase the forex reserves.

**Improves the Balance of Payment (BOP):**

- It will help in stabilizing the exchange rate and also improve the BOP of the country.

**Lowering down the cost of borrowing:**

- With increased capital inflows, the bond yield will be lower which in turn will reduce the cost of borrowings and benefit the government and Indian companies.

**Concern associated:****Euroclear:**

- One of the hindrances in the way of India's inclusion in the global bond indices is to clear and settle down the Indian debt on foreign platforms such as Euroclear.
- The preferable measure would be to settle down the debt locally by the government.

**Volatility:**

- There are high risks and issues of rupee volatility associated with the inclusion. In case of rating downgrading or any broader events, there will be capital outflow and investors may withdraw their money.

**Taxation Issue:**

- Taxation laws in India are rigid and taxes such as capital gains tax are very high in nature which act as the hurdle in India's entry into global bond indices.

**Reforms taken:**

- A Fully Accessible Route (FAR) for foreign investors which opens up part of India's securities fully for foreign investors.
- The securities under the FAR are likely to be selected for inclusion in the index.

**Conclusion:**

India's Inclusion in the global bond indices will lead to the availability of a diverse pool of capital and it will also ensure higher liquidity in the Indian Bond market. As the cost of borrowing will become lower for government and private entities, capital could be raised at a cheaper rate. Overall, more than retail investors, it is the institutional investors who are likely to benefit from this.



# INTERNATIONAL RELATIONS

## 1 China's "wolf warrior" era

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

**Mains: China's foreign policy**

### Context:

- President of the Republic of China Mr. Xi Jinping recently completed a decade in office and begins an unprecedented third term.

### Wolf warrior diplomacy:

- It is a new approach inside China which reinforces a presumed transition of Chinese diplomacy from conservative, passive, and low-key to assertive, proactive that goes as far as insulting or threatening those deemed to violate China's interests.
- Wolf Warrior and Wolf Warrior II are Chinese action blockbusters that highlight agents of Chinese special operation forces. They have boosted national pride and patriotism among Chinese viewers.
- 'Wolf-warrior diplomacy', named after these movies, describes offensives by Chinese diplomats to defend China's national interests, often in confrontational ways.
- Many Chinese believe the Western media portrayal of China is highly biased, often with ideological and racist tinges. Wolf-warrior diplomacy is part of the Chinese government's endeavour to "tell the China story."
- Wolf warrior diplomacy has been widely used in the past few years, particularly since the onset of the COVID-19 pandemic.

### Belt and Road Initiative (BRI) and Debt Trap:

- The launch of the Belt and Road Initiative (BRI) in 2013 was a foreign policy initiative and a platform to stake China's claim to global leadership.
- According to the estimates of the Green Finance and Development Centre at Shanghai's Fudan University, over the past decade, the total value of projects and investments through the BRI stands at over \$930 billion.
- China today is facing criticism for rising debt levels in many partner countries and for unsustainability in some of its projects in order to expand its global influence along with its political, economic and military strategies.
- It is alleged that China has been extending loans to financially vulnerable states, thereby paving the way to intrude into the sovereignty of such states. This practice, over the gradual progress of time, has taken the shape of a debt trap.
  - China has emerged as the biggest official creditor with its international loans reported to surpass more than 5% of the global GDP.
- Criticism aside, the fact that indebted partners have only returned to Beijing for more assistance underlines the reality of China's economic capacity, as well as an apparent push to evolve the BRI away from a hard infrastructure focus to a wider array of financial assistance.
  - For example, Pakistan and Sri Lanka, which have received more than \$26 billion from China in the past five years, and are dealing with financial crises, are turning again to Beijing for more monetary support.

### Great power rivalry:

- Beyond the BRI, rising China-U.S. rivalry and deepening China-Russia ties have been the clearest markers of the direction of China's foreign policy in the Xi era.
- China under Xi Jinping recognizes the need to overcome obstacles in the country's pursuit of its national goals. To do so, China appears to be pursuing a three-pronged medium-term strategy:
  - Maintaining a non-hostile external environment in order to focus on domestic priorities;
  - Reducing dependence on America while increasing the rest of the world's dependence on China; and
  - Expanding the reach of Chinese influence overseas.
- Every Chinese leader from Chairman Mao to President Xi Jinping has been clear-eyed that the U.S. represents an existential threat to the continued supremacy of the communist regime.
- Worsening relations with the U.S. have been accompanied by warming ties with Russia.
- The assertive diplomatic strategy has undercut China's global image and further exacerbated its relations with countries across the world, ranging from Europe to Asia.

### Relationship with India:

- In the 1950s, the leaders of the older generation of the two countries made the historical decision to establish diplomatic relations between China and India, and jointly advocated the Five Principles of Peaceful Coexistence.
- In the 1980s, the two sides agreed to solve the boundary question through peaceful and friendly consultation, established a strategic and cooperative partnership for peace and prosperity, and achieved the all-round development of bilateral relations.
- After 2013, Chinese President Xi Jinping and Indian Prime Minister Narendra Modi initiated "hometown diplomacy", held two informal summits in Wuhan (2018) and Mamallapuram (2019) respectively, carried out strategic communication on overarching, long-term and strategic issues of global and regional importance, and agreed to strengthen the closer partnership for development between the two countries.
- The still ongoing border crisis triggered by the Chinese military's multiple transgressions plunged the relations between both countries to the lowest level since the normalisation of ties in the 1980s which reflects the tensions in China's diplomacy in the Xi period.
  - Under Mr. Xi, China has come to view territorial problems with neighbours not as "disputes" to be mutually resolved but as threats to China's "sovereignty", thus reducing the space for resolution.
- Apart from the security and strategic dimension, there has also been turbulence on the trade front with improved focus and importance on greater 'protectionism'.
- Despite signs of some diplomatic normalcy, there are also contradictory signs indicating India and China moving away from each other.
  - Immediately after the clashes, India leaned toward the Quad.
  - Similarly, China is also getting closer to Russia, creating a partnership to target the United States and its partners, like India.



**Nut Graf:**

*China's foreign policy under President Xi Jinping appears to be caught between presenting itself as the saviour of the UN-centred world order and globalisation and pursuing China's core interests ever more aggressively, regardless of the consequences to global politics.*

**2. Why is Pakistan off FATF 'grey list'?**

**Syllabus: Important international institutions, agencies, fora – their structure and mandate.**

**Mains: Pakistan's status in the Grey list of FATF.**

**Prelims: Financial Action Task Force.**

**Context:**

- Pakistan was moved out of the grey list of FATF.

**Details:**

- The global watchdog on anti-money laundering (AML) and combating financing terrorism (CFT), the Financial Action Task Force (FATF), announced to take Pakistan out of the "grey list". The countries that are categorized as grey list are under "enhanced monitoring".
- Pakistan was grey listed in February 2018.
- FATF said that Pakistan made "significant progress" in this direction and improved legal and governance mechanisms. This can be attributed to the recent diplomatic efforts by Pakistan's Foreign Minister and Army Chief General, who visited the United States in this regard.
- In the recent plenary session (October 20-21, 2022), FATF members including India, reviewed the record of about 26 countries and unanimously agreed to take Nicaragua and Pakistan out of the "grey list". However, Mozambique, The Democratic Republic of Congo, and Tanzania were added to the "grey list", whereas Myanmar was moved from the grey list to the black list because of the actions taken by the military junta since the overthrow of the elected government in a coup in February 2021.

**Background Details of FATF:**

- The 39-member FATF was established in the year 1989 out of a G-7 meeting of developed nations. It comprises 37 countries and 2 regional organizations—the European Commission, the European Union's executive body, and the Gulf Cooperation Council.
- India joined it in 2006 with 'observer' status and became a full member in 2010.
- In accordance with its mission statement, the members meet regularly to monitor various countries.
  - The mission statement is "review money laundering and terrorist financing techniques and counter-measures, and promote the adoption and implementation of the FATF Recommendations globally".
  - The decision-making body of the FATF or Plenary meets three times a year (February, June, and October) to review "Mutual Evaluation Reports" (MERs). If there are major deficiencies in the AML/CFT regime of a country, it is put under "jurisdictions under increased monitoring" termed as a grey list. If it further fails to address the concerns of FATF then it is placed on a "high-risk jurisdictions" popularly called as a "black list".
  - The countries which are placed on both lists face increasing levels of financial strictures. This listing is similar to global ratings and makes it difficult for the country to procure loans from financial

organizations like the IMF, World Bank, Asian Development Bank, etc. Moreover, it is also difficult to invite investment from private companies and other countries.

- The deliberations of the FATF are made in absolute secrecy, and its decisions should be made strictly on the basis of procedures and technicalities.

**Pakistan's case:**

- Pakistan was on the "grey list" earlier from 2012-2015.
- Pakistan was handed two action plans encompassing 34 points (27+7) since 2018. It recommended the country to formulate laws against money laundering and terror activities in line with international requirements.
- Islamabad was also asked to maintain a database of terror groups operating on its soil and the actions that were taken against such groups. This has been reiterated from previous decades when terror groups like the Taliban, Al-Qaeda, and Jaish-e-Mohammad operated freely, and designated terrorists like Hafiz Saeed and Masood Azhar took part in political processes and public rallies.
- Though Pakistan adopted various steps, a major sticking point or last item that remained was addressing by "demonstrating that terror finance investigations and [the] prosecution target senior leaders and commanders of UN-designated groups". As per UNSC guidelines, member states should ensure that all designated terrorists are unable to access funds, arms, and travel, and such terrorists are duly and effectively prosecuted.
- In 2021 majority of Pakistan's FATF reporting was about bringing terrorists like Hafiz Saeed, Zakiur Rehman Lakhvi (26/11 commander), Sajid Mir (26/11 planner), Rauf Asghar (IC-814 hijacking planner) to court and hold a conviction. However, it was claimed that it couldn't trace JeM chief Masood Azhar could not be traced. He was wanted in a number of attacks like the 2001 Parliament attack, the J&K legislature bombing, strikes on military camps at Uri, Pathankot, and the Pulwama bombing in 2019.
- At the June plenary session, the FATF visited Pakistan and reviewed it from August 31-September 2. It concluded that Pakistan's measures were reflected "on the ground". After this procedure, it was expected that at the October plenary, the country would receive praise and earn a reprieve for completing the action plans.

**India's Reaction to the FATF decision:**

- All FATF decisions are adopted by consensus. India being a member of the body has agreed to the decision and has conceded in a statement that because of FATF, Pakistan was "forced" to take "some action against well-known terrorists" even including those involved in the 26/11 Mumbai attack.
- However, it was observed that India wanted more global checks on Pakistan.
- Some unease was also observed because the United States (U.S.), which has been consistently demanding action against Pakistan-sponsored terrorism, has become quite lenient in the last few months.
- The Indian government is preparing for its turn at FATF scrutiny or MER process that will begin in early 2023.

**Nut Graf:**

*Financial Action Task Force has unanimously taken the decision to take Pakistan out of the "grey list", owing to the completion of the action plan by Pakistan. India being the party to the organization has agreed to the decision but seems a bit apprehensive.*



### 3. National security strategy of the U.S.

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

**Mains:** National Security Strategy of the U.S.

**Context:**

- U.S. released its National Security Strategy.

**Details:**

- The United States of America released its National Security Strategy (NSS). According to the Goldwater-Nichols Department of Defense Reorganization Act of 1986, it is compulsory on the part of every U.S. president to formulate their NSS and communicate the vision of the Executive regarding national security to the Legislative body.
- The NSS reflects the views of the government regarding the National Security agenda.
- Moreover, it also gives Congress an opportunity to assess the investment areas and overall expenditure that the country will have to bear to achieve national security goals.

**New National Security Strategy:**

- The newly proposed NSS majorly focuses on the current decade as a 'decisive' one where the U.S. is looking forward to sustaining its global leadership, improving its economy, and building a huge and good network of partnerships and alliances.
- It also wishes to counter China and Russia as its strategic competitor and disruptor respectively. It aims to defend its democracy and boost its competitiveness.
- Furthermore, it portrays the ambitious agenda of the present administration, comprehensively covering transnational challenges, and tying domestic issues with international ones. These would incorporate issues like food insecurity, inflation, climate change, pandemics, energy security, and terrorism. Apart from these issues, a substantial focus is also given to outer space security and governance.
- **The three main fulcrums of the new NSS are:**
  - **Invest:** The strategy seeks to invest in the "tools of influence and power" by bolstering the domestic economy, upgrading critical infrastructure, and investing in technologies like microchips and semiconductors.
  - **Build:** It aims to build 'the strongest possible coalition of countries,' recognizing both the ambitions and limitations of the United States in unilaterally controlling global geopolitics.
  - **Modernize:** Modernization seeks to cater to internal and external security demands simultaneously.
- The three broad purposes served with the release of NSS are:
  - It fulfills the strategic vision of the Interim National Security Strategic Guidance (made public in March 2021).
  - It provides better clarity and regulation on other policy measures of the present administration.
  - It further puts an end to all speculations on the critical presidential doctrines in the U.S.
- It comes at the time of mid-term elections (November 2022) and can sway the elections owing to policy clarity.
- One of the most critical aspects of the NSS is to inform the U.S. Department of Defence's strategy, particularly in two major areas- nuclear use and missile defence.

Though the release of the NSS was delayed because of the Russia-Ukraine war, it has provided useful lessons about the potent use of nuclear weapons, which was last used in the Cuban Missile Crisis (1962).

- U.S. administration also released the Nuclear Posture Review, the National Defense Strategy, and the Missile Defense Review recently, thereby reinforcing the basic idea of the NSS.

**China-Russia challenge:**

- The NSS takes both immediate as well as long-term views on the emerging challenges and threats from China. Though it has outlined a joint strategy to deal with external challenges by out-performing China and restricting Russia, its focus is more tilted towards China.
- The present government places China at the pivot of its decadal outlook. The prominence of China is increasing globally and is particularly pronounced in the Indo-Pacific region across dimensions like development, economy, security, technology, global governance, and diplomacy.
- The document names China as the 'only competitor' with the ability and intent to change the international order in a fundamental way.
- The NSS has also clearly opposed the unilateral change in Taiwan's status by China. Therefore, creating a collective capacity through international alliances and partnerships.
- The new strategy also makes a serious case for downgrading the Russian economy, global influence, military, and soft power. It also identifies countries like India and Japan to fill the emerging gaps.
- It also hints at India's integration into important global forums like G7. However, it should be noted that these reflect the interests of the U.S., rather than the ambitions of its Indo-Pacific partners.

**India's dimension in NSS:**

- NSS identifies India as an important bilateral and multilateral partner in the Indo-Pacific region apart from its significance as a major defense partner and the largest democracy.
- It gives importance to the U.S.-India partnership through the Quad (Australia, India, Japan the U.S.) and the I2U2 ( Israel, India, the United Arab Emirates, and the U.S).

**Nut Graf:**

*The National Security Strategy of the United States was released. It is one of the most important presidential doctrines of the country. The recent strategy has clarified various policy decisions of the present government and aims to sustain the leadership of the United States in the world by adopting appropriate actions.*

### 4. The Interpol General Assembly meeting

**Syllabus:** Important International institutions, agencies and fora- their structure, mandate.

**Prelims:** About Interpol

**Mains:** The importance of international cooperation in order to combat organised crime.

**Context:**

The General Assembly of the International Criminal Police Organisation (Interpol) met in Delhi for four days.



## Interpol

- The International Criminal Police Organization or Interpol was set up in **1923** by 19 countries in the wake of an urgent need to facilitate cooperation between police across borders.
- Interpol plays a key role in the global security architecture, establishing stability, offering neutrality and inspiring trust in a fast-changing world.
- Interpol at present has about **195 countries** as its members.
  - Each of the member countries hosts an Interpol **National Central Bureau (NCB)** which is regarded as the “**heart of Interpol**” as they help connect their national law enforcement with other member countries.
- Interpol has its headquarters in **Lyon, France**.
- Interpol has remained the only organisation in the world with the mandate and technical infrastructure to share police information globally.

## General Assembly of the Interpol

- The General Assembly of Interpol is its supreme governing body and comprises delegates appointed by the governments of its member countries.
- It meets once a year and takes all the major decisions affecting general policy, the resources needed for international cooperation, working methods, finances and programmes of activities. These decisions are in the form of resolutions.
- This will be the 90th session of Interpol general assembly.
- The agenda is expected to include presentations, workshops and discussions on,
  - The future of policing – Diverse perspectives on the future of policing in an increasingly digitised world.
  - Policing today's crimes such as financial crime, cybercrime and crimes against children.
- The General Assembly also elects new members to the Executive Committee as the incumbents end their mandate.
  - Executive committee has 13 members including a President and three Vice Presidents. It is a part time and unpaid role.
  - Executive committee oversees the implementation of General Assembly decisions.



Source: INTERPOL

## Indian Prime Minister at the General Assembly meet

- The Prime Minister of India said that it is important to ensure that there are no safe havens across the world for the perpetrators of organised crimes such as terrorism and drug trafficking.
- In recent times nations and societies are becoming more inward-looking and at this moment it is significant that India has urged for more international cooperation as the PM of India said that “Global cooperation for local welfare – is our call”.
- PM Narendra Modi said that India has been fighting transnational terrorism even before the world realised the price of safety and security.
- The PM also acknowledged the increasing threat of cyber crimes and reiterated the need for formulating international strategies, setting up early detection and warning systems, safeguarding transportation services, and protecting communication infrastructure and critical infrastructure by enhancing technological cooperation and intelligence exchange.
- He also spoke about the role of corruption and financial crimes in terror funding and impacting democracies across the world.

## Achievements of India in handling crisis situations:

- The PM of India appreciated Indian police both at the Union as well as State levels for implementing more than 900 national and about 10,000 State laws in coordination.
  - He said that the police forces have played a huge role in safeguarding the democracy, diversity and rights of the people guaranteed by the Constitution.
- India had been one of the topmost contributors of troops to the United Nations peacekeeping operations.
- Further, in recent years India has played a lead role in combating various global crises such as climate change and the COVID pandemic.

## Nut Graf:

Due to growing interconnectedness in the global order, crimes against people in one region can now impact the rest of the world and hence such crimes are to be treated as crimes against the whole of humanity and the law enforcement agencies from across the world must collaborate to devise protocols to counter such organised crimes.

## 5. Iranian Kurds

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

**Prelims:** About Iranian Kurds

## Context

Iran's minority Kurdish community is in focus after the death of a Kurdish woman named Mahsa Amini in custody which has sparked national protests.

## Kurdish community

- The Kurdish community is spread across various Middle East countries and this community people are one of the world's largest people without a state.
- Kurds reside in a mountainous region along the borders of Armenia, Iraq, Iran, Syria and Turkey.
- Kurds are a minority in Iran as they are Sunni Muslims in Shi'ite-dominated Iran
- Kurdish community people mainly speak a language related to Farsi.



- Kurdish nationalism started in the 1890s during the last stages of the Ottoman Empire.
  - The Treaty of Sevres in 1920 had imposed a settlement and colonial carve-up of Turkey after the first World War and had assured independence to Kurds. However, Kemal Ataturk, a Turkish leader, tore up that accord three years later.
  - The Treaty of Lausanne ratified in 1924, divided the Kurds among the newly formed countries in the Middle East.
- Kurdish separatism began in Iran with the Republic of Mahabad in 1946 which was a Soviet-backed state stretching over Iran's border with Turkey and Iraq.
- The Islamic Revolution in Iran in 1979 resulted in bloodshed in its Kurdistan region with heavy clashes between the Shi'ite revolutionaries and the Kurdish Party of Iranian Kurdistan (KDPI).
- After the start of the Iran-Iraq war in 1980, Iranian armed forces and Revolutionary Guards have increased their repression of Kurds.
- With about 8 to 10 million Kurds living in Iran they account for 10% of the population and have been subjected to deep-rooted discrimination and their economic, social, political and cultural rights have been diluted.

## 6. OPEC+ oil production cut

**Syllabus:** Important International institutions, agencies and fora- their structure, mandate.

**Prelims:** OPEC and OPEC+ Countries.

**Mains:** Reduction in the oil production by OPEC+ Countries - its reasons, implications and associated concerns.

**In the news:**

- Recently oil producers cartel OPEC+ announced that it would reduce oil production by 2 million barrels per day
- For context, 2 million barrels per day is around 2 percent of current global oil supply. It would also be the largest cut since the beginning of the Covid-19 pandemic.

**What is OPEC and OPEC+?**

**OPEC**

- Organization of the Petroleum Exporting Countries or OPEC is a permanent intergovernmental organization of 13 oil-exporting nations that coordinates and unifies the petroleum policies of its Member Countries.
- The organization was established at the Baghdad Conference in 1960. The founding members were Iran, Iraq, Kuwait, Saudi Arabia and Venezuela.
- OPEC has since expanded and now has 13 member states. Member countries are: Algeria, Angola, Congo, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, United Arab Emirates, Venezuela.
- OPEC had its headquarters in Geneva, Switzerland, in the first five years of its existence. This was moved to Vienna, Austria, on September 1, 1965.
- Qatar terminated its membership on 1st January 2019.
- Ecuador, who joined OPEC in 1973 decided to withdraw its membership effective 1 January 2020.

**OPEC+**

- OPEC with another 10 allied major oil-producing countries signed the Declaration of Cooperation in December 2016, coming together to help rebalance the market, bring down inventory levels and support oil market stability and hence OPEC is known as OPEC+.
- 10 allied members in the OPEC+ are **Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico, Oman, Russia, South Sudan and Sudan.**
- The "Seven Sisters," a group of international oil corporations dominated by the west that had previously controlled the oil market, were displaced by OPEC in an effort to increase the influence of the countries that produce the oil. According to estimates from 2018, they hold 80% of the world's oil reserves and about 40% of the world's crude oil.
- Recently, the Organisation of the Petroleum Exporting Countries and its allies (OPEC+) has decided to cut oil production by 2 million barrels per day (bpd).
- The No Oil Producing and Exporting Cartels (NOPEC) bill, which aims to shield US consumers and companies from engineered oil price spikes, was approved by US lawmakers in May 2022.

**Reasons for cut in production:**

**The followings can be the reasons behind the decision on production cut:**

- Oil prices have shown fluctuating trends in recent months in the event of Russia- Ukraine war. Oil prices increased sharply after Russia's invasion of Ukraine. It directly helped OPEC countries especially Saudi Arabia which has become one of the fastest growing economies recently.
- It began to soften over the past few months. Then it started to drop down sharply due to fears of a recession in Europe and reduced demands from China because of its lockdown measures.
- OPEC+ members are also concerned with recession-like phenomena internationally and many nations are struggling to have a stable growth which further adds to their worries and they think reducing supply is a measure to protect their profit.
- European countries are imposing sanctions on Russia in the event of the ongoing war. After imposing economic sanctions on Russia, which is their main oil importing country, the next destination to fulfill their energy requirements will be the OPEC country. It has given an opportunity for OPEC countries to reap maximum profit in this scenario, so hiking prices will be in their favor.
- Again due to multiple waves of COVID there is a lot of uncertainty in the international markets especially in demand side due to phased lockdown and shutdown. So it is the most logical step for OPEC to cut short the production so that there is no oversupply. To avoid any oil market imbalances and to have stability over the period of time.
- The cut was necessary in response to rising interest rates in the West.

**Likely impact**

- **On the world:** The world is concerned about the oil cut as it threatens to push the countries backward which are still recovering from the brunt of the pandemic. High prices would mean reduced demand fears of recession are also being expressed. It also worsen situations in countries already reeling under inflation due to higher import bills such as the UK. Prices started to rise even before the cut was



announced & reported that oil prices were up by 4 per cent.

- **Impact on European Countries:** The European Union has decided to reduce oil exports from Russia by putting a price cap. Recent announcement of oil production cuts is likely to make oil prices high. This would mean that Russia can still continue to collect its significant revenue from oil export. It would be hard for European countries to implement their plan to reduce dependency on Russia.
- **Impact on the U.S:** The US, which has frequently requested that the organization increase oil output, is expected to suffer as a result of the announcement. Slashes in oil production and ensuing price increases can be especially risky for the US, which is attempting to lower inflation rates ahead of the November 2022 midterm elections.
  - In order to increase supplies and lower costs, the United States has teamed up with India, China, Japan, South Korea, and the United Kingdom to release oil from each country's strategic reserves. But this is only a temporary solution. US reserves, which are intended for national emergencies, are further put under strain. The US reserve is already at its lowest in four decades.
- **Impact on India:** It could lead to rise in import bill, increased domestic inflation, and rise in current account deficit. But India is confident of sailing through the spikes because oil output is cut. India is also diversifying its energy needs by investing in renewable energy.

#### Concerns:

- By keeping the interest of OPEC countries at forefront and to guard their profit for any kind of uncertainty in future will set a bad example for other countries who have monopoly power over other raw materials.
- Because high prices can further reduce demand, OPEC+'s justification for matching supply with alleged low demand is faulty.
- Russia is using oil exports to fund war. It is selling oil at discounted rates to countries to increase oil exports. As global prices rise, countries will find it hard to avoid Russian oil. The efforts of European countries and the US to wean the world off Russian oil and hurt the Russian economy can be harder to achieve than planned.

## 7. Children's death in Gambia

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

**Prelims:** Drug related regulations In India

**Mains:** Implications of Gambia cough syrup tragedy on India and Damage Control measures undertaken

#### In the news:

- Recently, the World Health Organisation (WHO) issued an alert about four Indian-manufactured Maiden Pharmaceuticals Limited cough syrup "**potentially linked cough syrups**", which are said to be linked to acute kidney injury in children and 66 deaths in the small West African nation of Gambia.
- The four cough syrups allegedly linked to the deaths are **Promethazine Oral Solution, Kofexmalin Baby Cough Syrup, Makoff Baby Cough Syrup and Magrip N Cold Syrup.**

- As per the tentative results received by WHO, out of the 23 samples of the products which were tested, four samples contained **Diethylene Glycol/Ethylene Glycol**.
  - Diethylene Glycol/Ethylene Glycol are colorless chemical ingredients that are not allowed in food or drugs, as they can when consumed can cause gastrointestinal symptoms such as nausea, vomiting, abdominal pain, diarrhea and even renal failure.
  - Some patients may develop early neurological symptoms like altered mental status, central nervous system depression, coma and mild hypotension. These chemicals may have caused the reported deaths.
- As these drugs are also being supplied to other countries as well, WHO has asked all countries to detect and remove these products from circulation to prevent further harm to patients.
- WHO said that not only single batch but complete batch should be taken as harmful. These should be analyzed by the relevant national regulatory authorities..

#### Cases of Past:

- Such incidents have been reported in the past as well. This toxic chemical has caused many cases of mass poisoning. Due to the presence of diethylene glycol in cough syrups, in Bangladesh between 1990 and 1992, death of 339 children had been reported. most of them died, after being given syrup contaminated with diethylene glycol.
- In 2020, nine children had died in Jammu because of the presence of a "poisonous compound" that was later found to be diethylene glycol.
- Same incident happened this year, when 14 children died in Himachal Pradesh due to the same contaminants – diethylene glycol.
- The company, Maiden Pharmaceuticals Limited claims to be a WHO-GMP & ISO 9001-2015 certified pharmaceutical company. The pharma company has a global presence with a strong concentration in Africa, in countries such as Algeria, Senegal, Nigeria, Cameroon, Kenya and Tanzania.
- The company said these were not sold in India and are only for export markets already approved by the DGCI.

#### Damage Control measures:

- External Affairs Minister Dr S Jaishankar on Thursday spoke to his Gambian counterpart Dr Mamadou Tangara and conveyed condolences on the deaths of young children allegedly linked to the contaminated cough syrups produced in India. He assured Tangara that a serious investigation is being undertaken by appropriate authorities in India to ascertain the facts over World Health Organization alerts.
- Samples of four cough syrups manufactured by the firm have been sent to the Central Drugs Laboratory in Kolkata for examination. Panels are formed to look into the matter. Appropriate action will be taken once the report comes.



## Drugs Regulation In India

### Decoding the regulatory norms

**Who can export drugs from India?**  
Any manufacturer with a certification from the Central Drugs Standard Control Organisation (CDSCO) – the apex regulatory body for cosmetics, pharmaceuticals and medical devices.

**Do drugs manufactured in India for export need to be tested domestically?**  
At the time of issuing license, drugs inspectors assigned by the Indian regulator may lift samples in any phase of manufacturing for quality checks. It is, however, not mandatory and rarely done.

**What safety norms need to be adhered to?**  
First point of testing is at a manufacturer's level to ensure that the drug adheres to the safety norms prescribed by the Indian Pharmacopoeia, and the regulatory requirement of the country of export. However, generally speaking, destination countries expect nations of origin to strictly follow the norms prescribed by the pharmacopoeia under which the sale is governed.

**What are the intn'l drug safety norms?**  
Drug regulatory norms are usually country-specific and are enforced at the level of individual countries. The US, Japanese, British, European and Chinese pharmacopoeias act as reference points for uniform preparations for the most commonly used drugs – with tests to assure their quality, potency and purity. The WHO's prequalification programme is another criterion wherein the UN body certifies safe of drugs/vaccines under the UN programmes.

**Are destination nations responsible for safety?**  
Some countries do internal testing at the point of entry, but it is not mandatory and varies by the country.

**For sale domestically  
What are the checks in place to ensure the safety of drugs in India?**  
The CDSCO and state drug regulators are responsible for ensuring quality of drugs that are manufactured, sold or distributed in Indian markets.



**Maiden Pharma controversies**  
**KERALA:** Maiden Pharmaceuticals' drugs – Matemin, Estipin, and Marcal-D – were lifted from the markets after they were found to be substandard.  
**BIHAR:** The state health department blacklisted the firm for 5 years in 2011 after six batches of two of its drugs were found 'not of standard quality'.



### The Drugs and Cosmetics Act 1940: (Amended in 2008)

- It regulates the import, manufacture and distribution of drugs in India. The primary objective of the Act is to ensure that the drugs and cosmetics sold in India are safe, effective and conform to prescribed quality standards.
- The Drugs and Cosmetics Act, 1940 and Rules 1945 carries various responsibilities to central and state regulators for regulation of drugs and cosmetics. Additionally, it offers the regulatory guidelines for issuing licenses to manufacture Ayurvedic, Siddha, Unani medicines. Manufacturers are required to follow the rules for licensing of manufacturing facilities and medications, including evidence of safety and effectiveness and adherence to good manufacturing practices.

### Central Drugs Standard Control Organization (CDSCO):

- It is a national level regulatory body under the Ministry of Health and Family Welfare. It discharges functions assigned by the central government under the Drugs and Cosmetics Act.
- It prescribes standards and measures for ensuring the safety, efficacy and quality of drugs, cosmetics, diagnostics and devices in the country.
- It controls the standards for clinical trials and the approval of new pharmaceuticals for the market. It oversees medicine imports and grants manufacturing permits. Indian pharma exports are governed by CDSCO. CDSCO approval is needed to export medicines outside of India.

### Drugs Controller General of India (DCGI):

- DCGI is the head of department of the CDSCO of the Government of India responsible for approval of licenses of specified categories of drugs such as blood and blood products, IV fluids, vaccines and sera in India.
- DCGI also sets standards for manufacturing, sales, import, and distribution of drugs in India. It prepares and maintains the national reference standard for drugs.
- It ensures that there is uniformity in the implementation of the Drugs and Cosmetics Act. It is also responsible for the training of Drug Analysts.
- In case of any dispute with respect to the quality of the drug, the DCGI is the appellate authority.

## 8. UK Tax Cut Plan

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

**Mains:** Details about the UK's Tax Cut Plan

### Introduction:

- The UK Chancellor announced a new growth plan for the country that includes a cut to stamp duty land tax, cancellation of planned rise in corporate tax, 1p cut to the basic rate of income tax one year earlier than planned. From April 2023, the basic rate of income tax will be cut from 20% to 19%.
- Apart from the tax cuts, the chancellor also abolished the additional rate of tax, taking effect from April 2023.

### Need of the package:

- The country is facing high levels of inflation, shortage of labor, lack of private investment, etc. The new growth plan was aimed to boost growth by tax cuts and regulations.

