

Monthly IQ

A Comprehensive Current Affairs Magazine for
UPSC CSE Exam

August 2023

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INDIAN POLITY

MULTI-STATE COOPERATIVE SOCIETIES (AMENDMENT) BILL, 2023

CONTEXT

The Rajya Sabha has passed the Multi-State Cooperative Societies (Amendment) Bill, 2023.

ABOUT COOPERATIVE SOCIETIES

- A co-operative society is a **voluntary association** of individuals having **common needs** who join hands for the achievement of common economic interest.
- Aim: Its aim is to serve the **interest of the poorer sections** of society through the principle of self-help and mutual help.
- Modus operandi:** Through formation of cooperatives, people come forward as a **group, pool their individual resources**, utilise them in the best possible manner, and derive some common benefit out of it.
 - In a cooperative society, people can **enter it as per their wish**, and also, they are **free to leave** a cooperative society, but they cannot transfer their share.
- Examples of Successful Cooperatives in India:** National Agricultural Cooperative Marketing Federation of India (NAFED), Indian Farmers Fertiliser Cooperative Limited (IFFCO), and AMUL.
- Relevance:** More than **12 percent of the world's population** is associated with cooperatives through more than 30 lakh cooperatives.
 - The **joint cooperative economy** of the world is the fifth largest economic unit.



CONSTITUTIONAL AND LEGAL PROVISIONS ON COOPERATIVES

- The item "Cooperative Societies" is a **State Subject** in the **7th Schedule** via entry 32 of the State List in the Constitution of India.
- 97th Constitutional Amendment Act 2011:**
 - It established the right to form cooperative societies as a **fundamental right (Article 19)**.
 - It included a new **Directive Principle of State Policy** on the Promotion of Cooperative Societies (**Article 43-B**).
 - It added a new **Part IX-B** to the Constitution titled "**The Co-operative Societies**" (Articles 243-ZH to 243-ZT).
 - It authorizes the Parliament to establish relevant laws in the case of **multi-state cooperative societies (MSCS)** and state legislatures in the case of other cooperative societies.
- Multi-State Cooperative Societies Act, 2002** provides for registration of cooperative societies with operations in more than one state.

Stats IQ

- According to the **Ministry of Cooperation**, there are around **8.5 lakh cooperatives** in India, with about 1.3 crore people directly attached to them.
- As per NCUI data from 2018, the percentage of cooperative members in proportion to the total population increased from **3.8% in 1950-51 to 22.2% in 2016-17**.
- There are close to **1,500 MSCSs** registered in India, the **highest number** being in **Maharashtra**.
- A large number of MSCSs are **credit societies**, while **agro-based societies**, dairies and banks are also sizable in number.

WHAT ARE MULTI-STATE COOPERATIVE SOCIETIES (MSCS)?

- Multi-State cooperatives are societies that have operations in **more than one state**- for instance, a farmer-producers organization which procures grains from farmers from multiple States.
- Such MSCSs are registered under the **Multi-State Co-operative Societies Act 2002**, and their regulation lies with the **Central Registrar**.

KEY HIGHLIGHTS OF THE MULTI-STATE COOPERATIVE SOCIETIES (AMENDMENT) BILL, 2023

About	The bill amends the Multi-State Cooperative Societies (MSCS) Act, 2002.					
Objectives of the bill	<input type="checkbox"/> To plug the “loopholes” in the MSCS Act, the Centre introduced the bill for more “transparency” and increased the “ease of doing business”. <input type="checkbox"/> To improve governance, reform the electoral process, strengthen monitoring mechanisms and enhance transparency and accountability.					
Election of board members	<table border="1"> <tr> <th>Earlier</th> <th>Now</th> </tr> <tr> <td>Under the MSCS Act 2002, elections to the board of a multi-state co-operative society are conducted by its existing board.</td> <td>According to the bill, the central government will establish the Co-operative Election Authority for this purpose.</td> </tr> </table>	Earlier	Now	Under the MSCS Act 2002, elections to the board of a multi-state co-operative society are conducted by its existing board.	According to the bill, the central government will establish the Co-operative Election Authority for this purpose.	
Earlier	Now					
Under the MSCS Act 2002, elections to the board of a multi-state co-operative society are conducted by its existing board.	According to the bill, the central government will establish the Co-operative Election Authority for this purpose.					
Cooperative Ombudsman	As per the Bill, the central government will appoint one or more Co-operative Ombudsman to inquire into complaints made by members of co-operative societies.					
Cooperative information officer	The bill proposed to make provisions for the “appointment of cooperative information officer” to provide information on affairs and management of the multi-state co-op society concerned to members of such society.					
Merging of Cooperative societies	<table border="1"> <tr> <th>Earlier</th> <th>Now</th> </tr> <tr> <td>The MSCS Act, 2002 provides for the amalgamation and division of multi-state co-operative societies.</td> <td>The Bill proposes merger of “any cooperative society (registered under state laws)” into an existing multi-state cooperative society.</td> </tr> </table>	Earlier	Now	The MSCS Act, 2002 provides for the amalgamation and division of multi-state co-operative societies.	The Bill proposes merger of “any cooperative society (registered under state laws)” into an existing multi-state cooperative society.	
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The MSCS Act, 2002 provides for the amalgamation and division of multi-state co-operative societies.	The Bill proposes merger of “any cooperative society (registered under state laws)” into an existing multi-state cooperative society.					
Fund for sick co-operative societies	The Bill establishes the Co-operative Rehabilitation, Reconstruction and Development Fund for revival of sick multi-state co-operative societies.					
Equity and Inclusiveness	To promote equity and inclusiveness, provisions relating to the representation of women and Scheduled Caste/ Scheduled Tribe members on MSCS boards have been included in the Amendment Bill.					
Increasing penalties	The Bill also increases the penalty amount for violation of the law to Rs. 1 lakh and potential imprisonment from six months to a year.					

CHALLENGES FACED BY COOPERATIVES IN INDIA

- Lack of Democratic Spirit:**
 - **Government Interference:** The government is a major source of financing for cooperatives and has the authority to regulate their operations through various rules.
 - **Politicization:** Many cooperative societies are controlled by influential members with strong political affiliations, leading to internal conflicts and a lack of interest among common members.
- Regional Imbalance in Growth:** Cooperatives in northeastern regions and states like West Bengal, Bihar, and Odisha are not as well developed as those in Maharashtra and Gujarat.
- Absence of Economies of Scale:** Most cooperatives have limited membership and operate in only a few villages, resulting in limited resources and constrained operations. Inadequate
- Human Resources:** Shortages of skilled personnel and a failure to attract efficient professionals pose challenges to cooperatives, leading to a lack of professionalism in their operations.
- Specific Challenges for Cooperative Banks:**
 - **Dual Regulation:** Cooperative banks face regulation by both the state registrar of societies and the Reserve Bank of India, which can result in a lack of accountability.
 - **Sinking Balance Sheets:** Many cooperative banks have significantly higher Non-Performing Assets (NPAs) compared to commercial banks, leading to financial instability.

- Governance Issues:** Poor governance practices, lax corporate governance standards, and political influence can undermine the effectiveness of cooperative banks, as exemplified by the failure of the Punjab and Maharashtra Co-operative Bank (PMC).

STEPS TAKEN TO STRENGTHEN THE COOPERATIVE MOVEMENT IN INDIA

- Ministry of Cooperation:** The ministry has been established to “provide a separate administrative, legal and policy framework for strengthening the cooperative movement”.
- The Banking Regulation (Amendment) Act, 2020:** It gives the RBI powers to supersede boards of the Cooperative banks and allows Cooperative banks to raise money via public issue and private placement, of equity or preference shares.
- The National Agricultural Cooperative Marketing Federation (NAFED):** to assist the Marketing Co-operatives in the States to develop their marketing business and to help them render better services to their members.
- The National Co-operative Development Corporation (NCDC):** It was set up in 1963. It provides assistance to schemes of marketing, processing, storage, and practicing in a share capital of cooperative sugar, cooperative spinning & weaving mills, in the form of loans and subsidies.

WAY FORWARD

- Emphasize Democratic Values:** Cooperatives should uphold democratic principles as their core value. To reduce political influence and enhance inclusivity, the following measures can be implemented:
 - Bring Cooperative societies under the **Right to Information Act, 2005**.
 - Mandate cooperative directors to **declare their assets annually**.
 - Raise awareness among members about their rights and the purpose of Cooperatives.
 - Instill **value-based education** to promote **ethical behavior** and a cooperative spirit from a young age.
- Promote Multipurpose Societies:** Encourage the establishment of multipurpose societies that can comprehensively address the needs of their members. To achieve this, merge weaker and inefficient societies with stronger and more efficient ones.
- Invest in Infrastructure Development:** Implement digitalization in governance, banking, and businesses to create a transparent, accountable, and efficient system.
- Develop a Skilled Workforce:** Provide cooperative training to employees of cooperatives, as well as students in schools, colleges, universities, and technical and professional institutions. Offer training to individuals interested in forming cooperatives who may be unfamiliar with the various procedures and requirements.

OVERHAULING INDIAN CRIMINAL JUSTICE SYSTEM

CONTEXT

The Union Home Minister introduced **three new bills** in the Lok Sabha to **revamp India's criminal justice system**.

MORE ON THE NEWS

- The three new bills include the following:**
 - The Bharatiya Nyay Sanhita Bill, 2023**, which will replace the IPC, 1860.
 - Indian Penal Code (IPC)** is the official criminal code of India drafted in 1860 in the wake of the first law commission established in 1834 under the Charter Act of 1833.
 - The Bhartiya Nagrik Suraksha Sanhita Bill, 2023**, which will replace the CrPC, 1898.
 - Code of Criminal Procedure (CrPC)** provides procedures for administering criminal law in India. It was enacted in 1973 and became effective on 1 April 1974.

Three bills introduced in Lok Sabha

Indian Penal Code (IPC), 1860 TO BE REPLACED BY Bharatiya Nyaya Sanhita Bill, 2023	Code of Criminal Procedure (CrPC), 1973 TO BE REPLACED BY Bhartiya Nagrik Suraksha Sanhita, 2023
<ul style="list-style-type: none"> It will have 356 sections (instead of 511 sections in IPC) 175 sections have been amended 8 sections have been added, and 22 sections have been repealed 	<ul style="list-style-type: none"> It will have 533 sections (instead of 478 sections in CrPC) 160 sections have been changed 9 sections have been added, and 9 sections have been repealed
Indian Evidence Act, 1872 TO BE REPLACED BY Bhartiya Sakshya Bill, 2023	<ul style="list-style-type: none"> It will have 170 sections (instead of 167 sections in IEA) 23 sections have been changed 1 section has been added, and 5 sections have been repealed

From 1860 to 2023, the country's criminal justice system functioned as per the laws made by the British. I can assure the House that these bills will transform our criminal justice system. The aim will not be to punish, it will be to provide justice." — AMIT SHAH

WHAT NEXT
The three bills will be studied by the standing committee on home affairs, which is chaired by BJP MP Brijlal (who is a retd IPS officer).

- **The Bharatiya Sakshya Bill, 2023**, which will replace the Evidence Act, 1872.
- ✓ **The Indian Evidence Act**, originally passed in India by the Imperial Legislative Council in 1872, during the British Raj, contains a set of rules and allied issues governing admissibility of evidence in the Indian courts of law.

The Need for new bills:

- The need for reforming the criminal justice system in India has been **felt for a long time**.
- The current laws are based on the **colonial legacy** and do not reflect the contemporary realities and aspirations of Indian society.
- The laws are also **outdated, complex, and ambiguous**, leading to delays, inefficiencies, and injustices in the delivery of justice.
- Moreover, the laws are **not in sync with the constitutional values** and principles of India, such as equality, dignity, secularism, and human rights.
- Therefore, there has been a demand from various quarters, including the **judiciary, the legal fraternity, civil society, and the public**, to revamp the criminal justice system in India.

Proposed Changes in the New Bills:

The Bharatiya Nyay Sanhita (BNS) Bill, 2023	<ul style="list-style-type: none"> <input type="checkbox"/> The bill defines terrorism and offenses such as separatism, armed rebellion against the government, challenging the sovereignty of the country, which were earlier mentioned under different provisions of law. <input type="checkbox"/> It repeals the offense of sedition, which was widely criticized as a colonial relic that curbed free speech and dissent. <input type="checkbox"/> It prescribes capital punishment as the maximum sentence for mob lynching, which has been a menace in recent years. <input type="checkbox"/> It proposes 10 years imprisonment for sexual intercourse with women on false promise of marriage, which is a common form of deception and exploitation. <input type="checkbox"/> The bill introduces community service as a form of punishment for specific crimes, which can help in reforming offenders and reducing overcrowding in prisons. <input type="checkbox"/> The bill fixes a maximum limit of 180 days to file a charge sheet, which can speed up the trial process and prevent indefinite delays.
The Bhartiya Nagrik Suraksha Sanhita (BNSS) Bill, 2023	<ul style="list-style-type: none"> <input type="checkbox"/> It promotes the use of technology for trials, appeals, and recording depositions, allowing video-conferencing for proceedings. <ul style="list-style-type: none"> - The bill makes video-recording of statement of survivors of sexual violence compulsory, which can help in preserving evidence and preventing coercion or manipulation. <input type="checkbox"/> The bill mandates that police must inform about the status of a complaint in 90 days, which can enhance accountability and transparency. <input type="checkbox"/> Section 41A of the CrPC will be renumbered as Section 35. This change includes an added safeguard, stipulating that no arrest can be made without prior approval from an officer at least at the rank of Deputy Superintendent of Police (DSP), especially for offenses punishable by less than 3 years or for individuals above 60 years. <input type="checkbox"/> The bill requires that police consult the victim before withdrawing a case punishable by seven years or more, which can ensure that justice is not compromised or denied. <input type="checkbox"/> It allows absconding criminals to be tried in-absentia by court and sentenced too, which can deter fugitives from escaping justice. <input type="checkbox"/> It empowers magistrates to take cognizance of offenses based on electronic records such as emails, SMSs, WhatsApp messages etc., which can facilitate evidence collection and verification. <input type="checkbox"/> Mercy petitions in death sentence cases to be filed within 30 days to the Governor and within 60 days to the President. <ul style="list-style-type: none"> - No appeal shall lie against the President's decision in any court.
The Bharatiya Sakshya Bill (BSB), 2023	<ul style="list-style-type: none"> <input type="checkbox"/> The bill defines electronic evidence as any information generated or transmitted by any device or system that is capable of being stored or retrieved by any means. <input type="checkbox"/> It lays down specific criteria for admissibility of electronic evidence such as authenticity, integrity, reliability etc., which can prevent misuse or tampering of digital data.

- It provides for special provisions for **admissibility of DNA evidence** such as consent, chain of custody etc., which can enhance accuracy and reliability of biological evidence.
- It recognises **expert opinion as a form of evidence** such as medical opinion, handwriting analysis etc., which can assist in establishing facts or circumstances relevant to a case.
- It introduces the **presumption of innocence** as a fundamental principle of the criminal justice system, which means that every person accused of an offense is presumed to be innocent until proven guilty beyond reasonable doubt.

ABOUT THE CRIMINAL JUSTICE SYSTEM

- The system that deals with agencies of government that are responsible for **enforcing the law in the country, maintaining peace and harmony and treating criminal conduct** is known as the criminal justice system.
- The aim of the criminal justice system is to ensure that **every person who suffers an injury or loss** at the hand of others is allowed to present his case and seek justice.
- Objectives of a criminal justice system:**
 - To punish the wrongdoers.
 - Prevent the further occurrence of crime in society.
 - Regulate the behaviour and conduct of people, especially criminals.
 - Provide relief to the victim.
 - Treatment of offenders and their rehabilitation.
 - To create deterrence in the minds of people at large not to indulge in any criminal activity.



TYPES OF CRIMINAL JUSTICE SYSTEMS

- There are **two major types** of criminal justice systems in the world. These are:
- Adversarial System:** This system is followed in **common law countries** that were once **colonies of a particular country**.
 - In this system, there is a **prosecution advocate** and a **defense advocate** who argue before the court, and the case is decided on the basis of principles of evidence law and procedural laws.
 - This system presumes the accused to be **innocent until proven guilty** beyond a reasonable doubt.
 - **India follows this system** because it was once a colony of the British empire and hence called a common law country.
 - In this system, **both parties are given rights to a fair trial and hearing**, and so justice is delayed.
- Inquisitorial System:** This system is followed in **civil law countries**.
 - In this system, the **judge can himself investigate** the matter and decide the case on the basis of investigation and inquiry.
 - The counsel from each side is present, but unlike in the adversarial system, there **is no cross-examination of witnesses**.
 - The decision and its accuracy depend on the **prudence and skills of the judge**.
 - This **trial procedure is much faster** in this system, and it is not costly.

OVERVIEW OF THE CRIMINAL JUSTICE SYSTEM IN INDIA

- Criminal law in India consists of the **Indian Penal Code, 1860** which defines the various offences along with their punishment and the **Criminal Procedure Code, 1973** which gives the procedure of the trial. The evidence is further governed by the **Evidence Act, 1872**.
- The Indian criminal justice system follows an adversarial system and depends on the maxim "**let 100 culprits be acquitted and freed, but one innocent person should never be convicted**".

NEED FOR REFORMS IN THE CRIMINAL JUSTICE SYSTEM IN INDIA

- Pendency of cases:** There are many pending cases in the court which result in delayed justice. According to a maxim, "justice delayed is justice denied".
 - The reports for 2022 reveal that almost 4.7 crore cases are pending in the courts.

- Undertrial prisoners:** Prisons in the country are filled with undertrial prisoners, leading to the problem of overcrowded jails.
 - Reports from 2020 reveal that 70% of the population in prison consists of under-trial prisoners.
 - This is also an infringement of their fundamental right to life under Article 21 of the Constitution.
- Lack of judges:** The courts in India suffer from a shortage of judges, which puts pressure on the judiciary as there is an increase in the number of cases pending in the courts.
 - According to the statistics and reports, there are 19 judges for approximately 10 lakh people in the country, revealing a huge shortage.
- Ineffectiveness of the justice system:** Due to corruption and political influence on the judiciary, the criminal justice system has become ineffective.
 - This leads to a situation where an accused easily escapes from their liability and an innocent person has to spend their life in prison.
- Issues within the police force:** It is the duty of the police to investigate the matter and find evidence to extract the truth. However, at times, the officers misuse their powers to harass and torture the citizens. Thus, there is a need to reform the criminal justice system in the country.
- Human Rights Violations:** The criminal justice system is often accused of violating the human rights of the accused, victims, witnesses, and other stakeholders. There are instances of custodial torture, extrajudicial killings, false arrests, illegal detentions, coerced confessions, unfair trials, and harsh punishments.
- Outdated Laws and Procedures:** The criminal justice system is based on laws and procedures that were enacted by the British in 1860. These laws are archaic and not in tune with contemporary times. They do not address new forms of crimes such as cybercrime, terrorism, organised crime, mob lynching, etc.

Recommendations of the Malimath Committee

The committee made various recommendations on criminal law and the criminal justice system. Some of its recommendations are as follows:

- It suggested changing the **adversarial form of the criminal justice system** to an inquisitorial system for speedy trials and to deal with the issue of pending cases.
- It recommended the **right to silence** for the accused against self-harming statements under Article 20(3) of the Constitution.
- It is felt that the **presumption of innocence** of an accused puts an extraordinary and unreasonable burden on the prosecution to prove the charges, which leads to a delay in justice.
- The committee made recommendations for **compensation to the victim**.
- It also made suggestions to **reform the police system** in the country and make it accountable and transparent.
- It stressed the **appointment of public prosecutors** through **competitive exams**.
- It suggested that every higher court must have **judges specializing in criminal law**.
- It recommended to **re-classify the offences** as socio-economic offences, correctional code etc.
- A **Presidential Commission** must be established in order to inspect the criminal justice system at regular intervals.

SIGNIFICANCE OF THE PROPOSED REFORMS

- Modernization and Simplification:** The reform aims to modernize and simplify the criminal laws, which are outdated and complex. The reform will make the laws more in tune with the Indian spirit and ethos, and reflect the changing nature of crime, society, and technology.
- Protection of Free Speech:** The repeal of the sedition law (Section 124A of the IPC) addresses concerns of misuse against dissenters and government critics.
 - This move promotes **freedom of speech and expression**, safeguarding the democratic values and principles of the nation.
- Addressing Contemporary Crimes:** The reform will also introduce new offences such as terrorism, corruption, mob lynching, and organised crime, which are not adequately covered by the existing laws.
- Gender Neutrality:** The reform will make some of the sexual offences gender neutral, by including men and transgenders as potential victims and offenders, in addition to women.
- Utilizing Technology:** The reform will increase the use of electronic evidence and forensics during investigation, prosecution, and adjudication.

- Empowering Citizens:** The reform will empower the citizens, by allowing them to register a police complaint in any police station, regardless of the location where the crime took place.
 - The reform will also provide for **effective protection of the constitutional rights** of citizens, such as right to life, liberty, dignity, privacy, and fair trial.

CONCERN WITH THE PROPOSED REFORMS

- Lack of Consultation and Transparency:** The bills were drafted by a Criminal Law Reforms Committee, 2020.
 - The composition **did not include any representatives from the judiciary, the bar, the civil society, or the marginalized communities.**
 - The committee also did not make its **report or draft bills public** for wider consultation and feedback.
- Lack of Coherence and Consistency:** The bills have been accused of being inconsistent and contradictory with each other and with other existing laws. For example,
 - **The BSB** also introduces a **new standard of proof for conviction** from "beyond reasonable doubt" to "clear and convincing evidence", which is not defined or explained in the bill.
 - **The BNSS** also creates a **new category of offences** called "social welfare offences" that can be dealt with by imposing fines or community service, but does not specify which offences fall under this category.
- Potential Violation of Human Rights:** The bills have been criticized for using **vague and broad terms** that could infringe on the human rights of the accused, victims, witnesses, and other stakeholders.
 - **For example, the BNS** introduces a new offence of "**acts endangering sovereignty, unity and integrity of India**" under Section 150, which is similar to the repealed offence of sedition under Section 124A of IPC. This could be used to suppress dissent and free speech.
 - **Similarly, the BSB** allows confessions made before a police officer to be admissible as **evidence under Section 27A**, which could increase the risk of custodial torture and coercion.
 - **The BNSS** also gives wide **powers to the police** to arrest, search, seize, and detain without any judicial oversight or safeguards.

WAY FORWARD

- Inclusive Engagement:** Begin a broader consultation process that involves all stakeholders, including the general public, to gather diverse perspectives before implementing reforms.
- Public Awareness:** Conduct awareness campaigns to educate the public about their rights and responsibilities within the criminal justice system, thereby enhancing relations between the police and the public.
- Consistent Legal Framework:** Ensure the proposed bills align coherently with existing laws, promoting consistency in the legal framework.
- Safeguarding Human Rights:** Explicitly integrate human rights principles and safeguards, while also providing clear definitions and minimizing vague terms to prevent potential misuse.
- Tech Integration:** Enhance technology usage in the criminal justice system by implementing digitized evidence collection, online proceedings, and video-recorded statements for faster trials, reduced backlog, and increased transparency.
- Embracing Restorative Justice:** Adopt restorative justice principles, emphasizing reconciliation, restitution, and rehabilitation to address the root causes of crime, lower recidivism rates, and provide closure to victims.

NPS AND OPS

CONTEXT

Several employees of the Union government and Central public sector undertakings are protesting, demanding the restoration of the old pension scheme (OPS).

WHAT IS THE OLD PENSION SCHEME (OPS)?

- The Old Pension Scheme (OPS) is a **retirement scheme** approved by the government. Government employees receive a monthly pension under the OPS.

- It provides a **guaranteed pension for government employees** who have completed at least ten years of service based on their last drawn basic salary and the years of service.
- Under the OPS, the **government pays the entire pension amount** to government employees after retirement. Thus, no amount is deducted from employees' salaries when they are in service.
- After retirement, government employees receive the pension amount and the **benefit of the revision of Dearness Allowance (DA) twice a year**.
- Since they receive **pensions based on their last drawn salary plus DA**, their pensions increase when the DA increases twice a year. However, OPS applies **only to government employees**.

INTRODUCTION OF THE NATIONAL PENSION SCHEME (NPS)

- The National Democratic Alliance (NDA) government **discontinued the OPS in 2004** and introduced the National Pension Scheme (NPS) for government employees.
 - The government **extended the scope of NPS** for all citizens, including self-employed and unorganized workers, in 2009.
 - It is a voluntary scheme administered by the **Pension Fund Regulatory and Development Authority (PFRDA)**.
- It is a pension scheme where **citizens can contribute an amount every month till 60 years** and receive a pension after retirement.
- Under the NPS, government employees can contribute **10% of their basic salary plus Dearness Allowance (DA)**, and the government contributes 14% of the basic salary plus DA every month.
 - Other citizens can contribute a **minimum of Rs.500 monthly towards NPS**.
- NPS is a **market-linked annuity scheme** where an individual can invest a regular amount during employment and receive an annuity when they retire.
 - The contributions are **consolidated into a pension fund**, which invests in a diversified portfolio of government bills, bonds, corporate shares, and debentures.
- Professional fund managers** regulated by the PFRDA, such as SBI, LIC, UTI, etc., manage the NPS investments.
 - Upon retirement, an individual can **withdraw up to 60% of the NPS amount** and **invest the remaining 40%** with any of the ten professional fund managers to receive pension annuities as a monthly pension.

DIFFERENCE BETWEEN OLD PENSION SCHEME AND NATIONAL PENSION SCHEME

Particulars	Old Pension Scheme	New Pension Scheme
Eligible employees	Only government employees	Government employees, individual citizens between 18-60 years and NRIs
Pension payment basis	Provides pensions to government employees based on their last drawn salary plus DA	Provides pension based on the investments made in the NPS scheme during their employment
Pension amount	50% of the last drawn salary plus DA or the average earnings in the last 10 months of service, whichever is more, is given as a pension	60% lump sum after retirement and 40% invested in annuities for getting a pension
Contribution amount	Employees don't contribute any amount	Government employees contribute 10% of their salary (basic + dearness allowance), and the government contributes 14%
Income tax benefits	No tax benefits	Employees can claim tax deductions of up to 1.5 lakh under Section 80C of income tax and up to Rs.50,000 on other investments under 80CCD (1b)
Tax on pension amount	The pension amount is tax-free	60% of the NPS corpus is tax-free, while the remaining 40% is taxable

OLD PENSION SCHEME ADVANTAGES AND DISADVANTAGES

Advantages of the OPS	Disadvantages of the OPS
<ul style="list-style-type: none"> <input type="checkbox"/> It assures life-long income post-retirement. <input type="checkbox"/> Employees get a pension under a predetermined formula, i.e., 50% of the last drawn basic salary plus DA or the average earnings in the last ten months of service, whichever is more. <input type="checkbox"/> Employee's pension increases with the revision of DA twice a year. <input type="checkbox"/> There was no deduction from the salary of employees for pension payments. <input type="checkbox"/> The government bears the expenditure incurred on a pension. <input type="checkbox"/> It provides guaranteed, inflation and pay commission-indexed pension payments to retired government employees and their spouses. 	<ul style="list-style-type: none"> <input type="checkbox"/> It is a massive pension burden on the Central and State government. <input type="checkbox"/> There is no corpus created for pensions which could grow continuously and reduce the government's liability for pension payments. <input type="checkbox"/> It is unsustainable since the pension liabilities would keep increasing every year. <input type="checkbox"/> Since life expectancy has increased due to better health facilities, resulting in longevity, the government has to bear the extended pension payouts.

NATIONAL PENSION SCHEME ADVANTAGES AND DISADVANTAGES

Advantages of NPS	Disadvantages of NPS
<ul style="list-style-type: none"> <input type="checkbox"/> Employees can withdraw 60% of the corpus upon retirement, which is tax-free. <input type="checkbox"/> Employees have more flexibility and control over NPS investments since they can choose the professional fund manager with the highest return. <input type="checkbox"/> It provides higher returns regardless of equity or debt since qualified professional fund managers manage the NPS investments. <input type="checkbox"/> A tax deduction is available for NPS contributions made every year during employment. <input type="checkbox"/> PFRDA regulates NPS with transparent investment norms, regular performance reviews and monitoring of fund managers by NPS trust, making it a safe investment option. <input type="checkbox"/> NPS accounts can be operated and managed online. <input type="checkbox"/> Employees can withdraw the NPS contributions before retirement. They can withdraw a certain amount after ten years of opening the account, and three withdrawals are allowed till they reach 60 years. 	<ul style="list-style-type: none"> <input type="checkbox"/> Employees should contribute 10% of their basic salary plus DA towards their monthly pension. <input type="checkbox"/> The pension amount is not fixed since it is paid based on the return on investments made in market-linked instruments managed by professional fund managers. <input type="checkbox"/> Many people are unaware of financial terms, such as equities, debt, securities, etc. Hence, they may fail to choose the best NPS fund manager for their investments.

SELF HELP GROUPS (SHGS)

CONTEXT

The government is planning skill development training for two crore women under the 'Lakhpatti Didi' scheme.

ABOUT THE 'LAKHPATI DIDI' SCHEME

- Lakhpatti Didi Scheme aims to encourage women to start **micro-enterprises** to help them earn at least Rs 1 lakh annually from the **Self Help Groups (SHGs)**.
- Under the scheme, women will be trained in skills like **LED bulb making, plumbing, and repairing drones**, among others.
- The scheme is **already in place in some states**, and now the government is planning to train **2 crore women** under it.

WHAT ARE SELF HELP GROUPS (SHGS)?

- A Self Help Group is defined as a "self-governed, peer-controlled information group of people with similar socio-economic background and having a desire to **collectively perform common purpose**."
- It is a method of **organizing the poor people and the marginalized** to come together to solve their individual problem.
- The poor collect their **savings** and save it in **banks**. In return they receive **easy access to loans** with a small rate of interest to start their micro unit enterprise.
- The SHG method is used by the **government, NGOs** and others worldwide.

Historical background:

- First ever SHG started from the **Gramin Bank of Bangladesh**. This group was created by Chittagong University economist Professor **Mohammed Yunus** in **1975** to provide small loans to impoverished individuals, primarily women, to help them start or expand businesses.
- SHG's became the **path for rural loan** in many regions of the world in a short period of time. In **1947** at the **world microcredit summit in Washington** many developed and rich countries offered to use **micro credit facilities in rural areas** to avoid rural poverty.

HOW DOES SHGS FUNCTION?

- An SHG normally consists of not **less than five persons** (with a **maximum of twenty**) of **similar economic outlook and social status**.
- The members of the group help each other** to solve their problems. A reasonably educated but helpful local person takes the lead in **mobilizing these people** to form a group.
- The person, called **animator or facilitator**, helps the group members develop the habit of thrift and **promote small savings** among them. The group savings are kept in a **common bank account** from which small loans are given to members.
- After six months, the SHG can **approach any bank for availing loan facility** to undertake a suitable entrepreneurial activity.
- The group **loan is distributed among the members** to run a small business. The loan is **repaid out of the profits earned**.

EVOLUTION OF SHGS IN INDIA

- The origin of SHGs in India can be traced back to the establishment of the **Self-Employed Women's Association (SEWA)** in **1972**.
- SHG as an **organized way for poverty eradication** was immerged during the **7th Five Year Plan (1985-90)**.
- The **SHG Bank Linkage Project** initiated by **NABARD** in **1992** has grown into the **largest microfinance endeavor** globally.
- In **1993**, **NABARD**, in collaboration with **RBI**, authorized SHGs to establish **savings accounts in banks**. This decision significantly propelled the **SHG movement**.
- In **1999**, Government of India, introduced **Swarn Jayanti Gram Swarozgar Yojana (SGSY)** to promote **self-employment in rural areas** through formation and **skilling of SHGs**.
- The programme evolved as a **national movement** in **2011** and became **National Rural Livelihoods Mission (NRLM)** – world's largest poverty alleviation programme.

BENEFITS OF SHGS

- Empowerment of Women:** SHGs have played a crucial role in empowering women in rural areas by providing them with a platform to voice their opinions, make decisions, and take control of their lives.
 - India boasts of some **12 million SHGs**, of which **88 per cent are all-women-member ones**.
- Financial Inclusion:** SHGs promote financial inclusion by encouraging members to save regularly and access credit from formal financial institutions.
- Poverty Alleviation:** SHGs contribute to poverty alleviation by promoting income-generating activities, providing access to credit for small businesses, and enhancing livelihood opportunities for members.
- Skill Development and Entrepreneurship:** SHGs encourage skill development and entrepreneurship by providing a platform for members to learn new skills and engage in income-generating activities.
- Social Capital:** SHGs build social capital among members, enabling them to collectively negotiate for better services, resources, and rights from local authorities and institutions.

SEVERAL CONCERNs ASSOCIATED WITH SHGS

- Credit Mobilization:** A study has shown that about 48% of the members had to borrow from local money lenders, relatives and neighbors because they were getting inadequate loan from groups. Also issues like hoarding of money was witnessed.
- Lack of training and capacity building:** Most of the SHGs work on their own without outreach from the state for skill development and capacity building.
- Lack of Technology:** Most of the SHGs work with rudimentary or no technology.

- Politicization:** Political affiliation and interference has become a serious problem with SHGs. Political affiliation is also a major reason for group conflicts.
- Too much dependence on government and NGOs:** Many SHGs are dependent on the promoter agencies for their survival. In case these agencies withdraw their support, the SHGs are vulnerable to downfall.
- Lacks security:** SHGs are mostly not registered. They are run based on the trust between the members. The savings made by the SHG members may not be safe, which brings in mistrust between the members.

INITIATIVES TO PROMOTE SHGS

Self Help Group-Bank Linkage Programme	<ul style="list-style-type: none"> <input type="checkbox"/> On the recommendations of SK Kalia Committee, the SHG-Bank linkage programme was started at the initiative of NABARD in 1992 to link the unorganised sector with the formal banking sector. <input type="checkbox"/> Under this programme, banks were allowed to open savings accounts for Self-Help Groups (SHGs). <input type="checkbox"/> Banks provide loans to the SHGs against group guarantee and the quantum of loan could be several times the deposits placed by such SHGs with the banks.
Priority Sector Lending	<ul style="list-style-type: none"> <input type="checkbox"/> GOI has included SHG as a priority sector to mandate and enhance banks focus on them. <input type="checkbox"/> Bank credit to members of SHGs is eligible for priority sector advance under respective categories viz., Agriculture, Micro, Small and Medium Enterprises, Social Infrastructure and Others.
Grain banks	<ul style="list-style-type: none"> <input type="checkbox"/> SHG, have been allowed to run grain banks to secure the food security in food & care regions.
Priyadarshini scheme	<ul style="list-style-type: none"> <input type="checkbox"/> With NABARD as the nodal agency, has aimed at women empowerment and livelihood enhancement through SHGs.
Deendayal Antodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM)	<ul style="list-style-type: none"> <input type="checkbox"/> It seeks to alleviate rural poverty through building sustainable community institutions of the poor. <input type="checkbox"/> Mission closely works with the Department of Financial Services (DFS), Reserve Bank of India (RBI) and the Indian Bank Associations (IBA) to provide bank credit to SHGs.

CASE STUDIES ON SHGS

- Kudumbashree in Kerala:** It was launched in Kerala in 1998 to **wipe out absolute poverty** through community action. It is the **largest women empowering project** in the country. It **has three components** i.e., microcredit, entrepreneurship and empowerment. It has **three tier structure** - neighborhood groups (SHG), area development society (15-20 SHGs) and Community development society (federation of all groups). Kudumbashree is a **government agency** that has a budget and staff paid by the government. The three tiers are also managed by unpaid volunteers.
- Mahila Arthik Vikas Mahamandal (MAVIM) in Maharashtra:** SHGs in Maharashtra were unable to cope with growing volume and **financial transactions** and needed professional help. **Community managed resource centre (CMRC)** under MAVIM was launched to provide financial and livelihood services to SHGs. CMRC is self-sustaining and provides **need-based services**.

WAY FORWARD

- Integrated Approach for Credit and Linkages:** This involves connecting SHGs with technology, processing, and marketing organizations to ensure a comprehensive support system that addresses various aspects of their livelihoods.
- Diversified Credit Activities:** This suggestion highlights the need to offer credit for a diverse range of activities that contribute to income generation, livelihood enhancement, housing, consumption needs, and even emergencies.
- Responsive Delivery System:** To improve the functioning of SHGs, the delivery system should be proactive and responsive to the financial needs of the members, particularly farmers.
- Training Programs:** These programs could cover topics such as financial management, record-keeping, production techniques, marketing strategies, and other skills that contribute to successful entrepreneurship.
- Gender Sensitization:** Recognizing the important role of women in SHGs, it's suggested to provide gender sensitization training to bank staff who interact with SHG members.

- Insurance Coverage:** Protect SHG-promoted businesses with adequate insurance against unforeseen losses.

SUB-CATEGORISATION OF OTHER BACKWARD CLASSES

CONTEXT

The long-awaited report of the Rohini commission that was set up to examine the sub-categorisation of Other Backward Classes (OBCs) was submitted to the President recently.

THE ROHINI COMMISSION

- The Justice G Rohini Commission, **headed by Justice G. Rohini**, a retired Chief Justice of Delhi High Court, was appointed on October 2, 2017.
- The commission **was established to address perceived distortions in the affirmative action policy related to Other Backward Classes (OBCs)** in India.
 - The affirmative action policy in India **includes a reservation system that grants certain percentages of seats and jobs in government institutions and educational institutions** to individuals from socially and educationally backward communities.

NEED FOR SUBCATEGORIZATION OF OBCS

- The need for sub-categorization of OBCs arises **from the desire to ensure equitable distribution** of the reservation benefits among different OBC communities.
- The **27% reservation for OBCs was intended to provide opportunities** and representation to historically marginalised and disadvantaged communities.
- However, over time, it was noticed that **only a few relatively affluent OBC communities were benefiting significantly from this quota**, while many others remained underrepresented and did not enjoy the full benefits of reservation.
- Thus, the **idea of subcategorization was to create further classifications or sub-quotas within the overall 27% OBC reservation**, so that the less privileged and more marginalised OBC communities get a fair share of the opportunities.
- Sub-categorization would allow the government to allocate specific percentages of the OBC quota to **different groups within the OBC category based on their social and economic backwardness**.
 - This is **expected to ensure that the benefits of reservation are distributed more fairly** and effectively reach those OBC communities that have historically remained deprived of educational and employment opportunities.

TERMS OF REFERENCE OF THE JUSTICE G ROHINI COMMISSION

- Examine the extent of inequitable distribution of benefits of reservation among the castes or communities included in the broad category of Other Backward Classes (OBCs) with reference to such classes included in the Central List.
- Work out the mechanism, criteria, norms, and parameters in a scientific approach for sub-categorization within such OBCs.
- Take up the exercise of identifying the respective castes or communities or sub-castes or synonyms in the Central List of OBCs and classifying them into their respective sub-categories.
- Study the various entries in the Central List of OBCs and recommend correction of any repetitions, ambiguities, inconsistencies, and errors of spelling or transcription.
- The initial tenure of the commission was 12 weeks, ending on January 3, 2018, but it received repeated extensions.
- In 2019, the commission wrote to the government expressing the need for clarifications and rectifications in the list before proceeding with sub-categorization.
- Consequently, in 2020, the fourth item was added to the terms of reference to address the corrections and ambiguities in the Central List of OBCs.

Parity check

The panel will report on the extent of inequitable distribution of benefits, including quotas, among the OBCs and work out scientific norms of sub-categorisation

Nine States already have OBC sub-categorisation, but the Cabinet move would take the concept to the Central level too



POLITICAL MEANING
Politically, this means an outreach to more backward castes among the OBCs but it may mean that the quotas available for better-off OBC groups shrink. The Centre cannot breach the cap of 50% imposed on quotas by the SC

OBCs as a whole are estimated to number anywhere between 41%-52% of the country's total population

PRELIMINARY FINDINGS OF ROHINI COMMISSION

The Commission analysed the data of **1.3 lakh central jobs** given under OBC quota over the preceding five years and OBC admissions to central higher education institutions (including universities, IITs, NITs, IIMs and AIIMS). The findings were:

- 97%** of all jobs and educational seats have gone to just **25% of all sub-castes** classified as OBCs.
- 95%** of these jobs and seats have gone to just **10 OBC communities**.
- 983 OBC communities** (37% of the total) have **zero representation** in jobs and educational institutions.
- 994 OBC sub-castes** have a total **representation** of only **2.68%** in recruitment and admissions.

CENTRAL GOVT EMPLOYEES BY SOCIAL CATEGORY						
	TOTAL	SC	ST	OBC	EWS	OTHERS
Group-A	50,068	6,440 (12.86%)	2,826 (5.64%)	8,455 (16.88%)	11 (0.02%)	32,226 (64.58%)
Group-B	1,25,732	20,954 (16.66%)	8,244 (6.55%)	19,829 (15.77%)	5 (0.04%)	76,700 (61.0%)
Group-C (excluding safai karmacharis)	3,22,503	58,744 (18.22%)	22,296 (6.91%)	72,710 (22.54%)	84 (0.03%)	1,68,639 (52.29%)
Group-D (safai karmacharis)	13,722	4,507 (32.72%)	1,056 (7.66%)	2,774 (20.14%)	0	5,435 (39.46%)
TOTAL	5,12,075	90,675 (17.70%)	34,422 (6.72%)	1,03,768 (20.26%)	100 (0.02%)	2,83,110 (55.28%)

CHALLENGES BEFORE ROHINI COMMISSION

- Lack of Data:** The absence of data for the **population** of various communities to compare with their representation in jobs and admissions.
- Lack of Survey:** The Commission had written to the Ministry of Social Justice and Empowerment in 2018 to request an appropriate **Budget provision** for a proposed **all-India survey** to estimate the caste-wise population of OBCs.
- Reluctance of Government:** In 2018, the Home Ministry had announced that in Census 2021, data of OBCs will also be collected, but since then the government has been silent on this.