### Challenges involved:

#### High Government borrowings:

- The tax cuts will reduce the government revenue hence a pressure will be placed on the government borrowings.
- Ultimately, the government will be burdened with a huge borrowing and it will worsen the nation's cost-of-living crisis.

#### Higher inflation:

- Tax cuts will lead to increased consumer demand and more money in the hands of people to spend. It will push the prices to a much higher level.

#### Inequality:

- The tax cuts would most likely increase economic inequality.

#### Global recovery will be hurt:

- It will lead to economic contraction along with rising prices which in turn may hurt the global recovery process.

#### Immediate impacts of the plan:

- Raised a concern among investors regarding the government borrowing and invoked investors-confidence crisis.
- The pound value declined against the dollar.
- The Bank of England had to intervene with a \$73 billion program to strengthen the market conditions.

### Optional Subject Coaching

for Political Science and International Relations, and Sociology



**Video Lectures**  
Online video lectures covering both Paper 1 and Paper 2 of the optional subject.



**Test Series**  
Test Series to improve your answer writing skills and boost your confidence.



**Mentorship Assistance**  
Mentorship assistance on a real-time basis to clear all your doubts and queries.



# ART AND CULTURE

## 1. National Maritime heritage complex and Lothal

**Syllabus:** Architecture from ancient times

**Prelims:** Facts about National Maritime Heritage Complex (NMHC) and Lothal Port

**Mains:** Details about NMHC and its significance

### Context:

The Prime Minister of India recently reviewed the construction of the National Maritime Heritage Complex (NMHC) site at Gujarat's Lothal.

### National Maritime Heritage Complex (NMHC):

- National Maritime Heritage Complex (NMHC) is the first of its kind initiative in India.
- NMHC is being developed as a world class international tourist destination which would consist of a maritime museum, lighthouse museum, maritime theme parks, amusement parks, etc.
- Plans are on to have a pavilion for each of the coastal States and Union Territories (UTs) of the country at NMHC.
  - These pavilions will showcase the artefacts of the maritime heritage of the respective States and UTs.
- The construction work of the complex was started in March 2022 at Lothal and is being developed at a cost of around ₹ 3500 crores.
- The NMHC would be funded by the Ministry of Shipping and the Ministry of Culture through the National Culture Fund (NCF) by way of a grant.
  - The Ministry of Culture would facilitate fundraising through the NCF.
  - The NCF can also receive funds in the form of grants, donations, foreign contributions, and corporate social responsibility (CSR) funds.

### Significance of NMHC:

- NMHC would play a significant role in showcasing India's maritime heritage ranging from ancient to modern times in an edutainment (education + entertainment) approach by adopting advanced technologies.
- NMHC will also play a crucial role in spreading awareness about the maritime heritage of the country both to the citizens as well as international forums.
- Every coastal State and UT can depict its unique cultural identities including both tangible and intangible heritage at NMHC and highlight India's cultural diversity at an international level.
- NMHC will further help boost the tourism sector and unlock the hidden potential of the heritage destinations in India which would lead to economic development in these regions.

### Lothal Port:

- Lothal was one of the most prominent cities of the Indus Valley Civilization or the Harappan Civilization.
- Lothal was one of the southernmost sites of the Harappan Civilization which is located in the Bhāl region of the state of Gujarat.
- The literal meaning of the word "Lotha" in Gujarati is "the mound of the dead".
- The Archaeological Survey of India (ASI) has unearthed a mound, a township, a marketplace, and the dock in Lothal.

- Lothal is famously known for the discovery of the oldest man-made dockyard ever as the port city is said to have been constructed in 2,200 BC.
  - The dockyard is believed to have connected Lothal to an ancient course of the Sabarmati river on the trade route between Indus Valley cities in Sindh and the peninsula of Saurashtra.
- Lothal was known to be a key trading centre in ancient times and is famous for its trade of beads, gems and ornaments with West Asian and African civilizations.
- Lothal was nominated as a UNESCO World Heritage Site in 2014 and its application is still pending on the tentative list of UNESCO.

### Nut graf:

The development of the National Maritime Heritage Complex at Lothal will not only play a significant role in boosting tourism but also act as a hub for learning about India's rich maritime power, history and prosperity.



**BYJU'S | IAS**  
EXAM PREP  
Mentorship

- Dedicated mentorship helpline for mentoring
- Aspirants can speak directly to subject matter experts and clear doubts.
- Get personalised strategy for preparation – Personalised Mentor Support



# SCIENCE AND TECHNOLOGY

## 1. Satellite broadband services in India

**Syllabus: Scientific developments & their Applications & Effects in Everyday Life**

**Mains: Policies to overcome Digital Divide in India**

**Context:**

- Companies like Jio, OneWeb, Hughes and Tata-backed Nelco are preparing to provide satellite broadband connectivity in India.

**Introduction:**

- Satellite communication has been gaining prominence globally and is seeing a lot of interest, investments, and innovations.
- The two biggest developments in the global satellite communication space are the emergence of LEO (low-earth orbit constellations) that promises to provide truly global coverage and lower latency service, and HTS (High Throughput Satellites Service) which offers unprecedented capacity and flexibility.
- Although India's satellite broadband market is still in its infancy, the growing demand for connectivity and Internet, the Digital India drive — calls to connect all unserved terrains.
- Nevertheless, according to several reports, despite India's impending 5G service rollout, infrastructure issues including insufficient tower fiberization raise concerns about 5G's success.

**Satcom players in India:**

- Several players offering satellite broadband services are preparing to start operations in India.
- Jio has received approval from the Department of Telecommunication (DoT) to provide satellite broadband services in India.
  - Jio Platforms Ltd and Luxembourg's SES, formed a joint venture called Jio Space Technology Ltd to provide satellite-based broadband services in India.
- The licences are for a period of 20 years and include voice and data services via satellite.
- In January 2022, satellite communication companies, OneWeb and Hughes Network Systems, announced a six-year agreement, to bring low Earth orbit (LEO) connectivity services in India.
  - OneWeb will then bring these solutions to enterprises, governments, telcos, airline companies and maritime customers.
- However, the ongoing Russia-Ukraine crisis forced OneWeb to cancel the planned launch of 36 satellites on Russia's Soyuz rockets after Russia cancelled its agreement with the company.
- OneWeb has partnered with ISRO's NewSpace India Limited (NSIL) and SpaceX to resume its satellite launches in early 2023.
- A Joint venture by Hughes Communications India, (HCI) and Bharti Airtel have received all statutory approvals to provide satcom.
  - HCI also launched India's first HTS broadband service to deliver high-speed broadband, including to the most remote areas beyond the reach of terrestrial networks.
  - HTS provides more throughput than conventional communication satellites.

- Higher-throughput refers to higher data processing and transfer capacity than conventional satellites, while using the same amount of orbital spectrum.

- Tata-owned satcom company Nelco, and Canada's Telesat have also successfully conducted the first in-orbit demonstration of high-speed broadband connectivity in India recently.

**Significance of Telesat services:**

- Satellite broadband services can connect the most remote parts of the country which are otherwise difficult to connect through fibres with high reliability and flexibility.
  - For example, Hughes India has partnered with Bharat Broadband Nigam Limited (BBNL) and Telecommunications Consultants India Ltd. (TCIL), as part of BharatNet, to provide high-speed satellite connectivity to 5,000 remote gram panchayats located in northeastern States and the Galwan Valley in Eastern Ladakh.
- Telesat services will deliver significant benefits for applications like 4G/5G backhaul, mobile hotspots, telemedicine, village connectivity and more.
- Additionally, Telesat will speed up the rollout of 4G and 5G networks and establish new performance benchmarks for business, telecom, mobility, and government broadband access on land, air, and sea.

**Challenges:**

- Due to the long distances that satellite signals must travel and all of the potential barriers in their path, satellite data transfer offers relatively poor Internet speeds and constrained satellite bandwidth.
  - Connection times can also be impacted by your surroundings, the length of your message, and the status and availability of the satellite network.
- Satellite Internet latency can be a significant problem which can affect real-time applications like video chats.
- Minor changes in weather can have a massive impact on both the speed and latency of satellite data.
- Complex satellite networks with costly equipment makes the service expensive.

**Nut Graf:**

*India is quickly catching up with global trends and with greater prospects in the global satellite communication market, the Department of Space should release the pending new Spacecom policy with clear guidelines to end uncertainty over the launch of commercial services in India. Rollout of satellite broadband communication services can close the digital divide in India.*

## 2. Space observatories

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

**Prelims: About Dark Sky Reserves, Vainu Bappu Observatory and Hanle Space Observatory**

**Context:**

- As the Department of Science & Technology (DST) announced the establishment of the country's first Dark Sky Reserve in Ladakh, there has been an increased focus on various space observatories of the country.



### Space observatories:

- Space observatories help astronomers identify stars and various cosmic phenomena such as supernovae and nebulae which are light years away.
- The location of these space observatories plays a crucial role in helping astronomers detect the faintest of stars and their radiation that usually lie outside the range of visible light.
- The cosmic radiations are easily absorbed by water vapour and hence the telescopes must be placed at observatories that are high above the ground where the atmosphere is drier and a dry, high-altitude desert is an ideal location.
- Various expeditions have been launched to identify such places to set up space observatories in India.

### Vainu Bappu Observatory:

- The Vainu Bappu Observatory is one of India's foremost observatories and is administered by the **Indian Institute of Astrophysics (IIA)**, Bengaluru.
- Vainu Bappu Observatory is set up in **Javadi hills in Kavalur, Tamil Nadu**.
  - The location was chosen in the 1960s due to its altitude of 750 metres above sea level, amidst a forest that offered unobstructed visibility of the night sky.
- Astronomers led by R. Rajamohan discovered an asteroid that was named "4130 Ramanujan" with the help of a 45-cm **Schmidt telescope** housed at Vainu Bappu Observatory.
- However, the location of this observatory is not ideal as Kavalur is placed in the region which is in the path of both monsoonal clouds (June-September) as well as retreating northeast monsoon (November) which forces the close down of the observatory.
  - The monsoon or rain clouds absorb radiations from cosmic objects thereby preventing them from being seen on a telescope.

### Hanle Space Observatory:



Source: The Better India

- The Indian Astronomical Observatory (IAO) located at Hanle near Changthang Wildlife Sanctuary (Leh) in Ladakh is said to be one of the most promising observatory sites globally.
- Hanle is a small village located over 14,000 ft above sea level. The Observatory is placed on the highest peak in **Digpa-ratsa Ri** called **Mount Saraswati**.
- The region offers numerous advantages such as more clear nights, minimal light pollution, background aerosol concentration, extremely dry atmospheric conditions, and uninterrupted by rains.
- The observatory consists of a multicoloured dish called the **Major Atmospheric Cherenkov Experiment Telescope (MACE)** which was jointly built by the Bhabha Atomic Research Centre, the Tata Institute of Fundamental Research, the Electronics Corporation of India Ltd. and the IIA.

- The dish, with a diameter of 21 m, is the second largest of its kind in the world and the goal of which is to detect **Cherenkov radiation**.
  - Cherenkov radiation is a special kind of light from gamma rays, or the most energetic sources of radiation, that can result from dying stars or several galactic events.
- The observatory also consists of a seven-telescope contingent, called **HAGAR (High Altitude Gamma Ray)** which also looks at Cherenkov radiation.
- Further, the highest of the observatories is the **Himalayan Chandra Telescope (HCT)**, which has been active since 2000.
  - HCT is an optical-infrared telescope with a 2-metre lens designed to detect light from the visible range of the electromagnetic spectrum and also the ones below the infrared spectrum.
- The second capsule which is located lower than the HCT is the **GROWTH-India telescope** which is a 70-cm telescope made by IIA and the IIT-Mumbai which helps detect and monitor various cosmic events.
- The telescopes at IAO are controlled remotely via a satellite link from the IIA's **Centre for Research and Education in Science and Technology (CREST)**, near Bengaluru.

### Dark Sky Reserve:

- A Dark Sky Reserve is public or private land with a distinguished nocturnal environment and starry nights that have been developed responsibly to prevent light pollution.
- As per the International Dark Sky Association (IDSA), Dark Sky Reserves comprise a core area with minimum criteria for sky quality and natural darkness, and a peripheral area that supports dark sky preservation in the core areas.
- **The key objectives of the Dark Sky Reserves are to:**
  - Promote astronomy tourism in a sustainable and environment-friendly manner
  - Facilitate astronomical observations
  - Protect nocturnal species which rely on darkness to hunt and forage
  - Use of various scientific methods to preserve the night sky from ever-increasing light pollution

### Dark Sky Reserve in India:

- The country's first-ever "Dark Sky Reserve" will be located at Hanle in Ladakh as a part of Changthang Wildlife Sanctuary.
- Hanle Dark Sky Reserve (HDSR) will be situated at a height of over 4,500 metres above sea level.
- For this purpose, a tripartite Memorandum of Understanding (MoU) was signed between the Indian Institute of Astrophysics (IIA), Ladakh Autonomous Hill Development Council (LAHDC) Leh, and the UT administration.
- The Department of Science and Technology and experts from IIA in Bengaluru will be providing scientific and technological support in developing the facility.
- The 22-km radius around the Hanle observatory, where the core Dark Sky Reserve will be established, will have restrictions imposed on outdoor lighting.
  - Vehicles will be barred from using high-beam headlights and households in the region would be urged to use curtains of darker shades, install light-reflecting shields and switch off all unwanted illumination.
- The establishment of the Dark Sky Reserve will help promote astro-tourism which will help boost local tourism and the overall economy of the region.



**Nut Graf:**

The setting up of the country's first Dark Sky Reserve at Hanle in Ladakh has gained a lot of significance as the establishment of this facility will further help in improving the research capabilities of the Indian Astronomical Observatory in Hanle and also promote Astro-tourism.

**3. Meat and milk from plants**

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

**Prelims:** About plant-based meat and plant-based dairy

**Context:**

Recently, there has been an emergence of plant-based meats across the world.

**What are plant-based meat and plant-based dairy?**

- Plant-based meats are products designed to imitate animal meat.
- Plant-based meat refers to products that bio-mimic or replicate meat, seafood, eggs, and milk derived from animals in terms of look, smell, and taste.
- Plant-based meats are known to have lower calories and saturated fat while having higher fiber content.
- Key ingredients in plant-based meats include coconut oil, vegetable protein extract, and beet juice
- Even the proteins and other solids-not-fat ingredients are sourced from plants.
- The main products of plant-based dairy are milk from oats, almonds, soyabean, coconut, and rice.
  - Plant-based dairy products also include ice-cream which isn't a frozen dessert that replaces milk fat with vegetable oil.

**Trends in the industry**

- As per the Good Foods Institute in the USA, retail sales of plant-based animal product alternatives in the US were recorded at \$7.4 billion in 2021.
- The main categories were plant-based milk, meat, creamer, ice-cream, yogurt, cheese, butter, ready-to-drink beverages, meals and protein liquids, powders, and bars.

**Scope in India**

- In India, both milk (which includes ghee, curd, butter, ice-cream and other dairy products) and meat (which includes fish and prawn) are considered superior food.
  - Superior foods are those whose share in the value of consumption increases with increasing incomes.
  - Whereas cereals and sugar are considered inferior foods as their share in the value of consumption reduces with increasing incomes.
- According to experts, the Plant-based meat and dairy industry cannot compete with the real milk or meat industry in India in terms of nutrition, taste, or affordability.
- Further, the market for plant-based dairy in the West has been fueled by the concerns of lactose intolerance and such concerns are not serious in India.
- Also, plant-based meat in the West, is seen as a replacement for red meats (beef, pork, and mutton) because of various health concerns. However, India's annual per capita consumption of fish (6 kg) and chicken (4.5 kg) is much more as compared to mutton (700-800 gms).

**4. Nobel Prize for Medicine 2022**

**Syllabus:** Achievements in science & technology

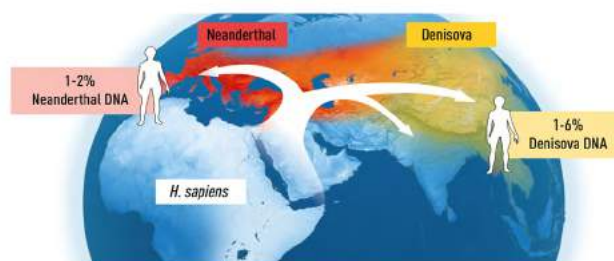
**Prelims:** Contributions of the Nobel Prize for Medicine winner 2022.

**Context**

Svante Paabo, a scientist from Sweden, won the Nobel Prize in Physiology or medicine in 2022.

**Contribution of Svante Paabo**

- Svante Paabo was awarded the Nobel Prize for his discoveries on human evolution that provided key insights into the immune system of modern humans and what makes modern humans unique as compared to other extinct species.
- Svante Paabo spearheaded the development of new techniques that allowed researchers to compare the genome of modern humans and that of other hominins such as the Neanderthals and Denisovans.
- The Neanderthal bones were first discovered in the mid-19th century and only by unlocking their DNA, the scientists were able to fully understand the links between species. This included the time when modern humans and Neanderthals diverged as a species around 8,00,000 years ago.
- Svante Paabo and his team found that gene flow had occurred from Neanderthals to Homo sapiens, demonstrating that they had children together during periods of coexistence.
  - His studies also showed that Neanderthals and Denisovans (the ancestors of modern humans) co-existed for about 20,000 years, during which they not only interacted with each other but also interbred.
- This transfer of genes between hominin species has had a significant impact on the immune system of modern humans. It was also seen that people outside Africa have 1-2% of Neanderthal genes.
  - By mixing with Denisovans after migrating out of Africa, Homo Sapiens picked up gene sequences that improved their chances of surviving in their new environments.



Source: [www.nobelprize.org](http://www.nobelprize.org)

- Svante Paabo is also credited with developing new and innovative methodologies to extract 'clean' DNA from human fossils tens of thousands of years old and reading the genetic information contained therein.
  - Earlier, scientists used to study the genomes of current human beings and extrapolated the information into the past which is called deduction.
  - However, this method involves indirect and involves uncertainties.
  - Paabo developed methodologies that have eliminated deductions, and rely on direct observation.
- Further, Svante Paabo's seminal research has given rise to an entirely new scientific discipline called paleogenomics.



## 5. Super App

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

**Prelims:** About Super Apps

**Mains:** Details about Super apps and its associated issues or concerns

### Context

As Elon Musk proceeded with his original plan to buy Twitter, the concept of “super app” or “everything app” has come to the limelight.

### Super apps

- A super app is an application developed by a company that offers several services under a single umbrella.
- Super apps or everything apps are regarded as the Swiss army knife of mobile apps as they provide a variety of services such as messaging, social networking, e-commerce shopping, and peer-to-peer payments for users under a single platform.
- Experts compare super apps to a mall that provides retail space to various brands and shops across businesses and verticals.

### Key examples

- **WeChat** app of China which initially started as a messaging app has now expanded its scope to include services such as payments, cab services, shopping, food delivery, etc. and has become a super app.
- **Grab** app which was launched in 2012 as a ride-hailing app like Uber has now become Southeast Asia’s leading super app which provides services such as offering rides, food delivery and financial services that includes loans, insurance, payments and investments.

### Who makes super apps?

- The concept of super apps initially emerged in China and southeast Asian regions as internet companies such as WeChat, GoJek, Grab utilised the opportunity of customer traffic on their platforms who originally registered themselves for social media and communication purposes.
  - Additional services offered to customers resulted in increased revenue realisations.
- Post this, companies that have a slew of services and goods to offer typically have made efforts to consolidate them into one single super app.
- In the west Asian region, a different approach has been adopted wherein traditional business conglomerates like real estate firms Majid Al Futtaim Group, Emaar, Chalhoub Group which have a large portfolio with presence in shopping malls, grocery and entertainment are building digital assets.
  - According to experts, these businesses are witnessing high customer footfalls and high repeat purchases which when seen from the lens of online players is the most important parameter for a super app in any region to grow.

### Super apps in India

- TataNeu is one of the super apps recently launched in India.
- The Reliance Industries, through its Jio umbrella, has provided consolidated services and offerings like shopping, payments, content streaming, cloud storage services, etc.

- Paytm also provides various services such as payments, ticket bookings, shopping, banking, etc. under one single app.
- The owners of the PhonePe app have also partnered with other companies like Ola, Swiggy, AJio, Grofers, Delhi Metro, booking.com, etc.

### Key concerns

- **Monopoly:** critics believe that the very concept of conglomerates trying to hold onto a customer within their own ecosystem increases the possibility of a monopoly.
- **Privacy related issues:** super apps provide firms with large amounts of consumer data and experts pointed out that data collected by the master app could then be used to train machines in artificial intelligence and predict consumer behaviour.
  - It is one of the key reasons why super apps have not penetrated the markets of countries like the US and the UK.

### Nut graf:

The penetration of smartphones and the internet at a rapid rate in recent years has provided a huge opportunity for companies to increase revenue realisation through super apps such apps also provide companies with large volumes of consumer data which can then be harnessed to learn more about user behaviour which has led to privacy concerns.

## 6. Integrated Cryogenic Engine Manufacturing Facility

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

**Prelims:** About Cryogenic Engine

**Mains:** Applications of cryogenic engine

### Context:

- Recently President Droupadi Murmu inaugurated the Integrated Cryogenic Manufacturing Facility at HAL in Bengaluru.
- The facility will produce cryogenic and semi-cryogenic engines for launch vehicles of ISRO.

### Cryogenic Engine:

- The cryogenic engine uses fuels which are stored at very low temperatures to maintain a liquid state. Certain fuels such as hydrogen and oxygen provide high thrust but are found in a gaseous state on earth.
- The cryogenic engine uses liquid oxygen as oxidiser and liquid hydrogen as fuel. they are stored at very low temperatures (-253 degrees C for Hydrogen and -183 degrees C for oxygen) and involve very complex systems.
- The cryogenic stage is the last stage in launch vehicles which will make use of cryogenics and will require comparatively more space for the storage of fuel.

### Applications of cryogenic engine:

- Cryogenic engines can produce more thrust and can carry a heavier weight into higher orbits.
- It is light in weight, cost-effective and environmentally friendly.
- It is used in the Vikas engine of GSLV (With 3 stages; solid, liquid and cryogenic respectively).
- GSLV Mk III is used in ISRO’s first human space flight programme Gaganyaan. The Upper stage of GSLV Mk III is powered by CE-20, the largest Cryogenic Engine built by ISRO.



- India successfully launched Geosynchronous Satellite Launch Vehicle (GSLV-D5), powered by an indigenous cryogenic engine in 2014. Cryogenic engines are a very complex technology and India is the sixth country to develop cryogenic engines.

## 7. Silphion

**Syllabus:** Awareness in the fields of medicine and biotechnology

**Prelims:** About Silphion Plant

### Context:

Ancient plant Silphion which cured many diseases and is considered extinct may be present today according to experts.

### Uses of Silphion:

- In 2021, a study from Istanbul University identified *Ferula drudeana* as a likely candidate for Silphium.
- It is considered a cure-all which was used to treat various health problems such as goiter, sciatica (nerve pain), toothache, intestinal disorders, hormonal disorders, epilepsy, tetanus, polyps (abnormal growth of tissues) and malignant tumours.
- Its resin is also used as a spice, perfume, aphrodisiac, contraceptive and medicine.
- It was also actively used in ancient trade and export.
- Silphion needs cold and moist conditions for seed germination and overharvesting is considered one of the reasons for extinction.

## 8. Next-Gen Launch Vehicle

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

**Prelims:** About Next-Gen Launch Vehicle (NGLV)

### Context:

The Indian Space Research Organisation (ISRO) is working on a Next-Gen Launch Vehicle (NGLV) to replace operational systems like the Polar Satellite Launch Vehicle (PSLV) in future.

### Details:

- According to Dr. S Somnath, in NGLV, ISRO is looking at a cost-efficient, three-stage, reusable heavy-lift vehicle with a payload capability of 10 tonnes to Geostationary Transfer Orbit.
- NGLV is to feature semi-cryogenic propulsion for the booster stages which is cheaper and more efficient. The semi-cryogenic stage envisioned for the NGLV consists of **refined kerosene as fuel with liquid oxygen (LOX)** as an oxidiser.
- NGLV will also be a **reusable launch vehicle** like the Reusable launch vehicle pioneered by SpaceX.
- ISRO's bigger ambitions such as the space station, the Aditya mission, etc., will require a heavy-lift vehicle like the NGLV.
- NGLV will feature a simple, robust design that allows bulk manufacturing, modularity in systems, sub-systems and stages and minimal turnaround time.
- Potential uses will be in the areas of launching communication satellites, deep space missions, future human spaceflight and cargo missions.

## 9. WEB 3.0 and Metaverse

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

**Prelims:** WEB 3.0 and metaverse

### Introduction:

- The World Wide Web is a subset of the Internet consisting of pages that can be accessed by a Web browser.
- Web 3.0 is a concept for a new version of the World Wide Web that is based on blockchain technology and integrates decentralization and token-based economics.

### Metaverse:

- The metaverse is "an integrated network of 3D virtual worlds." Here, users can interact with each other and with computer-generated objects and avatars.
- The Metaverse represents a highly interactive three-dimensional virtual world. Like the real world, users can trade land, buildings, and other digital assets in the Metaverse and explore the space using their personalized avatars.
- These avatars are replicas of the user that can do everything a human can do in the real world.

### WEB 1.0:

- World Wide Web 1.0 was invented in 1989 and is static in nature.
- Only a few groups created content and Web 1.0 did not have the algorithms to shaft through the pages which made it difficult to access the relevant information by the users.

### WEB 2.0:

- Web 2.0 was introduced with full features in 2004 and it was more interactive as compared to Web 1.0.
- In this kind of web, users were also able to create content and it had features such as Javascript, HTML, etc.
- It also came up with the social networking sites such as youtube, Facebook, Twitter, etc., and is also known as the social web.

### WEB 3.0:

- Web 3.0 is the next step in the evolution of the web, allowing it to process data with human intelligence through the deployment of AI systems that can run clever programs to help users.

### Need for WEB 3.0:

- In Web 2.0, most of the data are stored and owned by a few companies such as Google which has raised concerns about data security, data privacy, and data abuse.
- It has created disappointment among the users and they believe that the primary objective of the internet has been corrupted.
- WEB 3.0 will have a feature of decentralized and fair internet and here, the users will be able to control their data.

### Significance of WEB 3.0:

#### Data security:

- With decentralization and fair internet, Web 3.0 will be able to tackle the issues of data privacy and data security.



**Accurate browsing:**

- It will offer an accurate and efficient browsing experience to the users. Communication and knowledge sharing will become much easier.

**No intermediaries:**

- Blockchain technology records the time and place of the transactions on a permanent basis. Hence, the sellers and buyers will be able to interact directly with each other without any intermediaries.

**Challenges associated:**

- Decentralization of data may result in a lack of control and can create regulatory issues in controlling cybercrime, theft, misinformation, etc.
- It will be difficult for the newcomers to understand the working of web 3.0 and the gadgets which are not very advanced, will not be able to handle Web 3.0.

**Way Forward:**

- The WEB 3.0 is in the initial stages of evolution and it will take time to develop.
- The appropriate regulatory and legal framework should be there when Web 3.0 will be enforced completely.

**Conclusion:**

The Internet has been an ever-changing technology, from static to interactive, and now more influencing than ever in terms of Web 3.0. India is also part of the discussion happening around the world regarding Web 3.0 but it will take an ample amount of time to develop and implement it in India.

## IAS टेबलेट कार्यक्रम

सर्वोत्तम व्याख्यान की  
कहीं भी और कभी भी उपलब्धता



500 से अधिक घंटों का प्रारंभिक और मुख्य परीक्षा के पाठ्यक्रम को आवृत 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 प्रेक्टिस सेट का छात्र पोर्टल उपलब्ध



# DEFENCE AND INTERNAL SECURITY

## 1. Induction of artillery guns into the Army

**Syllabus:** Defence equipment

**Prelims:** Indigenous weapon systems

**Context:**

- Introduction of multiple weapons, including indigenous ones into the Army's Regiment of Artillery.

**Details:**

- Induction of guns includes the Dhanush, Sharang, M777 Ultra-Light Howitzer (ULH), additional K9-Vajra howitzers and the Advanced Towed Artillery Gun System (ATAGS).

**M777 Ultra-Light Howitzer (ULH):**

- Operationalization of the seventh regiment of the M777 is under way, and the induction of all 145 guns, contracted from U.S based BAE Systems, should be completed in the next few years.
- The guns are part of a \$750 million deal signed by India in 2016 with the U.S. government for 145 M777 guns.
- The M777 guns procured by India will fire Indian ammunition and be able to strike targets anywhere between 24-40 km.
- The gun weighs around 4.2 ton, which is roughly a third of what a normal 155mm howitzer weighs. This explains the ultra-light tag.

**K9-Vajra self-propelled howitzer:**

- The K9-Vajra self-propelled howitzer weighs 50 tonnes and can strike enemy targets 50 kilometres away.
- These howitzers can also turn around at zero radius, basically at the same place where they are standing.
- These guns are being made at the Armoured Systems Complex of Larsen and Toubro (L&T) in Gujarat under the Centre's 'Make in India' initiative.
- L&T had in 2017 won the ₹4,500-crore contract from the defence ministry to supply 100 units of K9-Vajra.
- The Indian Army has deployed the first K9-Vajra self-propelled howitzer regiment in the forward areas in Ladakh along the Line of Actual Control (LAC) with China in 2021.

**Dhanush artillery systems:**

- The Dhanush Howitzer is an upgraded version of the 155mm/39 calibre Field Howitzer (FH) 77B, manufactured by Bofors, Sweden, developed under the 'Make in India' initiative, by Advanced Weapons and Equipment India Limited (AWEIL), a Public Sector Undertaking (PSU) established in 2021, with technological collaboration from DRDO, Bharat Electronics Limited, Steel Authority of India Limited and other private firms.
- One regiment of the indigenous Dhanush artillery systems has been inducted and operationalized in a high-altitude area along the northern borders after extensive validation.
- By March 2023, the Army is expected to receive 18 guns to form the second Dhanush regiment.

**Sharang Guns:**

- The 155 mm Sharang is an upgraded version of the 130 mm M-46 field guns.

- The gun is 100% indigenous Artillery Gun which is designed and produced by the OFB. The SHARANG artillery gun has a range of 39 kms.
- The first indigenous SHARANG modified artillery gun system was handed over to the Indian Army in February 2020.
- Three regiments have been operationalised so far with the fourth regiment in process.
- The order for up-gunning 300 guns is being executed by three different DPSUs.

## 2. LCH Prachand

**Syllabus:** Defence equipment

**Prelims:** LCH Prachand

**Context:**

- Light Combat Helicopter (LCH) Prachand was formally inducted into the Indian Air Force recently.

**Introduction:**

- The LCH Prachand has been designed and developed indigenously by Hindustan Aeronautics Limited (HAL).
- The indigenously developed LCH Prachand, meaning fierce, was formally inducted into the Indian Air Force at the Jodhpur air base on 3rd October 2022.
- The LCH is the only attack helicopter in the world that can land and take off at an altitude of 5,000 metres (16,400 ft).
- The fleet of the first four helicopters was inducted into the 143 Helicopter Unit 'Dhanush'.



Source: The Print

**About the LCH project:**

- The LCH project can be traced to the 1999 Kargil war when the armed forces felt the need for a homegrown lightweight assault helicopter that could hold precision strikes in all Indian battlefield scenarios. This meant a craft that could operate in very hot deserts and also in very cold high altitudes, in counter-insurgency scenarios to full-scale battle conditions.
- India has been operating sub-3-ton category French-origin legacy helicopters, Chetak and Cheetah, made in India by the HAL. These single-engine machines were, primarily, utility helicopters.
  - Indian forces also operate the Lancer, an armed version of Cheetah. In addition, the Indian Air Force currently operates the Russian-origin Mi-17 and its variants Mi-17 IV and Mi-17 V5, with a maximum take-off weight of 13 tonnes, which are to be phased out starting in 2028.