UNDERSTANDING BACKWARD CLASSES AND OBCS

Backward Classes in India

- The backward classes are **not defined under the Indian Constitution**, but they refer to **economically and academically underprivileged individuals** compared to other social groups.
- The Backward Classes suffer from disadvantages and **disabilities** which are age-old, and which derive their sanction mainly from the **caste system**.
- Low status, poverty** and illiteracy are social problems, which they have inherited due to their ascribed status of being born in a low caste or tribe.
- The backward classes comprise roughly **one-third** of the total population in India. They are made up of:
 - **The Scheduled Tribes**
 - **The Scheduled Castes**
 - **The Other Backward Classes**
- The characteristics of backwardness are mentioned in different articles of the Indian Constitution:
 - **Article 15 (4)** speaks of social and educational backwardness.
 - In **Article 16 (4)**, mention is made of backward classes and their inadequate representation in services.
 - **Article 23** speaks of forced labour.
 - **Article 46** refers to weaker sections of the people in which the scheduled castes and scheduled tribes are included.

Who are Other Backward Classes (OBCs)?

- Other Backward Classes (OBCs) comprise the so called '**non-unouchable**', lower and intermediary castes who were traditionally engaged in agriculture, animal husbandry and handicrafts services.
- As per the Indian Constitution, they are **socially and educationally backward** classes.
- Article 340** gives the President the power to constitute a committee to investigate the conditions of backward classes in India and recommend measures for their welfare, upliftment, and development.

Reservations for the OBCs

- Protective Discrimination:** The constitution makers made special provisions for the upliftment of the backward classes in the form of protective discrimination. The policy of reservation is an instance of protective discrimination.

- First Backward Classes Commission (1953):** The Government under Jawaharlal Nehru appointed a commission under article 340 to identify backward classes other than the SCs and STs at the national level. It was headed by **Kaka Kalelkar.**
 - The Commission submitted its report in 1956 and recommended that caste is an important measure of backwardness.
 - The recommendations were **rejected** by the Union government as they failed to apply more objective criteria such as income and literacy.
- Second Backward Classes Commission (1978):** It was appointed by the Janata Party Government in 1978 under Article 340.
 - This Commission known as **Mandal Commission** submitted its report in 1982.
 - It identified 3943 castes as OBC and recommended **27% reservation in government and semi-government** jobs and admission to educational institutions.
 - In 1990, the Union Government headed by **V.P. Singh** issued an office memorandum extending 27% reservation to the OBCs on the lines recommended by the Mandal Commission.
 - The memorandum provided reservation for Socially and Educationally Backward Classes (SEBCs) of 27 % of the vacancies filled by **direct recruitment** in civil posts and services under the Union Government, PSUs and Financial Institutions.
 - A number of writ petitions were filed in the Supreme Court questioning the said Memorandum along with applications for staying the operation of the Memorandum.
- Issue of Creamy Layer:** The Supreme Court examined this issue and gave a landmark judgement in **Indra Sawhney vs Union of India Case (1992).**
 - The SC permitted the Union Government to reserve 27% of the jobs for the OBCs subject to the **exclusion of the 'creamy layer'** among the OBCs.
 - ✓ A person with an annual income of ₹8 lakh and above is classified as "creamy layer" and cannot get the reservation benefits.

National Commission for Backward Classes

- It is a body set up under the National Commission for Backward Classes Act, 1993.
- 102nd Constitution Amendment** Act, 2018 provides constitutional status to the National Commission for Backward Classes (NCBC).
- It has the authority to examine complaints and **welfare measures** regarding socially and educationally backward classes.
- Previously NCBC was a **statutory body** under the Ministry of Social Justice and Empowerment.

WAY FORWARD

- It is impossible to conduct an accurate sub-categorisation of Other Backward Classes groups without some form of a caste census.
- The Rohini Commission must incorporate the data from the last **Socio-Economic Caste Census (SECC)** conducted in 2011.
- The sub-categorisation of OBCs can ensure the **maximum reservation** going to caste groups that have been historically crowded out and **minimum reservation** for the dominant caste groups.

ROLE OF GOVERNOR IN PUBLIC UNIVERSITIES

CONTEXT

The West Bengal assembly passed a **Bill to replace governor with Chief Minister as Chancellor of state universities.**

MORE ON THE NEWS

- This is the **second time that the bill was passed** in the Assembly. The bill was passed last year however the Governor was yet to give his assent to the Bill.
- According to the West Bengal government, the decision was taken after considering the recommendation of the **M M Punchhi Commission on Centre-State Relations**, which had stated that it would not be proper to appoint the Governor as the Chancellor considering his other constitutional obligations.
- Similar developments in the past:**

- In November 2022, the Kerala government brought an ordinance to remove the governor as Chancellor of State-run universities.
- In April 2022, the Tamil Nadu Legislative Assembly passed two Bills, to transfer the power of appointing the Vice-Chancellor (in public universities) from the Governor, to the state government.
- In 2021, Maharashtra amended the process to appoint the Vice Chancellor of state public universities.
- In 2013, the Narendra Modi-led Gujarat government brought the **Gujarat Universities Laws (Amendment) Bill, 2013**, which took all the powers of the Governor as Chancellor – the bill received the Governor's approval only in 2015.

WHO IS THE CHANCELLOR & WHAT IS HIS/HER ROLE IN PUBLIC UNIVERSITIES?

- The Chancellor functions as the **head of public universities**, and **appoints the Vice-Chancellor of the university**.
- Powers and functions:**
 - The Chancellor can **declare invalid, any university proceeding** which is not as per existing laws.
 - In some states (such as Bihar, Gujarat, and Jharkhand), the Chancellor has the power to **conduct inspections in the university**.
 - The Chancellor also **presides over the convocation of the university**, and confirms proposals for conferring honorary degrees.
 - The Chancellor presides over the meetings of various university bodies (**such as the Court/Senate of the university**).
 - ✓ The Court/Senate decides on matters of general policy related to the development of the university, such as: (i) establishing **new university departments**, (ii) conferring and withdrawing **degrees and titles**, and (iii) instituting **fellowships**.

WHAT ARE THE POWERS OF A GOVERNOR IN RELATION TO PUBLIC UNIVERSITIES?

State Universities	<input type="checkbox"/> In most cases, the Governor of the state is the ex-officio chancellor of the universities in that state . <input type="checkbox"/> In 1997, the Supreme Court held that the Governor was not bound by the aid and advice of the Council of Ministers , while discharging duties of a separate statutory office (such as the Chancellor).
Central Universities	<input type="checkbox"/> Under the Central Universities Act, 2009 , and other statutes, the President of India shall be the Visitor of a central university . <input type="checkbox"/> With their role limited to presiding over convocations , Chancellors in central universities are titular heads, who are appointed by the President in his capacity as Visitor . <input type="checkbox"/> The Vice Chancellor too are appointed by the Visitor from panels of names picked by search and selection committees formed by the Union government. <input type="checkbox"/> The Act adds that the President, as Visitor, shall have the right to authorize inspections of academic and non-academic aspects of the universities and also to institute inquiries.
Philosophy	<input type="checkbox"/> The original intent of making Governors hold the office of Chancellor and vesting some statutory powers on them was to insulate universities from political influence .

RECOMMENDATIONS BY VARIOUS COMMISSIONS

- The Sarkaria Commission:**
 - It acknowledged the **distinction between the Governor's constitutional role and the statutory role** performed as a Chancellor, and also underlined that the Chancellor is not obliged to seek the government's advice.
 - It recommended that state legislatures should **avoid conferring statutory powers on the Governor**, which were not envisaged by the Constitution.
- The Punchhi Commission:**
 - It observed that the role of Governor as the Chancellor may expose the office to controversies or **public criticism**. Hence, the role of the Governor should be **restricted to constitutional provisions only**.

INTERNATIONAL RELATIONS

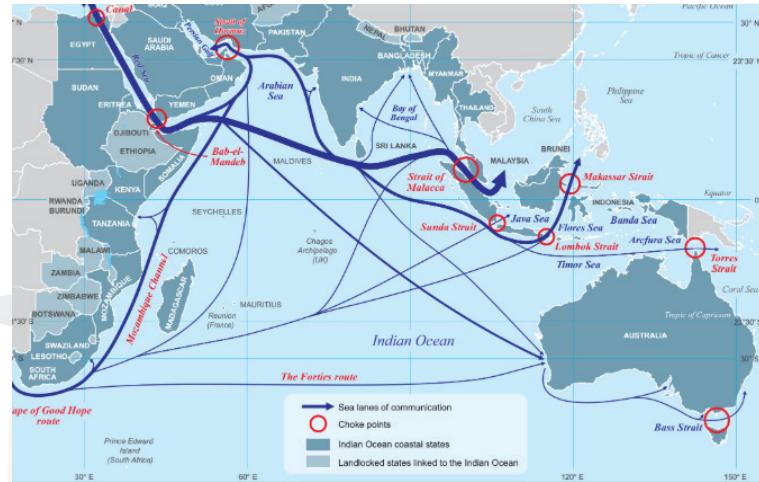
INDIA AND INDIAN OCEAN REGION

CONTEXT

Indian and Kenya signed an MoU for capacity building and collaboration in ship design and construction aiming for deeper cooperation in maritime security of Indian Ocean region.

INDIAN OCEAN REGION

- Indian Ocean is the **third largest water body in the world**.
- It is also known as '**sea of stability**'.
- It acts as a **lifeline to the international trade and transport** as it carries one third of the world's bulk cargo traffic and two thirds of the world's oil shipments (drive the economic vibrancy in Asia and Europe)
- The Indian Ocean contains a great degree of wealth in the form of abundance of **oil, natural gas, minerals**.
- While the **strategic and economic pivots are shifting to make the Indo-Pacific generally**, India has maintained trade and civilizational links with countries in the region since time immemorial.



SIGNIFICANCE OF INDIAN OCEAN

Economic:

- **Trade and Shipping:** The Indian Ocean region serves as a crucial maritime trade route, facilitating the movement of goods and resources between **Asia, Africa, Europe, and the Middle East**. A significant portion of the world's maritime trade, **approximately 75%**, passes through this region, making it a hub for international commerce.
- **Energy Resources:** The Indian Ocean contributes **around 40% of the world's offshore oil production**, with major oil-producing countries located along its shores. Also, the region is a vital source of **liquefied natural gas (LNG)**, and India, as the fourth-largest importer of LNG, depends significantly on these resources for its energy needs.
- **Sea Lanes of Communication (SLOCs):** The **three major Sea Lanes of Communication (SLOCs)** in the Indian Ocean are critical to global trade and energy security. These SLOCs connect major trading partners and energy suppliers, enabling the transportation of goods and resources.
- **Fishing Industry:** The Indian Ocean supports a substantial fishing industry that accounts for nearly 15% of the world's total fish catch. Fishing activities in the region contribute to global food supply, employment, and the economies of countries that rely on fishing as a significant sector.
- **Global Oil Transportation:** Approximately 50% of the world's daily oil consumption is transported through the Indian Ocean, making it a critical conduit for global energy flows. The sea routes in the region, including the **Strait of Hormuz** and the **Straits of Malacca**, are pivotal for the transportation of oil from key producing regions to major consumer markets.

Strategic and Security:

- India has a coastline of about 7500 km, and a large population is dependent on the fishing sector. Therefore, the **security in the region is vital for coastal security** as well as economic development.
- The region is a witness to continually evolving strategic developments including the competing rises of China and India, the US interventions in Iraq and Afghanistan, potential nuclear confrontation between India and Pakistan, terrorism, piracy in and around the Horn of Africa.

- The Straits of Hormuz, Malacca, and the Bab el Mandeb are some of the choke points.** These choke points are strategically important for global trade and energy. Countries like the USA, France and others maintain a naval presence in the Indian Ocean.
- China's special emphasis towards the Indian Ocean (through its Silk Road project and growing cooperation with the littoral nations) as well as its formation of the blue water navy increases the importance of the region.
- '**Pivot to Asia' policy of USA and 'OBOR & String of Pearls of China'**' has increased the strategic significance of the region.
- The docking of Chinese warships and submarine in Hambantota sends signals to protect the region.**

ROLE OF INDIA IN THE IOR

India's role in the Indian Ocean region is multifaceted and impactful, guided by its vision of '**SAGAR**' – Security and Growth for All in the Region.

- Security Provider and Maritime Strategy:** India has consistently advocated for maintaining the Indian Ocean as a Zone of Peace. Its maritime security strategy, outlined in the "**Ensuring Secure Seas**" document by the Indian Navy, covers vital areas such as the **Red Sea, Gulf of Oman, Gulf of Aden**, and the littoral countries of the Indian Ocean.
- Bilateral and Multilateral Engagements:** Through **exercises like Malabar** and bilateral engagements with nations like Indonesia, India showcases its readiness to play a critical role in the region. Initiatives like **re-engaging with the Indian Ocean Region (IOR)** and South Pacific nations underscore India's proactive engagement.
- Humanitarian and Disaster Relief:** India has actively participated in humanitarian and disaster relief operations. Notable examples include **assistance to Indonesia and Sri Lanka after the 2004 tsunami**, aid to Myanmar after Cyclone Nargis, and support to Bangladesh and Sri Lanka following cyclones. Such efforts highlight India's commitment to regional well-being.
- Blue Economy Development:** India's '**Sagarmala Project**' aims for port-led development using technology-driven modernization. This approach fosters sustainable growth by harnessing local resources and renewable inputs. The potential of the '**Blue Economy**' aligns with India's aspiration to become a \$10 trillion economy by 2032.
- Diaspora Engagement and Cultural Exchange:** India's historical diaspora has enriched the region with cultural diversity. The engagement of the Indian diaspora, facilitated by events like **Pravasi Bharatiya Diwas**, strengthens India's ties with the region and contributes to its growth trajectory.
- Space Technology Advancements:** India's indigenous **global navigation satellite system, NavIC**, enhances navigation capabilities for land, sea, and air. This technology's implications are particularly significant during natural and man-made disasters. Initiatives like the **South Asia Satellite (GSAT-9)** bolster communication, governance, education, healthcare, and disaster response across the region.

REGIONAL GROUPINGS IN THE IOR

- The region boasts of established regional organizations like **SAARC, BIMSTEC, ASEAN, GCC in the Gulf, IORA**, etc.
- Indian Ocean Rim Association** for Regional cooperation, also known as Indian Ocean Rim Association (IORA) is specifically dedicated to the Indian Ocean.

INDIAN OCEAN RIM ASSOCIATION

- It is an inter-governmental organisation aimed at strengthening regional cooperation and sustainable development within the Indian Ocean region through its **23 Member States bordering the Indian Ocean and 10 Dialogue Partners**.
- It was **formed in 1997** and its **secretariat is in Mauritius**.
- The IORA is a regional forum, tripartite in nature, bringing together representatives of Government, Business and Academia, for promoting co-operation and closer interaction among them.
- It is based on the **principles of Open Regionalism** for strengthening Economic Cooperation particularly on Trade Facilitation and Investment Promotion as well as Social Development of the region.
- The **members** include Australia, Bangladesh, Comoros, France, India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Mauritius,



Mozambique, Oman, Seychelles, Singapore, Somalia, South-Africa, Sri Lanka, Tanzania, Thailand, United Arab Emirates, Maldives and Yemen.

Significance:

- Regional cooperation among IORA countries will become increasingly important in order to ensure the **safety and security of vital trade routes**, particularly the choke points.
- It will help India to ensure the **freedom of navigation** and overflight over the region.
- Issues related to **Blue Economy and Piracy** will be addressed to ensure maritime safety and security.
- The IORA provides an effective **multilateral platform** that facilitates realization of untapped opportunities for **prosperity, peace and development** of the region through greater interactions.

MAJOR CHALLENGES FOR INDIA IN THE IOR

- Piracy:** Somalia-based piracy remains a significant concern in the Indian Ocean region. Piracy activities can disrupt maritime trade, endanger seafarers, and pose a threat to India's maritime interests.
- Trafficking:** The Indian Ocean region is known for drug production centers like the Golden Triangle and Golden Crescent, as well as other destabilizing activities such as gunrunning and human trafficking.
- Extra-Regional Military Presence:** The growing presence of extra-regional powers, such as China, in the Indian Ocean raises concerns about the balance of power and potential security challenges.
- Maritime Terrorism:** The extensive maritime activity in the IOR provides opportunities for terrorists to launch attacks on land, as demonstrated in the Mumbai terror attacks of 26/11.
- Regional Uncertainty:** Political and security uncertainties in neighboring countries like Somalia, Yemen, and Iran can lead to instability and insecurity in the IOR.
- Illegal Unreported and Unregulated (IUU) Fishing:** IUU presents a threat to maritime security because it gives piracy a base of operations.
- Climate Change and IOR:** Climate change may render the Indian Ocean nations vulnerable to stronger and more frequent and higher storm surges.
 - Sea surface temperature (SST) and upper ocean heat content (OHC, upper 700 m) in the tropical Indian Ocean underwent rapid warming during 1950–2015, with the SSTs showing an average warming of about 1 °C.

WAY FORWARD

- Regional Cooperation:** India needs to further elevate, strengthen and deepen its security cooperation with regional partners such as Sri Lanka, the Maldives, Seychelles and Mauritius, as well as the United States, Japan and Australia to protect its core security interests in the Indian Ocean.
- 5 Point Framework on Maritime Security:** The 5-point framework on maritime security by the UNSC should be implemented in letter and spirit. This includes:
 - Free maritime trade without barriers to establishing legitimate trade.
 - Settlement of maritime disputes should be peaceful and on the basis of international law only.
 - Responsible maritime connectivity should be encouraged.
 - Need to collectively combat maritime threats posed by non-state actors and natural calamities.
 - Preserve the maritime environment and maritime resources.
- Technological Advancement:** Importing and implementing most modern technology for predicting and preventing enemy attacks in oceans. Also, there is a need for modernization of the Navy.
- Keeping in mind **the Act East Policy**, and envisaging the future scenario in the Indian Ocean region and South-East Asia, the focus should be on developing the strategically located islands in Andaman and Nicobar.
- Policy Making:** Maritime security should be an integral part of Indian Foreign Policy; a well-defined policy should be there.

INDIA AND THE ARCTIC

CONTEXT

Murmansk, popularly called the **capital of the Arctic region** and the beginning point of the **Northern Sea Route (NSR)**, is witnessing the **rising trend of Indian involvement in cargo traffic**.

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- In the first seven months of 2023, India got a significant share with 35% of eight million tonnes of cargo handled by the **Murmansk port**.
- India has been showing greater interest **regarding the NSR** for a number of reasons.

Murmansk Port

- Murmansk is a seaport located on the **eastern shore of the Kola Bay** of the **Barents Sea** in the city of Murmansk, Russia.
- It is located about 2,000 km northwest of Moscow.**
 - The Barents Sea is a **marginal sea of the Arctic Ocean**. It is located along the northern coasts of **Norway and Russia**.
- The port ranks fourth in Russia in terms of processed goods and is the **second-largest port in northwest Russia (after the port of St. Petersburg)**.
- Other important ports along the Arctic coast include Arkhangelsk in Russia, Nuuk in Greenland, and Churchill in Canada.
- The port is **navigated all year round**. The dimensions of vessels calling at the port of Murmansk are not limited.



INDIA AND THE ARCTIC

Historical Background

- India's engagement **with the Arctic began when it signed the Svalbard Treaty** in February 1920 in Paris between Norway, the US, Denmark, France, Italy, Japan, the Netherlands, Great Britain, and Ireland, and the British overseas Dominions and Sweden concerning Spitsbergen.
- Ever since then, India has been closely monitoring all the developments in the Arctic region.
- India initiated its Arctic research program in 2007** with the objective of studying **teleconnections between Arctic climate and Indian monsoon**, to characterize sea ice in the Arctic using satellite data, to estimate the effect on global warming.
- India already has a research station in the Arctic, **Himadri**, for research purposes.
- Apart from Himadri, in 2008, the country launched its inaugural multi-sensor moored observatory and northernmost atmospheric laboratory in 2014 and 2016 respectively.
- Till last year, **thirteen expeditions to the Arctic** were successfully conducted.
- In May 2013, India became an **observer-State of the Arctic Council** along with five others including China.

Arctic Council

- The **Arctic Council** is a **high-level intergovernmental body** set up in 1996 by the **Ottawa declaration** to promote **cooperation, coordination and interaction** among the **Arctic States** together with the **indigenous communities** and other **Arctic inhabitants**.
- It promotes research and facilitates cooperation among Arctic countries on issues related to the **environmental protection and sustainable development of the Arctic region**.
- The Council has the **eight circumpolar countries** as member states and is mandated to protect the Arctic environment and promote the economies and social and cultural well-being of the indigenous people whose organizations are permanent participants in the council.
- Arctic Council Secretariat:** The standing **Arctic Council Secretariat** formally became operational in 2013 in **Tromsø, Norway**.
- The Council has **members, ad hoc observer countries and "permanent participants"**
 - **Members of the Arctic Council:** Ottawa Declaration declares **Canada, the Kingdom of Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden and the United States of America** as a member of the Arctic Council.



- Observer status:** It is open to **non-Arctic states**, along with **inter-governmental, inter-parliamentary, global, regional and non-governmental organizations** that the **Council determines** can contribute to its work.
- India holds one of the 13 positions as the Observer in the Arctic Council.

WHAT IS THE ARCTIC REGION AND HOW IS IT SIGNIFICANT FOR INDIA?

- The Arctic is a **polar region located at the northernmost part of Earth**.
- It consists of the **Arctic Ocean, adjacent seas, and parts of Alaska (United States)**, Canada, Finland, Greenland (Denmark), Iceland, Norway, Russia, and Sweden.
- The region is home to almost four million inhabitants, of which, about one-tenth are indigenous people and the land within the Arctic region has seasonally varying snow and ice cover.
- These **countries together form the core of the Arctic Council**.

SIGNIFICANCE

- The **vulnerability of the Arctic region**, which is above the Arctic Circle and includes the Arctic Ocean with the North Pole at its centre, to **unprecedented changes in the climate** may have an impact on India in terms of **economic security, water security and sustainability**.
- The region also constitutes **the largest unexplored prospective area for hydrocarbons** remaining on the Earth.
 - It is estimated that the **region may hold over 40 per cent of the current global reserves of oil and gas** and could hold significant reserves of coal, zinc and silver.
- The Arctic region is significant due to the **shipping routes** that run through it.
- The region **holds immense geopolitical importance** as the Arctic is projected to be ice-free by 2050 and world powers making a beeline to exploit the region rich in natural resources.
- According to the Ministry of External Affairs, **India can play a constructive role in securing a stable Arctic**.
 - The **government's Arctic Policy of 2022** mentions that the country's approach to economic development of the region is guided by **UN Sustainable Development Goals**.



INDIA'S ARCTIC POLICY

The Ministry of Earth Science unveiled **India's Arctic Policy**, titled '**India and the Arctic: building a partnership for sustainable development**' in 2022.

Provisions and Objectives:

- Six Central Pillars:**
 - Science and research.
 - Environmental protection.
 - Economic and human development.
 - Transportation and connectivity.
 - Governance and international cooperation.
 - National capacity building.
- Objectives:**
 - It aims to **strengthen national capabilities and competencies** in science and exploration, climate and environmental protection, maritime and economic cooperation with the Arctic region.
 - It seeks to **strengthen institutional and human resource capacities** within the government and academic, research and business institutions through inter-ministerial coordination in pursuit of India's interests in the Arctic.
 - It seeks to **enhance understanding of the impact of climate change in the Arctic region** on India's climate, economic and energy security.

- It aims to **promote better analysis, prediction and coordinated policymaking on the implications of ice melting in the Arctic on India's economic, military and strategic interests related to global shipping routes, energy security and exploitation of mineral wealth.**
- It seeks to study the **linkages between polar regions and the Himalayas and deepen the cooperation between India and the countries of the Arctic region** under various Arctic forums, drawing expertise from scientific and traditional knowledge.
- The policy also seeks to **increase India's participation in the Arctic Council and improve understanding of the complex governance structures in the Arctic, relevant international laws and geopolitics of the region.**

INDIA AND THE NORTH SEA ROUTE

- The Northern Sea Route (NSR)** is a shipping route that stretches across the Arctic Ocean, connecting Europe with countries in the Asia-Pacific region.
- It spans approximately **5,600 kilometers and passes through four seas of the Arctic Ocean.**
- The route begins at the boundary between **the Barents and Kara Seas (Kara Strait)** and ends at the Bering Strait (Provideniya Bay).
- One of the **key advantages of the NSR** is its potential **to significantly shorten the shipping distance between Europe and Asia**, potentially reducing transit times and costs.

MAKING THE NSR NAVIGABLE

- The NSR becomes navigable **due to the icebreaking assistance provided** to ensure safe passage for vessels.
- Russia plays a significant role in making the NSR navigable**, primarily because the Arctic Ocean's waters remain icebound for most of the year.
- Russia is unique in having a fleet of nuclear-powered icebreakers, which are crucial for breaking through the ice and creating safe routes for ships.
- The world's first nuclear icebreaker, "Lenin,"** was put into operation by Russia in 1959.
- Today, Rosatom's subsidiary, FSUE Atomflot, operates a fleet of nuclear-powered icebreakers, along with other vessels.
- This fleet ensures that the NSR remains operational for an extended shipping season.



DRIVING FACTORS FOR INDIA'S PARTICIPATION IN NSR DEVELOPMENT

India's interest in the development of the Northern Sea Route is driven by several factors:

- **Cargo Traffic Growth:** The cargo traffic along the NSR has been increasing consistently, with significant growth rates. This presents an opportunity for India to leverage this route for its imports and exports.
- **Energy Resource Imports:** India's increasing imports of crude oil and coal from Russia have created a strong incentive to utilize the NSR. The route offers a reliable and efficient transport option for these energy resources.
- **Geographical Advantage:** India's geographical location and its reliance on sea transportation make the NSR an attractive option to explore. The route's potential for reducing transit times can benefit India's trade relations.
- **Chennai-Vladivostok Maritime Corridor (CVMC) Project:** The CVMC project, a bilateral initiative between India and Russia, seeks to establish a maritime corridor connecting Chennai and Vladivostok. This corridor aims to significantly reduce transport time for goods between the two countries by utilizing the NSR.
- **Strategic Considerations:** The possibility of China and Russia gaining collective influence over the NSR has strategic implications. India's participation could help ensure its interests are represented in the evolving dynamics of the region.
- **Future Developments:** Russia's NSR development plan, approved until 2035, sets ambitious cargo traffic targets for 2024 and 2030. The plan aligns with Russia's efforts to make the NSR a prominent route for international shipping. Despite economic sanctions, Russia continues to prioritize the NSR's development.

INDIA GREECE RELATIONS

CONTEXT

India and Greece have taken a significant step by upgrading their relationship to a strategic partnership.

MORE ON NEWS

- The partnership aims to **double trade, enhance defence and security collaboration, and address shared challenges.**
- On this occasion, the Greek President conferred the Indian Prime Minister(PM) with "**The Grand Cross of the Order of Honour**".
- The Indian PM paid tribute at the '**Tomb of Unknown Soldier**' in Athens.

Tomb of the Unknown Soldier:

- The Tomb of the Unknown Soldier is a **war memorial located in Syntagma Square in Athens, Greece.**
- It is dedicated to **Greek soldiers who lost their lives in various wars.**
- The tomb serves as a symbol of remembrance and honour for the sacrifices made by anonymous soldiers.
- It was sculpted between **1930 and 1932 by sculptor Fokion Rok.**



Grand Cross of the Order of Honour:

- The Grand Cross of the Order of Honour is the **second-highest civilian honour in Greece, after the Grand Cross of the Order of the Redeemer.**
- The award was established in 1975 and features the **head of goddess Athena on its front side**, along with the inscription "**ONLY THE RIGHTEOUS SHOULD BE HONORED**".
- The award is given to individuals who have distinguished themselves in the fields of politics, diplomacy, culture, science, or social service, and who have promoted the interests and values of Greece.



AREAS OF COLLABORATION WITHIN THE STRATEGIC PARTNERSHIP

- **Defence and Security:** India and Greece have committed to enhancing their defence and security cooperation, particularly in areas like **maritime security, counter-terrorism, cyber security, and the defence industry.** They have also established a framework for a dialogue between their National Security Advisors.

- **Maritime Security and International Law:** Both countries, with strong maritime traditions, share a vision of a free, open, and rule-based Mediterranean Sea and Indo-Pacific. They emphasize adherence to international law, including the United Nations Convention on the Law of the Sea (**UNCLOS**), while respecting sovereignty, territorial integrity, and freedom of navigation.
- **Culture and Tourism:** Efforts will be made to promote cultural exchanges and preserve ancient sites. Collaboration within UNESCO will be strengthened to achieve these goals.
- **Trade and Investment:** India and Greece aim to double their bilateral trade by 2030. They plan to explore opportunities in various sectors such as renewable energy, infrastructure, pharmaceuticals, agriculture, and innovation.
- **Mobility and Migration Partnership Agreement (MMPA):** Both nations are working towards finalizing an MMPA, which will facilitate the free movement of the workforce between the two countries.
- **Broad Spectrum of Collaboration:** Discussions encompass a wide range of domains, including digital payments, shipping, pharmaceuticals, and education.
- **Culture and Tourism:** Both leaders welcomed efforts to promote exchanges in all forms of art. They also agreed to encourage joint efforts in preserving and protecting ancient sites and strengthen cooperation within the United Nations Educational, Scientific and Cultural Organization (**UNESCO**).

INDIA-GREECE TIES

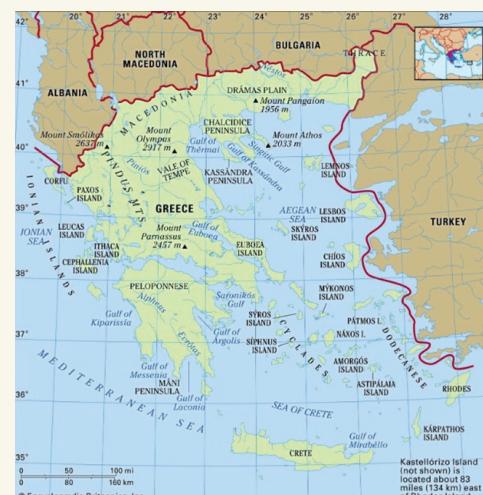
Historical Background

The historical relations between **India and Greece date back over 2,500 years** and have been marked by various significant interactions and exchanges:

- **Alexander the Great's Campaign:** In the 4th century BCE, Alexander the Great led a campaign that extended into the north-western part of the Indian subcontinent. While his conquests did not result in long-lasting Greek rule in India, they established early connections between the two regions.
- **Ashoka's Edicts:** The **Mauryan Emperor Ashoka**, in his edicts, mentioned diplomatic, trade, and cultural relations between India and Greece. This provides historical evidence of interactions between the two civilizations during ancient times.
- **Trading and Coinage:** Archaeological evidence, including coins and writings, indicates that there was trade between the Mauryan Kings of India and Greece. This trade relationship left tangible traces in the form of coinage that reflected both Indian and Greek influences.
- **Megasthenes and Chanakya:** Megasthenes, an ancient Greek historian and diplomat, served as an ambassador to the Mauryan King Chandragupta's court. His writings, such as the "**Indika**," provide valuable insights into Indian society and governance during that period. Chanakya, a prominent advisor to Chandragupta, also recorded Megasthenes' presence in his writings, notably in the "**Arthashastra**."
- **Gandhara Art:** Gandhara art, which flourished in the region of present-day Pakistan and Afghanistan, is believed to be a result of the fusion of Indian and Greek artistic influences. This art style is characterized by the incorporation of Greek artistic elements into traditional Indian artistic forms.

Greece

- Greece has the **longest coastline in Europe** and is the southernmost country in Europe.
- Capital is **Athens**.
- Greece is bordered to the east by the Aegean Sea, to the south by the Mediterranean Sea, and to the west by the Ionian Sea.
- It lies at the **juncture of Europe, Asia, and Africa** and is heir to the heritages of Classical Greece, the Byzantine Empire, and nearly four centuries of Ottoman Turkish rule.
- The **Pindus mountain range** on the mainland contains one of the world's deepest gorges, Vikos Gorge.
- **Mount Olympus** is Greece's highest mountain at 9,570 feet (2,917 meters) above sea level.
- The **largest Greek island** by both area and population is **Crete**, located at the southern edge of the Aegean Sea.



Commercial Relations

- Bilateral trade between India and Greece **stood at USD 2 billion in 2022-23.**
- India mainly exports aluminum, organic chemicals, fish and crustaceans and iron and steel to Greece, among other things.
- Meanwhile, Greece's top exports to India are minerals fuels, mineral oils and products, sulphur and aluminium foil.
- India Participated as 'Honoured Country' in the 84th Thessaloniki International Fair(TIF), 2019, the largest annual commercial exposition of Greece.

Political Relations

- Diplomatic relations were established between India and Greece in May 1950. Greece opened its embassy in Delhi in 1950 and India opened its embassy in Athens in 1978.
- Greece has been marked by consistent support to each other on issues of core national interest, such as Kashmir and Cyprus.
- Greece is also favouring United Nation Security Council (UNSC) expansion, with India as a permanent member.

Defence Relations

- India and Greece's Defence Cooperation accelerated in 1998, which envisages cooperation in areas such as military training, joint exercises, defence industry collaboration, etc.
- Indian Air Force participation in EXERCISE INIOCHOS-23.

Culture

- Dimitrios Galanos, a Greek, became the first European Indologist and spent 47 years in India translating many Hindu texts into Greek and compiled a Sanskrit-English-Greek dictionary of over 9000 words.
- A "Dimitrios Galanos" Chair for Hellenic Studies was established at Jawaharlal Nehru University in New Delhi, India in September 2000.
- The Indian Council for Cultural Relations has been offering an annual scholarship for Greek students to study in India.
- Prof. Nicholas Kazanas, a distinguished Greek Indologist, was declared as one of the awardees of the prestigious Padma Shri award on the occasion of the 72nd Republic Day of India in 2021.

INDIA - SRI LANKA RELATIONS

CONTEXT

Tamil Nadu Chief Minister revived the debate over Katchatheevu, demanding for retrieval of the island from Sri Lanka.

ABOUT THE KATCHATHEEVU ISLAND

- Katchatheevu is an uninhabited off-shore island in the Palk Strait.
- It was formed due to volcanic eruptions in the 14th century.
- The 285-acre land was jointly administered by India and Sri Lanka during British rule.
- The island is of historical importance for both India and Sri Lanka. It has been used by fishermen from both countries for centuries as a resting point during fishing expeditions in the Palk Strait.



WHAT IS THE ISSUE OVER KATCHATHEEVU ISLAND?

- India and Sri Lanka signed four Maritime Boundary Agreements between 1974-76, according to which, in which India recognized Sri Lanka's sovereignty over the island.
 - Sri Lanka claimed sovereignty over Katchatheevu on the ground that the Portuguese who had occupied Sri Lanka during 1505-1658 CE had exercised jurisdiction over the island.
 - India's contention was that the erstwhile Raja of Ramnad [Ramanathapuram] had possession of it as part of his zamin.
- According to the signed agreements, Indian fishermen were only allowed to use the island for resting, net drying and the annual St. Anthony's festival. They are not permitted to use the island for fishing.

- However, Indian fishermen continued to **trespass the Sri Lankan water boundary** in search of better catches in the area, leading to their **arrests by the Sri Lankan authorities**.
- Also, many in Tamil Nadu believe that the agreement was signed **without adequate consultation** and consideration of their fishing rights.
- The Katchatheevu issue was revived in 1991** with the then Chief Minister of Tamil Nadu demanding retrieval during her Independence Day address.
- In December 2022, the **Centre, pointed out** in its reply in the Rajya Sabha that Katchatheevu “lies on the **Sri Lankan side of the India-Sri Lanka International Maritime Boundary Line.**” It added that the matter was **sub-judice in the Supreme Court.**

INDIA-SRI LANKA TIES

Pre-Independence Relations

- The earliest mention of Sri Lanka in Indian history dates **back to the epic of Ramayana**, which mentions the rescue of Sita from Lanka by Lord Ram.
- Buddhism spread to Sri Lanka from India around 2000 years ago**, establishing a cultural and religious connection between the two countries.
- The northern and north-eastern regions of Sri Lanka have been historically had economically integrated with India.
- During the colonial period, Sri Lanka (**then known as Ceylon**) was under British rule but was administered separately and not as a part of British India.
- In the 19th century, British colonial authorities **brought indentured labourers from India**, mainly from Tamil Nadu, to work in Ceylon and eventually many Tamils settled in the northern part of the country.

Post-Independence Relations

- India gained independence in 1947, followed by Ceylon in 1948.
- The **Sinhalese-dominated government** in Ceylon implemented discriminatory policies against Tamils, leading to strained relations between India and Ceylon.
- In 1964, the **Shastri-Sirimavo Pact was signed**, granting citizenship to a large number of Indian Tamils in Ceylon and facilitating repatriation to India.
- In the 1970s and 1980s, **India's allegiance shifted towards the Soviet Union**, while Sri Lanka moved closer to the United States.
- Tensions **between the Sinhalese and Tamil communities in Sri Lanka escalated**, leading to violent incidents in 1977 and 1981.
- It is alleged that **during this period, India's Research & Analysis Wing (R&AW)** provided training and support to Tamil rebel groups in Sri Lanka, aiming to destabilize the Sri Lankan government while preventing the creation of a separate Tamil state.
 - The **Liberation Tigers of Tamil Eelam (LTTE)**, a separatist militant group, emerged in 1976 and became a prominent force.
- The **India-Sri Lanka Accord was signed in 1987**, granting limited autonomy to Tamil areas.
 - However, it **faced opposition from Sinhalese nationalists** who viewed it as interference in Sri Lanka's internal affairs.
 - The **Indian Peacekeeping Force (IPKF)** was deployed in Sri Lanka as part of the accord but faced resistance from both the LTTE and some sections of the Sri Lankan government.
 - In 1990, the IPKF mission was ended, and India's involvement in Sri Lanka reduced.

Post-Cold War Period Relations

- With the **end of the Cold War**, India adopted a **more outward-looking approach** and sought to improve relations with neighbouring countries, including Sri Lanka.
- The **India-Sri Lanka Free Trade Agreement was signed in 1998**, aiming to enhance economic cooperation.
- India encouraged dialogue and a ceasefire between Sri Lanka and the LTTE from 2000 to 2003, although it did not have direct involvement.
- The period from **2005 to 2009 saw the intensification of the civil war in Sri Lanka**, with the Sri Lankan government launching a military offensive against the LTTE.
- The LTTE's leader, Velupillai Prabhakaran, was killed in 2009, and the LTTE was militarily defeated.
- During this period, **Sri Lanka developed closer ties with Pakistan and China**, leading to concerns in India about security implications and increased influence of these countries in Sri Lanka.

- China's involvement in infrastructure development, including the Hambantota port, raised strategic concerns for India.

Current Focus of India-Sri Lanka Ties

- Both countries continue to engage in economic cooperation and bilateral discussions on various issues, including trade, investment, tourism, and regional security.
- India and Sri Lanka have ongoing collaboration in areas such as infrastructure development, maritime security, counterterrorism, and cultural exchanges.

KEY AREAS OF COOPERATION BETWEEN INDIA AND SRI LANKA

Political Relations	<ul style="list-style-type: none"> <input type="checkbox"/> Political relations between the two countries have been marked by high-level exchanges of visits at regular intervals. <input type="checkbox"/> In 2019, the first overseas visit of Indian Prime Minister to Sri Lanka, was an important symbolic gesture reflective of the special relationship between the countries and the government's focus on its Neighbourhood First Policy. <input type="checkbox"/> Sri Lanka is a member of regional groupings like BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) and SAARC in which India plays a leading role. <input type="checkbox"/> Sri Lanka has long been in India's geopolitical orbit, but its relationship with China has strengthened in recent years. <input type="checkbox"/> Former President Rajapaksa took Sri Lanka closer to China and side-lining Indian concerns including the rehabilitation of Tamils displaced by the long-running Sri Lankan civil war.
Economic Relations	<ul style="list-style-type: none"> <input type="checkbox"/> Sri Lanka is one of India's largest trading partners in SAARC, while India is Sri Lanka's largest trade partner globally. <input type="checkbox"/> Trade between the two countries grew rapidly particularly after the entry into force of the India-Sri Lanka Free Trade Agreement in 2000. <input type="checkbox"/> India is among the top four investors in Sri Lanka with investments in diverse areas including petroleum retail, IT, financial services, real estate, telecommunication, hospitality & tourism, banking and food processing (tea & fruit juices), metal industries, tires, cement, glass manufacturing, and infrastructure development (railway, power, water supply). <input type="checkbox"/> India is also one of the largest contributors to Foreign Direct Investment in Sri Lanka. FDI from India amounted to about US\$ 1.7 billion during the period 2005 to 2019. <input type="checkbox"/> In 2020, India was Sri Lanka's 2nd largest trading partner with the bilateral merchandise trade amounting to about USD \$ 3.6 billion. <input type="checkbox"/> Sri Lankan exports to India have increased substantially since 2000 when ISLFTA came into force and more than 60% of Sri Lanka's total exports to India over the past few years have used the ISFTA benefits.
Development Cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> The Government of India has committed significant financial assistance to Sri Lanka, with grants alone amounting to approximately USD 570 million, and the overall commitment exceeding USD 3.5 billion. <input type="checkbox"/> This financial support is utilized for a wide range of development projects in Sri Lanka, including the following sectors: <ul style="list-style-type: none"> - Housing: This initiative aims to provide housing units to internally displaced persons affected by the LTTE war and the humanitarian crisis. - Infrastructure: India has been involved in rehabilitation of the Northern Railway lines and wreck removal, which contribute to improving transportation connectivity in the region. - Vocational Training and Education: India has supported the establishment of vocational training centers in Sri Lanka, which aim to enhance skills and employability. - Culture and Heritage: India has been involved in the construction of a Cultural Centre at Jaffna and the restoration of the Thiruketheeswaram Temple.