- The Government of India sanctioned the design and development of the LCH in 2006. This project was later joined by the Indian Army in 2013.
- LCH received initial operation clearance on August 26, 2017. It was declared ready for production in February 2020.
- In November 2021, Prime Minister Narendra Modi symbolically handed over the LCH to the Indian Air Force, paving the way for its final induction.
- In March 2022, the Cabinet Committee on Security approved the procurement of 15 Limited Series Production (LSP) variants of the LCH. Of the 15 helicopters, 10 are for the IAF and five for the Army.

#### What are the main features of LCH?

- The multi-role attack helicopter has been customised as per the requirements of the Indian armed forces to operate both in desert terrains and high-altitude sectors.
- Powered by twin Shakti engines, a collaborative effort of the HAL and France's Safran company, the LCH is a 5.8-tonne class combat helicopter with potent ground attack and aerial combat capability.
- It incorporates several stealth features such as reduced radar and infra-red signatures, crashworthy features for improved survivability, armoured-protection systems and night attack capability.
- The helicopter is also fitted with radar and laser warning receivers, a missile approach warning system, countermeasure dispensing systems and a missile jammer.
- It is equipped with an advanced navigation system, air-to-air and air-to-ground missiles and guns customised for performing close combat operations.

#### Significance of LCH:

- The induction of the LCH creates a potent platform to meet the operational requirements of the IAF and the Army.
- The LCH helicopters can be deployed to assume air defence, anti-tank roles in high-altitude, counter-insurgency, and search and rescue operations, and are equipped with advanced technology such as electronic warfare systems which can be used to destroy the enemy's air defence.
- It can be deployed to perform Combat Search and Rescue (CSAR), bunker-busting operations, counter-insurgency operations in the jungle and urban areas and support the ground forces.
- The helicopter is equipped with advanced weapons systems including anti-radiation missiles, and Helina anti-tank guided missiles.
- The LCH is also equipped with a state-of-the-art sensor suite. It includes a camera and laser designator that captures the location and position of enemies, ensuring clear visibility during bad weather conditions.
  - The laser range finder and designator aim laser-guided bombs and missiles towards the target.
- The helicopter can fly at a maximum speed of 288 kmph and has a combat radius of 500 km, which can go up to a service ceiling of 21,000 feet, making it ideal to operate in Siachen along the Line of Actual Control.
- The recent conflicts in Ukraine and elsewhere showed us that heavy weapon systems and platforms, which do not allow for rapid movement on the battlefield, are sometimes vulnerable and become easy targets for the enemy. Therefore, the development of mobile and flexible equipment and platforms which meet the requirements of the armed forces is the need of the hour.

#### Nut Graf:

*The LCH, designed and developed by HAL, showcases the achievement of the Indian defence sector. The induction of LCH gives a major boost to India's 'Make in India' and 'Atma Nirbharata' endeavours. The versatility and offensive potential of the helicopter is on par or better than most attack helicopters operating globally which adds to the IAF's combat potential.*

### 3. C-295 aircraft

#### Syllabus: Defence equipment

#### Prelims: About C-295MW Aircraft

#### Context:

- The Prime Minister would be laying the foundation for a manufacturing facility for C-295 aircraft at Vadodara (Gujarat) by Tata Advanced Systems Ltd. in partnership with Airbus.

#### Background:

- The Ministry of Defence (MoD) had signed a ₹ 22,000-crore deal with Airbus for the procurement of 56 C-295 MW Aircraft.
- It was a one-of-a-kind agreement wherein a military aircraft would be manufactured in India under technology transfer by the private sector.
- Of the 56 C-295 MW aircraft to be procured by India, it is said that about 40 will be built at the new facility in Vadodara.

#### C-295MW Aircraft:

- The C-295MW is a transport aircraft of 5-10 tonne capacity which can be used for tactical transport of about 71 passengers or 50 paratroopers, and for logistic operations to locations that are not accessible by heavier aircraft.
- The aircraft is a new-generation tactical airlifter in the light and medium segments.
- The C-295 aircraft can operate from short or unprepared airstrips and has Short take-off and landing (STOL) capabilities.
- The C-295 aircraft has conducted multi-role operations worldwide under all weather conditions which includes day and night combat missions and in all extreme weather conditions such as desert and maritime environments.
- The C-295 Aircraft would be replacing the Indian Air Force's (IAF) ageing fleet of Avro aircraft that were procured in the 1960s and the IAF will become the 35th C295 operator worldwide.

### 4. Mission Defence Space

#### Syllabus: Security challenges and their management

#### Prelims: About Mission Defence Space

#### Mains: India and Militarization of Space

#### Context

- Recently Prime Minister Narendra Modi launched Mission Defence Space to provide new and innovative solutions to the armed forces.
- Under Mission DefSpace, 75 challenges are being opened to get innovative solutions, based on the defence requirements in the space domain



### India and Militarization Of Space:

- Space militarization involves placing and developing weapons and military technology in outer space.
- Indian defence forces also employ civilian government-owned satellites widely for communications, location accuracy, remote sensing, and meteorology.
- In December 2018, ISRO successfully launched its second advanced defence satellite exclusively for the Indian Airforce, called the GSAT-7 A.
- Presently, India has around 15 military-application satellites. In 2022, the \$225 million GSAT-7R, an Indian Navy communications satellite will replace GSAT-7 Rukmini launched eight years ago.
- India carried out an anti-satellite (ASAT) test using an interceptor missile (as a kinetic kill vehicle) to neutralise a target satellite in a Low Earth Orbit (LEO) at an altitude of around 300 km.
- The Defense Space Agency (DSA) and the Defense Space Research Organization (DSRO) are two new space agencies established in 2019.
- The DSA will operate systems to protect Indian interests in outer space and will deal with potential space wars. The agency will have the responsibility of developing a space warfare strategy.
- India conducted its first simulated space warfare exercise in 2019, called IndSpaceEx. The exercise was aimed at obtaining an assessment of threats and the creation of a joint space warfare doctrine

### Need for Space capabilities:

- In the past development of capabilities in sea and air helped in overcoming the geographical barrier and also provided an impetus to transport and commerce. Now the development of capabilities in space will make geography irrelevant.
- Thus India's space capability will be a crucial determinant in determining the hierarchical order in global power calculus.
- Space-based economy will prove to be disruptive since it can transform transport through higher speed and global communication networks transcending geographical barriers.
- Achieving space proficiency can also help in achieving a strategic advantage in warfare or improving military competitiveness. There is a need to improve military's space assets in the context of China developing more advanced anti-space capabilities like cyber warfare.

### Challenges:

- Need for collaboration between civil and military institutions and a faster procurement system.
- According to experts India needs to launch more satellites for strategic purposes when compared to US and China.
- Due to Budget constraints India's defence related space capabilities are still in their infancy.
- Due to resource constraints India's defence spending is falling when compared to total government spending.

### Way Forward:

- Need for creating a comprehensive, integrated vision for space and outer space and crafting a long-term road map.
- Need for collaboration between the public sector such as ISRO, DSA and private sector, start-ups and technologists.
- Improving the defensive and offensive capabilities in space to enhance the resilience and survivability of satellite configurations. To enhance survivability there is a need for a transition from large satellites to smaller cube satellites along with more equitable orbit postures.
- DSA also needs to transition like a startup with an emphasis on innovation and creativity.
- India can also look for space partnerships and military collaboration with like-minded countries.

### BYJU'S IAS Website

#### Daily Updates

- Comprehensive news analysis
- Video analysis of "The Hindu"
- PIB summary and analysis
- Topic of the day  
A brief analysis of important topics for the exam
- This day in history  
A brief note on a major event that happened in the history of India and the world on this date
- AIR Spotlight
- Sansad TV Perspective

#### Weekly Updates

- Economy this week  
Round-up of business newspapers
- Gist of economic and political weekly magazine
- International Relations This Week
- GK and current affairs quiz

#### Monthly Updates

- BYJU'S current affairs magazine  
Compilation of current affairs
- Gist of magazines  
Extracts of articles and points from "YOJANA" and "KURUKSHETRA"



# ENVIRONMENT AND ECOLOGY

## 1. COP27

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

**Mains:** Role of the UNFCCC in uniting the efforts of the fight against climate change.

### Contex

The 27th UN Climate Change Conference of the Parties (COP27) will take place in Sharm el-Sheikh, Egypt between 6th to 18th of November 2022.

### Details

- UNFCCC is the primary multilateral treaty governing actions to combat climate change through adaptation and mitigation efforts directed at control of the emission of Green House Gases (GHGs) that cause global warming.
- COP is the apex decision-making authority of UNFCCC which meets every year.
- The COP Parties are the attending countries that signed up to the original UN climate agreement in 1992.
- This will be the fifth time a COP has been hosted in the African continent.
  - The region's administration and public hope it will draw attention to the severe impacts of climate change on the continent.
  - Currently, 17 million people are estimated to be facing food insecurity in east Africa because of drought.

### Previous significant COPs:

- The participants of COPs signed and adopted the United Nations Framework Convention on Climate Change (UNFCCC) three decades ago. Presently UNFCCC has 198 members.
- The first COP was organized in **Berlin in 1995**.
- Some of the historic agreements at COPs are:
  - **COP3 in 1997:** The Kyoto Protocol was adopted which ensured industrialized economies limit and reduce greenhouse gas emissions.
  - **COP21 in 2015:** It concluded with Paris Agreement where member countries agreed to keep global warming below 2°C, preferably not more than 1.5°C, in comparison to pre-industrial levels.
  - **COP 26 in 2021:** It was held in Glasgow and concluded with the Glasgow Climate Pact that called for the countries to 'phase down' unabated use of coal power.

### Evaluation of COP26, Glasgow:

- The world has transformed since COP26 in Glasgow. Extreme weather events and scientific reports remind us of the devastating impact of humans on climate change. It also showcases the inefficiencies of the existing policies across the world. These reports have likely impacted the political agenda and environmental diplomacy and have built momentum for the upcoming summit in Egypt.
- As per a UN report, the "efforts remain insufficient" to arrest the global temperature increase to 1.5°C (as deliberated in Paris Agreement). Moreover, the UN Climate Change report highlights that the world is not acting urgently to restrict greenhouse gas emissions even though climate-enhanced heatwaves and floods

have become a common phenomenon after just 1.2°C of warming.

- According to the analysis of the Nationally Determined Contributions (NDCs) to cut emissions and adapt to climate impacts, even if the Nations abide by their pledges, the world is on the track for warming to 2.5°C.
- The report further adds that emissions should fall 45% by 2030 in comparison to 2010 levels to meet the goals of the Paris agreement.

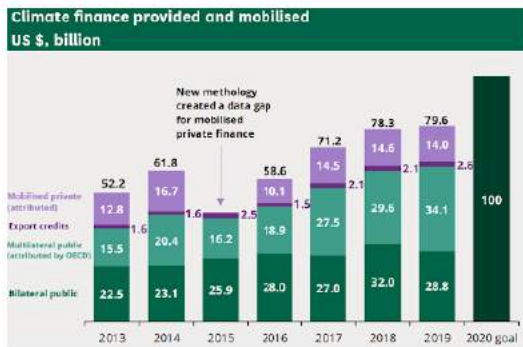
### Agenda of COP 27:

- COP27 is looking forward to strengthening a global response and deliberating if developed countries emitting more carbon dioxide should compensate for the loss to developing nations with a relatively low carbon footprint.
- It aims to "accelerate climate action across the world through emissions reduction, adaptations, and enhanced flow of finance" using its four priority measures of mitigation, adaptation, financing, and collaboration.
- According to the vision statement of the President, COP27 will focus on moving away from planning and negotiations to the implementation of pledges and promises.
- Experts hold the opinion that COP27 would emerge as an "in-between COP," because climate change goals have either already passed or are not due in near future. It can provide a platform to push the developed economies on the issues that are usually passed over.

### The core issues:

- Developing economies across the globe including India are worried about the damage to the economic growth from the COVID-19 Pandemic, Russia's war in Ukraine, and the global economy's downturn.
- Climate catastrophe along with the above issues hit developing economies and the poor the hardest.
- At COP 26, all 193 Parties to the Paris Agreement agreed to revisit and strengthen their climate plans. Only 24 new or updated climate plans were submitted up until September 23, 2022.
- A new report from UN Climate Change shows that countries are far away from the level of ambition needed to achieve the Paris Agreement goals.
- Areas requiring specific progress in the lead-up to COP27 include – emission reductions, adapting to the impacts of climate change, and climate finance, with a focus on finance for adaptation.
- At COP26, governments agreed on the need to provide more support to developing countries and called for adaptation finance to be doubled.
- Documents from the United Nations suggest that the cost for low-income countries to adapt to climate change disasters far exceeds the promised \$100 billion a year.
  - In 2009, at COP 15 in Copenhagen, climate finance funding of \$100 billion a year by 2020 was agreed.
  - Only \$83.3 billion is mobilised till 2020 – falling \$16.7 billion short of the target.





Source: House of Commons Library

### India's stand on Climate change:

- India is among the 197 countries that have promised to limit the increase of global temperatures to 1.5°C by 2030. India is also working on a long-term policy roadmap to achieve the target of net zero emissions by 2070.
- The Prime Minister of India during the Glasgow summit committed that India would increase its non-fossil energy capacity to 500 GW by 2030 and meet half of its energy requirement from renewable sources, thereby reducing carbon emissions.
- An independent analysis, the Climate Action Tracker categorizes actions taken by India as “highly insufficient”. This is because India’s continued support of the coal industry subverts a green recovery. India was also severely criticized for its stand to “phase down” coal instead of “phase out” at COP26.
- However, India is expected to play a key role at COP27 in Egypt. The major issue that will be taken up by India during the summit is Climate Financing.

### Targets for COP 27:

- Reaching carbon neutrality by 2050 is the absolute minimum for all major emitters to avert global climate disaster. COP27 should focus on this vital area.
- India shall advance the year to achieve the net zero target.
  - India, as the world’s third-largest emitter of greenhouse gases, faces many challenges, including a heavy dependence on coal and a lack of funding.
  - A strong and effective policy framework, as well as a transition to renewable energy, will help India accelerate its drive to net zero.
- China’s share of coal and gas in energy production remains over 70%, with the country continuing to finance massive fossil fuel-based infrastructure.
  - China has announced net zero for 2060.
- India and China weakened the goal of COP26 from a “phase-out” of coal power to a “phase-down”. Both countries shall advance their date for net zero to 2050.
- COP27 should call for the extensive use of markets to help shift the global economy to a low-carbon path.
- The summit could back a radical shift in countries adopting carbon pricing, for example, via a significant carbon tax on the source of pollution.
- It should reiterate the need for all countries to eliminate fossil fuel subsidies.
- Climate projects can be vastly scaled up by multilateral development banks, such as the World Bank and the Asian Development Bank.
- It’s crucial that G20 nations lead by example as they represent 80 per cent of the world’s emissions.
  - Ahead of COP27, Singapore has announced that it will achieve net zero emissions by 2050, a powerful signal from a country with only 0.1% of its carbon footprint.

### Nut Graf:

The world is presently not on track to achieve climate goals as per various reports. The upcoming COP27 has come at a crucial time when the world is already reeling under a lot of economic and geopolitical pressure. The need of the hour is that all countries take the threat of climate change seriously and take conclusive decisions at COP27.

## 2. World Sloth Bear Day

### Syllabus: Biodiversity and Conservation

### Prelims: IUCN red list, Wild life (Protection) Act,1972

### Context:

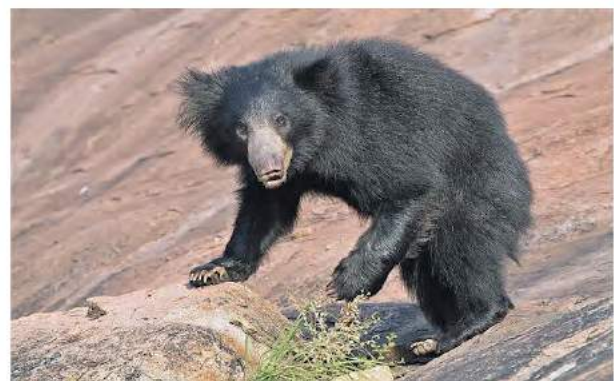
- The first World Sloth Bear Day was observed on October 12, 2022 in India.

### Key Details:

- Wildlife SOS India, an organisation involved in sloth bear conservation and protection for over 25 years, proposed to the International Union for Conservation of Nature (IUCN) that October 12 be declared as ‘World Sloth Bear Day’ to draw attention to the conservation and protection of the unique bear species endemic to the Indian subcontinent.
  - Wildlife SOS has rescued and rehabilitated over hundreds of performing dancing bears while also providing alternative livelihoods to the nomadic Kalandar community members who are involved in the 400-year-old tradition of dancing bears.
- The Ministry of Environment, Forests and Climate Change and the Central Zoo Authority (CZA), along with other stakeholders observed the day at Agra Bear Rescue Facility in Uttar Pradesh.
  - This is the world’s largest Rescue and Rehabilitation Centre for sloth bears that was established by Wildlife SOS in collaboration with Uttar Pradesh Forest Department in 1999.

### Sloth Bears (*Melursus ursinus*):

- They are endemic to the Indian subcontinent and 90% of the species population is found in India with small populations in Nepal and Sri Lanka.
- Sloth Bears are Classified as “vulnerable” on the IUCN Red List.
- Sloth Bears are listed under Schedule I of the (Wildlife Protection) Act of India, 1972, the species has the same level of protection as tigers, rhinos and elephants.
- Sloth bears are omnivorous and survive on termites, ants and fruits.
- It has long, shaggy fur, a mane around the face, and long, sickle-shaped claws. It is lankier than brown and Asian black bears.



Source: The New Indian Express



### 3. Slender Loris

**Syllabus: Biodiversity and Conservation**

**Prelims: Wildlife sanctuaries**

**Context:**

- Tamil Nadu recently notified India's first slender loris sanctuary.

**Key Details:**

- The survival of the slender loris species depends on habitat improvement, conservation and mitigation of threats.
- Realising the need for immediate conservation of this species, the Tamil Nadu government notified the Kadavur Slender Loris Sanctuary covering 11,806 hectares in Karur and Dindigul districts.

**Slender loris:**

- The slender lorises are a genus of loris native to India and Sri Lanka.
- The genus comprises two species, the red slender loris found in Sri Lanka and the grey slender loris from Sri Lanka and India.
- Slender lorises spend most of their life in trees, travelling along the tops of branches with slow and precise movements.
- They are found in tropical rainforests, scrub forests, semi-deciduous forests, and swamps.
- They have lifespans of approximately 15 years and are nocturnal. Slender lorises generally feed on insects, reptiles, plant shoots, and fruit.
- The species has a wide range of ecological roles in the terrestrial ecosystem. They also act as a biological predator of pests in agricultural crops and benefit farmers.

**Conservation Status:**

- **IUCN:** Endangered
- **CITES:** Appendix II
- **Wildlife (Protection) Act, 1972:** Schedule I



Slender Loris

Source: The Hindu

**Recent significant initiatives on wildlife conservation by Tamil Nadu:**

- The Tamil Nadu government notified India's first Dugong Conservation Reserve in Palk Bay.
  - Dugong, also known as 'Sea Cow' is one of the four surviving species in the Order Sirenia. It is the only existing species of herbivorous mammal that lives exclusively in the sea.
  - Dugongs in India are found in the Gulf of Mannar in Tamil Nadu, the Andaman and Nicobar Islands and the Gulf of Kutch (west coast) in Gujarat.
- It also notified Kazhuvelli Bird Sanctuary in Villupuram, Nanjarayan Tank birds sanctuary in Tiruppur and the State's fifth elephant reserve at Agasthyamalai in Tirunelveli.
- Further, 13 wetlands were declared as Ramsar sites.

### 4. Snow Leopard

**Syllabus: Biodiversity and Conservation**

**Prelims: National Parks and Tiger Reserves**

**Context:**

- Wildlife officials in Arunachal Pradesh await results of a survey to ascertain the presence of the elusive snow leopard in the Namdapha National Park and Tiger Reserve.

**Introduction:**

- Snow leopard, often referred to as a mountain ghost, has never been spotted or recorded in the Namdapha National Park and Tiger Reserve in Changlang district of Arunachal Pradesh.
- Namdapha is the known home of three other large cats – tiger, leopard and clouded leopard. The belief that the national park is also the habitat of the snow leopard is based on the claim of a hunter from the Lisu ethnic community that he possessed the skin of the snow leopard.
- Local name for a snow leopard is Lamaphu in Arunachal Pradesh. The tiger is called Lama in the Lisu dialect.
- Wildlife officials are awaiting confirmation on the presence of snow leopard after the survey which collected the data from a high altitude Himalayan belt across 11 wildlife divisions from Tawang in the west and Anini to the east.

**Namdapha National Park:**

- Namdapha National Park is a large protected area established in 1983 in Arunachal Pradesh.
- With more than 1,000 floral and about 1,400 faunal species, it is a biodiversity hotspot in the Eastern Himalayas.
- The 1,985 sq. km reserve bordering Myanmar has an elevation varying from 200 metres to 4,571 metres above sea level.
- Hoolock Gibbons, the only 'ape' species found in India is found in this National Park.
- It is located between the Dapha bum range of the Mishmi Hills and the Patkai range with a wide elevation range between 200 and 4,571 m.
- It is crossed from east to west by the Noa Dihing River that originates at the Chaukan Pass, located on the Indo-Myanmar border.



## 5. A new lease of LIFE for climate action

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

**Prelims:** About the LIFE initiative

**Mains:** Significance of the LIFE initiative and various other initiatives undertaken by India in mitigating the effects of climate change.

**Context:**

- According to the United Nations Development Programme's Human Development Report 2021-22, global human development measures have reduced across most countries in the past two years.

**Background:**

- The decline in the human development indices has come against the backdrop of a weak recovery post the COVID-19 pandemic, the Russia-Ukraine war fueling severe energy, food, and cost-of-living crisis and the crisis of climate change, pollution and biodiversity loss.
- Nine of the warmest years ever recorded have been witnessed in the last 10 years alone (years between 2013 and 2021). Also, the current year (2022) has been experiencing record levels of heat waves, floods, droughts, and other catastrophes.
- Despite countries undertaking urgent and collective efforts to mitigate the effects of climate change as seen in the case of the Paris Agreement and the COP26 summit in Glasgow, the commitments which are in place currently are not sufficient to arrest the warming below the 1.5°C targets.
- In this context, the LIFE, or Lifestyle for Environment, announced by the Prime Minister of India at COP26 in November 2021, brings a new perspective.

**LIFE, or Lifestyle for Environment initiative and its significance:**

- Instead of regarding climate change as a larger-than-life problem, the LIFE initiative acknowledges that small individual steps can help in balancing climate change.
- The LIFE initiative upholds the objectives of undertaking collective efforts to bring about positive change and protect the environment.
- The LIFE movement focuses on "mindful and deliberate utilisation" instead of "mindless and destructive consumption".
- The key vision of the initiative is to encourage people across the world to adopt basic climate-friendly actions in their everyday lives and embrace an environmentally conscious lifestyle. These actions include:
  - Actions that save energy at home
  - Use of cycles and public transport instead of vehicles
  - Consuming more plant-based foods and less wastage
  - Leveraging the position of customers and employees to demand climate-friendly choices.
- Several goals of the LIFE initiative can be attained even by using gentle nudging or persuasion techniques such as discouraging the wastage of food by providing food on smaller plates and promoting various recycling techniques.

**India's efforts to promote the objectives of LIFE initiative:**

- The Prime Minister of India along with the United Nations Secretary-General Antonio Guterres will launch a special environmental programme which is a part of the LIFE initiative at the Statue of Unity in Gujarat.
  - Through this, India is urging all the consumers around the world to become "Pro Planet People" by 2027 by adopting small lifestyle changes that can bring about revolutionary changes.
- Further, India has had a proven track record of manifesting the aspirations of national missions into society efforts.
  - This can be seen in the case of the Swachh Bharat Mission, which mobilised communities across the country to become drivers of collective good health and sanitation irrespective of their socio-economic status.
- India has assumed a lead in climate action on the international stage which crucial climate change mitigation efforts such as:
  - The announcement of Panchamrit targets at COP26.
  - Proposing and endorsing key initiatives such as the International Solar Alliance, the Coalition for Disaster Resilient Infrastructure and South-South cooperation platforms.
  - India being the world's fifth largest economy has made huge investments in the renewables and the electric mobility sector.
  - India by using its scale, expertise and legitimacy has also been promoting key actions at various global organisations such as the UN, the G20 and G77.

**Way forward:**

- The role played by consumers in fueling unsustainable production practices must be realised at the earliest.
- As per the **United Nations Environment Programme (UNEP)**, over 66% of greenhouse gas emissions are attributed to household consumption and lifestyles.
  - This suggests that immediate cuts to global emissions can be achieved only through the widespread adoption of greener consumption habits.
- The LIFE mission recognises that accountability is relative to contribution and emissions by the poorest half of the world's population accounts for less than 1% of that of the wealthiest half.
  - Further, those who consume less are often the most vulnerable and marginalised communities of society.
  - Thus it is not correct to persuade these communities to consume less, instead, they can be encouraged to participate in the green economy initiatives.
- The same can be seen in the case of developed and the developing world as the average carbon footprint of an individual in a high-income country is over 80 times more than that of an individual in a least-developed country.
  - Therefore, more obligations have to be accorded to the developed countries to support climate adaptation efforts and mitigation actions for those affected.
- Furthermore, on the sidelines of the upcoming COP27 and India's tenure as the G20 President, a unique opportunity has been provided to India to assume the role of a leader in the global fight against climate change.



**Nut Graf:**

The LiFE initiative has gained global significance at a time when climate change is turning out to be a disruption multiplier in a disrupted world which is deteriorating the progress made across various Sustainable Development Goals, as it aims to promote and persuade individuals and communities to adopt an environment-conscious lifestyle.

## 6. Vultures of Tamil Nadu

**Syllabus: Conservation**

**Mains: Conservation efforts to save the vulture population.**

**Context:**

- The Tamil Nadu government recently formed a committee for the effective conservation of vultures.

**Introduction:**

- Tamil Nadu is home to four species of vultures — the white-rumped vulture (*Gyps bengalensis*), long-billed vultures (*Gyps indicus*), the Asian king-vulture (*Sarcogyps calvus*) and the Egyptian vulture (*Neophron percnopterus*).
- Tamil Nadu boasts the largest population of vultures south of the Vindhya Mountain Range.
- The Nilgiris, Erode and Coimbatore districts are believed to form one of the largest contiguous expanses where vultures are spotted.
  - In the Nilgiris, it is estimated that there are between 100 and 120 white-rumped vultures, 10 and 15 long-billed vultures and less than 10 Asian king vultures.
- The Mudumalai Tiger Reserve, parts of the Nilgiris forest division and the Sathyamangalam Tiger Reserve are crucial strongholds for the vultures in southern India.
- Occasional migrants such as the Himalayan griffon vulture and the Cinereous vulture are also spotted in Tamil Nadu each year.
- However, there are no traces of the breeding sites of the critically endangered Asian king vulture in the state.

**Vultures in India:**

- India is home to nine species of vultures but most of them face the danger of extinction.
  - Vulture numbers saw a decline of as much as 90% in some species in India since the 1990s.



Source: Wildlife Sos

- **IUCN Status: Critically Endangered:**
  - White-rumped vulture
  - Slender-billed vulture
  - Long-billed vulture

- Red-headed vulture
- **Endangered:**
  - Egyptian vulture
- **Near Threatened:**
  - Himalayan Griffon
  - Cinereous vulture
  - Bearded vulture
- **Least Concern:**
  - Griffon Vulture

**Decrease in Vulture Population:**

- The population of the vultures in the state has remained largely stable. Yet the numbers are still extremely low, and even a single poisoning event could lead to several of the species going locally extinct, especially the long-billed and Asian king vultures.
- Over the last few years, breeding seasons have also seen fewer hatchings, than is the norm due to lesser availability of prey as well as erratic weather.
- The use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) to treat cattle, such as diclofenac, nimesulide, ketoprofen among others, has led to the crash in vulture populations across India. Vulture's tolerance for harmful substances does not extend to man-made drugs.
- Temple tourism in the Sigur plateau is centred primarily around vulture habitats. Over the last few years, there have been recorded instances of vultures abandoning nesting sites located too close to temples inside these reserves.
- Spread of invasive weeds such as the Lantana camara in vulture-landscapes, which hinder the birds from scavenging as their large wing spans require plenty of open areas to safely land and to take to the skies in case of any major threats.
- Vulture nesting areas are disappearing due to illegal tapping of water along the streams running through these areas, possible climate change, and forest fires.

**Way forward:**

- As scavengers, vultures help prevent the spread of many diseases and can remove toxins from entering the environment by consuming carcasses of dead cattle/wildlife before they decompose.
- The State government has banned the use of diclofenac, a drug, to treat cattle, while there are strict restrictions for the sale of other NSAIDs in the Nilgiris, Erode and Coimbatore districts.
  - The Union Ministry of Environment, Forest and Climate Change released the Action Plan for Vulture Conservation 2006 with the Drugs Controller General of India (DCGI) banning the veterinary use of diclofenac in the same year.
- Government should also focus on strict controls on the number of people allowed to attend festivals around the Sigur plateau which disturbs the vulture population.
- Vultures in the Sigur plateau utilise landscapes in neighbouring Karnataka and Kerala, there should be a synchronous vulture census to accurately identify vulture populations and nesting sites.
- The Central Zoo Authority (CZA) and Bombay Natural History Society (BNHS) have established the Vulture Conservation Breeding Programme. More state governments should be involved in the program for effective and timely conservation.

**Nut Graf:**

Tamil Nadu has the largest population of vultures in South India. Recent committee by the state government for the effective conservation of vultures is a step in the right



direction as the vulture numbers are decreasing over the last few years due to severe human interventions in their habitat.

## 7. Great Indian Bustards

**Syllabus: Biodiversity and Conservation**

**Prelims: About Great Indian Bustard (GIBs)**

**Mains: Key threat to GIBs and various conservation efforts undertaken in the country**

**Context:**

- The sightings of Great Indian Bustards (GIBs) deep in Pakistan's Cholistan desert have led to speculation that these birds might be migrating from India.

**Details:**

- GIBs have become critically endangered in Pakistan because of a lack of protection and large-scale hunting.
- However, a wildlife photographer from Pakistan recently spotted and released pictures of them from Punjab province's Cholistan game reserve.
- Environmental activists from Jaisalmer claim that these birds might have migrated from India's Desert National Park in Rajasthan because of the shrinking of their habitat.

**Great Indian Bustard (GIB):**



Source: Britannica

- The Great Indian Bustard (GIB) or *Ardeotis nigriceps* or Indian bustard is a bird species belonging to the Otididae family.
- The Great Indian Bustard is a large terrestrial bird mainly seen in dry grasslands and steppe regions. GIBs are one of the heaviest flying birds in the world.
- GIB is native to the Indian subcontinent.
- The GIBs can be distinguished by their black crown on the forehead contrasting with the pale neck and head.
  - The body of GIB is brownish in colour and the wings are black, brown and grey in colour.
- GIBs are omnivores in nature and they feed on various arthropods, worms, insects, reptiles and seeds such as wheat and peanuts.
- IUCN Status: **Critically Endangered**
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): **Appendix I**
- Convention on Migratory Species (CMS): **Appendix I**
- Indian Wildlife (Protection) Act, 1972: GIBs are protected under **Schedule I** of the Act.

**Great Indian Bustard in India:**



Source: IUCN

- The GIB was known to have been distributed throughout the western part of India, spanning across states such as Rajasthan, Gujarat, Maharashtra, Karnataka, Telangana and Andhra Pradesh.
- The GIB is the "State bird of Rajasthan" and its population in Rajasthan accounts for about 95% of its total population worldwide.
- However, the GIBs are now considered India's most critically endangered birds. As per a 2018 survey, only about 150 GIBs are known to survive as compared to 250 in 2011.