Defence Cooperation	<ul style="list-style-type: none"><input type="checkbox"/> The two countries have increased their military-to-military relationship, conducting joint exercises such as the 'Mitra Shakti' military exercise and SLINEX naval exercise.<input type="checkbox"/> India also provides defence training to the Sri Lankan forces, enhancing their capabilities and cooperation in the security domain.<input type="checkbox"/> In addition, a trilateral maritime security cooperation agreement was signed between India, Sri Lanka, and the Maldives, focusing on improving surveillance, anti-piracy operations, and reducing maritime pollution in the Indian Ocean Region.<input type="checkbox"/> Both countries have also collaborated on countering drug and human trafficking, signing an agreement in April 2019 to address these challenges effectively.
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ISSUES IN INDIA SRI LANKA RELATIONS

- Killing of Fishermen:** The killing of Indian fishermen by the Sri Lankan Navy has been a longstanding issue between the two countries.
 - In 2019 and 2020, a total of 284 Indian fishermen were arrested and a total of 53 Indian boats were confiscated by the Sri Lankan authorities.
- Influence of China:** China's growing economic presence and political influence in Sri Lanka have raised concerns for India.
 - China has become the largest investor in Sri Lanka, accounting for a significant share of **foreign direct investment (FDI)** in the country.
- 13th Amendment of the Sri Lankan Constitution:** The 13th Amendment of the Sri Lankan Constitution was introduced to address the demands of the **Tamil community for equality, justice, peace, and respect** within a united Sri Lanka.
 - India supports the full implementation of **the 13th Amendment**. However, the Sri Lankan government is yet to fully implement the amendment, leading to tensions and differences of opinion on this matter.

WAY FORWARD

- Conflict Resolution:** Addressing historical grievances and concerns related to the Tamil minority in Sri Lanka is essential for long-term stability in the region.
- Regional Engagement:** Both India and Sri Lanka are members of regional organizations like SAARC and BIMSTEC. Strengthening regional cooperation through these forums can lead to increased economic integration and stability in South Asia.
- Environmental Cooperation:** Collaborating on environmental issues, such as climate change and disaster management, can be a shared priority. The Indian Ocean region is susceptible to climate-related challenges, and joint efforts can help mitigate their impact.

MULTILATERAL DEVELOPMENT BANKS

CONTEXT

While addressing a G-20 event in Mumbai, the finance minister stated that the main focus of India's G-20 Presidency in 2023 has been to strengthen Multilateral Development Banks (MDBs) in order to address shared global challenges.

WHAT ARE MULTILATERAL DEVELOPMENT BANKS (MDBS)?

- A multilateral development bank (MDB) is an **international financial institution** chartered by **two or more countries** for the purpose of **encouraging economic development** in poorer nations.
- MDBs provide loans and grants to member nations to fund projects that support **social and economic development**, such as the building of new roads or providing clean water to communities.
- MDBs originated in the **aftermath of World War II** to rebuild war-ravaged nations and stabilize the global financial system.
- While **commercial banks seek to make profits** on loans and other financial services, the **goal of MDBs** is to issue grants and **low-cost loans** to improve the economic conditions of **impoverished or developing nations**.
- MDBs now operate throughout the world and control **trillions of dollars in assets**.

MAJOR MULTILATERAL DEVELOPMENT BANKS

World Bank Group (WBG)	<p>The World Bank was established in 1944 to help rebuild Europe and Japan after World War II. The World Bank is one of the largest and most well-known MDBs. It consists of five institutions:</p> <ul style="list-style-type: none"> <input type="checkbox"/> International Bank for Reconstruction and Development (IBRD): Provides loans to middle-income and creditworthy low-income countries for development projects. <input type="checkbox"/> International Development Association (IDA): Offers concessional loans and grants to the world's poorest countries. <input type="checkbox"/> International Finance Corporation (IFC): Supports private sector development by providing investment and advisory services. <input type="checkbox"/> Multilateral Investment Guarantee Agency (MIGA): Offers political risk insurance and credit enhancement to attract foreign investment. <input type="checkbox"/> International Centre for Settlement of Investment Disputes (ICSID): Provides facilities for arbitration and conciliation of investment disputes.
International Monetary Fund (IMF)	<ul style="list-style-type: none"> <input type="checkbox"/> While not exclusively a development bank, the IMF plays a significant role in global financial stability and provides financial assistance to countries facing balance of payments problems. <input type="checkbox"/> The IMF was established in 1944 in the aftermath of the Great Depression of the 1930s.
Asian Development Bank (ADB)	<ul style="list-style-type: none"> <input type="checkbox"/> Focused on the Asia-Pacific region, ADB provides loans, grants, and technical assistance to support a wide range of development projects, including infrastructure, health, education, and more. <input type="checkbox"/> The Asian Development Bank (ADB) was established on December 19, 1966.
New Development Bank (NDB)	<ul style="list-style-type: none"> <input type="checkbox"/> Also known as the BRICS Development Bank, NDB was established by the BRICS countries to finance infrastructure and sustainable development projects. <input type="checkbox"/> The establishment of the NDB was announced during the 6th BRICS Summit held in Fortaleza, Brazil, in July 2014.
European Bank for Reconstruction and Development (EBRD)	<ul style="list-style-type: none"> <input type="checkbox"/> Primarily focused on the transition economies of Eastern Europe, the EBRD promotes private sector development and invests in projects that contribute to market-oriented economies. <input type="checkbox"/> It was established in 1991 in response to the significant changes occurring in Central and Eastern Europe, as well as other countries in the aftermath of the Cold War and the dissolution of the Soviet Union.
African Development Bank (AfDB)	<ul style="list-style-type: none"> <input type="checkbox"/> Focused on the African continent, AfDB supports projects and initiatives that aim to alleviate poverty, promote sustainable economic growth, and enhance regional integration. <input type="checkbox"/> The African Development Bank (AfDB) was established on August 4, 1963.

SIGNIFICANCE OF MDBS

- Financing Development**: MDBs provide funding for development projects that might not otherwise attract sufficient investment from the private sector or national budgets.
- Global Partnerships**: MDBs foster partnerships with governments, private sector entities, civil society organizations, and other stakeholders which encourages collective action.
- Addressing Global Challenges**: MDBs contribute to addressing global challenges such as climate change, health crises, and infrastructure gaps.
- Catalyzing Private Investment**: MDBs play a role in attracting private sector investment by providing guarantees, co-financing, and technical assistance that mitigate risks and create a conducive investment environment.
- Capacity Building**: MDBs assist member countries in building institutional capacity, improving governance, and enhancing policy frameworks.
- Promoting Sustainable Development**: MDBs promote sustainable development by integrating environmental and social considerations into their projects and programs.

NEED FOR REFORMS IN MDBS

- Outdated Institutional Framework:** The current legal and institutional framework of many MDBs was designed in the post-war era to address reconstruction and development needs. This framework may not adequately address contemporary challenges and aspirations, especially those of the Global South.
- Inclusive and Sustainable Development:** The development landscape has shifted from a focus solely on economic growth to a broader emphasis on inclusive and sustainable development. MDBs need to realign their strategies and practices to promote social inclusivity, environmental sustainability, and resilience.
- Complex Development Needs:** Developing countries face a diverse range of challenges, from poverty and inequality to climate change and conflict. MDBs need to reform to offer tailored and flexible solutions that can address these complex and varied development needs.
 - The WBG estimates that the average annual **spending needed** to address global challenges of **climate change, conflict, and pandemics** is \$2.4 trillion per year for developing countries between 2023 and 2030.
- Inadequate representation:** Many MDBs have governance structures that may not reflect the changing global balance of power and influence. Reforms are needed to ensure better representation of the interests and voices of developing countries in decision-making processes.
- Rapid Technological Changes:** The digital revolution has transformed economies and societies. MDBs need to incorporate technology and innovation into their strategies to harness their potential for development, including digital financial services and e-governance.

CHALLENGES FOR REFORMING MDBS

- Diverse Member Interests:** MDBs have a diverse membership of countries with varying priorities, ideologies, and development needs. Reaching consensus on reform measures that satisfy all member states can be challenging.
- Resource Constraints:** Implementing reforms often requires financial resources for changes in policies, processes, and capacity-building.
- External Influences:** Geopolitical factors, global economic conditions, and changes in international development discourse can influence the direction and pace of reforms.
- Member Countries' National Interests:** Countries have their own national interests in mind, which might not always align with the broader development goals of MDBs. Balancing these interests with the collective mission of MDBs can be complex.
- Procedural Constraints:** MDBs often face criticism for being trapped in bureaucratic procedures, which can slow down project implementation and decision-making.
- Mobilizing Private Sector Investments:** MDBs face challenges in mobilizing private sector investments for development projects. They need to create an enabling environment that attracts private capital by addressing risks and providing financial incentives for private sector engagement.

IMPLICATIONS FOR INDIA

- Advocating the Voice of the Global South:** India, as a leader from the Global South, has an essential role in advocating for necessary reforms that reflect the perspectives and needs of developing countries.
- G20 Platform:** India's G20 presidency and the formation of the Expert Group on Strengthening MDBs aims to bring coherence to various efforts and initiatives to enhance the effectiveness of MDBs.
- India is also a **major borrower and beneficiary of MDBs**, especially the World Bank Group and the Asian Development Bank.
 - India has received **loans and grants** from these institutions for various sectors such as **infrastructure, health, education, agriculture, etc.**
- India is also a **contributor and shareholder of MDBs**.
 - India has provided **capital and resources** to these institutions to support their operations and lending capacity.
 - India has also participated in their **governance and decision-making** processes.

WAY FORWARD

- Broadening Mandate and Vision:** MDBs need to expand their mandate beyond traditional goals of poverty reduction and shared prosperity. This expansion should encompass challenges like transboundary issues, climate change, and pandemics.

- Balancing Priorities:** While broadening the mandate, it's essential not to compromise the funding available for traditional priorities such as poverty alleviation and inequality reduction, especially in Low-Income Countries (LICs).
- Mobilizing Private Capital:** MDBs need to create an environment that attracts private capital by mitigating risks associated with investment. Approaches such as blended finance and guarantees should be explored.
- Coordination Among MDBs:** MDBs should work in close coordination with each other to avoid duplication of efforts and enhance efficiency in addressing global challenges.
- Stakeholder Integration:** The overarching goal of reforming MDBs is to enhance human welfare. This requires deeper integration with various stakeholders, including governments, private sector, civil society, and international organizations.



ECONOMICS

ELECTRIC VEHICLES

CONTEXT

India saw 120 per cent growth in electric vehicles (EVs) in the second quarter of 2023, driven by a 400 per cent surge in hybrid vehicles, according to the report by CyberMedia Research (CMR).

WHAT ARE ELECTRIC VEHICLES?

- An electric vehicle (EV) is a type of vehicle that **uses one or more electric motors** for propulsion instead of an **Internal Combustion Engine (ICE)**.
- EVs can be **powered by batteries** that are recharged by plugging the vehicle into an **electric power source**, or they can be powered by a **hydrogen fuel cell** that converts hydrogen gas into electricity.
- Compared to traditional gasoline-powered vehicles, **EVs produce fewer emissions** and are **more energy-efficient** that can potentially save money on fuel and maintenance costs.

TYPES OF ELECTRIC VEHICLES

There are **four types** of electric vehicles available:

- Battery Electric Vehicle (BEV):** Fully powered by electricity. These are more efficient compared to hybrid and plug-in hybrids.
- Hybrid Electric Vehicle:**
 - **Hybrid Electric Vehicle (HEV):** The vehicle uses both the internal combustion (usually petrol) engine and the battery-powered motor powertrain. The petrol engine is used both to drive and charge when the battery is empty. These vehicles are not as efficient as fully electric or plug-in hybrid vehicles.
 - **Plug-in Hybrid Electric Vehicle (PHEV):** Uses both an internal combustion engine and a battery charged from an external socket (they have a plug). This means the vehicle's battery can be charged with electricity rather than the engine. PHEVs are more efficient than HEVs but less efficient than BEVs.
- Fuel Cell Electric Vehicle (FCEV):** Electric energy is produced from chemical energy. For example, a hydrogen FCEV.

NEED FOR PROMOTING EVS IN INDIA

- Reducing Oil Import Dependency:** During FY 2022-23, **India's dependency on oil** and oil equivalent gas imports is **78.6 percent**, underscoring the need to promote EVs to curtail this reliance.
- Improving Air Quality:** Vehicular emission is a major cause of air pollution in urban areas. As EVs produce fewer emissions, they can significantly improve air quality.
 - Typically, **vehicular emission** contributes **20-30% of Particulate Matter (PM) 2.5** at the breathing level of air quality.
 - At the same time, around **8% of total Greenhouse Gas (GHG)** Emissions in India are from the **transport sector**, and in Delhi, it exceeds 30%.
 - As per the '**World Air Quality Report, 2022**' released by IQAir, **39 of the top 50 most polluted** cities in the world are **in India**.
- International Commitments:** Promoting EVs can aid in fulfilling India's international commitments under initiatives like **Panchamrit**, aiming for **net-zero carbon emissions by 2070** and a **billion-ton reduction in carbon emissions by 2030**.

Current Status and Prospects of EV Ecosystem in India

- India is the **third largest automobile market** globally in terms of sales, ahead of Germany and Japan.
- The Economic Survey 2023** predicts that India's domestic electric vehicle market will see a **49 percent CAGR between 2022 and 2030**, with 10 million annual sales by 2030.
- Additionally, the electric vehicle industry is projected to create around **50 million direct and indirect jobs by 2030**.
- The Indian government has set a target to achieve **30 percent electrification** of the country's vehicle fleet by **2030**.

STEPS TAKEN BY THE GOVERNMENT TO PROMOTE ELECTRIC VEHICLES

- E-Amrit Portal:** India launched E-Amrit portal (at COP26 Summit in Glasgow) as a one-stop destination for all information on electric vehicles.
- National Electric Mobility Mission Plan (NEMMP) 2020:** Launched by the Department of Heavy Industry in 2012, it aims at promoting hybrid and electric vehicles.
 - It sets out the target to achieve **6-7 million sales of hybrid and electric vehicles** year on year from 2020 onwards by providing fiscal incentives.
- FAME (Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles) Scheme:** It was launched in April 2015 under the NEMMP, to encourage electric and hybrid vehicle purchase by providing financial support.
 - Its first phase **ran for four years until 2019**.
 - **The second phase (FAME II)** is a 3-year subsidy programme. It aims at supporting the electrification of public and shared transportation.
 - The programme also finances **charging infrastructures**.
- GST restructuring:** GST on electric vehicles has been reduced from 12% to 5%; GST on chargers/ charging stations for electric vehicles has been reduced from 18% to 5% by GST Council.
- Production Linked Incentive (PLI) scheme:**
 - For manufacturing of **Advanced Chemistry Cell (ACC)** in the country in order to bring down prices of battery in the country.
 - Auto and Auto component PLI Scheme, **hydrogen fuel cell-based vehicles** which are Zero Emission Vehicles (ZEVs) are covered under this.
- Guidelines for EV charging infrastructure:** The Ministry of Power has issued the revised consolidated Guidelines & Standards for charging infrastructure for Electric Vehicles.
 - The guidelines allow the entities or individuals to create **charging stations without the need for license**. However, they should meet certain technical and safety standards.
 - The guidelines allow **users to charge their electric vehicles** in their respective offices and homes.
 - The guidelines have introduced a **revenue sharing model** for using land. Government lands will be provided to entities interested in installing charging infrastructure.
 - The **Bureau of energy Efficiency** will create an online database of public charging stations.
 - The guidelines include **action plan for nine major cities**. They are Chennai, Pune, Surat, Kolkata, Hyderabad, Ahmedabad, Mumbai, Bengaluru, and Delhi.
- Green license plates:** Ministry of Road Transport & Highways (MoRTH) announced that battery operated vehicles will be given green license plates and be exempted from permit requirements.
- Model Building Bylaws 2016:** Ministry of Housing and Urban Development amended the law to establish charging stations and infrastructure in private and commercial buildings.
- Several states** (including Delhi, UP, MP, Telangana, Andhra Pradesh etc.) have **notified their EV policies** aimed at promoting manufacturing and increasing demand of electric vehicles in their respective states.
- ISRO has commercialized** indigenously developed **lithium-ion battery technology** and has selected 14 companies for transfer of technology.

CHALLENGES FOR EVS AND EV INDUSTRY IN INDIA

- Consumer Deterrents:** Consumers are discouraged from adopting EVs due to concerns about limited driving range, safety, uncertain resale value, lack of widespread charging infrastructure, unreliable electricity supply, and the price gap between EVs and internal combustion engine (ICE) vehicles.
- Inadequate Charging Infrastructure:** The establishment of charging stations is hindered by low utilization rates, high operational costs, concerns about overloading electricity DISCOMs, and other factors, creating a disincentive for charging station operators.
- Battery Technology Limitations:** The battery technology used in EVs is still evolving, and the cost of the battery is a significant factor in the overall cost of an EV.
 - Moreover, the **availability of rare earth metals** and other raw materials required for the production of batteries is limited.

- Limited Manufacturing Capacities:** India is heavily dependent on import in EV sector such as rechargeable batteries, equipment, etc.
- Lack of Scrapping Policy:** End-of-life disposal of EVs is a concern due to the presence of high-voltage components that can harm the environment if not properly managed.
- Shortage of Skilled Workforce:** EVs have unique components and systems, such as batteries, electric motors etc., that require specialized training and expertise to repair and service.
- Cyber Security and Privacy Concerns:** The interconnectedness of EVs and personal devices introduces potential threats such as mobile malware, phishing attacks, and data breaches.

WAY FORWARD

- Public charging stations:** As EV adoption surges, an extensive public charging network is vital to meet growing power demand. An effective solution is **repurposing gas stations into hybrid charging stations for EVs.**
- Use of renewable energy sources:** Incorporating renewables into EV charging boosts economic and environmental sustainability.
 - India's climate advantage can **harness solar power** to meet rising demands without overburdening the existing power grid.
- Development of fast charging technologies:** To enhance the viability of EVs for long-distance travel, the development of fast-charging infrastructure is crucial.
 - Fast-charging stations, capable of delivering **high-voltage charging**, significantly reduce charging time, alleviating range anxiety for EV owners.
- Innovative Payment Solutions:** To encourage EV adoption, it is essential to provide convenient and user-friendly payment systems for charging services.
 - Additionally, **transparent pricing models** and **subscription-based plans** can provide incentives for EV owners to opt for public charging infrastructure.
- Widespread consumer awareness:** Organizing public events in the form of educational campaigns, rides, and drives can have a transformative impact.

A Parliamentary Committee on Estimates presented a report titled '**Evaluation of Electric Vehicle (EV) Policy**' has suggested the following measures:

- National Policy on EVs:** The report said, although transport is a state subject and some states have formulated their own EV policies, a "strong National Policy framework on EVs" needs to be formulated.
- Reducing Initial Costs:** Lowering upfront expenses by increasing subsidies on electric four-wheelers, encouraging states to exempt road tax, and further reducing GST on EVs.
- Promotion of Diverse Technologies:** Promoting a variety of technologies alongside EVs, such as flex fuel vehicles, hydrogen ICE, and hydrogen fuel cell vehicles, with a stronger focus.
- Extending FAME-II:** Extending the FAME-II scheme by two years beyond its current deadline of March 31, 2024, and introducing a comprehensive FAME-III scheme based on lessons learned.
- Consumer Trust:** Establishing safety standards and offering battery life guarantees to build consumer confidence.
- Skill Development:** Creating specialized EV courses in ITIs, Industrial Training Centres, and Skill Development Centres.
- Battery Reuse and Disposal:** Implementing a proper plan for battery disposal and establishing dedicated recycling facilities to ensure a sustainable EV ecosystem.
- Lithium Extraction Acceleration:** The Geological Survey of India (GSI) has identified significant Lithium inferred resources in the Salal-Haimana area of Jammu & Kashmir, indicating the need to expedite extraction efforts.

GREEN HYDROGEN STANDARDS

CONTEXT

The government has notified the **Green Hydrogen Standard for India**, for the progress of the National Green Hydrogen Mission.

MORE ON NEWS

- The Green Hydrogen Standard for India has been issued by the **Ministry of New and Renewable Energy (MNRE)**.