**Key threats to the survival of Great Indian Bustards in the Indian subcontinent:**

- Poaching and hunting
- Expanding transportation and service corridors in their natural habitat
- Widespread agricultural expansion and mechanized farming
- Destruction of their habitat due to mining and energy production
- Setting up of high-tension electric poles in these regions
- Increasing stray dog population and threats from other invasive species

**Conservation efforts undertaken:**

- GIBs are listed under Schedule I of the Wildlife Protection Act of India.
- The World Wildlife Fund (WWF) – India issued "Guidelines for the State Action Plan for Resident Bustard Recovery Programme" which has played an important role in raising awareness about the declining populations and the importance of their conservation.
- Project Great Indian Bustard was launched by the Rajasthan government in 2013 with the objective of the conservation of the remaining population. Under this project, the State government has constructed several breeding chambers for the bird.
- The Ministry of Environment, Forests and Climate Change (MoEFCC) has come up with the "Habitat Improvement and Conservation Breeding of Great Indian Bustard" programme.
- The Supreme Court of India had issued an order to lay underground power lines in Gujarat and Rajasthan for the protection of the species. The SC has also ordered the installation of bird diverters on all power lines.
- The captive breeding of GIBs has been undertaken in the Desert National Park which is being executed by the Dehradun-based Wildlife Institute of India and supported by the International Fund for Houbara Conservation of the United Arab Emirates (UAE).
  - India had signed a memorandum of understanding (MoU) with the UAE to receive technological support to implement the conservation project.
  - UAE had executed a similar plan to protect its Houbara Bustard population.



- Further, several GIBs have been tagged to undertake behavioural analysis and monitoring of their movements.

#### Nut graf:

*Great Indian Bustards are regarded as flagship grassland species and they indicate the overall health of a grassland ecosystem. However, it is believed that these bird species have been wiped out from over 90% of their original habitat and this requires concerted efforts by the policymakers as well as environmental activists and experts to conserve the species.*

## 8. Health concerns with the use of fossil fuels

### Syllabus: Environmental pollution and degradation

### Mains: Key findings of the Lancet report on health and climate change

#### Context:

- The release of a report called “The Lancet Countdown on health and climate change: health at the mercy of fossil fuels.”

#### Details:



Source: The Lancet

- The report is prepared by the efforts of about 99 experts from 51 institutions which include organisations such as the World Health Organization (WHO) and the World Meteorological Organisation (WMO).
- The report has presented about 43 indicators that include new and advanced metrics that monitor the impact of extreme temperatures on food insecurity, household air pollution, and the alignment of the fossil fuel industry with a healthy future.
- The findings of the annual global report of the Lancet Countdown on Health and Climate Change highlight the fact that governments and companies across the world are continuing to follow strategies or policies that pose significant threats to the health and survival of people, and future generations.
- The report adds that climate change is increasing its health impacts as vulnerable populations such as infants and the elderly are experiencing a higher number of heatwave days.
  - As per the report, infants (under one year) collectively witnessed 600 million more days of heatwaves and the elderly (over 65 years) experienced 3.1 billion more days.
- The report also notes that food insecurity has been aggravated due to the increasing instances of heatwaves as increasing temperatures and extreme weather events threaten crop yields directly.

- The findings of the report show that the duration of the growth season for maize has decreased by 9.3 days, compared to a 1981-2010 baseline, whereas rice and winter wheat have each decreased by 1.7 days and 6 days respectively.
- Further, climate change is also impacting the spread of infectious diseases such as malaria and dengue.

#### Key findings of the report about India:

- According to the report, about 3,30,000 people lost their lives in India on account of exposure to particulate matter from fossil fuel combustion in 2020.
- The report further says that heat-related deaths rose by about 55% in India from 2000-2004 to 2017-2021.
- From 2012-2021, infants (under one year) experienced an average of 72 million more person-days of heatwaves per year, compared to 1985-2005.
  - During the same period, the elderly (over 65) witnessed 301 million more person-days.
- The report points out that close to 45% of urban centres in India are classified as moderately green or above and an urban redesign that prioritises health first can provide increased green spaces that help reduce urban heat, improve air quality, and benefit physical and mental health.
- As per the report, Indians lost about 16,720 crore potential labour hours due to heat exposure with income losses equivalent to 5.4% of the national GDP in 2021.
- The report highlighted that India had a net negative carbon price in 2019, which shows that the government was still subsidising fossil fuels.
  - India had allocated about ₹ 2,80,000 crores in 2019, which accounted for about 37.5% of the country's overall health expenditure that year.
- Furthermore, biomass usage was equivalent to 61% of household energy in 2019, whereas fossil fuels were equivalent to 20%. Due to the high reliance on these fuels, the average household concentration of particulate matter was more than that recommended by the WHO (more than 25 times nationally and 35 times in rural households).

#### Nut graf:

*The Lancet report published ahead of the UN Conference of the Parties (COP27) has shown that as countries across the world continue to tackle the health, social and economic impacts of the COVID pandemic, Ukraine war, and global energy and cost of living crisis, climate change has aggravated these impacts and a transition to clean energy is imperative to mitigate further climate change-related adversities and improve energy security.*

## 9. Rotterdam Convention

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

**Prelims:** About Rotterdam Convention, Basel Convention and Stockholm Convention

**Mains:** Various provisions of Rotterdam Convention and its importance

#### Context:

International trade of two new pesticides is recommended for “prior informed consent” (PIC) procedure under the Rotterdam convention.



### Ban of Pesticides:

- Iprodione and terbufos are two new hazardous pesticides included under the prior informed consent procedure. Both are considered harmful to human health and the environment.
- Iprodione, a fungicide used on vines, fruits, trees and vegetables, has been classified as carcinogenic and toxic for reproduction.
- Terbufos is a soil insecticide used commonly on sorghum, maize, beet and potatoes. It has also been found to pose risk to aquatic organisms due to its toxicity.
- Chemical review committee which is a subsidiary body of the Rotterdam convention recommended the inclusion of these pesticides in Annex III.
- The chemicals listed in Annex III include pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by two or more Parties.

### Rotterdam Convention:

- It is part of the Basel, Rotterdam and Stockholm Conventions. (BRS Conventions)
- Rotterdam Convention is a name for the Convention that was adopted by the Conference of Plenipotentiaries (COP) in 1998 in Rotterdam (Netherlands) that aims to promote shared responsibilities in relation to the international trade of hazardous chemicals. The secretariat of the convention is in Geneva, Switzerland.
- The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure.
- India is a member of the Rotterdam Convention.
- The Rotterdam Convention is a multilateral treaty to promote shared responsibilities in relation to importation of hazardous chemicals.
- The convention promotes open exchange of information and calls on exporters of hazardous chemicals to use proper labeling, include directions on safe handling, and inform purchasers of any known restrictions or bans.

### Prior Informed Consent:

- It is one of the main provisions of the Rotterdam Convention of 1998 that states that parties that are importing the chemicals as listed in Annex III of the Convention have to formally obtain and disseminate the decision of receiving future shipments of such chemicals.
- The importing parties have to ensure that decisions related to their import are well in compliance by the exporting parties.
- There are 54 chemicals listed in Annex III of the Rotterdam Convention for the trade of which parties have to follow the mechanism of Prior Informed Consent Procedure.

### Basel Convention and Stockholm Convention:

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is a comprehensive treaty that was adopted in 1989 by the Conference of Plenipotentiaries. It aims to protect the human environment from the adverse effects of hazardous waste that is generated, managed and disposed of in the world community.
- India is a member of the Basel Convention. It ratified the convention in June 1992 and brought it into force on 22nd September 1992.
- The Stockholm Convention on Persistent Organic Pollutants is a global treaty to protect human health

and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have harmful impacts on human health or on the environment.

- India is a party to the Stockholm Convention. In May 2002, India signed the global treaty and it brought it into force in January 2006

## 10. NeelaKurinji Blooms

**Syllabus:** Environment and Biodiversity

**Prelims:** About Neelakurinji

### Neelakurinji

- Neelakurinji is a shrub found in shola forests of the Western Ghats in Kerala, Karnataka and Tamil Nadu.
- The purplish blue flower blossoms only once in 12 years, and gave the Nilgiri Mountains range its name
- The Paliyan tribal people living in Tamil Nadu used it as a reference to calculate their age. This plant flowers during September–October.
- **Kurinjimala Sanctuary** protects the kurinji in approximately 32 km<sup>2</sup> core habitat in Kottakamboor and Vattavada villages in the Idukki district of Kerala.
- Kurinji flower is used to describe the associated mountainous landscape where it blooms in Sangam Literature classical Tamil literature.

## 11. Stubble Burning

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

**Mains:** Stubble Burning - key causes, impacts and solutions

### Introduction

Stubble burning is a term that is frequently seen in the news nowadays. It is one of the major causes of winter pollution in northern India, particularly, in Delhi and adjoining areas.

### Causes of Stubble Burning:

- Stubble burning is the intentional burning or setting on fire of crop residue to remove them from the field in order to sow the next crop.
- In Punjab and Haryana, farmers burn the stubble (rice chaff) left after the rice harvest so that the field may be readied for the next Rabi (winter) crop like wheat. In these areas, it begins around October, the same time at which the southwest monsoon withdraws.
- The Punjab Preservation of Subsoil Water Act (2009) made it mandatory for farmers to transplant paddy late during the Kharif season to prevent loss of water.
- This gives the farmers very little time between harvesting the rice crop and preparing the field for the next winter crop. Hence, stubble burning is a quick, cheap and easy way to clear the field of any rice chaff residue.
- Rice straw is not considered suitable as fodder for animals because of its high silica content (this is true for the non-basmati variety of rice).

### Effects of stubble Burning:

- Stubble burning has very adverse effects on the environment.
- **Pollution:** According to a study, the burning of crop residue released about 149 million tonnes of carbon dioxide, more than 9 million tonnes of carbon monoxide, 0.25 million tonnes of oxides of sulphur



(SOX), 1.28 million tonnes of particulate matter (PM) and 0.07 million tonnes of black carbon. As evident, it contributes to a lot of greenhouse gas emissions.

- o In particular, the stubble burning across Punjab and Haryana contributes to the **winter haze in Delhi** where about 40% of the near-surface PM can be attributed to the stubble burning.
- o It also contributes to the winter smog seen in these parts of the country.
- **Soil fertility:** Burning stubble also adversely affects soil fertility. It destroys the soil's nutrients making it less fertile. This is because the heat generated during the burning kills the bacterial and fungal populations which are crucial for fertile soil.
- Stubble burning can also cause an increase in '**enemy**' pests because, during the burning, many microorganisms in the air are killed. The loss of these organisms leads to an increase in pests, in turn, causing increased diseases in crops.

#### Solutions to stubble burning problem:

- Use machinery like the **Happy Seeder** to remove the stubble. The government should make these machines available and economically viable for farmers.
- Incentivise farmers for not burning the stubble and provide economic value for the crop residue. The stubble can be converted into **fodder or organic fertilizer or fuel**. The government should also subsidise or incentivise the industries that are engaged in converting stubble into economically viable products.
- Efforts should be made to **improve the combine harvester** that farmers use to harvest the crop. The current machine used leaves behind a huge residue. Improvement should be made in the technology used in such machines so that minimal residue is left behind.
- Encourage farmers to sow **alternate crops and shift them** away in the long run from paddy to maize, fruits, vegetables and cotton.
- Eminent agricultural scientist M.S. Swaminathan has suggested that the Delhi, Haryana and Uttar Pradesh governments could set up '**Rice Bio Parks**', where farmers could convert stubble into **products including paper, cardboard and animal feed**.

## 12. Living Planet Report

**Syllabus:** Conservation and degradation

**Prelims:** About Living Planet Report 2022

**Mains:** Key findings of Living Planet Report 2022 and recommendations

#### Context:

Living Planet Report 2022 – There has been a 69% decline in the wildlife populations of mammals, birds, amphibians, reptiles and fish, across the globe in the last 50 years.

#### Living Planet Report 2022:

- The **World Wildlife Fund for Nature (WWF)** published the Living Planet Report in collaboration with the Zoological Society of London (ZSL) It is a biennial report (published every two years.) ZSL manages the **living planet index (LPI)** that too is released along with the report.

#### Key findings of the Living Planet Report 2022:

1. **Decline in Freshwater Species:**
  - Population of Freshwater Species reduced by 83% globally.
    - o Habitat loss and barriers to migration routes were responsible for about half of the threats to monitored migratory fish species.
2. **Collapsing Vertebrate Wildlife Populations:**
  - Living Planet Index (LPI) showed that vertebrate wildlife populations are collapsing at a particularly staggering rate in tropical regions of the world.
  - Featuring about 32,000 populations of 5,230 species across the world, LPI is a measure of the state of the world's biological diversity based on population trends of vertebrate species from terrestrial, freshwater and marine habitats.
3. **Region-wise Decline in Wildlife Populations:**
  - The highest decline in the wildlife populations was in Latin America with (94%) and the Caribbean region.
  - Africa recorded a 66% fall in its wildlife populations from 1970-2018 whereas the Asia-Pacific recorded a decline of 55%.
4. **Mangrove Degradation:**
  - Mangroves continue to be lost to aquaculture, agriculture and coastal development at a rate of 0.13% per year.
    - o Many mangroves are also degraded by overexploitation and pollution, alongside natural stressors such as storms and coastal erosion.
  - Around 137 square kilometres of the Sundarbans mangrove forest in India and Bangladesh has been eroded since 1985, reducing land and ecosystem services for many of the 10 million people who live there.
5. **Key Threats to Biodiversity identified by WWF:**
  - WWF identified six key threats to biodiversity to highlight '**threat hotspots**' for terrestrial vertebrates:
    - o Agriculture
    - o Hunting
    - o Logging
    - o Pollution
    - o Invasive Species
    - o Climate Change

#### Living Planet Report 2022- Recommendations:

- The planet is experiencing double emergencies of human-induced climate change and biodiversity loss, threatening the well-being of current and future generations. Biodiversity loss and climate crisis should be dealt with as one instead of two different issues as they are intertwined.
- A nature-positive future needs transformative, game-changing shifts in how we produce, how we consume, how we govern and what we finance.
- An all-inclusive collective approach towards a more sustainable path must be adopted. It will ensure that the costs and benefits from our actions are socially just and equitably shared.



### 13. Battery Waste Management Rules, 2022

**Syllabus: Environmental Pollution and Degradation**

**Prelims: Battery waste management rules, 2022**

**Introduction:**

- The Indian government has notified the Battery Waste Management Rules, 2022 to ensure eco-friendly management of waste batteries in the country.
- The new rule will replace the Batteries Management and Handling Rules, 2001, and will cover all types of batteries including portable batteries, electric vehicle batteries, industrial batteries, and automobile batteries.

**Key Features of the Battery Waste Management Rules, 2022:**

**Extended Producer Responsibility (ERP):**

- The producers as well as the importers of the batteries will be responsible for the collection, recycling, or refurbishment of batteries. Disposal of batteries in landfills and incineration are strictly prohibited under new rules.

**EPR certificates:**

- Under new rules, a mechanism and a centralized online portal will be set up for facilitating the exchange of the EPR certificates between the producers and recyclers to ensure the fulfillment of the producers' obligations.

**Environmental Compensation:**

- If the EPR targets, responsibilities, and obligations will not be fulfilled, environmental compensation will be imposed on the basis of the polluter pay principle.

**Recycling industries:**

- The new rules promote and encourage the establishment of recycling industries and entrepreneurship for the collection and refurbishment of batteries.

**Significance of the New Rules:**

- It will bring new and innovative technologies into the recycling industry and will also help to create new business opportunities.
- Digitization of the process such as online registration, reporting, auditing, and monitoring will ensure effective and efficient implementation of the rules and regulations.
- Eclectic mobility will be promoted with effective regulation of the electric battery industry.

**Conclusion:**

With India and its EV adoption as the context, the country still doesn't have major lithium-ion (Li-ion) cell, producers. The lack of raw materials is one of the key reasons behind this. As a result, India is still dependent on imports of EV cells from countries such as China, Korea, and the US. While cell manufacturing is beginning to take shape in India, a proper recycling industry would further help in achieving the country's goal of self-sustainability for cell production.



# HEALTH ISSUES

## 1. Tele-MANAS

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

**Prelims:** About Tele-MANAS and World Mental Health Day

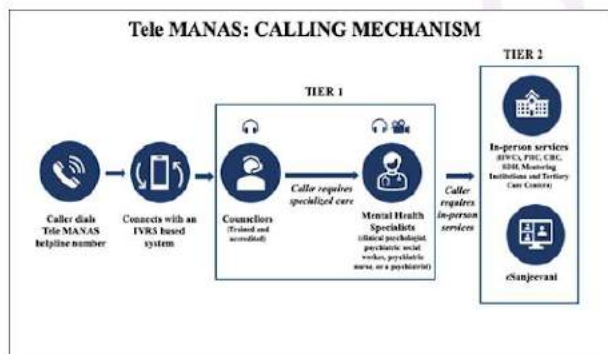
**Context:**

- As a part of World Mental Health Day, the Governor of Karnataka launched the Tele Mental Health Assistance and Networking Across States (Tele-MANAS) initiative of the Union Ministry of Health & Family Welfare.

### World Mental Health Day:

- World Mental Health Day is celebrated on October 10 every year since 1992.
- World Mental Health Day is observed by the **World Federation for Mental Health (WFMH)**, the **World Health Organization**, and other member organisations of WFMH.
- Objective:** To raise awareness about mental health issues around the world and to mobilise efforts in support of mental health.
- The **theme for World Mental Health Day 2022** as set by WFMH is “to make mental health and well-being for all a global priority”.

**Tele Mental Health Assistance and Networking Across States (Tele-MANAS):**



Source: PIB

- Tele-MANAS is under the **National Tele Mental Health Programme (NTMHP)** announced in the Union Budget 2022-23 by the Union government considering the prevalent mental health crisis during the COVID pandemic.
- Tele-MANAS initiative aims to extend round-the-clock, free tele-mental health services all across the country, especially to people in remote or under-served areas.
  - The Union government aims to set up at least one Tele-MANAS Cell in each state and union territory.
- Further, this 24/7 mental health facility also aims to provide universal access to equitable, affordable and quality mental health care.
- The programme includes a network of 23 tele-mental health centres of excellence, with **NIMHANS** being the **nodal centre** and the **International Institute of Information Technology-Bangalore (IIITB)** will provide

the technical and technological support along with the National Health Systems Resource Centre (NHRSC).

- Tele-MANAS facility will be in a **two-tier system** wherein
  - The Tier 1 facility consists of state Tele-MANAS cells which include trained counsellors and mental health specialists.
  - The Tier 2 facility consists of specialists at District Mental Health Programme (DMHP)/Medical College resources for physical consultation and/or e-Sanjeevani for audio-visual consultation.
- By linking the Tele-MANAS facility with other programmes such as the National tele-consultation service, e-Sanjeevani, Ayushman Bharat Digital Mission, mental health professionals, Ayushman Bharat health and wellness centres and emergency psychiatric facilities, a holistic mental health system can be developed.

### ORGANIZATIONAL FRAMEWORK



Source: PIB

## 2. Lead Poisoning

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

**Mains:** Implications of lead poisoning and various preventive Measures undertaken

**Context:**

A central report jointly prepared by Niti Aayog and the Council of Scientific & Industrial Research (CSIR) has found that India bears the world's highest health and economic burden due to lead poisoning.

**Lead Exposure:**

- Lead is a naturally occurring toxic metal found in the Earth's crust. Its widespread use has resulted in extensive environmental contamination, human exposure and significant public health problems in many parts of the world.
- Even after banning the use of lead in petrol, there is a continuous rise in cases of lead poisoning. This is due to exposure to other sources of lead.
- Mining, smelting, manufacturing and recycling activities and the **continued use of leaded paint, leaded gasoline, and leaded aviation fuel (in some countries)** are important sources responsible for environmental contamination.
- Drinking water supplied through lead pipes or pipes joined with lead solder may contain lead.
- The government report cites battery recycling, and occupational sources such as lead mining, smelting, welding, soldering and automobile repatriating. other sources include adulterated spices, cosmetics and traditional medicines.



**Effects of Lead Exposure:**

- Lead is a cumulative toxicant (increasing in quantity in the body over many years) that affects multiple body systems (neurologic, hematologic, gastrointestinal, cardiovascular, and renal systems).
- Young children are particularly vulnerable to the toxic effects of lead which can have adverse effects on the **development of the brain and nervous system.**
- Adults exposed to lead are at increased risk of developing high blood pressure and kidney damage. Exposure of pregnant women to high levels of lead can cause miscarriage, stillbirth, premature birth and low birth weight and malformations.

**Lead Poisoning in India:**

- Bihar, Uttar Pradesh, Madhya Pradesh, Jharkhand, Chhattisgarh and Andhra Pradesh had the highest average blood lead levels (BLL) among Indian states, according to the report.
- These states account for 40 per cent of India's population that is plagued with this poor health indicator.
- A level of **5 mcg/dL and above** is considered unsafe and can have adverse effects. In this context, the national average is worrying at **4.9 µg / dl** for children less than two years old and 23 states have an average BLL that goes beyond **5 mcg/dL.**

**Preventive Measures:**

- The Global Alliance to Eliminate Lead Paint (Lead Paint Alliance) by UNEP to prevent exposure to lead by promoting the phase-out of paints containing lead.
- Government of India has passed a notification "Regulation on Lead contents in Household and Decorative Paints Rules, 2016" and has prohibited manufacture, trade, import as well as export of household and decorative paints containing lead or lead compounds in excess of 90 parts per million (ppm).



# HISTORY

## 1. Jalal-ud-din Akbar

Syllabus: Indian History

Prelims: Facts about Akbar

Context:

- The Mughal emperor Akbar is said to have passed away on 27th October 1605.

**Jalal-ud-din Akbar:**

- Jalal-ud-din Akbar, who is famously known as Akbar, was born on October 15 in 1542 in Umarkot which is currently located in the Sindh province of Pakistan.
- He was the son of the Mughal emperor Humayun and Hamida Banu Begum.
- Akbar reigned from 1556 to 1605 and is regarded as the greatest Mughal emperor of India.
- Akbar is known for his religious tolerance, empire-building, administrative and financial reforms and patronage of the arts.
- Akbar built a hall called **Ibadat Khana** (Hall of Prayer) at his new capital, Fatehpur Sikri wherein he invited learned scholars from all religions like Hinduism, Jainism, Christianity and Zoroastrianism and used to conduct religious discussions with them.
- Akbar also set up a new religion called **Din-i-Ilahi/Tawhid-i-Ilahi** (Divine Monotheism) which believes in one God and Sulh-i-Kul (equal toleration and respect to all religious sects).
- **Akbar's court is also known for housing extraordinary officials who are called Akbar's Navratna as they were nine in number and they included the likes of:**
  - Birbal, Tansen, Abul Fazal, Faizi, Raja Man Singh, Raja Todar Mal, Mullah Do Piazza, Fakir Aziao-Din and Abdul Rahim Khan-I-Khana.



# SOCIAL JUSTICE

## 1. Supreme Court verdict on abortion rights

**Syllabus:** Issues related to Women.

**Prelims:** Medical Termination of Pregnancy Act.

**Mains:** Abortion laws in India.

**Context:**

- Recent Supreme Court ruling on the abortion issue.

**Background:**

**Medical Termination of Pregnancy (Amendment) Act, 2021:**

- This Amendment increased the upper limit of the gestation period from 20 weeks in the original act of 1971 to 24 weeks for some specific cases.
- For termination of pregnancy within 20 weeks, the opinion of one doctor is needed and for termination of pregnancy between 20-24 weeks, opinion of two doctors is required.
- After 24 weeks, termination of pregnancy is allowed only on grounds of foetal abnormalities and if a **four-member Medical Board** set up in each State under the Act gives permission.
- The words “any woman or her partner” was introduced in the amended act in place of “married woman or her husband” in the original act 1971 for termination of pregnancy within 20 weeks.
- For termination of pregnancy between 20-24 weeks section 3B of rules specifies certain criteria. They are
  - A woman is either a survivor of sexual assault or rape or incest
  - A woman is a minor
  - If the woman's marital status has changed during the ongoing pregnancy (either widowed or divorcee)
  - If a woman has major physical disabilities or is mentally ill
  - On the grounds of foetal malformation incompatible with life or if the child is born, it would be seriously handicapped
  - If the woman is in a humanitarian setting or disaster or emergency situation as declared by the government.

**Details:**

- The Supreme Court while interpreting Rules of the Medical Termination of Pregnancy (MTP) Act, 1971, directed that single/unmarried women with pregnancies between 20 and 24 weeks can access legal and safe abortion care similar to married women.
- The bench observed that “the rights of reproductive autonomy, privacy, and dignity give right of choice to unmarried regarding whether to bear a child or not on a similar to a married woman.”
- The court also adjudicated (in another judicial discussion) that marital rape (sexual assault by a husband on his wife) can take the form of rape. Presently Indian Penal Code does not recognize marital rape as an offence.
- The MTP Act has set exceptions to the criminalization of abortion in sections 312 to 318 of IPC.
- Earlier the Medical Termination of Pregnancy Rules, 2003, did not allow the termination of pregnancy

before the completion of 24 weeks for unmarried women.

- Taking a “purposive” view of a “beneficial legislation”, while hearing the plea of a 25-year-old woman, whose request to terminate the pregnancy before the completion of 24 weeks was rejected by the Delhi High Court like the MTP Act, the apex court declared that unmarried women should be included within the ambit of Rule 3B of the MTP Rules.
- The MTP (Amendment) Act, 2021, made a key change in Section 3. It extended the upper limit for termination of pregnancy from 20 to 24 weeks. Particularly, Explanation II which said that— anguish caused by a pregnancy resulting from a failure of any device or method used by any “married woman or her husband” was replaced with the clause “any woman or her partner”. It thus brings pregnancies outside the institution of marriage within the “umbrella of the law”.

**Rationale behind the Supreme Court Decision:**

- The constitutional values that led to the reinterpretation of the MTP Act and Rules:
  - Right to reproductive autonomy
  - Right to live a dignified life
  - Right to equality
  - Right to privacy
- The court is of the view that –“In the context of abortion, the right to dignity entails recognizing the competence and authority of every woman to take reproductive decisions, including the decision to terminate the pregnancy”.
- SC held that the rights of reproductive autonomy, dignity and privacy under Article 21 of the Constitution give an unmarried woman the right of choice as to whether or not to bear a child on a similar footing as that of a married woman.
- In **Puttaswamy judgment** also SC ruled right to privacy under article 21 includes the decision to continue or terminate a pregnancy.
- SC also held that allowing married pregnant women to terminate a pregnancy between 20 - 24 weeks while denying the same for single or unmarried pregnant women violates the right to equality before law and equal protection of law under Article 14.

**Present Scenario:**

- Unmarried and single women in India face huge challenges while exercising their rights thus leading to greater risks and complications. This can be attributed to patriarchal mindsets and social stigma persisting in the country.
- Many women have to resort to quacks in case of unwanted pregnancy.
- According to the National Family Health Survey 5 of 2019, spousal violence (both sexual and physical) in the age group 18-49 years is faced by 29.3% of women.
- The courts have noted that unsafe abortions are the major cause of maternal mortality in India.
- However, abortion laws are moving in a positive direction in India, especially at times when countries like the USA have overturned their right to abortion.
- Presently marital relationships are out of the ambit of the Criminal law Amendment Act, of 2013.



### Significance of the Judgment:

- The judgment reinforces the right to privacy guaranteed by the constitution and ensures the right to equality.
- The latest National Family Health Survey shows that around 3 per cent of total pregnancies in India end up in abortions. This judgment will ensure the right to the safe and legal termination of pregnancy for all women.
- This judgment also assumes significance at a time when The Supreme Court of the United States **overturned** the 50-year-old Roe v Wade judgement which allowed pregnant women to choose abortion.

### Court's Ruling in Marital Rape:

- The Court has ruled that the meaning of the words "rape" or "sexual assault" in Rule 3B(a) should incorporate rape or sexual assault committed by a husband on his wife. Thus implying that the meaning of rape should also entail marital rape, only for the purposes of the MTP Act.
- Various Human rights experts have pointed out that if autonomy, dignity, and equality are guaranteed to individuals under Articles 14 and 21, then marital rape should be referred a criminal offence.
- Similarly, Justice Verma Committee had recommended that the law should clearly specify that marital relationships cannot be an excuse for sexual violence. The committee has rightly concluded that "A rapist remains a rapist regardless of his relationship with the victim".

### Nut Graf:

*As evident from the current ruling, India is moving in the right direction when it comes to the dignity and autonomy of Women. However, a lot needs to be done when it comes to marital rape.*

## 2. Issue of Child abandonment

**Syllabus:** Issues related to the Vulnerable section of the population.

**Mains:** Child issues- abandonment.

### Context:

- Rising cases of child abandonment.

### Background Details:

- There are multiple incidents of abandonment of newborn children often found in places like dustbins, garbage piles, roadside bushes, or religious places.
- As per the National Crime Records Bureau's data (2021), more than 709 criminal cases of 'exposure and abandonment of child under twelve years' were registered under Section 317 of the Indian Penal Code (IPC).
- It should be noted case is not registered for the surrender of children to the Child Welfare Committee (CWC), which is constituted under the Juvenile Justice (Care and Protection of Children) Act, 2015 (or the JJ Act).

### Facts:

- As per the Central Adoption Resource Authority (CARA) portal, approximately 2,991 in-country adoptions and around 414 inter-country adoptions took place in the year 2021-22.
- Likewise, the 118th report on the Review of Guardianship and Adoption Laws (presented in the Rajya Sabha in 2022), reported that 2,430 children were legally available for adoption against nearly 26,734 adoptive parents-in-waiting (as on December 2021).

### Difference between Abandonment and Surrender:

- An abandoned child refers to a child that is deserted by his biological/adoptive parents or guardians. Whereas a surrendered child is relinquished due to emotional, physical, or social factors that are beyond the control of parents or children.
- According to the Juvenile Justice Act, no first information report (FIR) should be registered against the biological parents of the child during the inquiry process for the abandonment and surrender of the child. This is to ensure that parents/guardians of the child are efficiently traced without initiating any criminal action against them.
- If the conditions to retain the child are unfavorable for the parents/guardian, then the child should be surrendered before CWC. CWC guarantees the protection of children till they attain majority or are adopted by willing and fit parents.
- The abandonment might risk the life of a child.
- Moreover, the disclosure of the identity of the surrendered child is prohibited and the related reports of that child are confidential. Thus making the situation conducive for the parents to surrender their children. It should also be noted that surrendering the child does not entail any criminal action against the parents.
- **The most common reasons for the abandonment of a child are:**
  - Breakdown of relationship.
  - Unwanted pregnancy
  - Lower socio-economic status
  - Both parents being drug addicts or alcoholics

Under the above conditions, the child is eligible to surrender.

### Judicial interpretation:

- The apex Court of the country gave a liberal interpretation to the Medical Termination of Pregnancy (MTP) Act, 1971.
  - As per the recent (2021) amendment to Section 3(2)(b) of the MTP Act, the words "married woman" were replaced with "any woman" and "husband" was replaced by "partner".
  - Moreover, the Supreme Court(SC), in X vs The Principal Secretary Health and Family Welfare Department and Another case (2022), noted that the parliamentary intent was not to restrict the beneficial provisions only to a matrimonial alliance, thus giving an interim order to allow an unmarried woman petitioner to abort her 24 weeks pregnancy (subject to the recommendation of Medical Board).

### Remedial Measures:

- The major ground for the abandonment of children is inadequate awareness of the provisions of the surrender of undesired children. Thus awareness can provide a key to the issue:
  - As it is observed that unwanted pregnancies are well known to Accredited Social Health Activists (ASHAs), daais, and Anganwadi workers, they can play a crucial role in building a strong network in villages and spreading education and awareness about the issue, and reducing the menace of abandonment.
- A parent can also approach childline services, public servants, police, non-governmental organizations (NGO), child welfare officers, social workers, maternity homes, etc to surrender a child. These authorities/officers should produce the child before the CWC within 24 hours.
- It should also be adequately publicized that non-



reporting of abandonment within the prescribed time limit might become a criminal offence.

#### Nut Graf:

Wide publicity about the provisions of the surrender of the child is the need of the hour. It is the responsibility of all the stakeholders that no child is deserted and denied their basic rights. Moreover, parents/guardians/functionaries should report cases of abandonment without facing any legal risk.

### 3. Global Hunger Index 2022

**Syllabus:** Issues related to poverty and hunger.

**Mains:** Hunger issues.

**Prelims:** Global Hunger Index 2022.

#### Context:

- Release of Global Hunger Index 2022.