KEY SPECIFICATIONS UNDER GREEN HYDROGEN STANDARD

- Emission Threshold:** The standard sets a specific emission threshold that hydrogen production processes must adhere to in order to be classified as “Green” hydrogen.
 - The well-to-gate emission, which includes various stages of hydrogen production (such as water treatment, electrolysis, gas purification, drying, and compression), should not exceed 2 kg CO₂ equivalent per kg of hydrogen produced.
- Scope:** The definition of “Green” hydrogen covers hydrogen production methods using both electrolysis-based and biomass-based techniques. This means that the emission threshold applies to hydrogen produced through these methods as long as they meet the specified emission criteria.
- Methodology:** The notification states that a detailed methodology for the measurement, reporting, monitoring, on-site verification, and certification of green hydrogen and its derivatives will be specified by the Ministry of New & Renewable Energy. This ensures that the emission calculation and verification processes are standardised and consistent.
- Nodal Authority:** The Bureau of Energy Efficiency (BEE), under the Ministry of Power, is designated as the Nodal Authority for accrediting agencies responsible for monitoring, verification, and certification of Green Hydrogen production projects. This ensures proper oversight and compliance with the emission standards.

ABOUT HYDROGEN

- It is a colourless, odourless, tasteless, non-toxic and highly combustible gaseous substance.
- Also, it is the lightest, simplest and most abundant member of the family of chemical elements in the universe.
- While hydrogen is not typically found in its pure form on Earth, it is commonly found in compounds such as water (H₂O) and hydrocarbons.

WHAT IS GREEN HYDROGEN?

- Depending on the type of production used, different colours are assigned to the hydrogen.
- Green hydrogen is produced by renewable energy through electrolysis of water. Electrolyser technology is central to the green hydrogen production process.
 - Electrolysis involves the splitting of water (H₂O) into its constituent elements, hydrogen (H₂) and oxygen (O₂), using an electric current.
- Commercially available technologies for green hydrogen production:
 - **Alkaline Electrolyzers:** Alkaline electrolyzers operate via transport of hydroxide ions (OH⁻) through the electrolyte from the cathode to the anode with hydrogen being generated on the cathode side.
 - **Polymer Electrolyte Membrane Electrolyzers:** In a polymer electrolyte membrane (PEM) electrolyser, the electrolyte is a solid specialty plastic material.
 - **Solid Oxide Electrolyzers:** It uses a solid ceramic material as the electrolyte that selectively conducts negatively charged oxygen ions (O²⁻) at elevated temperatures (700°–800°C) to generate hydrogen.
- Applications: Green hydrogen can be consumed through either direct combustion, electricity generation through fuel cells and industrial processes like ammonia, steel manufacturing and petroleum refinery to be used as chemical feedstock.

ADVANTAGES OF GREEN HYDROGEN AS A FUEL

- High Calorific Value:** Hydrogen has almost 2.5 times the energy per tonne compared to natural gas, shifting to Hydrogen thereby reduces natural gas imports.
- Energy efficiency:** A hydrogen fuel cell is two to three times more efficient than an internal combustion engine fueled by gas.
- Climate change mitigation:** The method of producing green hydrogen does not emit any greenhouse gasses, helping in our fight against climate change.
 - Also, Green hydrogen can potentially replace coal and coke in iron and steel production, decarbonizing this sector will also have a significant impact on India's climate goals.

GREEN
Hydrogen produced by electrolysis of water, using electricity from renewable sources like hydropower, wind, and solar. Zero carbon emissions are produced.
PINK/PURPLE/RED
Hydrogen produced by electrolysis using nuclear power.
TURQUOISE
Hydrogen produced by the thermal splitting of methane (methane pyrolysis). Instead of CO ₂ , solid carbon is produced.
BLACK/GRAY
Hydrogen extracted from natural gas using steam-methane reforming.
BLUE
Grey or brown hydrogen with its CO ₂ sequestered or repurposed.
BROWN
Hydrogen extracted from fossil fuels, usually coal, using gasification.

- Hydrogen can be effectively used as a **fuel for heavy duty vehicles**, helping in the **decarbonization of the transportation sector** too.
- Storage:** Hydrogen has the highest energy per mass of any fuel, which means that the higher the energy density of a system, the greater the amount of energy you can store.
- Cost effective:** India's distinct advantage in low-cost renewable electricity means that green hydrogen will emerge as the most cost-effective form.
- Grid stability:** The intermittent nature of renewable energy, especially wind, leads to grid instability. But green hydrogen can be stored for long periods of time which can be used to produce electricity using fuel cells.
- Monetary benefits:** Experts say the oxygen produced as a by-product can also be monetized by using it for industrial and medical applications or for enriching the environment.
- Demand:** It is expected that Hydrogen demand in India could grow more than **fourfold by 2050**, representing almost **10% of global demand** of which majority of this demand could be met with green hydrogen.

CONCERN WITH GREEN HYDROGEN

- Transportation and Storage:** Storage and transportation of hydrogen have traditionally been difficult due to the unique characteristics of the gas flammability, low density, ease of dispersion, and brittleness.
- High cost:** The cost of green hydrogen production is much higher than what is produced from fossil fuels, due to high prices of renewables and rare earth material used as electrodes.
- High energy consumption:** The production of green hydrogen in particular requires more energy than other fuels. Also, availability of renewable energy is not at par demand.
- Prone to leakages:** Because gaseous hydrogen consists of such a **small molecule**, it is **more prone to leakages throughout the value chain**. Impacts of hydrogen fuel leak include:
 - **Aggravates global warming:** When hydrogen leaks, it reacts with other greenhouse gasses at the atmospheric level and increases their GWP (global warming potential). **According to scientists, if 10% leaks** during its production, transportation, storage, or use, the **benefits of using green hydrogen** over fossil fuels would be **completely wiped out**.
 - **Risk of fires:** As a fuel, hydrogen is highly flammable and so hydrogen leaks generate a serious risk of fire.
 - **Asphyxiation:** If leaked hydrogen accumulates in a confined space in sufficient concentrations it, like all other gasses except oxygen, is an asphyxiant.

ABOUT THE NATIONAL GREEN HYDROGEN MISSION

Launch	The mission was first launched on August 15, 2021 , with a view to cutting down carbon emissions and increasing the use of renewable sources of energy .
Nodal agency	The Ministry of New and Renewable Energy (MNRE)
Outlay	<ul style="list-style-type: none"> <input type="checkbox"/> The initial outlay for the Mission will be Rs.19,744 crore. <input type="checkbox"/> Out of the total outlay, the government has allocated ₹17,490 crore for the Strategic Interventions for Green Hydrogen Transition (SIGHT) programme. <input type="checkbox"/> The rest ₹1,466 crore for the upcoming pilot projects, ₹400 crore for R&D, and ₹388 crore towards other mission components.
Expected outcomes by 2030	<ul style="list-style-type: none"> <input type="checkbox"/> Development of green hydrogen production capacity of at least 5 MMT (Million Metric Tonne) per annum <input type="checkbox"/> Renewable energy capacity addition of about 125 GW in the country <input type="checkbox"/> Cumulative reduction in fossil fuel imports over Rs. One lakh crore <input type="checkbox"/> Abatement of nearly 50 MMT of annual greenhouse gas emissions
Key features of the mission	<ul style="list-style-type: none"> <input type="checkbox"/> SIGHT Programme: Under this, two distinct financial incentive mechanisms – targeting domestic manufacturing of electrolyzers and production of Green Hydrogen – will be provided under the Mission. <input type="checkbox"/> Green hydrogen hubs: Regions capable of supporting large scale production and/or utilization of Hydrogen will be identified and developed as Green Hydrogen Hubs. <input type="checkbox"/> End-use sectors: The Mission will also support pilot projects in emerging end-use sectors and production pathways. <input type="checkbox"/> Strategic Hydrogen Innovation Partnership (SHIP): A public-private partnership framework for R&D will be facilitated under the Mission.

Benefits of the mission	<input type="checkbox"/> Creation of export opportunities for Green Hydrogen and its derivatives; <input type="checkbox"/> Decarbonisation of industrial, mobility and energy sectors; <input type="checkbox"/> Reduction in dependence on imported fossil fuels and feedstock; <input type="checkbox"/> Development of indigenous manufacturing capabilities; <input type="checkbox"/> Creation of employment opportunities ; and <input type="checkbox"/> Development of cutting-edge technologies .
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IMPLEMENTATION CHALLENGES FOR GREEN HYDROGEN MISSION IN INDIA

- Cost barrier:** The high cost of manufacturing green hydrogen using renewable energy is the most significant barrier to its adoption in India, accounting for around 65% of the entire cost.
 - At present, in India, green hydrogen is **not commercially viable**. The current cost in India is around **Rs 350-400 per kg**; It is likely to become viable only at a production cost of under **Rs 100/ kg**.
- Insufficient Demand Incentives:** The measures to boost demand for green hydrogen have not kept pace with the significant incentives provided for its supply, resulting in uncertainty for potential investors.
- Fluctuating Renewable Energy Supply:** The usage of renewable energy in the grid can cause shifts in supply and demand, posing challenges for determining the real-time availability and pricing of renewable energy at green hydrogen locations.
- Inconsistent State Rules and Incentives:** States lack clear rules defining incentives for green hydrogen plants, and investors are concerned about the continuity of renewable energy supply over the plant's lifespan.
- Dependence on Limited Natural Resources (Water and Land):**
 - **Water Requirement:** Green hydrogen production relies heavily on water, with each kilogram of hydrogen requiring approximately 9 liters of demineralized water.
 - **Land Requirement:** Setting up a typical green hydrogen facility generating 10 tonnes per day necessitates a substantial land area of around 750 acres for a 150 MW renewable energy plant.

WAY FORWARD

- To overcome the above challenges:**
 - To reduce Green Hydrogen (GH2) costs, India needs consistent and **low-cost renewable energy**.
 - India needs to invest in **indigenous manufacture of Electrolyzers** and secure geo-political partnerships for procurement of critical minerals to overcome Electrolyser related challenges.
 - **Hydrogen hubs near demand centers** can lower GH2 transportation costs.
 - India must invest in **sustainable water usage** and utilize industrial/municipal wastewater or seawater for electrolysis.
 - R&D is necessary to **enhance Electrolyzers' efficiency**, stack life, and reduce water and power requirements.
 - To encourage exports, GH2 projects and RE plants may be eligible for **tax and duty waivers**.
- Encouraging State-Level Action and Policy Making:** Promote and support state governments in implementing their own initiatives regarding Green Hydrogen, in addition to the national-level efforts.
- Support for MSMEs:** Introduce incentives and support mechanisms at all levels to facilitate MSMEs harnessing the advantages of adopting Green Hydrogen as an alternative fuel.
- Capacity Building and Skill Development:** Foster the development of knowledge and skills in the government, industry, and academia, focusing on Green Hydrogen adoption.
- Enhanced Coordination:** Streamline coordination among different ministries and departments to expedite the mission's implementation process.

INDIA'S FOOD PROCESSING INDUSTRY

CONTEXT

As per the Ministry of food processing industries, the food processing industry has made an investment of ₹7,427 crore under the production-linked incentive (PLI) scheme so far.

MORE ON NEWS

- As of the end of the financial year 2021-22, an incentive of ₹517.604 crore has been disbursed to **beneficiaries under the PLI scheme**.
- The PLI scheme for the food processing industry (PLISFPI) **was approved in March 2021**, with a total outlay of ₹10,900 crore. It is designed to be implemented over a seven-year period until 2026-27.
 - **The PLISFPI consists of three main components:**
 - ✓ **Incentivizing manufacturing in four major food product segments:** ready-to-cook/ready-to-eat foods, processed fruits & vegetables, marine products, and mozzarella cheese.
 - ✓ Promoting innovative/organic products of small and medium enterprises (SMEs).
 - ✓ Supporting branding and marketing efforts for Indian food brands in overseas markets.
- A recent KPMG report predicts significant growth in the Indian food processing market. It estimates that the market is expected to expand to \$470 billion by the year 2025, a substantial increase from \$263 billion in the fiscal year 2019-20.

WHAT IS FOOD PROCESSING?

- Food processing refers to the transformation of raw agricultural products or ingredients into processed or value-added food products through various methods and techniques.
- It involves a series of operations that change the physical, chemical, or biological properties of food materials to make them more suitable for consumption, extend their shelf life, enhance their flavour, improve their nutritional value, and make them more convenient for storage, distribution, and consumption.

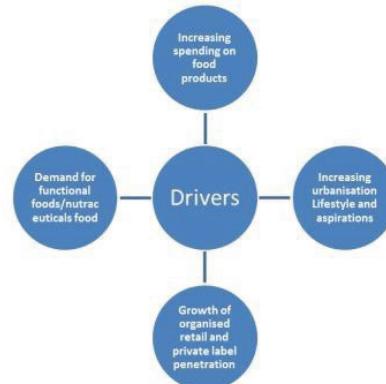
SIGNIFICANCE OF FOOD PROCESSING INDUSTRY FOR INDIA

- **Enhancing Farmer's Income:** Food processing provides a market for agricultural produce beyond the raw form, allowing farmers to earn better returns on their crops.
 - Also, value addition through processing increases the **economic viability of farming**.
- **Minimizing Wastage:** The food processing industry helps reduce post-harvest losses by providing facilities for proper storage, transportation, and processing.
 - India's post-harvest fruit and **vegetable losses are over Rs 2 lakh crore annually**, owing to inadequate cold storage facilities and lack of proper food processing units, a study has said.
- **Export Promotion:** Processed food products, with proper packaging and quality assurance, have greater potential to tap into international markets, earning valuable foreign exchange.
 - In India, processed food contributed **22.6% share of Agri-food exports in 2021-22**.
- **Employment Generation:** The industry generates direct and indirect employment opportunities.
 - From agricultural processing to manufacturing and distribution, the sector provides jobs across various skill levels, contributing to economic growth and livelihoods.
 - The number of persons engaged in the registered food processing sector increased from **17.73 lakh in 2014-15 to 20.05 lakh in 2018-19**.
- **Nutritional Improvement:** Processed foods can be fortified with essential vitamins and minerals, addressing nutritional deficiencies in the population and helping combat malnutrition.
- **Crop Diversification:** Food processing creates demand for various types of agricultural produce, leading to crop diversification.
 - This diversification is crucial for soil health, sustainability, and overall agricultural growth.

FOOD PROCESSING METHODS



Figure 2: Key Potential Drivers in the Growth of Indian Food Processing Industry



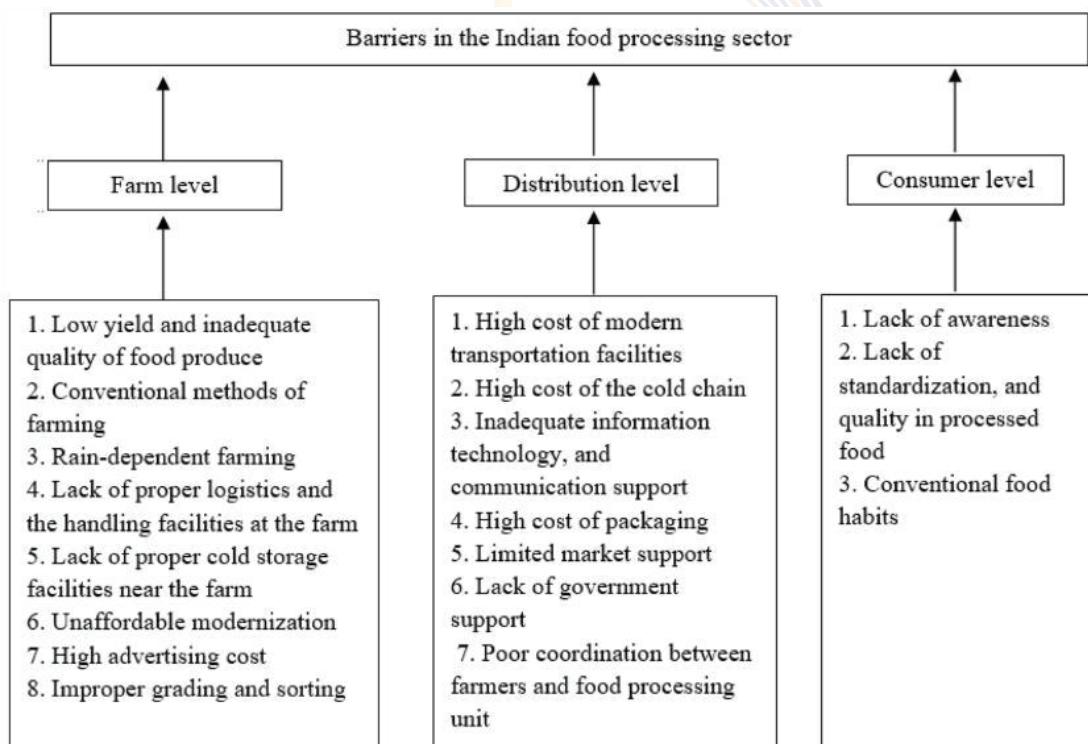
INDIAN FOOD PROCESSING SECTOR

- The Indian food and grocery market is the world's sixth largest, with retail contributing 70 per cent of the sales.



- The Indian food processing industry accounts for **32% of the country's total food market**, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth.
- It contributes around **8.80 and 8.39% of Gross Value Added (GVA)** in Manufacturing and Agriculture respectively, 13% of India's exports and 6% of total industrial investment.
- The **Indian gourmet food market** is currently valued at US\$ 1.3 billion and is growing at a Compound Annual Growth Rate (CAGR) of 20 per cent

CONCERNs AND CHALLENGES



GOVERNMENT INITIATIVES

- PM Kisan Sampada Yojana:** This scheme is aimed at promoting entrepreneurs in setting up food processing units, closer to agricultural areas. Development of cold storage facilities, specialised packaging units, warehousing facilities, etc and other

preservation facilities are eligible for grants under the scheme. The scheme **provides a grant in aid of 35% of the eligible project cost** in most states and **50% of the project cost in North-east and Himalayan states.**

- PM Formalisation of Micro Food Processing Enterprises Scheme:** This scheme aims at helping small micro-units engaged in the food processing industry. Many businesses at the grass-root level such as chilli drying, spice packaging, pickle, and papad making engage directly with farmers. Recognising the role of such micro-units, **a 35% subsidy can be availed by such units on their project cost, up to a maximum of ₹10 lacs**
- Operation Greens:** In the budget 2018-19, the government announced the Operations Greens scheme to promote integrated value chain development for crops. They are tomato, potato, onion. Post-harvest processing facilities will be eligible for a **grant in aid of up to 50% of the project cost. It also subjects to the maximum limit of 50 crores**
- National Mission on Food Processing (NMFP):** The National Mission on Food Processing is a centrally sponsored scheme aimed at decentralizing the implementation of food processing-related schemes through state and district-level missions. This approach enhances state participation, improves planning, supervision, monitoring, and policy formation.
- Mega Food Parks Scheme:** The Mega Food Park Scheme focuses on creating processing hubs that connect farmers, processors, and retailers. These hubs aim to maximize value addition, reduce wastage, increase farmers' income, and generate employment opportunities, especially in rural areas.
- Cold Chain Infrastructure Scheme:** The Integrated Cold Chain, Value Addition, and Preservation Infrastructure Scheme promote the establishment of cold chain facilities for seamless preservation of food products from farm gate to consumer.
- Shift from Product Approval to Ingredient-Based Approval (2016):** The Food Safety and Standards Authority of India (FSSAI) shifted **from product-by-product approval** to an ingredient and additive-based approval process. This change simplifies the approval process and facilitates ease of doing business in the food processing sector.
- 100% FDI Approval for Food Processing Sector (Automatic Route):** The government permitted 100% Foreign Direct Investment (FDI) approval under the automatic route for the food processing sector. This move encourages foreign investment and technology infusion in the sector.
- Special Food Processing Fund with NABARD:** A Special Food Processing Fund of Rs. 2000 crore was established in partnership with the National Bank for Agriculture and Rural Development (NABARD). This fund provides **affordable credit for investments in setting up Mega Food Parks (MFP)** and processing units within them, as well as for Agro-Processing Clusters and individual manufacturing units.
- Vision 2015 for Food Processing:** A Vision Document (Vision 2015) was developed to outline a strategy and action plan for the growth of the food processing sector. The vision includes targets such as increasing the processing of perishables, enhancing value addition, and expanding India's share in global food trade.
- Modernization of Abattoirs Scheme:** This scheme aims to modernize abattoirs (slaughterhouses) with scientific and sanitary facilities. It encourages private sector participation and technology infusion, improving the supply of hygienic raw materials for meat processing and exports.

WAY FORWARD

- National Food Processing Policy:** It's essential for the Ministry of Food Processing Industries (MoFPI) to formulate and announce a comprehensive National Food Processing Policy which shall address the specific needs and challenges of the sector and provide a clear roadmap for its growth and development.
- Balancing Trade Liberalization:** The government should strike a balance between trade liberalization and protecting the domestic food industry. **Ensuring fair competition and providing support to domestic producers** can help the industry grow while still benefiting from global trade opportunities.
- Beneficiary Targeting:** Efforts should be made to ensure that government schemes and incentives reach the intended beneficiaries, especially small and marginal farmers. Effective implementation and monitoring mechanisms are crucial in this regard.
- Industry-Farmer Collaboration:** Encouraging collaboration between food processing industries and farmers can create a win-win situation. This can involve contract farming, technology transfer, and market linkages to help farmers increase their income and supply quality raw materials to the industry.
- Fairness in Producer Prices:** Policies or regulations that ensure fair prices to farmers across the value chain can be instrumental in improving farmers' livelihoods and incentivizing agricultural production.

- Food Safety and Quality Assurance:** Implementing food safety and quality standards, such as ISO certifications and HACCP, is critical. These measures not only protect consumer health but also enhance the industry's competitiveness in the global market.
- Boosting Processing Levels:** Encouraging investments in processing infrastructure and technologies can help capture more value from agricultural production.
- Support for MSMEs:** Adequate funding, technology transfer, and skill development programs can empower MSMEs to contribute significantly to the industry's growth.
- Crop Value Chain:** Strengthening the entire crop value chain, from production to processing and distribution, is crucial. This involves investment in agricultural infrastructure, logistics, and technology adoption to reduce post-harvest losses and ensure food security.

INDIA'S BLUE ECONOMY

CONTEXT

The G20 Environment and Climate Sustainability Working Group (ECSWG) and Environment and Climate ministers meeting that concluded recently adopted a series of "Chennai High-Level Principles" for a sustainable and resilient blue economy.

MORE ON NEWS

- These principles shall **serve as a guiding framework globally** to drive the transition to a sustainable and resilient blue economy.
 - Blue economy refers to advocating **sustainable use of ocean resources** for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystems.
- The Environment ministry said the **adoption of these nine principles will not only help conserve ocean biodiversity** but also address the consequences of climate change on ocean-based economies in the G20.

9 HIGH LEVEL PRINCIPLES ON BLUE ECONOMY

The 9 key principles that have been adopted on the blue economy are as follows:

- Addressing Coastal and Marine Pollution:** The principle aims to tackle pollution in coastal and marine environments caused by various sources, including plastics, air pollutants, and other persistent pollutants, including those derived from the maritime sector.
- Sustainable Exploitation:** This principle focuses on promoting **sustainable use of ocean resources** to ensure economic growth, improved livelihoods, and job opportunities while also preserving the health of ocean ecosystems.
- Illegal Activities:** The principle addresses the need to combat illegal activities that negatively impact the marine environment.
- Acknowledging Ocean-Climate Interlinkages:** This principle emphasizes the recognition of links between the ocean and climate, encouraging ocean-based economies to understand the opportunities for climate change mitigation and adaptation through sustainable ocean-based actions.
- Protection and Restoration of Coastal and Marine Ecosystems:** This principle emphasizes the importance of protecting and restoring coastal and marine ecosystems as part of climate change mitigation and adaptation efforts.
- Harnessing Low and Zero Greenhouse Gas (GHG) Emissions:** The principle focuses on utilizing low and zero greenhouse gas emissions sources in ocean-based economic activities.
- Research on Ocean-Based Carbon Dioxide Removal and Sequestration:** This principle highlights the importance of research on safe and effective methods of removing and sequestering carbon dioxide from the ocean.
- Promoting Social and Inter-Generational Equity and Gender Equality:** The principle advocates for transparent and inclusive approaches that empower women, communities, and Indigenous Peoples to participate in planning, decision-making, and implementation processes related to the sustainable blue/ocean-based economy.
- Support for the Global '30 by 30' Goal:** The principle reiterates the G20's commitment to the global '30 by 30' goal, which aims to ensure that at least 30 percent of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, and at least 30 percent of terrestrial and inland water areas, and of marine and coastal areas, are effectively conserved and managed by 2030.

UNDERSTANDING BLUE ECONOMY

- **Definition:** The World Bank defines “blue economy” as “**sustainable use of ocean resources** for economic growth, improved livelihoods and jobs, while preserving the health of the ocean ecosystem”.
- **Activities:** Seafood harvesting (fishing and aquaculture), extraction and use of marine non-living resources (such as minerals and oil and gas), generation of renewable energy (such as offshore wind), and commerce and trade are examples of activities that could count towards a blue economy.
- **14th SDG Goal:** Developing a blue economy is also linked to the 14th Sustainable Development Goal.
 - It aims to protect “**life below water**”, which involves the conservation and sustainable use of the oceans, seas and marine resources for development.
- **Sustainable Blue Economy Finance Principles:** In 2018, the United Nations Environment Programme (UNEP) had laid out the Sustainable Blue Economy Finance Principles.
 - It is a framework that investors can use to fund ocean-based industries.
 - Financiers can use it as a reference point to see how marine investment can impact livelihood and poverty eradication.
- **Global Biodiversity Framework:** Targets set out in the Global Biodiversity Framework of COP15 focus on reducing the rate of loss of biodiversity, ensuring the fair and **equitable sharing of benefits arising from the use of genetic resources**, and restoring degraded ecosystems. It serves as a blueprint for countries to work together and make progress in addressing the global biodiversity crisis.



INDIA AND BLUE ECONOMY

India envisions a blue economy that will contribute to food security, poverty alleviation, the mitigation of and resilience to the impacts of climate change, enhance trade and investment, enhance maritime connectivity, boost diversification, job creation and socio-economic growth.

- **Facilitate Economic Growth:** India is the **third largest fish producing** country, contributing 8% to the global fish production and ranks second in aquaculture production.
 - With 12 major ports and 187 non-major ports, handling about 1,400 million tonnes of cargo, 95% of India's trade by volume transits by sea.
 - **India's Exclusive Economic Zone** is rich in living and non-living resources and holds significant recoverable resources of **crude oil** and of recoverable **natural gas**.
- **Marine Biotechnology and Food Security:** Fish, being an affordable and rich source of animal protein, is one of the healthiest options to **mitigate hunger** and **malnutrition** in India.
 - **Aquaculture & Marine Biotechnology programme** was initiated during 1988-89 to support R&D projects towards development of useful products and process from the marine resources.
- **Fisheries as a Commercial Enterprise:** Having commenced as a purely traditional activity, India's fisheries are being transformed into a commercial enterprise.
 - The sector has shown steady growth and has become a **major contributor of foreign exchange**. India is among the **top 5 fish exporting countries** in the world.
- **Generation of Jobs:** Fisheries provide livelihood to about **15 million fishers** and fish-farmers at the primary level in India.
 - This sector also generates almost twice the number of jobs, along the value-chain — in **transportation, cold-storages, and marketing**.
- **Marine Tourism:** Marine tourism is also a sector that has been one of the fastest growing globally and in India. Particularly in coastal states like **Kerala, Karnataka, and Tamil Nadu**, coastal tourism has contributed largely to both the state economies and livelihood creation.

India's opportunity region

- | | |
|---|---|
| <ul style="list-style-type: none"> ► Blue economy involves harnessing vast oceanic resources sustainably, equitably and efficiently ► Blue economy presently contributes 4% of India's GDP ► Ocean-based trade would quadruple by 2050 ► By 2050, two-third of India's food production would be farmed from the seas ► Clean offshore wind energy would be the leading power generation technology in the next few years ► 80% of the world's population lives within 200 km of the coast. Global population would require 30% more water, 40% per cent | <ul style="list-style-type: none"> more energy and 50% more food by 2030 ► India has a 7,516-km coastline, 14,500-km navigable inland waterways, and 1,382 islands ► India fishes only 70% per cent of 5.3 million metric tonnes in its Maritime Zone ► 90% is from fishing in waters up to 50 metres. That provides large opportunities for deep-sea fishing ► India currently plans to tap just one-tenth of its 300-gigawatt offshore wind energy potential ► The Bay of Bengal has 8% of the world's coral reefs and 12% of all mangroves, providing opportunities for coral reef tourism |
|---|---|

CHALLENGES IN BUILDING INDIA'S BLUE ECONOMY

- Lack of Investment:** There is lack of investment in India's **Deepwater fleet**. Indian fishing vessels do not venture into rich fishing grounds and most of the fishing is being undertaken in coastal waters.
 - Consequently, Indian fishermen have to **compete** with those of neighbours, **Sri Lanka** and Pakistan, in restricted fishing grounds.
 - Fishing vessels often drift into foreign waters leading to apprehension by navies/coast guards and **prolonged imprisonment** of the crew.
- Lack of Infrastructure:** Since Independence, India's marine fishery has been dominated by the "**artisanal sector**" i.e. poor, small-scale fishers who can afford only **small sailboats** or canoes to fish for subsistence.
 - India's artisanal fishers deliver only 2% of marine fish to the market, while 98% is caught by mechanised and motorised craft.
 - The rich resources in India's Exclusive Economic Zone remain **underexploited**. Much of the catch from India's fishing grounds is taken away by the **better equipped fishing fleets** of other **Indo-Pacific countries**.
 - ✓ These countries also indulge in **Illegal, Unregulated, and Unreported (IUU)** fishing which has serious security and environmental implications.
- Low Level Value Addition:** Currently, most of India's **fisheries exports** are at a low level of value addition in frozen and chilled form, **without** going for higher-order "ready-to-eat" or "ready-to-cook" marine products.
- Stress on Coastal Ecosystem:** India needs to curb **uncontrolled and unplanned tourist** activities that cause stress on the carrying capacity of coastal ecosystems, especially those on fragile island territories.
- Environmental Issues:** The increase in human activity, trade and commerce and the construction of large-scale infrastructure around these areas, pose a significant threat to the **sustainability** of these zones.
- Lack of Skilled Human Resource:** Shipping and ports require skilled manpower, but to meet the growing and changing demands in this sector India would require **re-skilling and upskilling** in the future.

INDIA'S INITIATIVES FOR BLUE ECONOMY

- Pradhan Mantri Matsya Sampada Yojana:** Launched in 2020 for sustainable development of India's fisheries sector with an estimated investment of Rs 20,000 crores over the next five years.
- Draft Blue Economy Policy:** It envisages optimal utilisation of all sectors of the maritime domain, from living and non-living resources to tourism and ocean energy for sustainable development of coastal areas. The 7 key areas are shown in the image:
- Sagarmala Initiative:** A Union Government's initiative that aims to promote **port-led** direct and indirect development and provide infrastructure to transport goods to and from ports quickly, efficiently and cost-effectively.
- Fisheries and Aquaculture Infrastructure Development Fund (FIDF):** It was launched by the Union Government in 2018 with a total fund size of Rs 7522.48 crore with the aims to achieve a **sustainable growth of 8-9%**, in a move to augment the country's **fish production** to the level of about 20 million tonnes by 2022-23.

- 1 National Accounting Framework for Blue Economy and Ocean Governance Priority Area
- 2 Coastal Marine Spatial Planning and Tourism
- 3 Marine Fisheries, Aquaculture and Fish Processing
- 4 Manufacturing, Emerging Industries, Trade, Technology, Services and Skill Development
- 5 Logistics, Infrastructure and Shipping, including Trans-shipments
- 6 Coastal and Deep-Sea Mining and Offshore Energy
- 7 Security, Strategic Dimensions and International Engagement

WAY FORWARD

- Implementing Sustainable Practices:** This includes measures like setting catch limits, establishing marine protected areas, and enforcing regulations to prevent overfishing and resource depletion.
 - India should look to adopt the **Gandhian approach** of balancing economic benefits with sustainability for meeting the broader goals of growth, employment generation, equity and protection of environment.
- Research and Development:** Allocate resources to R&D efforts aimed at improving technologies and practices within the blue economy, enhancing efficiency, and mitigating environmental impacts.
 - India must focus on **marine ICTs**, and transport (shipping) and **communication services**, and the creation of a knowledge hub for marine research and development.
- India needs to evolve a **long-term vision for its fishing industry** with focus on **four areas**:

- Mechanisation and modernisation of **fishing vessels** by providing communication links and electronic fish-detection devices, with artisanal fishers being funded for this.
- Developing deep-water fishing fleets, with bigger, sea-going vessels equipped with refrigeration facilities.
- A DWF fleet will have to be built around the “**mothership**” concept, wherein a large vessel would accompany the fleet to provide fuel, medical and on-board preservation/processing facilities.
- Development of **modern fishing harbours** with adequate berthing and post-harvest facilities, including cold storage, preservation, and packaging of fish.

REALTY SECTOR IN INDIA

CONTEXT

An expert committee led by the former NITI Aayog chief, has submitted its report to the central government, proposing measures to curb stress in India's real estate or realty sector.

KEY HIGHLIGHTS OF THE REPORT

- The committee was set up in March 2023 to tackle the problem of incomplete real estate projects following a recommendation made by the **Central Advisory Council** under the **Real Estate (Regulation and Development) Act, 2016**.
- According to the committee, the Indian Banks' Association has estimated that **4.12 lakh stressed dwelling units** involving **₹4.08 lakh crore** are impacted in the **stalled real estate projects**.
- According to the report, the **primary reason for stress** in real estate projects is **lack of financial viability** which has resulted in cost overruns and delays.
- Measures suggested by the report:**
 - **Improving Internal Rate of Return (IRR):** There is a need to improve the Internal Rate of Return of real estate projects which would attract more funding.
 - **Use of IBC:** Judicial interventions such as Insolvency and Bankruptcy Code (IBC) should be used only as a last resort.
 - **Subsidized Interest Rates Scheme:** The panel recommended the formulation of a scheme offering subsidized interest rates for financial institutions to fund stalled projects. This scheme would be similar to the one available for Micro, Small, and Medium Enterprises (MSMEs).
 - **Guarantee Fund:** The panel proposed the establishment of a guarantee fund similar to the MSME sector to support the finances of stalled real estate projects.
 - **Suspension of Interest and Penalties:** To alleviate financial stress caused by extraordinary circumstances like the Covid pandemic, the committee recommended suspending interest and penalties. State governments could consider extending the zero-period based on local conditions.
 - **Allowing Co-Developers:** The panel suggested allowing developers to bring in co-developers for either entire projects or specific parts without requiring permission from authorities.
 - **Excess Land Utilization:** If a project has excess land, the committee recommended using it for purposes such as shopping centers to generate immediate resources for construction.

WHAT IS REALTY SECTOR?

- The realty sector, also known as the **real estate sector**, refers to the industry that deals with **properties, land, buildings, and other physical structures**.
- It encompasses various activities related to **buying, selling, renting, and developing properties**, as well as the associated financial and legal aspects.

REAL ESTATE IN INDIA

- The real estate sector comprises **four sub-sectors - housing, retail, hospitality, and commercial**.
- In India, the real estate sector is the **second-highest employment generator**, after the agriculture sector.
- Real estate sector in India is expected to reach **US\$ 1 trillion in market size by 2030**, up from US\$ 200 billion in 2021.
- It will contribute **13% to the country's GDP by 2025**.

PROSPECTS/GROWTH DRIVERS OF REAL ESTATE IN INDIA

- Robust demand:** Organised retail real estate stock is expected to increase by 28% to 82 million sq. ft. by 2023.
- Growing Urbanisation:** urban areas currently face a shortage of nearly 10 million units. An additional 25 million units of affordable housing is required by 2030 to meet the future growth in the urban population.
- Increasing Investments:** Construction is the third-largest sector in terms of FDI inflow. FDI in the sector (including construction development & activities) stood at US\$ 54.17 billion between April 2000-March 2022.
- Policy support:** Under Union Budget 2021-22, tax deduction up to Rs. 1.5 lakh on interest on housing loan, and tax holiday for affordable housing projects have been extended until the end of fiscal 2021-22.
 - Also, '**Housing for All**' initiative is expected to bring US\$ 1.3 trillion investment in the housing sector by 2025.
 - The residential sector is expected to grow significantly, as **Pradhan Mantri Awas Yojana (PMAY) scheme** is aiming to build 20 million affordable houses in urban areas by 2022.
- Attractive opportunities:** As per ICRA estimates, Indian firms are expected to raise >Rs. 3.5 trillion (US\$ 48 billion) through infrastructure and real estate investment trusts (REITs) in 2022.

MAJOR ISSUES PLAGUING INDIA'S REAL ESTATE SECTOR

- Unavailability of land:** Land regulations, land readjustment and land pooling policies need to be promoted by reforming the Land Acquisition Resettlement and Rehabilitation Act of 2013.
- Overpopulation:** India will overtake China next year to become the world's most populous nation with over 1.4 billion people. It is an immensely challenging task to accommodate the huge population, given the resource constraints.
- Affordability concerns:** The real estate market in urban areas is marked by high prices, making it difficult for the majority of Indians to purchase homes in major cities.
 - The increase in **global commodity prices** has significantly raised construction costs.
 - Combined with **rising living costs** and **higher interest rates** on home loans, affordability becomes a concern.
 - **Inflation** and the unpredictable nature of **financial markets** further compound the challenges for the real estate sector.
- Inadequate project management:** The need for multiple clearances from various government departments, delays in obtaining approvals from civic authorities, a shortage of funding sources, and budget overruns due to extensive delays contribute to project setbacks.
 - **For instance, in the National Capital Region (NCR)** alone, approximately 240,000 housing units face stalled construction due to these issues.
- Outdated building techniques:** The Indian real estate sector is still dependent on old building techniques and hence they are over-dependent on extensive human labour for construction activities.
- Transparency gaps:** Although real estate agents and projects are registered, not all of them undergo thorough verification. This reveals a gap in the proactive action of authorities.
- Corruption:** The real estate sector is marred by collusion between corrupt government officials, builders, and local political leaders.
 - Frequently, laws and regulations related to **land use, floor space index (FSI), fire and safety** compliance, etc., are openly disregarded.
 - **An illustrative example is the Noida Supertech towers** constructed on land initially designated for a public park. The initial plan was altered to allow for 9-storey towers, but the final result was towers with 40 floors. Later, the Supreme Court ordered for their demolition.

GOVERNMENT INITIATIVES

- Real Estate (Regulation and Development) Act, 2016 (RERA):** It was enacted to regulate the real estate industry, protect buyers' interests, and encourage developers to provide more professional and timely services.
 - The salient provisions of RERA, 2016 include:

Regulatory Authorities	<input type="checkbox"/> The Act provides for State Governments to create regulatory authorities with a mandate to register and maintain a database of real estate projects; and to protect the interest of buyers. <input type="checkbox"/> All projects with plot size of minimum 500 sq.mt or eight apartments need to be registered with Regulatory Authorities. <input type="checkbox"/> Real Estate Agents also need to register with the Authority.
Grievance Redressal	<input type="checkbox"/> Regulatory Authorities have power to address grievances of buyers. <input type="checkbox"/> If buyer is not satisfied with the decision, they can challenge it to the Appellate Tribunal established in each State.
Penal Provisions	<input type="checkbox"/> The Authorities can send show cause notices to developers, brokers and promoters if they violate their obligations under the RERA. <input type="checkbox"/> If they are unable to justify their acts or omissions, they can be subjected to heavy fines . <input type="checkbox"/> There are provisions of imprisonment of up to 3 years for developers and up to 1 year in case of agents and buyers for violation of orders of Appellate Tribunals and Regulatory Authorities.
Timely Completion	<input type="checkbox"/> 70% of the funds collected from buyers need to be deposited in a separate dedicated account (escrow account) meant for that project only. <input type="checkbox"/> The deposited money can be used only for the construction of that project. <input type="checkbox"/> The provisions have been added to prevent diversion of funds by developer to some other project as was the common practice earlier. <input type="checkbox"/> It will ensure timely construction . In case of delays, builders have to refund buyers or pay interest on their money for delays.
Transparency	<input type="checkbox"/> At the time of registration of project, the developer has to furnish specific details related to project like the Sanctioned plan, time period or completion etc. <input type="checkbox"/> The Act defines terms like Carpet Area, Common Area etc. <input type="checkbox"/> Buyers will be charged for the carpet area and not super built-up area. <input type="checkbox"/> Developers can't do alteration or addition in the sanctioned plans and specifications of project layout, without the written consent of 2/3rd of allottees/homebuyers.
Protecting Buyer's Interest	<input type="checkbox"/> The developer is liable to repair any structural defects that occur within 5 years of purchase. <input type="checkbox"/> Similarly, a builder cannot take more than 10% of the cost of the project from the buyer as advance or application fees.

Performance of RERA

According to a **2021 report by Boston Consulting Group** and Omidyar Network India.

- About **70% of consumers are aware of RERA**, however, awareness is limited to its top few benefits.
- 77% of projects are RERA registered**.
- There is **higher compliance in metros and tier-I cities**.
- Nearly **70% of the states** have a **basic RERA setup**.
- 7 states contribute** to over 90% of the total number of **complaints resolved by RERA authorities** with top 3 being Uttar Pradesh, Haryana, and Maharashtra.
- To enable transparency and reduce information asymmetries, **27 states have set up web portals**. However, awareness of the websites continues to be low.
- States like **Meghalaya, Nagaland and West Bengal** are yet to establish their RERA Authority.

Challenges to RERA

- Developers complain **lack of mechanism to ensure timely approvals** from local government/sanctioning authorities (single-window mechanism).
- There is also a **lack of consumer awareness**, which leads to a lack of use of RERA website portals.
- Continued **lack of clarity regarding the role of state RERAs** in case of stalled projects.
- Lengthy complaint resolution** timelines leading to high consumer and developer dissatisfaction.