#### Details:

- The Global Hunger Index (GHI) comprehensively measures and tracks hunger at regional, national, and international levels. The scores are evaluated on the basis of four indicators:
  - Undernourishment
  - Child stunting
  - Child wasting
  - Child mortality
- A GHI score is calculated on a 100-point scale on the basis of the values of four indicators. Zero is considered to be the best score as it reflects no hunger and 100 is considered to be the worst.
- On the basis of the respective score, countries are classified into five groups of hunger namely 'low', 'moderate', 'serious', 'alarming', and 'extremely alarming'.
- The recent 2022 edition is the seventeenth annual edition jointly published by Welthungerhilfe and Concern Worldwide.

#### India-Specific Findings:

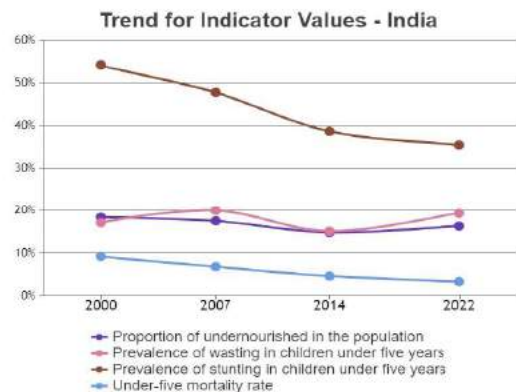
- India's rank in GHI is 107 out of 121 countries. India fares worse than all other South Asian countries except for Afghanistan.
- India has a score of 29.1 thus putting it under the 'serious' category. India also ranks below its neighbours like Sri Lanka (64), Nepal (81), Bangladesh (84), and Pakistan (99).
- Afghanistan is the only country in South Asia that performs worse than India on the index with a rank of 109.
- China is among the countries collectively ranked between 1 and 17 having a score of less than 5.



Source: [www.globalhungerindex.org](http://www.globalhungerindex.org)

- The overall score has slightly worsened from 28.2 in 2014 to 29.1 in 2022.
- The child wasting rate (low weight for height) in India is 19.3% which has declined from 15.1% in 2014 and 17.15% in the year 2000. It is the highest among all the countries of the world.

- Undernourishment (the proportion of the population facing chronic dietary energy deficiency) has also increased from 14.6% in 2018-2020 to 16.3% in 2019-2021. It implies that 224.3 million people in India are undernourished.
- Child stunting has improved in India, which has decreased from 38.7% in 2014 to 35.5% in 2022. Moreover, child mortality has also reduced from 4.6% to 3.3% during the same time period.
- It should also be noted that the rankings in the GHI annual reports are not comparable with each other across different years. The GHI score for 2022 can only be compared with scores of the year 2000, 2007, and 2014.



Source: [www.globalhungerindex.org](http://www.globalhungerindex.org)

#### Nut Graf:

India continues to perform poorly in the Global Hunger Index. Though child stunting and child mortality indicators have shown improvement, indicators like undernourishment and child wasting have further worsened in India. A careful analysis of the situation and efforts to address the issue is the need of the hour.

### 4. Food day as a reminder to 'leave no one behind'

**Syllabus:** Issues related to Hunger and poverty.

**Mains:** Food and Nutritional Security

**Prelims:** World Food Day

#### Context:

- World Food Day is celebrated on 16th October.

#### Details:

- Food and nutrition security continue to be impacted by various factors like:
  - COVID-19 pandemic
  - Climate change
  - Fluctuating food inflation
  - Conflicts
  - Inequality
- Approximately 828 million people across the world do not have enough food to eat, and more than 50 million people face severe hunger.
- The Hunger Hotspots Outlook 2022-23 warns about increasing hunger issues as nearly 205 million people spread across 45 countries will require emergency food assistance to survive.
  - The Hunger Hotspots Outlook is a report published by the World Food Programme (WFP) and the Food and Agriculture Organization (FAO) of the United Nations.



- World Food Day is celebrated on October 16 every year. This year it was rightly reminded that it is important to ensure easy accessibility of safe and nutritious food to the vulnerable section of society.
- World Food Day nudges to 'Leave No One Behind' and use it as an opportunity to strengthen food security nets, provide access to essential nutrition for millions and promote livelihood for vulnerable communities in various countries.
- The target of ending hunger by 2030 is possible only through collective and transformational steps that can bolster agri-food systems through better production, nutrition, environment, and eventually a better life.

#### Production and Nutrition in India:

- India increased its production levels and achieved self-sufficiency. It is now one of the largest exporters of agricultural products in the world.
  - India recorded \$49.6 billion in total agriculture exports in the year 2021-2022. This was a 20% increase from the exports in 2020-21.
- FAO has played a crucial role in India since 1948 in various fields like crop/livestock/fisheries production, food security, and natural resources management.
- To ensure food equity India adopted National Food Security Act (NFSA) 2013 which anchors
  - Targeted Public Distribution System (TPDS)
  - PM POSHAN scheme (earlier referred to as the Mid-Day Meals scheme)
  - Integrated Child Development Services (ICDS)
- Moreover, the WFP collaborates with State and National governments to strengthen these schemes and make them accessible to the most needful sections.
- Furthermore, the Government authorities adopt various other measures like digitization, rice fortification, and sanitation programmes for additional improvements.
- India adopted Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) to deal with the impacts of the COVID-19 pandemic on food security.
  - It should also be noted that an International Monetary Fund (IMF) paper titled 'Pandemic, Poverty, and Inequality: Evidence from India' asserted that extreme poverty was maintained below 1% in 2020 due to the PMGKAY.
- Concerns and remedial measures
  - The recent climate shocks in India have raised concerns about wheat and rice production for the subsequent year. A greater focus should be given to climate adaptation and resiliency.
  - India has a large population that is expected to rise further (Approximately 1.5 Billion by 2030). Thus it is important to adopt effective, inclusive, and sustainable methods of improving production thus moving away from conventional input-intensive agriculture.
  - India's upcoming G20 presidency can be used as an opportunity to bring food and nutrition security to the very center of a resilient and equitable future.

#### Environmental Aspect in food security:

- Apart from climate change, nutrition and agricultural production are also associated with environmental sustainability. Excessive use of chemicals and non-judicious use of water causes soil degradation which hampers the nutritional value of food. The need of the hour is urgent attention.
- **Benefits of Millets:**
  - Millets are climate-smart crops that are good for nutrition, health, and the overall planet.
  - They require fewer inputs and are less extractive for the soil.
  - Moreover, they can revive the health of the soil and preserve agro-biodiversity.
  - They have the potential to increase yields for small farmers (including rural women).
  - The International Fund for Agricultural Development's (IFAD's) Tejaswini programme with the Government of Madhya Pradesh highlighted that the millet production can increase income by nearly ten times. For instance, the income of ₹1,800 per month in 2013-14 increased to ₹16,277 in 2020-21.
  - It also ensures better food security as millet crops are not impacted by excessive rainfall.
- **Measures taken by India:**
  - India has taken various steps to revive millet production in the world. It also appealed United Nations General Assembly (UNGA) for declaring 2023 as the International Year of Millets.
  - It is the largest producer of millet in the world. It produced nearly 41% of total millet production in 2020. The Union government has implemented a Sub-Mission on Nutri-Cereals (Millets) under the ambit of the National Food Security Mission.
  - State-level interventions in Andhra Pradesh, Madhya Pradesh, and Odisha are proof of India's resolve to revive indigenous crops.

#### Way Ahead:

- Transformation of food systems, making them more sustainable, resilient, and equitable.
- Improving food and nutrition security, including non-distortionary income support and social protection schemes.
- Encouraging the production and consumption of indigenous foods like millet through consumer sensitization.
- The global and regional supply chain should be strengthened by increasing transparency. Measures like labeling, tracing, etc can be used.
- Promoting cooperation among various stakeholders to leverage innovations.
- India can showcase its local solutions and best practices to champion the principle of leaving no one behind and lead the world in Food and Nutritional security.

#### Nut Graf:

*Food security continues to be a major issue across the world. India has proactively worked in this direction but still, a lot needs to be done. India can also lead the world in this aspect, thus ensuring that no one is left behind.*



# GOVERNANCE

## 1. Swachh Survekshan 2022

### Syllabus: Government Policies

**Mains: Government initiatives to achieve the vision of a 'Clean India'.**

#### Context:

- The President of India announced the results of Swachh Survekshan 2022 recently.

#### 2022 Survey:

- The President of India formally released the Swachh Survekshan 2022 dashboard and the awards were given away as part of the Azadi@75 Swachh Survekshan 2022 hosted as part of the Swachh Bharat Mission.
- In the “greater than 1 lakh people” category, Indore won the title of Cleanest City for the sixth year in a row, while Surat came second and Navi Mumbai took third place.
- Indore also emerged as India’s first 7-star Garbage Free city, while Surat, Bhopal, Mysuru, Navi Mumbai, Visakhapatnam, and Tirupati earned 5-star Garbage Free certifications.
  - The revised Star Rating Protocol of Garbage Free Cities was launched in 2021 to holistically evaluate cities across solid waste management parameters.
- In the population category of less than one lakh, Panchgani and Karad from Maharashtra bagged the first and third positions respectively, while Patan from Chhattisgarh bagged the second position.
- Tirupati received the best city award in Safai Mitra Suraksha category.
- Haridwar in Uttarakhand received the award for the best Ganga town in more than one lakh population cities.
- Shivamogga in Karnataka received the fast mover city award.
- Madhya Pradesh emerged as the Cleanest State in the category of “more than 100 Urban Local Bodies”, pushing Chhattisgarh, the cleanest State of the previous three years, to second place while Maharashtra emerged as the third cleanest State.
- Tripura got the cleanest state award in the “less than 100 urban local bodies category”, while Jharkhand and Uttarakhand received the second and third spots respectively.
- This year’s Survekshan, which took place in 4,355 cities, also saw an unprecedented number of citizens’ feedback – over 9 crores, compared to 5 crores last year.

#### Ranking cleanliness

The tables list the top six urban local bodies (ULBs) and the best performing States according to Swachh Survekshan, 2022. Indore retained the tag of India’s cleanest city for the sixth consecutive time, while Madhya Pradesh is ranked first among States.

Ranking of urban local bodies (with more than 1 lakh population)

City	State	Rank
Indore	Madhya Pradesh	1
Surat	Gujarat	2
Navi Mumbai	Maharashtra	3
Visakhapatnam	Andhra Pradesh	4
Vijayawada	Andhra Pradesh	5
Bhopal	Madhya Pradesh	6

Source: Swachh Survekshan 2022

Best performing States (~100 ULBs)

Rank	State
1	Madhya Pradesh
2	Chhattisgarh
3	Maharashtra
(< 100 ULBs)	
1	Tripura
2	Jharkhand
3	Uttarakhand

Source: The Hindu



### Swachh Survekshan:

- It has been conducted by the Union Ministry of Housing and Urban Affairs since 2016.
- It is the world’s largest urban sanitation and cleanliness survey.
- It has been instrumental in fostering a spirit of healthy competition among towns and cities to improve their service delivery to citizens and towards creating cleaner cities.
- The primary goal of Swachh Survekshans is to encourage large scale citizen participation and create awareness amongst all sections of society about the importance of working together towards making towns and cities better places to reside in.
- Conducted under the ambit of the Swachh Bharat Mission (Urban), the annual survey has managed to mobilise people, resources and authorities in an effort to prove that their city, of all cities in India, is the cleanest and that sustainable practices, both by citizens and ULBs, are being encouraged and promulgated.

### Nut Graf:

- Over the years, Swachh Survekshan has emerged as an effective tool for transforming the urban landscape. The Award ceremony was a platform for reaffirmation of commitment from cities and citizens to move forward with renewed vigour towards the vision of Garbage Free cities.

## 2. Unfilled vacancies, stagnant workforce delay RTI replies

### Syllabus: Important aspects of governance, transparency and accountability

#### Prelims: About the Right to Information Act

**Mains: The implications of rising pendency in RTI requests on transparency and accountability in governance**

#### Context:

- The report named “Report Card on the Performance of Information Commissions in India, 2021-22” released by the Satark Nagrik Sangathan highlights that close to 3.15 lakh complaints and appeals under the Right to Information (RTI) Act are still pending with 26 information commissions across India.

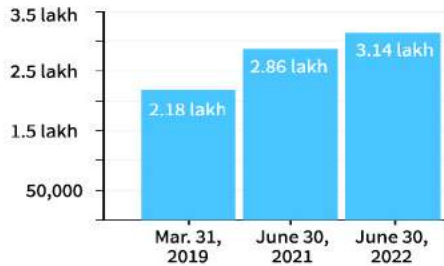
#### The structure of the implementation of the RTI Act:

- The Right to Information (RTI) Act is implemented as a three-level structure.
- The first level consists of the **Central Assistant Public Information Officer or the Central Public Information Officer (CAPIO/CPIO)**.
  - As an RTI appeal reaches the CAPIO/CPIO, they are required to reply within 30 days.
- The second level consists of **First Appellate Authority (FAA)**, wherein an applicant can appeal to the FAA if he finds the reply of the CAPIO/CPIO not satisfactory or not on time.
- The third level consists of the **Central Information and State Information Commissions** which can be approved if the FAA’s answer is not satisfactory or if the FAA has failed to answer.



### Data on the backlogs in RTI applications:

- **Increase in the number of pending appeals:** the number of pending appeals and complaints has increased from 2.18 lakh to 3.14 lakh since 2019.



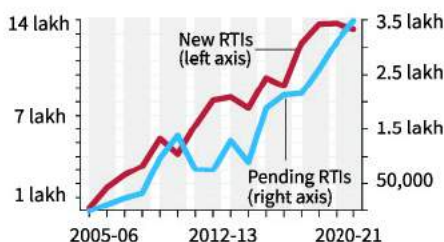
- **State-wise backlogs:** reports show that the highest number of pending cases was seen in Maharashtra, followed by Uttar Pradesh, Karnataka, the Central Information Commission (CIC) and Bihar.



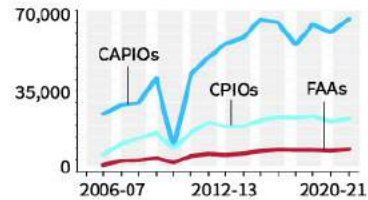
- **Delay in the disposal of applications:** the report has calculated the time taken by the Information Commissions to dispose of an appeal by taking into account the backlog data and the monthly disposal rate.
  - As per the Report, West Bengal State Information Commission required 24 years and 3 months to dispose of an appeal filed on July 1, 2022.
  - Odisha and Maharashtra would require five years.
  - Further only Meghalaya and Mizoram states showed no waiting time.



- **Increase in the number of RTI requests at the start of every year and the number of new RTI requests filed in a year.**



- **The number of CAPIOs, CPIOs and FAAs working for Central government agencies:** this number has remained constant in recent years.



### Nut graf:

The increase in the number of new RTI applications along with the failure to increase the number of information officers have led to the piling up of RTI complaints. The increasing pendency and the long waiting time must be addressed to make the RTI regime effective.

## 3. Amended IT Rules

### Syllabus: Government Policies and Interventions

### Mains: Pros and Cons of Information Technology Rules, 2021.

### Context:

- The Union information technology ministry recently notified the setting up of Grievance Appellate Committees to hear appeals from social media users.

### Introduction:

- The Union ministry notified the setting up of Grievance Appellate Committees (GAC) which will have control over content moderation decisions taken by social media platforms in India.
- The GACs will hear appeals from users challenging the decision of social media companies to remove or moderate content on their platforms.
- The decision to form such panels within the next three months was notified as an amendment to Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021.

### Key changes effected by the amendment:

- Recent amendments impose a legal obligation on intermediaries to take reasonable efforts to prevent users from uploading harmful/unlawful content. The new provision will ensure that the intermediary's obligation is not a mere formality.
- For effective communication of the rules and regulations of the intermediary, it is important that the communication is done in regional Indian languages as well.
- The grounds in rule 3(1)(b)(ii) have been rationalised by removing the words 'defamatory' and 'libellous'. Whether any content is defamatory or libellous will be determined through judicial review.
- Some of the content categories in rule 3(1)(b) have been rephrased to deal particularly with misinformation, and content that could incite violence between different religious/caste groups.
- The amendment requires intermediaries to respect the rights guaranteed to users under the Constitution, including a reasonable expectation of due diligence, privacy and transparency.
- Grievance Appellate Committee(s) will be established to allow users to appeal against the inaction of, or decisions taken by intermediaries on user complaints. However, users will always have the right to approach courts for any remedy.
  - Each Grievance Appellate Committee shall consist of a chairperson and two whole time members



appointed by the Central Government, of which one shall be a member ex-officio and two shall be independent members.

- o Any person aggrieved by a decision of the Grievance Officer may prefer an appeal to the Grievance Appellate Committee within a period of thirty days from the date of receipt of communication from the Grievance Officer.
- o The Grievance Appellate Committee shall deal with such appeal expeditiously and shall make an endeavour to resolve the appeal finally within thirty calendar days from the date of receipt of the appeal.

#### Significance of this amendment:

- The latest amendment lays a definite due diligence obligation on social media firms so that no unlawful content or misinformation is posted on their platforms.
- Several digital platforms are accused of taking a “casual” and “tokenism” approach towards user complaints in the past one year.
  - o The government had received lakhs of messages from citizens regarding the action/inaction on the part of the intermediaries on grievances regarding objectionable content or suspension of user accounts.
- The amendments will ensure that these digital platforms respect the fundamental rights accorded to citizens under Articles 14, 19 and 21 of the Constitution.
- This is in line with the government’s focus to make the Internet a safe, trusted and accountable space for users.

#### Criticism against recent amendments:

- Grievance Appellate Committees are appointed by the union government which would give the government power to moderate content on social media.
  - o This would make the government the arbiter of permissible speech on the internet and incentivised social media platforms to suppress any speech that is against the government.
  - o Non-government organisation Internet Freedom Foundation have shared their concern that the government-appointed committees could apply “opaque and arbitrary methods” while hearing the appeals.
- The amendment put forth the obligation that all social media intermediaries resolve all complaints within 72 hours of reporting.
  - o The shortened timelines might lead to hastier decision making with respect to censoring the content without proper scrutiny.
- Several media outlets have challenged the new IT rules in courts. They have argued that the guidelines will allow the government to directly control their content.
  - o In May 2022, the Supreme Court had put a stay on the proceedings pending before various High Courts on petitions against the new Information Technology Rules.
  - o In August 2022, a division bench of the Bombay High Court had stayed the implementation of Rule 9 (1) and (3) of the new IT rules. The provisions deal with the code of ethics under the new IT rules.
- In a country where there is still no data privacy law to protect citizens from excesses committed by any party, encouraging digital platforms to exchange more information could backfire.

#### Nut Graf:

*In a major push towards an Open, Safe & Trusted and Accountable Internet, the Ministry of Electronics and IT notified amendments to IT rules 2021, aimed at protecting the rights of Digital Nagriks. They have been notified against the backdrop of complaints regarding the action/inaction on the part of the intermediaries on user grievances.*

#### 4. Babus to Karmayogis

**Syllabus:** Government policies and interventions for development in various sectors

**Prelims:** About Mission Karmayogi

**Mains:** Significance and the achievements of the Mission Karmayogi scheme

#### Context

This article talks about the implementation of mission Karmayogi and its significance.

#### Mission Karmayogi



Source: dopt.gov.in

- **Mission Karmayogi:** National Programme for Civil Services Capacity Building (NPCSCB) programme is a capacity-building scheme for civil servants launched by the Union Cabinet in 2020.
- The mission aims to upgrade the post-recruitment training mechanism of the officers and employees at all levels, lay down the foundations for the Indian civil servants’ capacity building and enhance governance.
- Mission Karmayogi initiative will be delivered by establishing a digital platform named **iGOT-Karmayogi** which would work under the Ministry of Human Resources and Development (MHRD).
- The programme intends to bring about a transition from Rules Based to a Roles Based Human Resource (HR) Management.
- The programme will be governed by the **Prime Minister’s Human Resource Council**, which will also include state Chief Ministers, Union Cabinet ministers and experts.
- Further, a Capacity Building Commission (CBC) has been instituted which includes experts in respective fields and global professionals for the functional supervision of training institutions and help in the formulation of capacity-building plans.
- Further, a fully-owned **Special Purpose Vehicle (SPV)**, which will govern the iGOT-Karmayogi platform has been set up under the provisions of the Companies Act, 2013.





Source: dopt.gov.in

### Significance of the Scheme

- It is regarded as the largest capacity-building programme in the world, which would cover nearly 2 crore civil servants working at the Union, state and local level.
- The programme will play a crucial role in ensuring better and on-time service delivery to citizens and will significantly improve public satisfaction and eliminate grievances.
- The outcomes of the programme will induce more accountability and transparency in governance.
- The programme will further help officials to design and develop solutions to local problems using the best available knowledge.

### Various achievements under the scheme

- Under the Mission, close to 95,000 railway staff have taken part in various workshops and programmes which have helped to enhance their motivation to serve.
  - These trained staff have been applauded by the passengers and freight customers for their compassion and motivation to serve.
- The Union Home Minister had instructed that the Mission must focus on improving the professional and investigative skills of the police and the results have been successful.
- At a time when the government is focusing on achieving its vision of “Maximum Governance, Minimum Government”, Mission Karmayogi has been helping civil servants to gain cross-learning across the private sector and breaking barriers between the public and private sectors.
- Further, the CBC has worked closely with the Department of Economic Affairs and coordinated with the UK’s National Infrastructure Authority, IIM Ahmedabad and Larsen and Tubro project management learning centres to develop online learning courses.
  - The approach adopted by the Mission has been guided by the “70-20-10” formula where 70% of adult learning is from on job experience, 20% is a result of peer-to-peer sharing and 10% is from classroom teaching.
  - The CBC has been working with about 750 government-run civil servant training institutions to provide classroom and online instruction.
- The Indian Institute of Secretariat Training and Management (ISTM) has been involved in transforming the training programme for section officers (SO) and assistant section officers (ASO).
  - The institute is helping to enhance the operational and practical skills of SOs and ASOs such as working on E-procurement platforms and using computer-based data processing tools.
  - This has helped to increase the efficiency of the SOs by about 70% in tasks such as answering RTI queries, data processing and managing government E-markets.
- “Whole Government Approach” is another key

programme of Mission Karmayogi, wherein the training resources are being shared across various departments.

- Further, CBC and the Ministry of Skill Development and Enterprise have organised training programmes for officials in premier institutions of the country such as the Indian School of Business, India Institute of Management and Rashtriya Raksha University.
  - This has helped the officials to gain managerial competencies and enhanced domain knowledge.

**Nut graf:** Civil servants have remained the backbone of all governance activities in the county and the Mission Karmayogi plays a crucial role in making the civil servants more accountable, compassionate, innovative, proactive, professional, progressive, transparent and technology-enabled.

## 5. Star rating of packaged food

**Syllabus:** Government policies and interventions for development in various sectors and issues arising out of their design and implementation

**Prelims:** About FSSAI and Indian Nutrition Rating (INR)

**Mains:** Details about Indian Nutrition Rating, the need and significance of star ratings

### Context:

FSSAI has released the **draft notification** for star rating of packaged foods to encourage consumers to buy healthy food.

### Indian Nutrition Rating (INR):

- It is modelled on the lines of the health star rating program and is similar to the star rating for energy-efficient products.
- Star rating is aimed to discourage consumers from buying packaged food that is rich in high salt, sugar and fat content which will lead to lifestyle diseases.
- It will require packaged food to contain a star rating next to the brand name. INR system assigns **½ star for unhealthy food and a maximum of 5 stars for healthy food.**
- Certain food items are exempted from star rating are milk and milk products, ghee, vegetable oil and fat, fresh and frozen fruit and vegetable, fresh and frozen meat etc.
- Food product manufacturers have to submit the nutritional profile of products to FoSCoS (Food Safety Compliance System) portal of FSSAI.
- Scores will be given based on the contribution of energy and content of saturated fat, sugar, sodium, fruit and vegetables, nuts, legumes and millets and protein per 100gm of solid or 100ml of liquid foods.

### Need for Star rating:

- The aim of star rating is to guide consumers to choose healthy products and to avoid lifestyle diseases.
- According to the study report “India: Health of the Nation’s States” - The India State-Level Disease Burden Initiative by Indian Council of Medical Research (ICMR), it is estimated that the proportion of deaths due to **Non-Communicable Diseases (NCDs) in India have increased from 37.9% in 1990 to 61.8% in 2016.**
- The four major NCDs are cardiovascular diseases (CVDs), cancers, chronic respiratory diseases (CRDs) and diabetes which share four behavioral risk factors – **unhealthy diet, lack of physical activity, and use of tobacco and alcohol.**



**FSSAI:**

- Food Safety and Standards Authority of India is a statutory body established under the Ministry of Health & Family Welfare, Government of India.
- The FSSAI has been established under the Food Safety and Standards Act, 2006, which is a consolidating statute related to food safety and regulation in India.
- The Food Safety and Standards Authority of India (FSSAI) was set up for the proper monitoring of food hygiene and quality in India. It was functional since 2011 and ever since has been responsible for managing food safety in our country.
- To improve public health in India and combat negative nutritional trends to fight lifestyle diseases, FSSAI launched 'The Eat Right Movement' in 2018.
- Eat Right India is aligned with the National Health Policy 2017 with its focus on preventive and promotive healthcare and flagship programmes like Ayushman Bharat, POSHAN Abhiyaan, Anemia Mukta Bharat and Swachh Bharat Mission.
- FSSAI also launched a campaign called Project Dhoop to spread awareness around the importance of Vitamin D for school going children and the role of natural sunlight and fortified food in assuring its good intake.

## 6. United Nations World Geospatial Information Congress & SVAMITVA Scheme

**Syllabus:** Government policies and interventions for development in various sectors and issues arising out of their design and implementation

**Prelims:** About SVAMITVA scheme and Geospatial data policy 2021

**Mains:** About Geospatial data and technology

**Context:**

India hosted the Second United Nations World Geospatial Information Congress (UNWGIC 2022) in Hyderabad. In 2021 the Government announced liberalised guidelines for geo-spatial data which deregulated the sector and did away with prior approvals for surveying, mapping and building applications.

**Geospatial data and technology:**

- Geospatial data is data about objects, events, or phenomena that have a location on the surface of the earth.
- Geospatial data combines location information, attribute information (the characteristics of the object, event, or phenomena concerned), and often also temporal information or the time at which the location and attributes exist.
- Geo-spatial data usually involves information of public interest such as roads, localities, rail lines, water bodies, and public amenities.
- Geospatial data has now become imperative for the government in planning for infrastructure, development, social development, natural calamities as well as the economy.
- It involves the usage of technologies such as **Remote Sensing, Geographic Information Systems (GIS), and Global Positioning System (GPS)**.
- It finds application in a wide range of fields such as Agriculture, metrology, ecology, climate change, transportation, disaster management, resource management etc
- **National organizations** like the Survey of India, Geological Survey of India, National Atlas and Thematic

Mapping Organization (NATMO), Indian Space Research Organisation (ISRO) and National Informatics Centre have implemented several GIS-based pilot projects across a range of domains like waste resource management, forestry, urban planning, etc

**United Nations World Geospatial Information Congress:**

- The Prime Minister cited that the geospatial technology has been driving inclusion and progress in national development projects like SVAMITVA, PM Gati Shakti master plan, JAM Trinity, etc.
- The Minister Dr Jitendra Singh said that the geospatial economy is expected to cross Rs 63,000 crore by 2025 at a growth rate of 12.8% and to provide employment to more than 10 lakh people mainly through Geospatial start-ups.

**SVAMITVA scheme:**

- Survey of villages and mapping with improvised technology in village areas or SVAMITVA scheme is a Central Government initiative to enable an integrated property validation solution for rural India.
- It was launched on April 24, 2020, which is also National Panchayat Day. The Nodal Ministry for this scheme will be the Ministry of Panchayati Raj (MoPR).
- SVAMITVA Property cards will be provided to the landowners by the Government authorities, under this scheme.
- Drone Surveying technology and a Continuously Operating Reference Station (CORS) will be used for the demarcation of rural abadi areas.
- This will help owners possess their houses in the inhabited areas and use them as an asset for loans or other financial requirements

**Geospatial data policy 2021:**

- Under the new guidelines, the sector will be deregulated and aspects such as prior approvals for surveying, mapping and building applications based on that have been done away with.
- For Indian entities, there will be complete deregulation with no prior approvals, security clearances and licences for the acquisition and production of geospatial data and geospatial data services, including maps.

## 7. Taxing Online Games

**Syllabus:** Government policies and interventions for development in various sectors and issues arising out of their design and implementation

**Prelims:** About Gaming Laws in India

**Mains:** Online Gaming in India, challenges associated with it and the way forward

**Introduction:**

Online gaming refers to the games that are played through the internet or on some form of computer network.

**Online Gaming in India:**

- There has been a massive growth in the online gaming industry in recent years.
- One one hand, the gamers are involved in the games such as poker, rummy, etc. for thrill. On the other hand, the companies earn a huge amount of profit from the industry.
- There are more than 30 crores online gamers in India and in 2020, the online gaming industry earned approximately 1.8 billion revenue.



- In India, the number of new paying online gamers is increasing at a faster rate than as compared to China and the US. India is in the top five list of the mobile gaming markets in the world.

#### Policy:

- Policymakers should focus on a progressive policy that is not only industry friendly but also focused on consumer rights protection.

#### Gaming Laws in India:

- The gambling laws in India provide exemption to the skill-based games that require a considerable amount of knowledge, skills, and expertise as against the games such as lottery, gambling, etc. that are purely based on chance. Hence, there is a difference between 'game of skills' and 'game of chance'.
- However, the GST council does not define online gaming and is still facing the challenge regarding the game of skill and game chance.

#### Taxation on Online Gaming:

- There is 28% GST on games of chance such as lottery, gambling, horse riding, etc. and 18% GST on games of skills like rummy, poker, etc.
- A Group of Ministers (GoM) has been appointed by the government to evaluate the services provided by the online gaming platforms, casinos, etc. for levying GST.
- The GoM recommended a uniform tax rate of 28% on online gaming, horse riding, and casinos. However, this rate has been opposed by states such as Goa and the GST Council has asked the GoM to reconsider the proposal.

#### Challenges involved in the Online Gaming Industry:

##### Addictive:

- Online games such as poker, rummy, etc. are very popular among the youngsters and they are addictive in nature.
- Paid games lead to higher debts, depression, suicide, and crimes. Many cases of killing, theft, and suicides have been reported due to mounting debt pressure of online games.

##### No strict regulation:

- In India, there is a lack of strict regulatory framework for online gaming.

##### Higher taxation:

- High rates of taxes will open up the gates for gray market operators, shutting down the domestic operators.
- A huge amount of revenue will be lost and the gaming industry will not be able to become the top contributor in the digital economy.

#### Way Forward:

##### Regulation of the industry:

- There is a need to regulate the online gaming industry in India. It will help in generating economic opportunities.

##### Central Law:

- There should be a central law governing the online gaming industry. Checks and balances should be there such as monitoring the operations of online gaming, consumer protection, tackling illegal activities, etc.

##### Bans on Promotional Ads:

- Betting and gambling, illegal in most parts of the country, pose significant financial and socio-economic risk for the consumers. Hence, the government has banned the advertisements that promote online betting in India.



# DISASTER MANAGEMENT

## 1. Challenge of urban floods

**Syllabus:** Disaster and disaster management

**Mains:** Shortcomings with the urban flood mitigation efforts in the country and solutions

**Context:**

- The recent instances of urban flooding in the country.

**Background:**

- The recent instances of flooding in Bengaluru have severely disrupted the operation of the city's IT companies.
- Similarly, such events were also seen in the case of Delhi (2013, 2021), Mumbai (2005, 2017), Chennai (2015, 2021), and Hyderabad (2020).
- The instances of urban flooding in the country have caused large-scale losses to property and life.
  - Mumbai reported a loss of over ₹ 14,000 crores between 2005 and 2015 and it was estimated that Chennai faced losses worth ₹ 15,000 crores in 2015.
- Further, urban flooding also comes with significant social and human costs, which usually impact the poorer sections of society as they tend to live in environmentally vulnerable regions.
  - As seen in the case of Bengaluru, more attention was on the impact of floods on the city's IT industry and less focus was on the destruction of several informal settlements in these areas.

**Flaws and shortfalls in the solutions and action plans to thwart urban flooding:**

- Whenever such instances of flooding occur, politically motivated accusations followed by river/drain cleanup measures, anti-encroachment drives, and stormwater network projects are undertaken by the administrators to appease the public and the media.
  - However, such actions are said to be piecemeal solutions and are incompetent to tackle the challenges holistically.
- Further, there is a lack of interest in developing master plans for urban development in the country.
  - Bengaluru lacks a master plan to control its development since 2015 and over 65% of urban settlements in the country lack such master plans.
  - The Drainage Master Plan for Delhi was drafted in 1976 and a new plan is being implemented now after over 46 years.
  - Despite the inadequate capacity and bandwidth of the State governments to undertake master plans, the powers to develop master plans still remain with the State government.
- Even if there exists a master plan, such plans do not take into account the issues of environmental protection and climate change mitigation.
- Furthermore, the responsibilities of maintaining drainage lines and the lakes are split among several agencies/departments at the State and city levels.
  - This has caused various challenges and disruptions in the administration of drainage lines and lakes.
- The role of urban local bodies and urban governments has been reduced to mere stakeholders with limited authority. Despite this, many city administrations have come up with various flood mitigation plans but these

plans lack statutory support as that of master plans.

- City administrations in cities like Mumbai, Ahmedabad, and Nagpur have started developing climate action plans. However, these plans are said to be toothless as they lack statutory support and fail to prescribe any regulatory controls.
- Additionally, these plans are developed mainly by experts and authorities without public participation. This further reduces the plan's credibility.
  - The lack of civic consultations dampens the credibility of such plans.

**Recommended solutions:**

- There is a need to develop a comprehensive climate action plan for all the important cities in the country and to accord statutory status and support to these plans by placing them under the purview of the city's master plan.
- There is a need for institutionalising the processes of public consultations as a part of the process of developing the plan as such measures provide the required credibility for the plans to tackle administrative and political opposition.
  - Further, public consultations also help in identifying various issues in areas that are often overlooked by the media and decision-making bodies.
- There is also a need for setting up an environmental protection agency that is to be mandated to tackle issues related to climate change proactively.
  - To undertake coordinated efforts, this agency must be made an overarching body along the lines of the unified transportation authority formed by different cities.

**Nut Graf:**

*Urban flooding in India has not just resulted in huge economic losses but also come with large-scale social and human costs which affect the poorer sections of society largely. This requires immediate attention towards the country's urban planning as unchecked urban develo*

## 2. Early warning system for heat waves

**Syllabus:** Important geophysical phenomena like Heatwaves.

**Mains:** Heatwaves and their prediction.

**Prelims:** Heatwaves.

**Context:**

- Prediction of heatwaves event in India.

**Details:**

- A heatwave is defined as a period of unusually hot weather with temperatures more than normal. Heatwaves typically last for 3 or more days.
- India experiences heatwaves during the period of March to June. Two or three heatwave events take place in a season. They are usually observed in two areas:
  - Central and northwest India
  - Coastal Odisha and Andhra Pradesh
- The frequency, intensity, and duration of heatwaves have increased due to climate change. For instance, the total duration of heatwaves has increased by about



- three days during the last thirty years.
- It is further expected to increase by 12-18 days by 2060. It is also expected to spread to new regions including southern parts of India in the future.
- Large-scale atmospheric circulation anomalies such as upper-troposphere, high-pressure areas, jet streams, etc are also responsible for heatwaves.
- Furthermore, global forcing like the El Nino Southern Oscillation (ENSO) and the Indian Ocean also regulate the duration and frequency of heatwaves in India.
- The situation is further heightened by local factors like increased sensible heat and depleted soil moisture.

#### Impact of Heatwaves:

- Heatwaves have cascading and multiple effects on agriculture, ecosystems, human and animal health, water, energy, and the economy of the country.
- The heatwave in Pakistan and India which took place in March-April 2022 caused more than 90 deaths.
- An extreme Glacial Lake Outburst Flood in northern Pakistan was also a consequence of the heatwaves.

#### Measures to tackle heatwaves:

- An effective and comprehensive heat response plan with an early warning system, awareness programs, and technological interventions can minimize the negative impacts of heatwaves.
- India has developed a strong framework with the involvement of the India Meteorological Department (IMD), State and National disaster management authorities, apart from the local bodies. Early warning systems are an important element of this heat action plan.
- IMD can predict the genesis, duration, and intensity of the event up to 4-5 days in advance with the desired accuracy.
- The Ministry of Earth Sciences (MoES) had set up an advanced prediction system for early warnings of heatwaves under the ambit of the National Monsoon Mission.
- A recent scientific study published by the Indian Institute of Tropical Meteorology (IITM), Pune, highlighted that genesis and duration of heatwaves in India can be predicted nearly two weeks in advance with decent accuracy.
  - The scientists used the hindcasts from the MoES Extended Range Prediction System (ERPS) which uses an ensemble method that combines four atmospheric general circulation models.
- Similarly, another study from the scientists of IMD, IITM, and MoES (published in the International Journal of Climatology of the Royal Meteorological Society), documented that heatwaves in India can be predicted even one season in advance.
  - To carry out these studies scientists used 37 years (1981-2017) of hindcasts from the Monsoon Mission Coupled Climate Forecast Model (MMCFS).
  - They used this data to document the seasonal predictions of the frequency and duration of heatwaves.
  - It could also produce the spatial distribution of frequency and distribution of heatwave. Apart from that, the model is also capable of predicting the characteristics of heatwaves for different months.
- Seasonal forecasts can provide an outlook on heatwaves one season in advance. It can be further strengthened by using short-range and extended-range forecasts for more focused region-wise mitigation and adaptation strategies.

- Moreover, seasonal forecasts can use a multi-model ensemble forecasting strategy. Similarly, short-range ensemble forecasts should use higher-resolution global models, along with data on soil moisture through microwave satellites and IMD's soil moisture network. Thus leveraging the forecast system in the future.

#### Nut Graf:

*An end-to-end seamless prediction system to predict heatwaves in all time scales, from short-range to seasonal can help generate a better response to heatwave events. This would reduce its negative impact manifold thus benefiting life on earth.*



# GEOGRAPHY

## 1. Crisis in Coffee Industry

### Syllabus: Cropping Patterns

### Mains: Challenges faced by the coffee industry in India

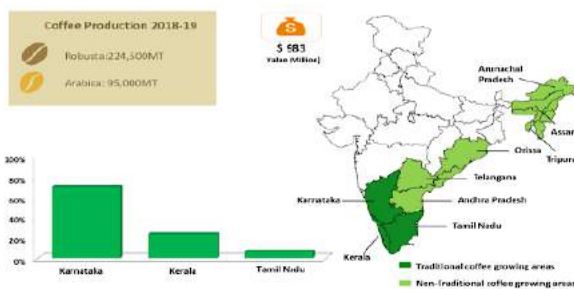
#### Context:

- Heavy and erratic rain between July and September months is causing heavy damages to coffee plantations in South India.

#### Introduction:

- In India, coffee is traditionally grown in the Western Ghats spread over Karnataka, Kerala and Tamil Nadu. Coffee cultivation is also expanding rapidly in nontraditional areas in AP and Odisha as well as in the North East states.
- Coffee is predominantly an export-oriented commodity and 65% to 70% of the coffee produced in the country is exported while the rest is consumed within the country.
- The Indian coffee industry earns foreign exchange to the tune of about Rs.4000 Crores.
- Coffee is an export product with low import intensity and high employment content. This is evident from the fact that more than six lakh persons are directly employed and an equal number of individuals get indirect employment from this sector.
- The two main varieties of coffee viz, Arabica and Robusta are grown in India.
- According to the Coffee Board of India's post-blossom estimate, production for the 2022 crop year was estimated at 3,93,400 metric tonnes. But given the extreme climatic conditions, it is anticipated to be around 30% lower.
  - The harvest of Arabica takes place between November to January, while for Robusta it is from December to February.

### INDIA COFFEE MARKET-KEY DATA



Source: Coffeebi.com

#### Coffee Board of India:

- The Coffee Board is a statutory organisation constituted under Section (4) of the Coffee Act, 1942 and functions under the administrative control of the Ministry of Commerce and Industry, Government of India.
- The Board comprises 33 Members including the Chairperson which mainly focuses its activities in the areas of research, extension, development, market intelligence, external & internal promotion, and welfare measures.
- It is headquartered in Bengaluru.
- The Board has a Central Coffee Research Institute at Balehonnur (Karnataka).

#### Reasons behind drop in Coffee output:

- Coffee production is dropping due to excessive rainfall, plant damage, bean splitting and berry dropping.
- Continuous rainfall has amplified many diseases affecting plants, and estate infrastructure suffering long-term damage.
- Climate change has only compounded the financial issues of growers that have been in the making for long.
  - The volatility in market prices and the reduced influence of producers in the value chain render coffee cultivation an increasingly loss-making proposition.
  - More than 75% of Indian coffee production is exported. This has an impact on the cost competitiveness of Indian coffee vis-à-vis the coffee that is exported from other producer regions, especially since those growers get their finances at very low interest rates.
- In India, the production of coffee is low while the cost of production is on the rise compared to other coffee countries such as Vietnam and Brazil.
  - In Brazil, labour charges account for 25% of the entire production cost, whereas it costs about 65% in India.
  - The cost of production per acre has gone up substantially to ₹ 80,000-85,000 from ₹ 50,000 five years ago.
- Mechanisation in coffee production is also difficult as Indian coffee has a unique positioning as it is shade-grown and grown at elevations, while other major producing countries grow coffee in flat lands.
- Power cuts during the summer months make irrigation expensive as the cost of diesel is high.
- The increasing costs of fertilisers and labour costs are also slowing down investment in production.

#### Way Forward:

- Coffee growers should create additional revenue streams through intercropping of pepper and cardamom and other exotic fruits.
- Coffee has high value and high imagery potential at home and overseas markets. This should be encashed with better branding and promotion.
  - Coffee Board is working on a separate India brand and certification system for coffee growers.
- More research needs to be done in the area of mechanisation and productivity enhancement, which can help cultivators enhance production without compromising on the distinguishing attributes that define Indian coffee.

#### Nut Graf:

*Coffee Industry in India is facing several challenges with erratic rainfall and increased cost of production. The coffee community in India, comprising coffee planters, associations, curers and exporters, hopes to boost coffee in the domestic and international markets and counter the problems the industry faces.*



# INDIAN SOCIETY & SOCIAL ISSUES

## 1. As India ages, keeping an eye on the elderly

**Syllabus:** Population and associated issues

**Prelims:** International Day for Older Persons and World Population Prospects 2022

**Mains:** Issues associated with the increasing elderly population in India and the way forward

**Context:**

- The occasion of International Day for Older Persons (1st of October).

**Background:**

- The **World Population Prospects 2022** report of the UN Department of Economic and Social Affairs (UNDESA) projects that India will house the largest population in the world which would include a large elderly sub-population.
- Even other United Nations reports have also estimated that the proportion of India's elderly population will increase by nearly two times to reach about 20% of the total population by 2050.
- The changes projected in the demographic structure of the country will increase the burden on public health systems that are not equipped to deliver universal health services efficiently.
  - Further, the social security measures of the country such as old-age and disability pensions are also not adequately equipped to address the issues.

**Issues related to elderly:**

- The **Hyderabad Ocular Morbidity in the Elderly Study (HOMES)** by the L.V. Prasad Eye Institute has been undertaking a series of studies and reports on aspects such as health, quality of life, mental health, morbidity, and disability among the elderly living in old age homes in Hyderabad.
- Various studies have been using eye care as an entry point to measure various aspects of health and social metrics over a large range of socio-economic circumstances.
- In India, there is an increase in the prevalence of non-communicable diseases like diabetes, hypertension, heart diseases, vision disabilities, hearing defects and problems with mobility among the elderly.
- Close to 50% of the participants had a minimum of one disability and about 33% of them had multiple morbidities.
- Further, nearly 70% of the participants used at least one assistive device with spectacles being the most common assistive device used.

**The challenges of eye care:**

- According to a study, more than 30% of the elderly who participated in the study had distance vision loss and more than 50% of the participants had near vision impairment.
- The reports have also shown the interconnection between vision impairment and mental health and the confidence of the elderly.
- Individuals with vision impairment or defects are seen to have greater fear and are at risk of falling

which is said to be one of the key causes of disability and hospitalisation among the elderly population.

- Also, vision impairment reduced the movement and independence of elderly individuals which often led to depression.
- Other chronic health conditions like diabetes and hypertension cause irreversible vision loss which has also become a major challenge.

**Way forward:**

- There is a need to introduce a series of interventions that covers various aspects such as assistive devices for defects in vision hearing and mobility to psychiatric support for depression and other mental health issues.
- Setting up a comprehensive national eye care model as a holistic eye care model will help in recalibrating the overall elderly care services as per the requirements.
- Introduction of cross-subsidy models in eye health in India to help address the financial issues of the elderly.
- Incentivising centres which can carry out eye examinations because such examinations and tests help in identifying and recognising various systemic issues among the elderly.
- Adoption of modern and advanced imaging technologies, tele-health facilities, portable devices and apps that help to increase access to eye care facilities.
- Creating referral platforms that help connect eye care with other health specialities.

**Nut Graf:**

*The reports on the changes in the demographic structure of the country indicate that the country's elderly population would increase significantly in the coming years. This requires the policymakers to come up with a long-term strategy that is comprehensive, universal, integrated and accessible to elderly individuals.*

## 2. Hindi imposition and its discontents

**Syllabus:** Salient features of Indian Society, Diversity of India.

**Mains:** Critical evaluation of recommendations made by the Parliamentary Committee on Official Language and the moves to promote Hindi as the only official language of India.

**Context:**

- The criticism of the imposition of Hindi on non-Hindi-speaking states has once again come under the spotlight in the wake of recent recommendations by the Parliamentary Committee on Official Language.

**Historical background:**

- The roots of this linguistic controversy go back to times of the debate in the Constituent Assembly on official languages.
- Hindi was voted as the official language by a single vote in the Constituent Assembly and the Indian Constitution, in 1950, declared Hindi in Devanagari script to be the official language of the union.



- o It was also added that English shall continue to be used as an associate official language and would be phased out in favour of Hindi after a period of 15 years.
- However, at the time of the completion of these 15 years, severe anti-Hindi protests took place in the country in several non-Hindi-speaking states.
- The Official Languages Act was introduced after the completion of the 15-year period which upheld Jawaharlal Nehru's assurance that English would continue to be in until the non-Hindi speaking people wanted it.
  - o As per the Act, both Hindi and English shall be used for certain official purposes of the Union such as transaction of business in Parliament, for Central and State Acts and certain purposes in High Courts.
- The Tamil Nadu Chief Minister has asked the Union government to undertake such efforts that promote all languages and ensure equal treatment of people of all languages with respect to education and employment.

**Nut graf:**

*The essence of the Official Languages Act is to ensure that different groups meet their objections and safeguard their position and any attempt to unsettle this status quo has been met with severe agitations. Hence the Centre must stick to its assurances made and also work towards promoting other languages of the country.*

**3. Language issue**

**Syllabus:** Salient features of Indian Society, Diversity of India.

**Mains:** Critical evaluation of recommendations made by the Parliamentary Committee on Official Language and the moves to promote Hindi as the only official language of India.

**Context:**

- The 11th volume of the Report of the Official Language Committee was recently submitted to President Droupadi Murmu.

**Background:**

- It is known that the Constituent Assembly experienced numerous debates on the question of official language. Finally, Hindi was announced as the official language of the Union and it was also declared that the English language would be in use for 15 years from the commencement of the Constitution.
  - o **Article 343** of the Indian Constitution provides that Hindi in Devanagari script would be the official language of the Union.
- Parliament could extend the use of English even after the expiry of 15 years through an Act and accordingly, the Parliament introduced the Official Languages Act in 1963 which facilitated the use of English indefinitely as an official language along with Hindi for official purposes of the Union and for the transaction of business in Parliament.

**Agitation of Tamil Nadu against "Hindi imposition":**

- The state of Tamil Nadu has had a long history of protests and discomfort against the imposition of Hindi.
- In August 1937, the then Presidency of Madras, the regime headed by C.Rajagopalachari had resolved to make Hindi compulsory in secondary schools.
  - o E.V. Ramasamy who was famously known as Periyar undertook and led an agitation against this decision to make Hindi compulsory making it the first such protest.
  - o However, in February 1940, the British government, a few months after C.Rajagopalachari's resignation, made Hindi optional.
- Further in January 1965, the second round of protest started in the wake of Hindi becoming the official language of the Union government along with various approaches of the Central government on this issue.
- Additionally, in recent times, various provisions of the National Education Policy (NEP) and the reports of English signage on National Highways in the State being replaced with Hindi signage have once again triggered agitations from the political class of the State.

**Key recommendations made by Parliamentary Committee on Official Language:**

- The reports suggest that the Parliamentary Committee on Official Language has recommended the use of Hindi as the medium of instruction in central institutions of higher education in the Hindi-speaking States and regional languages in other States.
- As per various reports, English will be permitted to be used as a medium of instruction in all technical and non-technical institutions only if it is absolutely essential.
  - o Institutions such as IITs, IIMs and All India Institute of Medical Sciences are considered technical institutions whereas the Kendriya Vidyalayas and Navodaya Vidyalayas come under the other category.
- Further, the committee has also recommended the removal of the use of English as one of the languages in various examinations held for the recruitment to various Central services. The Committee has suggested that prerequisite Hindi knowledge among the candidates must be ensured.

**Alternative suggested by the critics of "Hindi imposition":**

- The Chief Ministers of the states of Tamil Nadu and Kerala have sought equal treatment of all the languages mentioned under the Eighth Schedule of the Constitution.
- The Chief Minister of Kerala has particularly said that the question papers for competitive examinations must



### Official Language Committee:

- The Official Language Committee is a statutory committee which has been established under the provisions of the Official Language Act, 1963 in 1976.
- The Union Home Minister is the chairperson of this Committee.
- The Committee consists of 30 members out of which 20 members are from Lok Sabha and 10 are from Rajya Sabha.
  - The members are elected to the Committee in accordance with the system of proportional representation by means of a single transferable vote (PRSTV).
- The Committee is mandated to review the progress made in the use of Hindi for the official purposes of the Union.
- As per the provisions of the Official Language Act, 1963, Committee submits its reports directly to the President.
- The Official Language Act also makes it binding on the President to issue directions “in accordance with the whole or any part of the report”.
  - Hence the committee’s recommendations must be acted upon.

- Further, attempts by the Union government to exclude English and replace it with Hindi in the past have met with an upsurge, violent protests and immolations by non-Hindi speaking states.

### Arguments for the continuation of the use of English:

- India consists of two major language groups namely the **Indo-European language group** and the **Dravidian language group**.
  - Hindi belongs to the Indo-European group, whereas languages such as Kannada, Tamil, Telugu, and Malayalam belong to the Dravidian group.
  - The English language has played a key role as a bridge between these different language groups from the northern and southern regions of the country.
- Maulana Abul Kalam Azad in the Constituent Assembly debates had said that “we have to admit that as far as the language is concerned, the North and South are two different parts. The union of North and South has been made possible only through the medium of English. If today we give up English then this linguistic relationship will cease to exist”.
- The use of the English language has helped the southern and other non-Hindi-speaking States to influence the decision-making of the Union and raise the concerns of the people from these regions.
- Further, English plays a crucial role in enhancing knowledge in science and technology, to meet the requirements of modern science and technology and also other fields of human activity.
- The knowledge of English also helps to understand the developments across the world, maintain cordial relationships with other countries and put forth opinions on common international platforms.

### Key recommendations of the Committee:

- Replacing English with Hindi as the medium of language for examinations for recruitment to government services.
- Further, the knowledge of Hindi would be made compulsory in various government jobs.
- Hindi is to be made the only medium of instruction in all technical and non-technical central institutions of the country such as Kendriya Vidyalayas, Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs) and other central universities.
- It must be ensured that it is constitutionally binding on State governments to propagate Hindi.
- Hindi should be accepted as an alternative to English and not to local languages.

### Nut graf:

*For a country that is home to over 179 languages and 544 dialects, the idea of imposing one official language will have serious implications on the unity of the people and result in imbalances in the regional representation of government structure and services. Thus the focus must be on devising a multi-linguistic accommodative policy.*

### Issues associated with these recommendations:

- Experts feel that the move to replace English as a medium of instruction in central universities, IIMs, IITs, etc. will have severe consequences on the performance and rankings of these institutions which are regarded as premier institutions of the country.
- Critics also question the authority of the Committee to recommend the medium of instruction in universities and professional institutions as the Committee is only mandated to review the progress made in the use of Hindi.
- As it is established by the law of the Parliament that English shall continue to be in use along with Hindi, experts question how a Committee set up under that same Act can recommend the discontinuation of English.
- If Hindi is used as the only language in the recruitment examinations of central services, candidates from the non-Hindi States especially from the south will face a great disadvantage when compared to Hindi-speaking candidates.



## MISCELLANEOUS

### 1. Nobel Prize 2022

**Syllabus: Developments & their Applications & Effects in Everyday Life**

**Mains: Recent discoveries and advancements in science**

**Context:**

- The 2022 Nobel Prize in Chemistry and Physics was announced recently.

**Nobel in Chemistry:**

- Carolyn R. Bertozzi, Morten Meldal and K. Barry Sharpless won the 2022 Nobel Prize in Chemistry for discovering reactions that let molecules snap together to create desired compounds and that offer insight into cell biology.
- Barry Sharpless and Morten Meldal have laid the foundation for a functional form of chemistry – click chemistry – in which molecular building blocks snap together quickly and efficiently.
  - Mr. Sharpless joins an elite band of scientists who have won two Nobel prizes. The other individuals are John Bardeen who won the Physics prize twice, Marie Curie, who won Physics and Chemistry, Linus Pauling who won Chemistry and Peace and Frederick Sanger who won the Chemistry prize twice.
  - He coined the concept of Click Chemistry around 2000.
- Click Chemistry was a form of simple and reliable chemistry where reactions are quick without unwanted by-products.
  - Shortly afterwards, Meldal and Sharpless (independent of each other) presented what is now the crown jewel of click chemistry: the copper catalysed azide-alkyne cycloaddition.
  - Azide is an organic compound with the formula  $N_3$  while an alkyne is a hydrocarbon containing at least one carbon-carbon triple bond.
  - This is an elegant and efficient chemical reaction that is now in widespread use. Among many other uses, it is utilised in the development of drugs, for mapping DNA and for creating materials that are more fit for purpose.
- Carolyn Bertozzi has taken click chemistry to a new dimension and started utilising it in living organisms.
  - To map important but elusive biomolecules on the surface of cells – glycans – she developed click reactions that work inside living organisms. These bioorthogonal reactions take place without disrupting the normal chemistry of the cell.
- These reactions are now used globally to explore cells and track biological processes.
- Using bioorthogonal reactions, researchers have improved the targeting of cancer pharmaceuticals, which are now being tested in clinical trials.
- The Nobel Prize in Chemistry is awarded by the Royal Swedish Academy of Sciences, Stockholm, Sweden.

**Nobel for Physics:**

- Alain Aspect, John F. Clauser and Anton Zeilinger have jointly won the Nobel Prize in Physics “for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science”.

- One key factor in this development is how quantum mechanics allows two or more particles to exist in what is called an entangled state. What happens to one of the particles in an entangled pair determines what happens to the other particle, even if they are far apart.
- Entangled quantum states hold the potential for new ways of storing, transferring and processing information.
- Being able to manipulate and manage quantum states and all their layers of properties gives us access to tools with unexpected potential. This is the basis for quantum computation, the transfer and storage of quantum information, and algorithms for quantum encryption. This opens up the door to work on supercomputers and encrypted communication.

### 2. Nobel Award for Literature

**Syllabus: Current events of national and international importance.**

**Prelims: Nobel Awards 2022**

**Context:**

- French author Annie Ernaux was awarded the Nobel Prize in Literature for 2022.

**Key Details:**

- Annie Ernaux is known for her deceptively simple novels drawing on personal experiences of class and gender and was awarded the 2022 Nobel Prize in Literature.
- She was honoured with the award “for the courage and clinical acuity with which she uncovers the roots, estrangements and collective restraints of personal memory”.
- Her literary work, mostly autobiographical, maintains close links with sociology.
- Many of her books have been school texts in France for decades, offering one of the most subtle, insightful windows into the social life of modern France.
- She debuted with the novel Cleaned Out in 1974, an account of an abortion she went through in her youth and that she had kept secret from her family.

### 3. Nobel Peace Prize

**Syllabus: Current events of national and international importance.**

**Prelims: Nobel Awards 2022**

**Context:**

- Recently, the Nobel Committee announced the Nobel Peace Prize for the year 2022.

**Key Details:**

- The Nobel Peace Prize for 2022 has been awarded to human rights advocate Ales Bialiatski from Belarus, the Russian human rights organisation Memorial, and the Ukrainian human rights organisation Centre for Civil Liberties.
- They are awarded the Peace Prize for promoting the right to criticise power and protect the fundamental rights of citizens by documenting war crimes, human rights abuses and the abuse of power.



- They demonstrate the significance of civil society for peace and democracy.

## Triumphant trio

Human rights activists/organisations from Belarus, Russia and Ukraine won the Nobel Peace Prize on Friday

**1. Ales Bialiatski** (in pic) | A prominent Belarusian rights activist and founder of Viasna Human Rights Centre. He is currently held in prison without trial

**2. Memorial** | The organisation founded in 1987, compiles information on human rights abuses and tracks the fate of political prisoners in Russia

**3. Center for Civil Liberties** | Founded in 2007, the Ukraine-based organisation has identified and



documented "Russian war crimes against the Ukrainian civilian population", since the invasion in February

Source: The Hindu

## 4. Nobel Prize for Economic Sciences 2022

**Syllabus: Current events of national and international importance.**

### Prelims: About Nobel Prize for Economic Sciences 2022

#### Nobel Prize for Economic Sciences 2022:

- Former U.S. Federal Reserve Chair **Ben Bernanke** along with **Douglas W. Diamond** and **Philip H. Dybvig** won the Nobel Prize for Economic Sciences for their research into the fallout from bank failures.
- Ben Bernanke played a key role in reviving the American economy after the financial crisis in 2007-2008 by using his academic expertise on the Great Depression.
- The trio who have won the Nobel Prize have shown the importance of preventing bank collapses through their findings in the early 1980s which now act as a basis for regulating financial markets.
- Ben Bernanke, by studying the Great Depression of the 1930s, pointed out the dangers of bank runs and how the following bank collapses cause widespread economic crises.
- Douglas W. Diamond and Philip H. Dybvig have highlighted the significance of government guarantees on deposits in preventing a financial crisis.

#### Dada Saheb Phalke award

- President Droupadi Murmu gave away the National Film Awards for the year 2020 under various categories at the 68th edition of the ceremony recently.
- The Dadasaheb Phalke Award was conferred on veteran actor Asha Parekh, an accomplished Indian classical dancer who has also been a director and producer.
  - In 1992, she was honoured with the Padma Shri by the Government of India for her contribution to the field of cinema.

## 5. Booker prize

### Prelims: About Booker Prize

#### Context:

Sri Lankan author Shehan Karunatilaka won the 2022 Booker Prize for his second novel *The Seven Moons of Maali Almeida*.

#### Booker prize:

- The **Booker Prize** is a literary prize awarded each year for the **best novel written in English** and published in the United Kingdom or Ireland.
- The Booker Prize was first awarded in 1969. Initially, the Booker prize was given to novels written by citizens of the United Kingdom, the Republic of Ireland, and the Commonwealth only and since 2014 it was widened to any English-language novel.
- **The International Booker Prize** is awarded for a book translated into English and published in the United Kingdom or Ireland.
- Many **Indian-origin writers** have won the Booker in the past, such as Arundhati Roy ('The God of Small Things'), Salman Rushdie ('Midnight's Children'), Kiran Desai ('The Inheritance of Loss'), and Aravind Adiga ('The White Tiger').
- **Geetanjali Shree** became the first Indian author to win the **International Booker Prize** for her novel 'Ret Samadhi', which was translated into English as 'Tomb of Sand' by American translator Daisy Rockwell.



# YOJANA OCTOBER 2022 - OUR ECOSYSTEM

## 1. Zoological Diversity

### Introduction:

- According to world biogeographic classification, India represents two of the major realms, the Palearctic and Indo-Malayan, and three biomes viz. Tropical Humid Forest, Tropical Dry Deciduous Forests, and Warm Deserts/Semi-Deserts. And, the Indian landmass has been classified into 10 Biogeographic Zones.
- In order to protect biodiversity, 990 Protected Areas sprawling over 5.27% of the country's geographical area have been designated, of which faunal communities have been thoroughly listed among 120 Protected Areas by the Zoological Survey of India (ZSI).
- Altogether, 1,03,258 species have been documented in India. Among the animals reported from the country 2,841 species are protected under different schedules of the Wildlife (Protection) Act, 1972 for better conservation.
- In 2021, ZSI discovered one new genus and 131 species and recorded 102 species.

### Coastal and Marine Biodiversity:

- India has a long coastline of 7516.6 km on the mainland, Lakshadweep, and the Andaman & Nicobar Islands.
  - The coast is diversified into the categories of bay, cover, gulf, estuaries, and peninsula.
  - Indian coasts are endowed with different ecosystems such as mangrove swamps, coral reefs, seagrass beds, beaches, dunes, salt marshes, and mud flats.
- It has the 18th largest Exclusive Economic Zone (EEZ) with a total area of 2.37 million square kilometres.
- In the Indian Ocean region, India is one of the highest marine biodiverse countries with 20,444 species.
- Besides, 9,457 species from freshwater, 3,939 species from estuarine, and 5,747 species from mangrove ecosystems have been recorded in the country.
- Among the Indian fauna, 5,632 species have been included in various categories on the 'IUCN Red List' which requires much attention for conservation.

### Status Survey by ZSI:

- Significant progress has been made in the monitoring of the status of the endangered/rare species of animals by ZSI.
- Recently, ZSI has taken the initiatives of a massive tagging programme of Olive ridley turtles along the Odisha coast and Leatherback turtles in the Great Nicobar Island for tracking their migration in the Indian Ocean.
- ZSI also initiated several innovative programmes from the molecular level to the monitoring of fauna.
- There are at least 37 species of mammals genetically identified from Himalayan regions through non-invasive genetic study techniques.
- Similarly, the population genetics of the Arunachal Macaque (*Macaca munzala*) and population genetics of Barking Deer (*Muntiacus muntjak*), as well as Chinese Pangolin, have been carried out by scientists of ZSI.
- Adding to this, advanced research on soundscape (acoustics) through spectrogram of vocalisation of animals, and the impact of forest fire on faunal diversity in the Northeastern Region of India are vital contributions by ZSI.

### India – Long-Term Monitoring of Fauna:

- The Union Ministry of Environment, Forest and Climate Change has launched the Long-Term Ecological Observatories (LTEO) programme as a constituent activity of the Climate Change Action Programme of the country.
- The India – Long Term Ecological Observatories (India – LTEO) programme is a multi-institutional programme that aims to set up long-term ecological monitoring for different taxa in six landscapes across India.
- India LTEO includes nine themes including forests, grasslands, soil, herpetofauna, marine ecosystems, arthropods, freshwater fish birds and movement ecology.
- The LTEO landscapes include the Western Ghats, Western Himalayas, Eastern Himalayas, Central India, North West Arid Zone and the Andaman and Nicobar Islands.

### Forensic Study:

- ZSI is designated as a Forensic Laboratory by the Ministry of Home Affairs, Government of India, for solving wildlife case materials and supporting the MoEF&CC.
- Studies dealing with chromosomal mapping, PCR, and DNA Barcoding of animals including threatened species have been taken up by ZSI and more than 8,000 DNA sequences have been barcoded and registered in the National Centre for Biotechnology Information (NCBI) database.

### Mapping of Fauna:

- ZSI has implemented a number of geospatial modelling studies including the mapping of biological corridors, landscape change analysis, and climate change risk modelling for several studies of Himalayan as well as other areas in collaboration with the State Forest Department.
- Out of 5.7 million specimens, 3.8 million specimens are identified and geo-tagged to 4.2 unique localities, pertaining to about 40,000 animal species.
- Mobile Applications and Web GIS have been developed in collaboration with National Remote Sensing Centre, ISRO, to provide specific information on different animals in Protected Areas of India.
- A geospatial database has been created for the threatened vertebrates of the Indian Himalayan Region which will be useful in understanding the diversity and richness of wildlife species in the Himalayan region.
- Studies on pollinators, invasive and alien species, and climate change with reference to faunal diversity and conservation have been envisaged.
- Studies have also been made to understand the impact of forest fires in Northeast India and also to predict the fire-prone area.

### Reef Restoration:

- Approximately, 1050 square metre area of degraded coral reefs has been restored with branching coral species belonging to the family Acroporidae, which are the dominant reef contributors in all world reefs, in collaboration with the Government of Gujarat through World Bank-Integrated Coastal Zone Management (ICZM).
- Presently, the translocation of corals in the Gulf of Kutch is being carried out for Indian Oil Corporation.



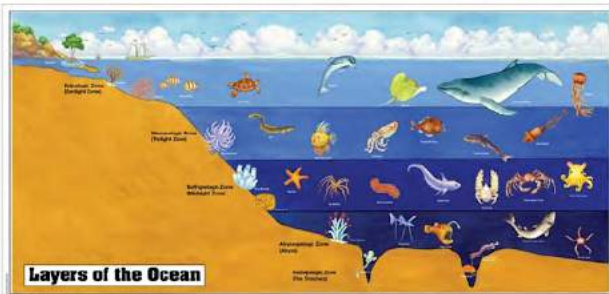
## 2. Safeguarding Oceans

### Introduction:

- The oceans are the most significant source of our present and future energy requirements.
- About two-thirds of our Earth's surface is covered by water, and the oceans hold about 96.5 percent of the entire earth's water.
- There is about 70 percent water in the protoplasm of millions of cells, the basic biological unit of plants and human beings.

### Diversity in oceans:

- Different organisms are found in different ocean depths, providing a colourful spectrum to marine life and its ecosystem. According to scientific studies, so far, about 2.5 lakh marine life species have been identified all over the world.
- Evidence of diversity is also found in their size. They range from 0.2 micrometres of small sea creatures to about 110 feet long blue whales found in the sea.
- Sunlight permeates about 200 metres below the sea surface called the sunlight or Epipelagic Zone.
- From 200 metres to 1000 metres, the faint light of the sun percolates, hence it is called the twilight zone or Mesopelagic Zone.
- The depth from 1000 metres to 4000 metres is called the midnight or Bathypelagic Zone.
  - Due to the absence of light, creatures in this zone use bioluminescence.
  - The water pressure in this zone is very high.
  - The sea creatures here are primarily black or red in the absence of light.
  - The average temperature remains below 4 degrees celsius in this region.
- The Abyssal Zone with a depth of 4000 to 6000 metres is very dark and the temperature is almost freezing point.



Source: Allisonmontessori

### Innovative Scientific Research Initiatives:

- Research on ocean organisms, minerals and other natural resources is being carried out by Indian scientists to deal with the effects of environmental pollution, anthropogenic interference and climate change on the ocean. A few examples of such efforts are mentioned below.

### RV Sindhu Sadhana Scientific Research:

- By the National Institute of Oceanography, headquartered in Goa which focused on the Indian Ocean.
- The expedition team conducted a scientific analysis of proteins and genes in marine organisms to understand the process occurring at the cellular level.
- Proteins act as markers and catalysts in biochemical reactions which occur in organisms that survive in different ocean conditions.
  - The branch of biology that deals with protein

studies is called Proteomics.

- This helps in understanding the impact of climate change, pollution and stress on organisms.
- Expeditions also studied the impact of trace metals such as manganese, cobalt, iron and nickel on marine organisms.
  - These trace metals present in small amounts of animal/plant tissue act as catalysts in enzyme systems and energy metabolism.
  - They settle in oceans through continental water flow and atmospheric and hydrothermal activities.

### Deep Ocean Mission:

- The Deep Ocean Mission was launched with the aim to explore the marine diversity in our country, which is still unexplored.
- This project is managed by the Ministry of Earth Sciences (MoES).
- Through this mission, the Government aims to conduct the exploration of the underwater world on similar lines as ISRO does for space.

### Samudrayaan Mission:

- It is India's first unique manned ocean mission that aims to send men into the deep sea in a submersible vehicle for deep-ocean exploration and mining of rare minerals.
- It will send three persons in a manned submersible vehicle MATSYA 6000 to a depth of 6000 metres into the sea for deep underwater studies.
- It is a part of the Deep Ocean Mission.
- With this Mission, India joined the elite club of nations such as the US, Russia, France, Japan, and China to have niche technology and vehicles to carry out subsea activities.

### Conclusion:

Increasing human population, tourism, the release of industrial chemicals and fertilisers into the sea and other physical interventions in the coastal areas are creating dead zones in the oceans. It is essential to curb these activities to save the oceans and their ecosystems as oceans will be the primary custodians of human existence in the future.

## 3. Wonder in the West

### Introduction:

- The region in and around Gujarat is blessed with a varied ecosystem that accommodates numerous species of wildlife. The State has many biodiversity hotspots that are abodes of several migratory birds and other rare and endangered species of flora and fauna.
- The richness of Gujarat's biodiversity is indicated by the presence of 7,500 species of flora and fauna, among these 2,550 are angiosperms and 1,366 are vertebrate species (of which 574 are bird species and the rest are mammals, reptiles, amphibians, fish, etc.).
- Gujarat State has many biodiversity hotspots like Little Rann of Kutch, Greater Rann of Kutch, Marine National Park, Jamnagar, wetlands and forests of Barda Sanctuary, Porbandar, Grasslands of Velavadar, Thol Lake and Nalsarovar, Northern part of Western Ghat in South Gujarat, etc.
- The flora of this region is unique in nature as the species have developed many adaptations like resistance to salinity to sustain themselves in hostile and adverse climatic conditions in arid and semi-arid regions.



**Conservation Status:**

- In order to conserve such a rich and diverse natural heritage of wildlife in Gujarat, four National Parks, 23 Sanctuaries, and one Conservation Reserve have been established over a period of time.
- In spite of industrialisation in the State, the Government has managed to succeed in preserving the ecosystems and also in spreading awareness amongst the general public.
- Gujarat has four Ramsar sites, i.e., wetlands of international importance and several wetland-based Important Bird and Biodiversity Areas (IBAs).
  - The notable Ramsar sites of the State are Nalsarovar and Thol Bird Sanctuaries near Ahmedabad, Khijadia Sanctuary near Jamnagar and Wadhvana wetland near Vadodara.
- Way back in 1977, a Natural History Museum was established in Gandhinagar. The area is now popularly known as Indroda Nature Park (INP).
  - Later, this was subsumed into Gujarat Ecological Education and Research (GEER) Foundation which was founded in June 1982 to undertake activities such as ecological education, research, natural history interpretation, climate change research, wetland monitoring, biodiversity monitoring of Sanctuaries and National Parks. INP now serves as the headquarters of the GEER Foundation.
- The GEER Foundation was also recognised as the Scientific and Industrial Research Organisation (SIRO), Gujarat State Centre on Climate Change by the Department of Science and Technology, Government of India and the Nodal Agency of Gujarat State Wetland Authority by the State Government.
- The Union Ministry of Environment, Forest and Climate Change has assigned the work of the Long Term Ecological Observatories (LTEO) Project under the Climate Change Action Programme.
  - LTEO project was launched during the Conference of the Parties (COP) of the UNFCCC in Paris in December 2015.
  - The main aim of this project is to know the biophysical and anthropogenic drivers of ecosystems in selected biomes as well as their effect on social-ecological responses.
  - The GEER Foundation along with the Indian Institute of Science (IISc), Bengaluru, has established three field stations in the Asiatic lion landscape area viz. Sasan Gir, Bajana and Hingolghadh and one in Jessore for the North Western Arid Zone under Forests and Soil Theme.
  - The observations recorded at these sites will be correlated with data on various climatic parameters collected from Automatic Weather Stations (AWSs) which are installed therein as per the guidelines of the World Meteorological Organisation to know the effect of climate change.
- GEER Foundation under the National Green Corps' Programme of MoEF&CC, Govt has been sensitising young minds about environmental conservation through Eco-Clubs established in 16,500 schools and 162 colleges in the State.
- The GEER Foundation is also involved in the creation of the "Cactus Garden" at "The Statue of Unity" in Kevadia. It is said to be a "Grand Architectural Greenhouse" consisting of 450 species of cactus and succulents from India and 17 other countries.

**Conclusion:**

With industrialisation, ecosystems across the world have been destroyed leading to an impact on humans

themselves, therefore, the balance between technological development and nature becomes all the more critical. Any deliberate or unprecedented imbalance in biodiversity disturbs its surroundings causing an imbalance in the ecosystem which further trickles down to food chains and then to the food web. Realising the sensitivity of the overall impacts, various governments have deliberated and formulated policies to protect the biodiversity of their respective lands.

**4. Water Governance****Introduction:**

- The State of Gujarat witnessed a turnaround from being a water scarce state to water secure state in the first decade of the 21st century.
- The State transformed by adopting environment-friendly policies, climate-resilient engineering, and strengthening grassroots leadership stand out as an example of sustainable development and offers a path to follow.
- The scarcity of water contributes negatively to socio-economic development. Economic growth led to policies and practices to achieve long-term water security.
- The critical relationship between water, environment and ecosystems was acknowledged, built upon, shaped and transformed by the policymakers in a sustainable way to meet the challenges without compromising the health of the natural world.

**Gujarat in the 2000s:**

- Two decades ago, the western and northern parts of Gujarat region were prone to repeated droughts and water scarcity, damage to life and livelihood due to devastating earthquake with epicentre in Kutch in 2001 and the resultant economic crisis with shrinking economy.
- There were cases of mass migration of pastoral communities like Maldharis in search of fodder and water for their livestock.
- On an average, every third year was marked as a drought year leading to uneven distribution of water. Annually, thousands of tankers were deployed to mitigate drinking water scarcity and make water available to people.
- There were also times when special water trains had become the new norm for the delivery of water.
- The administration focused only on temporary fixes neglecting the emptying aquifers and damage to the environment remained unattended.

**Transformation:**

- Water was placed at the centre stage of Gujarat's developmental policy to address the issue of water scarcity.
- Viable solutions were explored to conserve water and achieve an ecological balance whilst resolving to ensure adequate and assured availability of clean water in every home became the top priority.
- A series of policy decisions, including the integration of the overall water sector to manage demand and supply coherently ensured accountability at all levels.
- A great value was placed on the water as a 'finite resource' that needed to be replenished every year. As all water is received from precipitation during limited rainy days in the State, the focus was on making the State open-defecation free with emphasis on rainwater harvesting and efficient use of water.
- A component of drought-proofing was adopted in



building climate-resilient water infrastructure.

- The State-wide drinking water supply grid was planned to provide clean tap water free from chemical and bacteriological contamination.
- Sardar Sarovar dam on the Narmada River was completed and the existing canal systems were further strengthened. Inter-basin transfer of water from reasonably water-rich South and Central Gujarat to North Gujarat, Saurashtra and Kutch was planned and executed in the form of a 332 km-long Sujalam Sufalam Canal with speed and scale.
- Further, to meet water requirements, especially in areas with groundwater salinity, desalination plants were set up.

#### Enabling Water-Use Efficiency in Agriculture:

- With about 85% of all freshwater being consumed for agricultural purposes, micro-irrigation and Participatory Irrigation Management (PIM) were promoted in an extensive manner to optimise water use in farms.
- Agriculture extension activities to educate farmers on the concept of 'Per Drop, More Crop' were initiated as a campaign.
- Farmers were provided financial and technical support to build check dams, farm ponds, bori-bandhs, etc., in and around their farmlands to 'catch the rain where it falls'.
- 'Sujalam Sufalam Jal Abhiyan' was initiated around the twin objectives of deepening water bodies before monsoons and enhancing water storage for rainwater collection.
  - It entails numerous water conservation activities including the cleaning and deepening of ponds, canals, and tanks, check dams and reservoirs, repair of water storage structures, construction of rainwater harvesting structures, etc., through a participative approach.
- With the integrated water management approach and groundwater table continuously improving, the total irrigable area in the State increased by 77%, and the agriculture production in the State also increased by 255%, leading to a green economy. This has paved the way for a sustainable and environment-friendly model.

#### Jal Jeevan Mission:

- JJM was announced on 15th August 2019 to bring tap water connections to every rural household of the country by 2024.
- The program will also implement source sustainability measures as mandatory elements, such as recharge and reuse through greywater management, water conservation, and rainwater harvesting.
- The Jal Jeevan Mission will be based on a community approach to water and will include extensive Information, Education, and Communication as a key component of the mission. JJM looks to create a Jan Andolan for water, thereby making it everyone's priority.
- The vision of the mission is that every rural household has a drinking water supply in adequate quantity, of prescribed quality on a regular and long-term basis at affordable service delivery charges leading to improvement in the living standards of rural communities.
- Under the mission, Pani Samitis or Village Water Sanitation Committee at the Village level are being set up across 06 lakh rural villages of the villages, where they are empowered to plan, implement, and manage their in-village water supply systems by adopting an end-to-end approach involving the four

key components, namely, source sustainability, water supply, greywater treatment and reuse and operation & maintenance.

#### Way Forward:

- The socio-economic development and economic growth, especially in drought-prone and desert areas depend upon how wisely water resources are utilised.
- Water, being a finite resource, plays a key role especially in arid and semi-arid regions in restoring and sustaining the environment including flora and fauna. Its vitality for reducing the burden of disease and improving the health, welfare and productivity of human populations and keeping other life forms on earth possible cannot be underestimated or ignored.

### 5. Indigenous Bioresources of NER

#### Introduction:

- The Northeastern Region (NER) of India shares both Himalaya and Indo-Burma biodiversity hotspots which are the natural habitats of several endemic species, which are unexplored, untouched, and extremely beneficial.
- Its scenic beauty and exotic biodiversity have attracted scientists, policymakers and various stakeholders to work together as one coherent unit for the overall wellness of the people of NER.
- Landlocked by international borders, NER states are innately connected with nature and have a rich socio-economic and cultural heritage.

#### Intervention in Farming Strategies of NER:

- The majority of the tribal community from NER practices jhum shifting cultivation, which accelerates habitat destruction, deforestation and environmental pollution.
- To have self-sufficiency in agriculture, policymakers are aiming for doubling farmers' income through the introduction of high-yielding varieties and modern scientific farming strategies that prove productivity.
- Recent studies show that extensive urbanisation, wild harvests of natural flora and changing environmental conditions become an extreme threat to NER.
- As a result, many medicinally and commercially important plant species are on the verge of extinction. In such a scenario, in-vitro plant tissue culture techniques are a highly reliable approach for germplasm conservation, eco-restoration and phytopharmaceutical production, especially for several medicinally and commercially important plant species.

#### Qualitative Improvement of Genetic Resources of Indigenous Tree Species – *Camellia* sp:

- Tea plant (*Camellia* sp.) is an evergreen socio-economic crop species and belongs to the family 'Theaceae'.
- The indigenous tea cultivator of Assam is named *Camellia assamica* ssp. *assamica* (TV21) having broad leaves and high content of catechins, dominates in black tea production as compared to China-type tea (*Camellia sinensis*).
- The extreme cross-pollinating nature of tea plants results in high heterozygosity (high variability), which leads to inconsistent quantity and quality of phytochemicals.
- Conventional methods of plant propagation through seeds do not produce genetically uniform clones/identical plants and, on the other hand, stem-cutting and grafting have a poor survival rate and require adequate care to best suit the changing environmental conditions.



- Being a woody perennial, tea plants require a longer time period to attain reproductive maturity, which causes less success rate of the development of superior clones/plants from existing parent plants following conventional farming strategies.
- Furthermore, the improvement of genetic constituents and a further selection of superior varieties require several years in conventional breeding practices.
- In such a scenario, the in-vitro tissue culture method not only acts as a potential way of qualitative development of superior plants but can also produce a large number of true-to-type (identical) plants in a comparatively shorter duration.
- The in-vitro-developed plants could serve as a potential source for the development of pure breeding plants and would also facilitate the consistent production of medicinally important bioactive metabolites, independent of seasonal variation.

#### **Azadirachta Indica:**

- *Azadirachta indica*, commonly known as the Neem plant, is native to the Indian subcontinent and Southeast Asia. All parts of the Neem tree, the leaves, stems, roots, flowers, fruits, and seeds contain medicinal metabolites and are used for household remedies against various diseases.
- It is also renowned for its eco-friendly, insect-eliminating properties, thus regularly used in agriculture. The extreme cross-pollinating nature of Neem plants causes high variability in plants which leads to inconsistent quantity and quality of phytochemicals.
- To satisfy the growing demand and the vast need for pharmaceutical industries, attaining enhanced production of metabolite compounds should be our utmost priority.
- In-vitro tissue culture methods would be the most suitable alternative strategy for the production of homozygous clones (purebred plants) containing high amounts of metabolites compared to seed-borne trees.

#### **Stevia Rebaudiana:**

- It is a medicinally important plant containing low-calorie sweeteners (steviol glycosides) in leaves. Excess consumption of sucrose in the diet is associated with diabetes and cardiovascular diseases.
- Vegetative propagation of *Stevia Rebaudiana* is limited by unfavourable climatic conditions, and seeds of the stevia plant show low viability in the field. However, in-vitro propagation is a rapid reliable system for the production of a large number of genetically uniform disease-free plantlets, irrespective of the seasonal variations.

#### **Tinospora Cordifolia:**

- *Tinospora cordifolia* or Giloy is a multipurpose woody liana that generally grows in tropical climates and is readily available in Northeast India.
- It is widely known for its immunomodulatory, hepatoprotective, anti-hypertensive, and antioxidant properties, hence called a rejuvenating herb.
- The nutraceutical features are also mainly due to the presence of high protein, carbohydrates, calcium, phosphorus, potassium, and iron.
- Recent studies show that the consumption of Giloy has increased the recovery rate in dengue and SARS-CoV-2 patients.

#### **Musa Balbisiana and Musa Paradisiacal:**

- The *Musa* sp. commonly known as banana belongs to the family Musaceae and is one of the most widely distributed and consumed fruits with high content of minerals, vitamins, carbohydrates, flavonoids, and phenolic compounds.
- In Assam, farmers are growing bananas commercially due to high profitability. There are 15-20 different varieties of bananas available to Assam.
- Rutin, a flavonoid, naturally present in banana leaves has antioxidant properties and is beneficial to health.
- Banana leaves also have the potential for use as an inexpensive and new source of bioactive metabolites.

#### **Conclusion:**

Biodiversity plays a pivotal role in maintaining the ecological balance in nature. Nowadays, indigenous bioresources of NER have experienced a number of challenges, such as habitat destruction due to the ever-increasing human population, illegal mining, landslide, and over utilisation and illegal trading of medicinal plants. Considering the above alarming situations, ex-situ conservation and sustainable utilisation of indigenous bioresources of NER should be given top priority.



# KURUKSHETRA-OCTOBER 2022 (AGRIPRENEURSHIP)

## 1. AatmaNirbharta through Agripreneurship

### Introduction:

- The announcement of the “Udyami Bharat” on 30 June 2022 by the Prime Minister of India highlights the importance of entrepreneurship and its underlying potential.
- According to economic theory, the reward for entrepreneurship, which is one of the four factors of production, is profit.
  - An entrepreneur would take the risk of organising the other three factors of production namely land, labour and capital to maximise the objectives such as sales, revenue, profit, etc.
- Agriculture is one of the key sectors of the Indian economy, accounting for around 18 to 20% share of the GDP and about 70% of the rural population relies on agriculture and allied sectors for their livelihood.
- However, in recent years there has been an increase in rural-urban migration as the poor infrastructural facility has acted as one of the key push factors and better job opportunities in urban areas has acted as one of the important pull factors.
  - The ratio of urban population to the total population of the country has grown at a rapid rate of 2.76 percent i.e. urban population which stood at 27.81% in 2001 increased to 31.16% in 2011.
- Against this backdrop, **Agripreneurship** is seen as an important option to mitigate the burden on agriculture and arrest the rate of rural-urban migration.

### Agripreneurship:

- Agripreneurship is nothing but entrepreneurship in agriculture and its allied sectors.
- The adoption of innovative methods, processes and techniques in agriculture and its allied sectors ensures better output and profits, and has become a catalyst of progressive change in the rural economy.
- The demand for an entrepreneur in the agriculture and allied set-up has grown in the recent past, due to the rapid integration of global supply chains and the associated compliances required in maintaining ecological balance.
- Agripreneurship spans various sub-sectors such as food processing, fisheries, seed processing, smart agri-tech provisioning, soil testing, vermicompost, etc.
- Agripreneurship also includes rice mills, pulses mills, sugar factories, bakeries, fertiliser production units, food processing units, agro-service centres, etc.

### Significance of Agripreneurship:

- The agripreneur is said to be the one who utilises information at the right time, relies on innovative solutions, and uses state-of-the-art technology in cultivation.
- An agripreneur bears the risks arising out of the vagaries of nature, market and consumer preferences.
- Further, by promoting agripreneurship, it can be ensured that losses involving perishable commodities are minimised, consumer benefits are enhanced and price discovery is attained effectively.
- As Agripreneurs are also involved in post-production operations such as processing and marketing which require specialised handling, higher investments can be attracted.

- Agripreneurship also promotes and provides a boost to the cooperatives, e.g. dairy cooperatives.
- Agripreneurship can also act as a tool for women's empowerment.
- Agripreneurship can also be a solution for the increasing rate of the disguised and unemployed workforce and provide them with a remunerative alternative.
- Furthermore, agripreneurship makes use of local resources which thereby decreases the possibility of post-harvest losses and reduces the push factor for rural-urban migration.

### Government policies and programmes:

Various Ministries and Departments of the Government of India have formulated policies and schemes to promote agripreneurship and provide an enabling environment

- **Rashtriya Krishi Vikas Yojana – Remunerative Approaches For Agriculture and Allied sector Rejuvenation (RKVY- RAFTAAR):** This scheme aims at making farming a remunerative economic activity.
  - The scheme provides financial support and nurtures the incubation ecosystem by strengthening farmers' risk mitigation efforts, and focuses on the development of pre and post-harvest infrastructure by promoting agripreneurship.
  - RKVY-RAFTAAR includes agripreneurship orientation, with a stipend for the entrepreneur; seed stage funding and funding for incubatees. Know more on RKVY-RAFTAAR in the link.
- **PM Formalisation of Micro Food Processing Enterprises Scheme (PMFME):** This scheme of the Ministry of Food Processing Industries provides financial, technical and business support for the upgradation of existing micro food processing enterprises.
  - The PMFME scheme aims to enhance the competitiveness of existing individual microenterprises in the unorganised segment of the food processing industry and promote the formalisation of the sector.
- **Agriculture Infrastructure Fund:** This programme was launched under the AatmaNirbhar Bharat Package in 2020.
  - This is a dedicated Central Government scheme for providing medium to long-term credit facilities for investment in the creation of postharvest management infrastructure and community farming assets. Know more about the Agriculture Infrastructure Fund in the link.
- **Udyam registration portal:** Launched on 01 July 2020 as a part of the AatmaNirbhar Bharat package specifically designed to help MSMEs emerge out of the ill effects of the COVID-19 pandemic.
- **Gramodyog Vikas Yojana:** It is a scheme of the Ministry of MSME, which is an artisan-centric programme implemented with the aim of the revival of traditional and inherent skills of rural artisans in village industries, has a special focus on Processing Industry such as Oil Industry, Aromatic Oil, Honey and Bee-Keeping.
- **Collateral Guarantee Scheme:** It is also a scheme of the Ministry of MSME which involves the provision of collateral-free loans for MSMEs.
- **Special Credit Linked Capital Subsidy Scheme (SCLCSS):** This scheme of the Ministry of MSME promotes the setting up of new enterprises by aspiring entrepreneurs of the SC/ST communities.



- The Ministry of MSME's other programmes such as the PM Employment Generation Programme (PMEGP) and A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship (ASPIRE)

#### Path ahead:

- Entrepreneurship has been adopted as a subject in the curricula of many teaching institutes in urban areas so that young entrepreneurs are aware of entrepreneurship being one of the career options and also for honing the skills of young entrepreneurs.
  - But there is an urgent need for promoting entrepreneurial culture among people in rural areas.
- In this context, the Rural Entrepreneurship Awareness Development Yojana (READY) which has been incorporated into undergraduate education in agriculture and its allied sub-sectors can be successful in generating awareness and interest among the youth.
- The country's diversity is reflected in the variation across its geographies, land profiles, and consequently the agricultural produce and hence the agripreneurship policies need to incorporate the region-specific potential and demands.
- Further, the potential of agripreneurship can be tapped fully only if there is effective management of soil, seed, water, etc.
  - Therefore a converging approach is required amongst the initiatives being taken by the various Ministries/Departments of the Central Government, along with those of the state governments. This will help in making agripreneurs self-reliant.

## 2. Economic Development

### Introduction:

- A shift from agriculture to agribusiness is a key transformation to revitalise Indian agriculture and make it an attractive and profitable venture.
- Agripreneurship has the potential to contribute to a range of social and economic development such as employment generation, poverty reduction and improvement in nutrition, health and overall food security in the national economy.
- Further, it stimulates growth in rural and urban areas by diversifying income and creating entrepreneurship opportunities.
- Since the inception of New Economic Reforms and the adoption of liberalisation, privatisation and globalisation in 1992-95, it has been expected that rural areas will grow at par with urban areas.
- The practice of entrepreneurship in the field of agriculture in recent years has generated a wide range of economic benefits such as increased agri productivity, creation of new business ventures, new employment, innovative products and services, development of rural areas and increased wealth.

### Recent trends in the development of agriculture:

- The proportion of the agriculture and allied sector in India's total Gross Value Added has improved to 20.2% in 2020-21 from 18.8% in 2021-22.
- According to the Economic Survey 2021-22, agriculture and the allied sector proved to be the most resilient to the COVID-19 shock as it registered a growth of 3.6% in 2020-21 which further increased by 3.9% in 2021-22.
- In terms of real value added, the Indian agriculture sector ranks second after China.
- Further, in recent years, there has been a considerable emphasis on crop diversification towards horticulture

(fruits, vegetables, medicinal and aromatic plants), plantation crops (coconut, cashew nuts and cocoa) and increasing manufacturing plants.

- Contract farming is becoming more common these days.
- Bilateral and regional trade agreements have helped to reduce tariff and non-tariff barriers to cross-border agricultural production flow and increased financial market transparency resulting in increased capital flow in the form of FDI.

### Economic development in agriculture due to Agri-Entrepreneurship:

- Setting up of agri-enterprises such as apiaries, food processing units, seed processing units, mushroom production units, commercial vermicompost units, goat rearing, organic vegetable and fruits retail outlet, bamboo plantation and jatropha cultivation has helped to increase profitability in agriculture and allied sectors.
- Easy access to technology, the emergence of microfinancing, liberalised government rules, and awareness and training programmes on agri and allied sectors have prompted people to take up self-employment in the field of agriculture which has enhanced the potential of agriculture.
- According to the recent trends in agricultural markets, agriculture has shifted from a deficit-driven to a surplus-driven industry.

### Various initiatives:

- National Spot Exchange Limited (NSEL) which is a nationalised transparent electronic spot exchange based in Mumbai, is offering a cutting-edge marketplace that offers solutions to agricultural producers, processors, exporters and other stakeholders.
- The e-Seva Kendra of the Grameen Sanchar Society (GRASSO) offers agri-related services such as market access, the price for agricultural products, availability of cold storage facilities and labour and job opportunities.
- Agricultural Marketing Information System (AGMARKNET), the internet-based information system, seeks to provide a "single window" service appealing to various information demands.
- Farmers Market is a unique move by some state governments known as Uzhavar Santhai (Tamil Nadu), Rythu Bazaars (Andhra Pradesh), and Apna Mandi (Punjab). These markets research the huge potential of agri-entrepreneurship training.
- The Agriclinc and Agribusiness Centre scheme, launched by the Ministry of Agriculture along with NABARD, aims to tap the expertise of the large pool of agri-graduates.

### Key challenges for Agri-Entrepreneurship:

- Lack of technological dissemination
- Complex legal formalities
- Lack of technical understanding
- Poor quality control and other bottlenecks in the growth of agripreneurship

### Recommendations to address the fundamental challenges:

- Financial institutions and banks must assure prompt financial security to entrepreneurs
- Proper supply of scarce raw materials
- Adequate training facilities are needed
- It is important to understand the relationship between Agripreneurship and Marketing, especially contractual marketing and digital marketing



### 3. Agri Start-ups: Transforming Agripreneurship

#### Introduction:



- Agritech start-ups work with technology at the core of their work philosophy and their uniqueness lies in the innovative ways they follow to link technological advancement to farmers.
- Most of the agritech start-ups have based their business models around state-of-the-art technologies such as Artificial Intelligence (AI), Machine Learning (ML) and the Internet of Things (IoT) and the farmers are being introduced to the new agri practices and are getting exposure to the tools in a way they never were earlier.
- The Agri start-ups are undertaking various innovations to bring technology to the doorsteps of the farmers at affordable rates.
- This way these agritech start-ups are revolutionising agripreneurship.

#### Agri Start-ups in India:

- Due to the special focus on agri marketing and the use of technology in agriculture by the Government of India, the sector witnessed a sudden surge of small agri enterprises.
- The number of agritech start-ups has increased from 43 in 2013 to 1,300 by April 2022.
- According to a study by India Brand Equity Foundation, the investments and growth phase for agritech start-ups started in 2019 and India has received total funding of USD 1.6 billion in these entities till 2021.
- Agritech funding stood at USD 245.2 million in 2019 which increased at a whopping 90% CAGR to USD 889 million as of 2021.

#### Categories of Agri Start-ups:

Agri start-ups have mainly emerged into five categories namely:

- Market linkage and supply chain
- Farm inputs
- Precision agriculture and farm management
- Farming as a Service (FaaS)
- Financial Services

#### Bringing Technology to the Fields:

- **Vertical Farming:** India is a country of small and marginal farmers with about 86% of the total farmers having less than 5 acres of land.
  - Vertical farming is seen as a viable solution to the problem as this technology facilitates farmers to cultivate over 4-5 times more crops on a single piece of land.
  - Vertical farming is also called four-level or five-level cultivation in which different types of crops are selected on the basis of their place of fruiting.
  - Vertical farming not just helps in increasing income but also ensures efficient use of water.

- **Hydroponics, aquaponics and aeroponics:** these methods are also part of vertical farming where the necessary nutrients are supplied directly from water or air.
  - The most important aspect of these technologies is that they help people cultivate in their balconies or terraces or even drawing rooms.
  - This has gained significant importance considering the ever-increasing urban population.
  - Urban Kisaan, Urban Green Fate (UGF) Farms, Triton Foodworks, and 365Dfarms are some of the start-ups which are offering such unique solutions.
- **AI Farming and Precision Farming:** these technologies help farmers with weather forecasts based on real-time data, increase crop yield, pest control and monitor the soil.
  - Cropin, Fasal, Intello Labs, AgNext, ReshaMandi and DeHaat are a few notable start-ups that are making their mark in AI-based precision farming.
- **Robotics and Drone Technology:** using robotics and drone technology in agriculture can help address health hazards such as excessive use of pesticides and fertilizers.
  - These technologies can also help to increase the efficiency of agriculture as it helps in the conservation of soil health and groundwater.
- **Agri Fintech Platform:** arranging funds at the right point in time is key to success in agriculture. However, according to the data from RBI only 41% of the small and marginal farmers are covered by public and private banks.
  - In this context, the Agrifintech platforms play a crucial role in filling this gap.
  - Samunnati, Jai Kisan, FarMart and Arya ag are a few key fintech agri startups.
- **Organic farming:** Agri startups involved in organic farming are playing a significant role in ensuring the authentic quality of bio-fertilisers, bio-pesticides, vermicompost, natural compost, and jeevamrut at affordable prices.
  - UGF Farms, Pindfresh, Growing Greens, and Urban Kisaan are some such start-ups.
- **Livestock Farming Technology:** the Livestock Sector which is an agri-allied sector has been growing at a CAGR of 8.15% between 2014-15 to 2019-20.
  - There are various start-ups that are helping the farmers in setting up these businesses apart from providing inputs and creating infrastructure for them.

### 4. Artificial Intelligence in Agripreneurship

#### Introduction:

- The demand for food is increasing at a rapid pace on account of the rising population but the availability of land is deteriorating. This adverse correlation between land availability and food demand calls for the adoption of AI in this sector in order to reduce the input cost and assure a continuous supply of the foodgrains.

#### Statistics related to agriculture practice in India:

- The world population is likely to touch the 10 billion mark by 2050. It would result in rising demand for food grains. This calls for the introduction of technology like AI, and biotech in this field.
- By an estimation, there is a need to raise the production of food grains by 70% from the present level in order to meet future demands.
- In India agriculture contributes 18-20% of the total GDP and is responsible for generating 11% of total export income.



- Nearly 60% of India's population relies on agriculture for their livelihood.

The major concern in the present context is that there is slow adoption of technology in the field of agriculture, resulting in higher input costs and lower productivity. The use of technology enables the country to generate high-quality food and higher yields and thus significantly reduces the need for chemicals.



Source: analyticsvidhya.com

#### Role of AI in the agriculture sector:

- **Soil management:**
  - With the help of AI, the farmers would have prior information regarding the type of soil, when to sow the crops and when to apply herbicides and when to anticipate insect outbreaks.
  - AI would help the farmers in acknowledging the practices which are harmful to the soil profile and cause long-term damage to its profile. Such information would help the farmers in practising sustainable agriculture.
- **Farm management:**
  - Integration of technology like AI, with machine learning and others, would help in accessing the quality of the crops, and taking remedial measures in case of an aberration.
  - It can also advise farmers regarding the optimum practices that should be followed in the field of agriculture.
- AI also helps in proper farm management through comprehensive planning and accessing the requirement of the labours to service the crop production.
  - With the help of AI, production can be boosted and farmers' input costs can be reduced to a drastic level.
  - Another advantage of AI is to cut down waste production by a substantial level and make agricultural practices sustainable.
- **Weather forecast:**
  - It can also analyse the long-term weather in greater detail and recommend to the farmers the changes they need to introduce in agriculture in order to make it sustainable and environmentally friendly.
- **Market access:**
  - It will help in improving the efficiency of the resources and overcome market asymmetry that prevent the farmers from accessing the markets.
  - The use of AI such as agriculture credit scoring and 'smart' farms will help in reducing the cost of servicing for small landholders.
  - It can play a role in precision farming. With the help of precision farming, every aspect of the agricultural practices is analysed in greater detail and effective measures are taken to improve the malpractices that have crept into the system.

- **Irrigation management:**

- With the help of AI, soil quality is analysed in greater detail along with the type of crops to be produced. Thus, the amount of water needed by the crops is spelt by AI. It will thus help in reducing the wastage of farms.

#### Conclusion:

The adoption of technology is crucial to achieving the demands of food crops. The way the population is increasing in the world, only scientific tools can help us in achieving the task of food security. Adoption of technology is also imperative for making agriculture activities profitable for the farmers and saving the environment from the adverse effect of harmful emissions.

## 5. Agripreneurship and farm prosperity

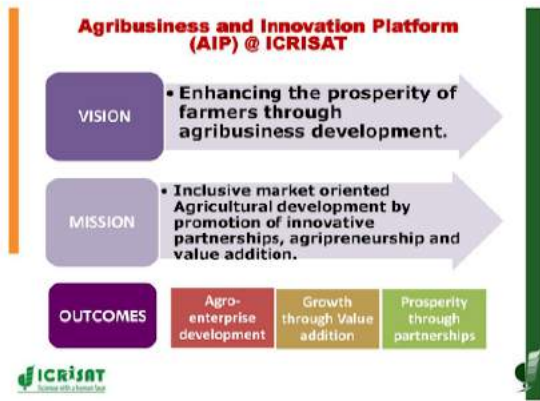
#### Introduction:

- Nearly 60% of India's farmers are engaged in agriculture and contribute nearly 18% to the country's GDP. The rise of agripreneurship in rural areas can offer various advantages like reducing the rural-urban divide, reduction of poverty, and generation of employment opportunities for millions living in rural areas. It also has the potential to drastically change the prospect of women and make them empowered in the rural landscape.
- Agripreneurship is a branch of economic activities wherein the potential of agriculture is exploited for the generation of profit. India offers a very wide scope for agripreneurship since there is the availability of land, various reforms taking place in the field of agriculture and the government is taking adequate steps to promote startups in the country.

#### Scope of agripreneurship:

- The government is designing various policies and frameworks in order to encourage youngsters to look for employment opportunities in the field of agriculture.
- Various microfinancing facilities are available in the markets for those who seek to develop a career in agriculture.
- There is also low penetration of technology in the field of agriculture which makes it a very lucrative economic opportunity.
- At the same time, various dimensions are available in the field of agriculture like dairying, sheeping, horticulture, organic farming, etc.
- Various skill development programmes are initiated by the government in the field of agriculture. Once the individual acquires that skill, they can carry out business on their own.
- Highly qualified individuals are looking up to agriculture for employment opportunities. It will create a revolution in this field.
- The recent logistics policy of the government aims to reduce regulatory complexities and provide a level playing ground for every farmer. It will lead to the creation of positive sentiments in the market.





Source: slideplayer.com

- It can purge women from many social stigmas like patriarchy, economic domination, poverty, hunger etc.

#### Conclusion:

The path of AtmaNirbhar Bharat passes from the field of agriculture because it plays a cardinal role in providing employment opportunities to a large number of people in the country. Unless the agriculture sector is made profitable, the path of prosperity cannot be realised.

#### Role of Agripreneurship in the process of farm prosperity:

- It will help in **increasing the productivity** of small and marginal farmers by integrating them into national, international and local markets.
- Improving the well-being of poor farmers through the **creation of competitive agribusiness** enterprises through technology development and commercialization.
- **Value addition and post-harvest management in the agri-food** sector through innovative processing and product development
- It is also easier for agripreneurship to **secure microfinance from the bank** and use it for the purpose of starting startups.
- It will help in **reducing the challenges that agriculture faces in the field of supply chain** networks and thus reducing the cost and waste.
- It will also help in **providing prior information to the farmers** so that they can take their decisions accordingly.
- Small farmers are not in a position to buy expensive agricultural equipment, thus entrepreneurship in this field would enable the **small farmers to get these services on rent** and thereby reduce their cost of production.
- Moreover, agricultural activities in India were basically traditional and primitive with low induction of technology. But, the growth of entrepreneurship in this field would promote the **induction of technology and enhancement of production**.
- **Creating synergies through private sector partnerships.** Substantial capital flow for commercialising agricultural technologies.
- **Goodwill in the local community and society** for creating wealth and employment.
- **Ability to reduce the risk in the commercialization of Agri-technologies** and improve its impact.
- Developing **collaborative research partnerships with public, private and allied sectors** to benefit the smallholding farmers of dry land tropics across the agricultural and agribusiness value chain.

#### Women and agripreneurship:

- Out of the total population that is engaged in agriculture, women constitute nearly 70% of the total population engaged in this sector.
- These women play the role of primary food producers and dedicate most of their time to farm activities. But, most of their efforts go unnoticed.
- Therefore, accessibility of agripreneurship to women can drastically change their position in the rural landscape and make them economically empowered so that they can make their own decisions.



# SCIENCE REPORTER

## 1. Council of Scientific and Industrial Research Legacy and the Path Forward

### Context:

- On 26th September Council of Scientific and Industrial Research (CSIR) celebrated the 80 years of its existence.

### Introduction:

- CSIR was founded on 26 September 1942 as an autonomous organization. The agency has played a very important role in technology-led industrialisation and immensely helped in socio-economic development of the society.
- CSIR-India is a unique intramural research agency on a global platform with widely differing sectoral interests. CSIR remains the intellectual leader in creating Intellectual Properties with potential commercial interests.
- CSIR has gone through evolutionary changes from its inception upto current times, in terms of quality of its work to development of number of laboratories.
  - CSIR played a strong support function in India's food security drive. Swaraj tractor and several other agricultural implements to suit India's culture-based agricultural systems and technologies for agrochemicals.
  - Technology for Amul powder from buffalo milk is a case in point of CSIR's effort in providing technology solutions to national problems
  - Research in the development of drugs through process innovations for rendering the Indian health care system affordable became a priority

SWOT Analysis of Current CSIR

Strength	Weakness	Opportunity	Threat
Build-up of physical assets	Ageing of physical assets created	Emerging National priority and flagships	Outdated intellectual infrastructure
Expertise-base in diverse R&D areas of industrial interest and brand image	Critical gaps in converting knowledge into wealth/value creation	To emerge as reliable source of game-changing technologies and lead Atmanirbhar Bharat	Competition from R&D systems of MNCs in India for R&D for India
Strong IPR base and patenting work culture	Inadequate capitalisation of IPR assets for royalty flow	Leveraging first mover advantages in IPR world	Flight of talent base of CSIR in favour of other S&T systems
Proven record of past performance in technology delivery in planned economy	Weak record of performance in areas where technology assets are mobile	Scope for entering into dynamic global competition in global technology market	Competition shake out in globalised knowledge economy in select R&D areas
Linkage capital with some core industrial sectors and academy	Excessive reliance on transaction model & poor cash inflow outside R&D services	Scope for building relationship model with some select industrial sectors with IPR sharing provisions	Horizontal transfer of technologies into manufacturing base and import of high technology products
Corporate work approach for non-strategic research and development with networking capacity	Excessive dependence on public funds with low revenues from IPR and royalty accrual	To gain leadership in catalysis of technology and innovation-led manufacturing in non-strategic sector	Changing world view of industrial research in favour of outsourcing to small companies and non-corporate systems
Ability to create technology-leads in time scales aligned to industrial partners	Low share of sustained incomes from private sector	Leveraging intellectual assets for moving towards financial self-sustainability	Internal complacencies and imbalances in open to targeted R&D priorities

### Way forward:

- CSIR is on the march in the 21st century. CSIR Vision 2030, launched recently, has the laudable objective of providing innovative Science and Technology solutions with the aspiration of assuming global leadership
- **Creating a STIR in CSIR:**

### STIR

- Speed, Scale and Sustainability
- Talent, Technology and Trust
- Integration, Innovation & Inclusion
- Reimagining, Rebuilding and Repositioning

**Speed:** The COVID-19 pandemic is a classic example. CSIR responded speedily by reorienting the scientific manpower in providing quick solutions in various domains such as, Digital and Molecular Surveillance. But CSIR could do much better if it succeeds in removing bureaucracy by creating enabling, dynamic and positive hassle-free systems

**Scale:** the CSIR technology must not only be ready for commercialisation but also remain sustainable over a large number of years

**Sustainability:** For remaining robust in a volatile world CSIR, Digitization, virtualization, mobilization and personalization are the four new megatrends aided by Web3.0 and emergence of Metaverse. All these will lead to game changing co-creative, self-organizing, self-correcting, asynchronous, dynamic and open systems that will be borderless and globally distributed. CSIR must totally reinvent itself to benefit from this mega trend.

**Talent:** We need new recruitment processes that bring speed, flexibility and innovation in terms of not just hiring new NextGen talent but also creating access to such talent. Dual appointments with industry and academia and within CSIR labs themselves, new models in human resource mobility within and outside CSIR are some examples of such innovation.

**Technology:** We need new recruitment processes that bring speed, flexibility and innovation in terms of not just hiring new NextGen talent but also creating access to such talent. Dual appointments with industry and academia and within CSIR labs themselves, new models in human resource mobility within and outside CSIR are some examples of such innovation.

**Trust:** CSIR cannot become a leader in generating start-ups without backing its talent and technology with trust. To build the trust in CSIR participation and collaboration of industry, academia and government should be promoted.

**Integration:** CSIR must not only integrate itself with national goals but also with a diversity of partners – with industry ranging from large to MSMEs, academia, NGOs, start-ups, social entrepreneurs, policy think tanks and various disciplines.

**Innovation:** Innovation is successful conversion of a new idea into practice. It comprises the journey from mind to



market place, from ideas to impact

**Inclusion:** India needs accelerated inclusive growth, where no Indian is left behind. Inclusive innovation can act as an inspiring accelerator. CSIR should be a global leader in inclusive innovation that creates the world's most affordable products and services with the highest quality.

**REINVENTING, REPOSITIONING AND REBUILDING:** The new India will need a new CSIR. And therefore, CSIR must continuously reimagine, rebuild and reposition itself so that it always remains relevant to India.

## 2. CSIR Contribution

**1. Indelible Ink- Mark of Elections in India:** Developed in 1952 by the CSIR National Physical Laboratory (CSIR-NPL). The indelible ink developed by CSIR is also exported to countries like Nepal, Cambodia, Turkey, South Africa, Nigeria and others.

- **Optical glass:** The manufacture of optical glass used in lenses and prisms in a wide range of scientific, photographic and survey instruments.
- **Amulspray Instant Milk Baby Food:** CSIR-Central Food Technological Research Institute (CSIR-CFTRI) developed baby food from buffalo milk, breaking the international monopoly.
- **SWARAJ:** CSIR-Central Mechanical Engineering Research Institute (CSIRCMERI) developed the Swaraj, a 20 HP tractor.
- **Nutan:** The CSIR Indian Institute of Petroleum (CSIR-IIP) developed Nutan, a smokeless cooking stove, with funding and marketing support from Indian Oil Corporation (IOC).
- **India Mark II pump:** The CSIR-Central Mechanical Engineering Research Institute (CSIR-CMERI) developed , easy to operate and maintain Mark II pump. Made of non-corrosive non-metallic parts, the low-cost pump has been successful not only in rural India but in several other nations.
- **Flosolver- India's First Parallel Computer:** In 1986, when the US government refused to supply a Cray supercomputer to India, scientists from the CSIR National Aerospace Laboratories (CSIR-NAL) built their own supercomputer – India's first. They connected several computers in parallel to create Flosolver; its success triggered other successful parallel computing projects in the country such as PARAM.
  - **Nalgonda Technique- Fluoride Removal from Water:** The CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) pioneered the Nalgonda technique to remove fluoride from water in 1988.
- **Pioneer Investor:** The CSIR-National Institute of Oceanography (CSIR-NIO) played an important role in exploring the oceans for its resources. Ocean waters are a source for strategic metals like Nickel, Cobalt and Copper at water depths of 4-6 km. India was the first nation to get "Pioneer Investor" status from the United Nations, which gave it mining rights of over 1.5 million square kilometers area.
- **Hansa:** CSIR's National Aerospace Laboratories designed and developed Hansa, India's first all-composite two-seater trainer aircraft.
- **Asmon:** Non-toxic to Liver Herbal medicine for the management of bronchial asthma christened

Asmon, was developed by the CSIR-Indian Institute of Chemical Biology (CSIR-IICB).

- **Bamboo Flowering:** Bamboo flowers only once during their lifetime and that too just once in seven to a hundred years depending on the species. CSIR scientists created history when they made bamboo flowering within weeks possible by using tissue culture technologies.
- **Turmeric Patent Revoked – Landmark Case:**
  - CSIR challenged the US patent granted to the wound healing properties of turmeric in 1995.
  - In 1997, India won the patent battle and the turmeric patent was revoked. This landmark case set a precedent for challenging patents based on traditional knowledge.
  - In a pioneering initiative, CSIR developed a digital archive of Indian traditional knowledge – **the Traditional Knowledge Digital Library (TKDL) to prevent misappropriation of Indian traditional knowledge in International Patent Offices.**
  - **Centre for DNA Fingerprinting and Diagnostics (CDFD)** The CSIR-Center for Cellular and Molecular Biology (CSIR-CCMB) developed a Bkm-derived probe for DNA fingerprinting, which is extensively used for forensic investigation, paternity determination and seed stock verification.
- **Arteether: Fast-acting Agent:** The scientists at the CSIR-CDRI developed a drug to treat malaria – Arteether.
- **Tejas – India's Light Combat Aircraft** CSIR-NAL took a bow when the Light Combat Aircraft (LCA) soared into the skies for the first time in 2001.



**Figure: LCA Tejas**  
Source: science reporter

- **Saras – India's First Civilian Plane:** CSIR-NAL also developed SARAS, the 14-seater twinengine turboprop aircraft with a maximum speed of over 600 km/hour.



**Figure: SARAS**  
Source: Science reporter



- **LaCONES- Conserving Endangered Animals Project:** LaCONES is aimed at the conservation of endangered animals through the use of biotechnological intervention.
- **Complete Genome Sequencing:** The CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) completed the first ever Human Genome Sequencing of a healthy Indian citizen.
- **C-NM5 aircraft:** CSIR-NAL and Mahindra Aerospace announced the successful maiden flight of their jointly developed C-NM5 aircraft. This is India's first public private partnership in the development of aircraft.



**Figure: C-NM5**  
Source: Science reporter

- **Sindhu Sadhana:** India's first ever indigenously built research ship "Sindhu Sadhana" was launched by CSIR-NIO to enhance the capabilities of Indian oceanographers to understand the multidisciplinary observations and oceanographic processes in the seas.



**Figure: Sindhu Sadhana**  
Source: Science reporter

- **Soleckshaw:** The green solution to urban transport Soleckshaw is a pollution-free, safe and economical electric three-wheeler, designed and developed under the CSIRNew Millennium Indian Technology Leadership Initiative (NMITLI) scheme to meet the need for short to medium distance transport within cities.
- **Neerdhur- Improved Domestic Cookstove:** The improved cooking stove designed and developed by the CSIR-National Environmental Engineering Research Institute, Nagpur, is efficient and can run on multi-fuels (biomass pellets, charcoal, agro residue, wood chips, wood logs, cow dung cakes, etc.)
- **"Geopolymer Concrete" for Road Construction:** The Indian Roads Congress (IRC) has accredited the construction of the road by "Geopolymer Concrete" developed jointly by NETRA-NTPC Ltd and CSIRCBRI, Roorkee. The geo-polymer road stretch is unique in India and its replication across the nation can address environmental problems associated with huge quantities of fly ash being generated by coal-based power plants.

- **India's First Ever Biofuel-Powered Flight A bio-aviation fuel developed by CSIR-IIP successfully powered India's first historic biofuel-powered flight in 2018 from Dehradun airport.**
- **Eco-friendly Green Crackers – SWAS, SAFAL and STAR:**
  - Central Electrochemical Research Institute (CECRI), Tamil Nadu and National Environmental Engineering Research Institute (NEERI), Nagpur, have developed ecofriendly 'Green Crackers' which are 15-20% cheaper than conventional ones.
  - The crackers have been named as safe water releaser (SWAS), safe minimal aluminum (SAFAL) and safe thermite cracker (STAR)



Green firecrackers developed by CSIR laboratories (Source: CSIR-NEERI)

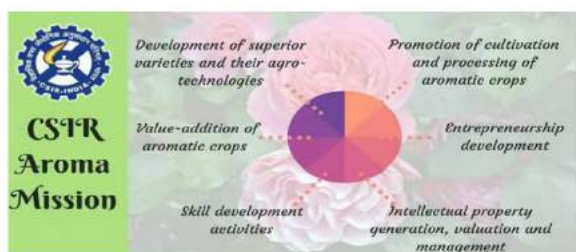
- **Eco-friendly, Efficient and DME Fired "Aditi Urja Sanch" Unit** CSIR-NCL developed the nation's first pilot plant operated with clean and cost-efficient fuel DME (Dimethyl Ether) with 20-24 kg/day capacity.
- **Asafoetida (Heeng) for Cultivation for the First Time in India** CSIR-IHBT has ensured cultivation of Heeng, or Asafoetida, an essential spice in many Indian dishes.
- **Bharatiya Nirdeshak Dravya (BND)** BPCL quality assurance (QA) department and M/s Aashvi Technology LLP (ATL) joined hands with CSIR-NPL for manufacturing and marketing of "Bharatiya Nirdeshak Dravya" (Certified Reference Material) to ensure correct and accurate results of Lab Instruments
  - **The certified reference materials** play a crucial role in establishing the SI traceability to the various measurements. To establish the uniform measurement system, India being the member of Bureau International des Poids et Mesures which is commonly known as International Bureau of Weights and Measures (BIPM) & the APMP is maintaining standards at par with international standards.
  - **Gold BND 4201: In 2017 India's first home-grown high purity gold reference standard BND-4201 was launched**





Figure: Gold Purity  
Source: Policybazaar

- **India's first Hydrogen Fuel Cell (HFC) Prototype Car** CSIR and KPIT, Pune, conducted successful trials of India's first Hydrogen Fuel Cell (HFC) prototype car.
- **CSIR's Key Initiatives to Fight against COVID-19:**
  1. **FELUDA Paper-strip:** CSIR-IGIB developed a low-cost FELUDA (FNCAS9 Editor-Limited Uniform Detection Assay) paper-strip coronavirus test which can detect the virus within an hour.
  2. **SwasthVayu – Non-invasive Ventilator.**
  3. **Karuna Bhawan:** Makeshift Hospital for COVID-19, Karuna Bhawan, a portable, prefabricated, foldable steel structure.
- **Nutraceuticals:** Nutraceuticals are biologically active phytochemicals that possess health benefits. These may be delivered to the consumer as a dietary supplement and/or as a functional food. CSIR labs, such as, CSIR-CFTRI, CSIR-IHBT, CSIR-NBRI, CSIR-IICT have developed several nutritionally rich products during the past two decades. These products range from low calorie natural sweeteners, herbal soft drinks and antioxidant-containing tea to Polyphenols-Zinc rich food supplement, microalgae as source of essential fatty acids and Omega 6 fatty acid from *Spirulina platensis*.
- **CSIR Mission Aroma:** The Aroma mission was launched in 2016 to promote the cultivation of lavender plants, which hold aromatic healing effects through advanced technology set by the CSIR (Council of Scientific & Industrial Research).
  - **Popularly known as the Lavender or Purple Revolution,** the Aroma mission began from **Jammu and Kashmir significantly** changed the dynamism of farmers who can produce lavender, make lucrative returns, and enhance their lives.



Source: CSIR

- **Precision Agriculture:** Precision agriculture enhances input use efficiency of agricultural inputs such as seed, fertilizer, water, chemicals and energy. It includes deploying AI, ML and Big Data Analytics in crop production activities or agro technologies, and system dynamics model based on AI for real time crop monitoring and management using multi/hyper-spectral imageries. Some of the work being carried out in developing different technology components of precision agriculture.



# DOWN TO EARTH

## 1. Only together can we win

### Context:

- There is demand from around the world that loss and damage must be acknowledged as a valid demand of nations in need of climate reparations at the 27th Conference of Parties (cop27), which is being held in the Egyptian beach city of Sharm el-Sheikh.

### Details:

- The world has consistently rejected the fundamental tenets that must govern climate change action. These consist of;
  - Since climate change is a global problem, all countries must work together to solve it.
  - It requires fair and just laws that apply to both wealthy and underdeveloped countries.
  - According to science, humans are to blame for the rise in global temperatures, which will cause an increase in unpredictable and catastrophic weather events.
  - It is possible to estimate each country's responsibility for the stock of emissions already in the atmosphere—the historical cumulative emissions that have “forced” climate change impacts.
  - Simply because the globe has neglected the necessity to create international regulations that would apply equally to all, nations that have not yet contributed to the emissions will do so in the future.
- At cop27, we have a chance to fix this horrible situation we're in—not completely, but at least to reestablish some degree of trust.
- The world can do this by putting on the table the issue of loss and damage—the negotiations on the need to pay for damages that the countries of the South are experiencing because of climate change.
- The issue of loss and damage is not new but it has been sidelined, openly rejected and dismissed.
- Climate nightmare moments can turn into a dream only if the world that gathers in Egypt has the courage to act differently and to realize that in this only one Earth of ours, we are interdependent.

## 2. Power of Evidence

### Context:

- Upgrading to a robust instrument to assess the loss and damage brought on by extreme weather events is necessary because frequency and intensity of extreme climate events are increasing in India.

### Details:

- Between July and September, rain washed away the standing crops of 4.5 million farmers in Marathwada, the region of the country most prone to drought.
- The most significant increase in farmer suicides in the region coincided with the monsoon's erratic development, which fluctuated between dry and wet spells.
- More than 87% of suicide cases in the Marathwada region were caused by crop failure.

### Extreme swings:

- 188 districts, or 27% of the country, reported deficient rainfall at the end of the monsoon season.
- Jharkhand, Bihar, Uttar Pradesh, Uttarakhand, Assam, Haryana, Delhi, and Punjab are among the states that saw a shortage in precipitation.

### Year-round damages:

- According to a study by the Down To Earth Data Centre, India saw extreme weather events for 242 of the first 273 days of this year (January-September).
- According to the UN Office for Disaster Risk Reduction's 2020 report, India had the third-highest number of natural disasters over the previous 20 years.
- The National Institute of Disaster Management report states that India registered 1,058 climate disaster incidents between 1995 and 2020 (up till October).

### Lost in assessment:

- India lacks a robust infrastructure to assess the more holistic losses that arise from disaster damages.
- The existing system is centered around relief and offers little to rebuild an area and its economy post-disaster.

### Relief to resilience:

- The country has realized the limitations of the existing system, and is slowly transitioning to a more robust assessment tool called post disaster needs assessment.

## 3. Hidden Costs

### Context:

- Estimates of loss and damage following weather events do not take non-economic impacts into account; this was seen in the most recent floods in Pakistan and Nigeria.

### Details:

- Down to Earth research reveals that every month of 2022 has thus far seen at least one calamity that set a new record, and every continent has been affected by such unprecedented extreme weather events.
- These have revived calls for climate reparations as climate negotiators prepare for the 27th Conference of the Parties (cop27) to the UN Framework Convention on Climate Change (unfccc) in Sharm el-Shaikh, Egypt.

### Estimation of Loss and Damage:

- To estimate the costs, countries usually follow two internationally accepted methodologies;
  - Rapid needs assessment.
  - Post-disaster needs assessments.
- Despite being widely acknowledged, the existing technique for both assessments does not take into consideration the entire scope of long-term consequences including displacement and unemployment.
- The World Bank, EU, and UN Development Program raised concerns about the shortcomings of the current post-disaster needs assessment methodology in 2018.
- The absence of losses resulting from extensive environmental harm and non-economic effects, such as the loss of cultures, traditions, languages, and even



entire communities, which are irreplaceable and hence very difficult to measure, is a significant flaw in present assessments.

#### 4. Translation between change in weather and damages is not linear

##### Context:

- Attribution research has advanced significantly to establish the link between weather events and climate change. However, experts claim that this connection does not include evaluating loss and damages.

##### Weather Attribution:

- Attribution science is the study of relationships between climate and extreme weather.
- In the last five years, there has been significant progress in the science of weather attribution.
- For some sorts of events, attribution studies are still challenging to conduct. These are primarily small-scale phenomena like flash floods or floods caused by glacial lake outbursts.
- With the help of attribution studies, we can identify how emissions from certain companies or nations affect the global mean temperature, which in turn affects weather patterns and results in further losses and damages.
- The translation between the change in the weather and the damages is not linear.
  - Let's say that there is a 50% increase in rainfall intensity, which might result in a 700% rise in flooding. This can be the result of some thresholds being crossed.

#### 5. What the science says

##### Context:

- The UN Intergovernmental Panel on Climate Change's assessment report last year confidently stated that humans have a role in the world's changing weather patterns and cited the work of World Weather Attribution (WWA), a global initiative that studies the influence of climate change on extreme weather events.

##### Details:

- According to WWA experts, once the contribution of climate change to an event is established, historical polluters like the UK, US, and EU countries can be held accountable.
- According to Harjeet Singh, head of global political strategy at Climate Action Network International, a coalition of environmental non-profits, such applications of attribution science can aid in holding polluters accountable, even through lawsuits.
- A loss and damage funding facility was demanded by developing countries at the 26th UN Conference of the Parties to the Framework Convention on Climate Change (UNFCCC) last year.
  - Such a tool, according to Singh, can help attribution studies get better, especially in underrepresented areas.
- A loss and damage funding facility was demanded by developing countries at the 26th UN Conference of the Parties to the Framework Convention on Climate Change (UNFCCC) last year.
- Such a tool can help attribution studies get better, especially in underrepresented areas.
- In the context of reparations, attribution science

confronts power and makes reference to past emissions.

- In an ideal world, it would then be used to distribute compensation from historical emitters.
- The focus on attribution will also result in discussions on the "timeline" of emissions.

#### 6. Deny, distract and delay

##### Context:

- In a discussion with the media prior to the Conference of Parties (cop27) to the UN Framework Convention on Climate Change, António Guterres, the UN Secretary-General, declared that Cop27 "must be the place for action on loss and damage".

##### Details:

- Even after twenty years, there is still no binding consensus on loss and damage funding.
- For a while now, nations that are most vulnerable to the effects of climate change have been calling for a loss and damage funding institution.
- However, the process might be difficult because a loss and damage finance method is directly related to the idea of "polluter pays," which holds that nations are responsible for their historical emissions.
- The Alliance of Small Island States, Least Developed Countries, and developing countries brought up the subject of loss and damage at many events, including COP10, COP11, COP13, and COP15.
  - In 1991, Vanuatu demanded for the first time an insurance mechanism for loss and damage by wealthy countries under the UNFCCC on behalf of the Alliance of Small Island States.
  - The G77 demanded a loss and damage mechanism at COP18. To exert more pressure, the Like Minded Developing Countries negotiation bloc was formed.
  - The Warsaw International Mechanism (WIM) for loss and damage was created at the COP19.
  - In accordance with Article 8 of the Paris Agreement, loss and damage was elevated to the third pillar of climate action at COP21. But the article does not impose financial obligations on industrialized nations.
- But industrialized nations like the US pushed back the demands.
- Later in August, following a request from G77 to the UNFCCC executive secretary, loss and damage was added to cop27's provisional agenda.



# Comprehensive Learning Programs by BYJU'S to Crack IAS



## BYJU'S Online Classroom for IAS

A comprehensive IAS program with a combination of live online lectures, self-assessment tests, and exclusive doubt clearing sessions.



## BYJU'S IAS Tablet

Prepare at your own convenience, anywhere and anytime with the BYJU'S IAS Tablet.



## BYJU'S IAS Classroom Program

Prepare for Prelims and Mains with India's Leading IAS trainers.



## Mentor Support

A dedicated mentorship helpline to provide complete guidance throughout the preparation process.



## Student Portal

Get access to recorded sessions of the Weekly Webinar, Issues in News, Current Affairs Magazine, Gist of Yojana and Practice Sets.



## Current Affairs Webinar

Twice a week live webinar classes to discuss current affairs followed by handouts.



## Study Material

In-depth coverage of syllabus which includes the following study material: Indian Polity by M Laxmikanth, India's Ancient Past by R S Sharma, History Of Modern India by Bipan Chandra, Ethics, Integrity and Aptitude by P N Roy Chowdhury and G Subba Rao +15 more titles.



## Test Your Knowledge

Perfect your answer writing skills for the Civil Services mains exam by improving your knowledge with modular tests at regular intervals, question paper discussions, answer writing strategies, essay writing strategies and personalised analysis of the answers.



## Current Affairs Updates

All the three stages of the Civil Services Exam – Prelims, Mains and the Interview require the aspirants to be up-to-date with the current affairs. Regular and in-depth current affairs updates will help you stay updated.

## Additional Features

- Daily Video Analysis of The Hindu
- **YouTube Videos:** International Relations This Week, Economy This Week, Target Prelims etc
- Objective and Descriptive Type Unit Tests
- **Daily Updates on Free IAS Prep Website:** Comprehensive News Analysis, PIB Summary
- Gist of Yojana, Kurukshetra and Economic and Political weekly magazines
- Current Affairs Magazine
- **Test Series** – Prelims and Mains
- Interview Guidance