- SWAMIH Fund:** In 2019, the central government launched the '**Special Window for Funding Stalled Affordable and Middle-Income Housing Projects**' or '**SWAMIH**' Fund Scheme.

- The objective of the scheme is to provide **priority debt financing for the completion of stalled housing projects** falling under the **affordable and middle-income housing** categories.
 - This '**last mile financing**' of stalled projects will be extended through a **Category-II AIF (Alternate Investment Fund or AIF) debt** fund registered with the **Securities and Exchange Board of India (SEBI)**.
 - The Fund is sponsored by the **Ministry of Finance**, Government of India, and is managed by **SBICAP Ventures Ltd., a State Bank Group company**.
- The Smart City Project:** With a plan to build 100 smart cities, is a prime opportunity for real estate companies.
 - It was **launched in 2015** as a **Centrally Sponsored Scheme** by the **Union Housing and Urban Affairs Ministry**.
 - The main objective of the Mission is to promote cities that provide core infrastructure, clean and sustainable environment and give a **decent quality of life to their citizens** through the application of '**smart solutions**'.
- The **Atmanirbhar Bharat 3.0 package** included income tax relief measures for real estate developers and homebuyers for primary purchase/sale of residential units of value up to Rs. 2 crores.
 - The **Ministry of Housing and Urban Affairs** has recommended all the states to consider reducing stamp duty of property transactions in a bid to push real estate activity.
- Government has created an **Affordable Housing Fund (AHF)** with an initial corpus of Rs. 10,000 crores for micro financing of the HFCs.
 - A scheme for **Affordable Rental Housing Complexes (AHRCs)** for urban migrants and poor has been approved in 2020 as a sub-scheme under Pradhan Mantri Awas Yojana - Urban (PMAY-U).
- Indian Institute of Architects (IIA) and CII-Indian Green Building Council (IGBC) signed a MoU to boost green building movement in the area of architectural design and planning.
- Investments:** Government has allowed **FDI of up to 100%** for townships and **settlements development projects**.
 - The Union Cabinet has approved the setting up of Rs. 25,000 crore **alternative investment fund (AIF)** to revive around 1,600 stalled housing projects across top cities.

WAY FORWARD

- Technology would pave the way for new-age constructions.** The increased awareness will lead to greater utilization of advanced technology to create world-class products in India. Prefab construction, driven by cutting-edge technology, could help to solve the housing shortage in the country.
- Sustainable homes would be in demand.** With this, zero energy homes are expected to be the next big wave in Indian real estate.
- Market consolidation would come forward** on the back of a series of structural reforms in the form of Real Estate (Regulation and Development) Act (RERA), GST, and AIF.
- India's Global Real Estate Transparency Index** ranking improved by five notches from 39 to 34 since the past six years from 2014 until 2020 on the back of regulatory reforms, better market data and green initiatives.
- The demand for co-working spaces will uptick.** The financial distress caused by COVID-19 has offered a great opportunity to co-working space companies to generate revenue from the agility-demanding businesses.

TECHNICAL TEXTILES

CONTEXT

The Indian technical textiles industry is said to achieve a market value of \$50 billion in the upcoming five years.

MORE ON THE NEWS

- In the recent half-decade, the progress of technical textiles in India has gathered momentum, **displaying an annual growth rate of 8%**.
- The objective is to accelerate this advancement, **aiming for a substantial growth range of 15-20% over the next five years**.
- Presently, the global market for technical textiles is **valued at USD 250 billion**, and India holds a **share of USD 19 billion within it**.
- As an emerging contender, **India's position in this market is marked by a USD 40 billion presence**, accounting for an 8% share.

- The dominant players encompass the **USA, western Europe, China, and Japan**, collectively holding a 20-40% share.
- The Indian technical textiles sector is on the brink of an impressive trajectory of expansion, with the **vision of attaining an astounding \$50 billion** within the forthcoming five years, departing from its **current position of \$22 billion**.

WHAT ARE TECHNICAL TEXTILES?

- Technical textiles are **functional fabrics** that have applications **across various industries** including automobiles, civil engineering and construction, agriculture, healthcare, industrial safety, personal protection etc.
- Based on usage, there are 12 technical textile segments:**

Meditech	Mobiltech	Oekotech	Packtech	Protech	Sportech
• Diapers, Sanitary Napkins, Disposables, Contact Lens, Artificial Implants	• Airbags, Helmets, Nylon Tyre Cords, Airline Disposables	• Recycling, Waste Disposal, Environmental Protection	• Wrapping Fabrics, Polyolefin Women Sacks, Leno Bags, Jute Sacks	• Bullet Proof Jackets, Fire Retardant Apparels, High Visibility Clothing	• Sports Net, Artificial Turf, Parachute Fabrics, Tents, Swimwear
Agrotech	Buildtech	Clothtech	Geotech	Hometech	Indutech
• Shadennets, Fishing Nets, Mulch Mats, Ant – hall Nets	• Cotton Canvas Tarpaulins, Floor and Wall Coverings, Canopies	• Zip Fasteners, Garments, Umbrella Cloth, Shoe Laces	• Geogrids, Geonets, Geocomposites	• Mattress and Pillow Fillings, Stuffed Toys, Blinds, Carpets	• Conveyer Belts, Vehicle Seat Belts, Bolting Cloth

- Conventional textiles v/s technical textiles:**

Conventional textiles	Technical textiles
<ul style="list-style-type: none"> <input type="checkbox"/> Manufactured primarily for aesthetic or decorative purpose. <input type="checkbox"/> Fiber (natural or synthetic) is usually first spun into yarn and then yarn is woven/knit into fabric. 	<ul style="list-style-type: none"> <input type="checkbox"/> Manufactured primarily for performance or functions rather than aesthetics. <input type="checkbox"/> May be both woven and non-woven and is made out of primarily synthetic and some natural fibers.

ABOUT THE NATIONAL TECHNICAL TEXTILES MISSION (NTTM)

- Launch:** It was approved in 2020 by the Cabinet Committee on Economic Affairs (CCEA) with the aim to position the country as a global leader in technical textiles and increase the use of technical textiles in the domestic market.
- Implementation period:** FY 2020-21 to 2023-24.
- Outlay:** Rs. 1480 crores.
- Goal:** To achieve a market size of \$40 billion and export of \$10 billion in the technical textiles segment by 2024-25.
- The focus of the Mission is also for developing the usage of **technical textiles in various flagship missions, programmes** of the country including strategic sectors.
- Components:** The mission has four components:
 - **First component:** It will focus on **research, development and innovation** with an outlay of Rs. 1,000 crores.
 - **Second component:** It will be for the promotion and development of the **market for technical textiles**.
 - **Third component:** It will focus on **export promotion** so that technical textile exports from the country reach from Rs 14,000 crores to Rs 20,000 crores by 2021-2022 and ensure 10% average growth every year till the Mission ends.
 - **Fourth component:** It will focus on **education, training and skill development**.

INITIATIVES RELATED TO TECHNICAL TEXTILES

- Production Linked Incentive (PLI) Scheme for Textiles Sector:** It aims to promote the production of high value Man-Made Fiber (MMF) fabrics, garments and technical textiles.

- 100% FDI under Automatic Route:** The Government of India allows 100% Foreign Direct Investment (FDI) under automatic route.
- Harmonized System of Nomenclature (HSN) Codes for Technical Textile:** In 2019, Government of India dedicated 207 HSN codes to technical textiles to help in monitoring the data of import and export, in providing financial support and other incentives to manufacturers.
- Technotex India:** It is a flagship event organized by the Ministry of Textiles and comprises exhibitions, conferences and seminars with participation of stakeholders from across the global technical textile value chain.

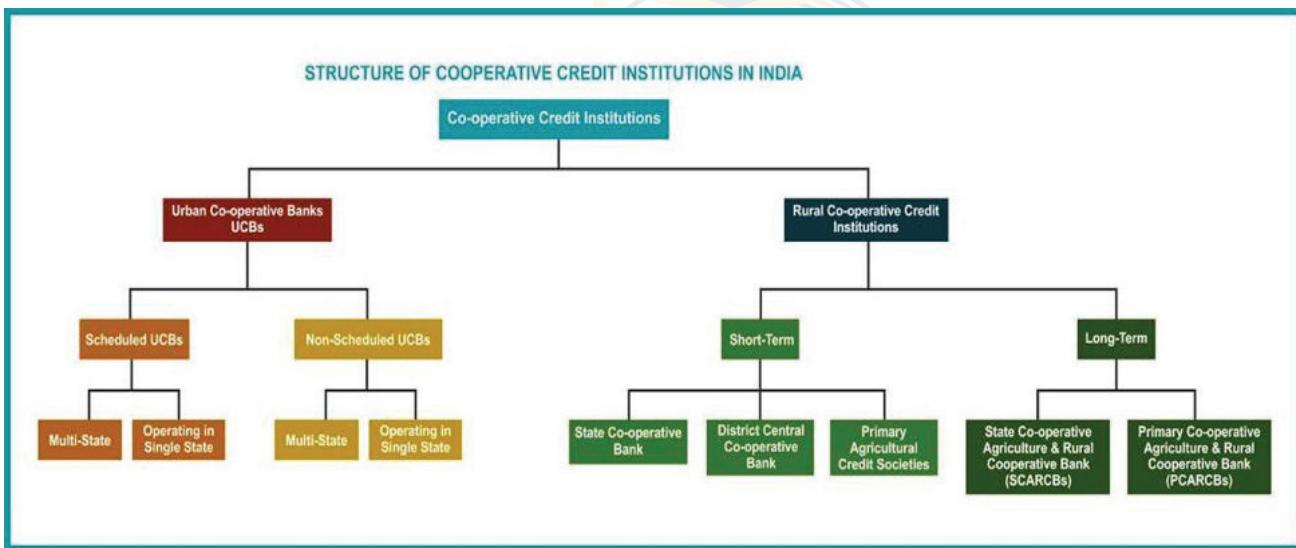
URBAN COOPERATIVE BANKS (UCBS)

CONTEXT

The governor of Reserve Bank of India (RBI) asked the boards of urban cooperative banks (UCBs) to strengthen financial and operational resilience to ensure overall financial and banking sector stability.

WHAT ARE COOPERATIVE BANKS?

- Co-operative banks are financial entities established on a **cooperative basis** and belonging to their members. This means that the **customers** of a co-operative bank are **also its owners**
- They are registered under the **Cooperative Societies Act of the State concerned** or the **Multi-State Cooperative Societies Act, 2002**.
- The Cooperative banks are governed by the **Banking Regulations Act, 1949** and **Banking Laws (Cooperative Societies) Act, 1955**.
- They are broadly divided into **urban and rural cooperative banks** (see the image below).



WHAT ARE URBAN COOPERATIVE BANKS (UCB)?

- The term Urban Cooperative Banks (UCBs) is not formally defined but refers to **primary cooperative banks** located in **urban and semi-urban areas**.
- Till 1996, UCBs were allowed to lend money only for **non-agricultural purposes**. This distinction does not hold today.
- The urban cooperative banking movement in India began in the late 19th century, influenced by successful **cooperative experiments in Britain** and **credit movements in Germany**.
- There were **1,539 UCBs in the country** as of March 31, 2020, with deposits worth Rs 5,01,180 crore and advances worth Rs 3,05,370 crore. UCBs accounted for **3.24% of the deposits** and **2.69% of the advances in the banking sector**.

CHALLENGES FACED BY THE COOPERATIVE BANKS

- Adapting to Financial Sector Changes:** The emergence of microfinance, FinTech firms, e-commerce platforms, and NBFCs, along with shifts in financial trends, poses difficulties for smaller Urban Cooperative Banks (UCBs) lacking diversification and professional management.
- Erosion of Trust:** Mismanagement incidents have eroded public trust in cooperative banks over time.
 - According to the Ministry of Finance, **urban cooperative banks reported 323 frauds in FY21**, while state cooperative banks witnessed 482 frauds in the same fiscal year.
 - While **Maharashtra**, home to the highest number of cooperatives, accounted for 67% of the fraud cases in urban cooperative banks in FY21, **Kerala** made up for 44% of the frauds in state cooperative banks.
- Reduced Agricultural Lending:** Despite historically significant roles, cooperative banks' contribution to agricultural lending has declined markedly, dropping from 64% in 1992-93 to just 11.3% in 2019-20.
- Decrease in Numbers:** After liberalization in 1993, a significant portion of newly licensed cooperative banks struggled financially. The RBI merged weaker banks in 2005 to consolidate.
- Dual control:** The UCBs were under dual regulation by the state registrar of societies and the RBI. But in 2020, all UCBs and multi-state cooperatives were brought under the supervision of RBI.

SWOT ANALYSIS OF URBAN COOPERATIVE BANKING SECTOR IN INDIA

STRENGTHS	<ul style="list-style-type: none"> <input type="checkbox"/> UCBs are self-reliant in financial with less risk in operations. <input type="checkbox"/> They have been filling the credit gap in the urban, sub-urban and semi-urban areas. <input type="checkbox"/> One hundred years of existence. <input type="checkbox"/> UCBs have responsibility for the economic upliftment of the weaker sections of the community. <input type="checkbox"/> Non-discrimination against caste, class, creed, religion, and gender. <input type="checkbox"/> The principle of member's participation has resulted in a unique system of share capital linked to borrowing in UCBs. <input type="checkbox"/> Democratic management is the principle of cooperative sector. <input type="checkbox"/> The deposits of UCBs are protected by the Deposit Insurance and Credit Guarantee Corporation of India (DICGC). <input type="checkbox"/> There is a good network of UCBs organized at grassroots levels. <input type="checkbox"/> Cooperatives are required to maintain lower reserve requirements i.e., 3% and 25% of their time and demand liabilities towards CRR and SLR respectively. This provides a greater liquidity to cooperatives.
WEAKNESSES	<ul style="list-style-type: none"> <input type="checkbox"/> UCBs had the highest net non-performing asset (NNPA) ratio (5.26%) and gross non-performing asset (GNPA) ratio (10.96%) across the banking sector as of March 2020. These levels correspond to around twice that of private sector banks, and around five times that of small finance banks. <input type="checkbox"/> Staff recruitment is not done properly in UCBs. There is a shortage of manpower. <input type="checkbox"/> The process of computerization of UCBs is rather slow. Though computers have been installed, trained staff is not available. <input type="checkbox"/> Lack of professional management. <input type="checkbox"/> Regional imbalance in the distribution and development of UCBs. <input type="checkbox"/> Political factors play an adverse role and hamper the smooth functioning of banks i.e., organizing loan melas and campaigning for waiver of loan in the same breath. <input type="checkbox"/> Ineffective supervisory mechanism and internal control system. <input type="checkbox"/> The low business level is one of the major reasons for non-viability of UCBs. <input type="checkbox"/> Financial margin of UCBs is inadequate to meet transaction and risk costs. <input type="checkbox"/> Poor image in the minds of people about cooperative institutions. <input type="checkbox"/> UCBs concentrate more on jewel loan than others. <input type="checkbox"/> Lack of initiative and innovation among the staff and members.
OPPORTUNITIES	<ul style="list-style-type: none"> <input type="checkbox"/> UCBs are integrated into their local environment and their role goes beyond that of provider of financial services. <input type="checkbox"/> On account of their proximity to their members and their firms, UCBs have a good scope for enlarging the membership. <input type="checkbox"/> UCBs are pioneers in the field of micro finance.

THREATS	<input type="checkbox"/> Acute competition in the market. <input type="checkbox"/> Increasing incidence of frauds and misappropriation . <input type="checkbox"/> Tightening of Income Recognition and Asset Classification Norms had a direct bearing on the balance sheet of the UCBs. <input type="checkbox"/> Higher cost of management especially for interest on deposits and establishment cost. <input type="checkbox"/> External pressure to finance ineligible borrowers. <input type="checkbox"/> Loan waiver announcement of government then and there.
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RECENT STEPS TAKEN FOR UCBs

- **Categorization of UCBs:** In December 2022, the RBI announced a four-tiered regulatory framework for categorization of UCBs.
 - The four-tiered regulatory framework is based on **size of deposits of the UCBs**.
 - The RBI has categorised all unit UCBs and salary earners' UCBs (irrespective of deposit size), and all other UCBs having deposits up to Rs 100 crore in **Tier 1**.
 - In **Tier 2**, it has placed UCBs with deposits more than Rs 100 crore and up to Rs 1,000 crore.
 - **Tier 3** will cover banks with deposits more than Rs 1,000 crore and up to Rs 10,000 crore.
 - UCBs with deposits more than Rs 10,000 crore have been categorised in **Tier 4**.
- **Banking Regulation (Amendment) Act, 2020:** It brought management / governance, audit, reconstructions / amalgamation, winding up, etc. of co-operative banks under **RBI's purview** to enable improvement in the quality of their management and the standards of their cooperative governance.
 - **Earlier, the banking related functions of a UCB** were regulated by **RBI** under the provisions of Banking Regulation Act and powers with regard to **incorporation, management, audit and winding up** were governed by the **co-operative societies acts** concerned.
- **Supervisory action Framework (SAF):** In January 2020, the RBI revised the Supervisory Action Framework (SAF) for UCBs. SAF seeks to ensure **expeditious resolution of financial stress** faced by some of the UCBs.
 - The SAF is similar to the **Prompt Corrective Action (PCA)** framework which is imposed on commercial banks.
- **Umbrella Organisation (UO):** RBI had accorded regulatory approval to National Federation of Urban Cooperative Banks and Credit Societies Limited (NAFCUB) in June 2019 for formation of an UO for the UCB sector.
 - UO can act as a **self-regulatory body for small UCBs**, will have a **paid-up capital of Rs.300 crore** and should provide cross liquidity and capital support to the UCBs when needed.

RBI's Recommendations for UCBs

- The RBI directed the directors of UCBs to **strengthen their governance practices**, especially the three supporting pillars of **compliance, risk management, and internal audit**.
- The RBI urged the boards to be more proactive in **Asset Liability Management** and the necessity of managing liquidity risk in a more **systematic manner**.
- On the functioning of the boards, the RBI emphasised **five aspects** - adequate **skills and expertise** of directors, the constitution of a **professional board of management**, diversity, and tenure of board members, **transparent and participatory** nature of board discussions, and effective functioning of **board-level Committees**.
- The RBI cautioned them against using **innovative accounting practices** to camouflage their actual financial position.
- The RBI encouraged them to adopt appropriate business strategies and **explore suitable technology solutions** to sustain and grow their business and serve their customers.

SECURITY

CAPFS - CHALLENGES AND SUGGESTIONS

CONTEXT

Four hundred and thirty-six personnel of the Central Armed Police Force (CAPF) died by suicide in the last three years and overall, 1,532 personnel died by suicide since 2011, according to data provided by the Ministry of Home Affairs (MHA) to Parliament.

WHAT ARE THE KEY HIGHLIGHTS OF THE DATA?

- According to the data provided by the MHA, “136 CAPF personnel died by suicide in **2022**, 157 in **2021** and 143 in **2020**. This year, 71 such deaths were reported”.
- Data also shows that the **last three years saw the highest numbers** of CAPF personnel dying by suicide than in any year over the past decade.
- In the last three years, **maximum number of suicides** were reported in the **CRPF (154)**, while **111 suicides** were from the **BSF**.
- “Among **reasons for suicides**, a task force by the MHA recorded **extended working hours**, inadequate time to **rest and recreation**, lack of **job satisfaction** as compared with their counterparts of other sectors, **sense of isolation** and lack of social as well as familial support, and lack of robust grievance redressal mechanism.”

WHAT ARE THE CENTRAL ARMED POLICE FORCES (CAPFS)?

- Central Armed Police Forces is the **collective name of central police organizations (CPOs)** in India under the **Ministry of Home Affairs**.
- Background:** These are technically paramilitary forces formerly known as **Central Para-Military Forces (CPMF)**. Since 2011, India adopted the term “central armed police forces” to drop the word “paramilitary”.
 - A paramilitary force is an organization that operates similarly to a military force, but is **not part of the regular armed forces** of a country.
 - The Indian Armed Forces comprise of three divisions – **Indian Army, Indian Navy, and the Indian Air Force** (under the management of the **Ministry of Defence**).
- Mandate of CAPFs:** These forces are responsible for **internal security** and **guarding the borders**.
- Current CAPFs:** There are **7 security forces in CAPF namely-** Central Reserve Police Force (CRPF), Central Industrial Security Force (CISF), Sashastra Seema Bal (SSB), Assam Rifles (AR), Indo-Tibetan Border Police (ITBP), National Security Guards (NSG) and Border Security Forces (BSF).

THE SEVEN CENTRAL ARMED POLICE FORCES



Border Guarding Forces	Other Forces
<ul style="list-style-type: none"> <input type="checkbox"/> Of the CAPFs, the AR, BSF, ITBP and SSB are Border Guarding Forces. <input type="checkbox"/> The Border Security Force (BSF) is responsible for guarding India's land borders with Pakistan and Bangladesh. <input type="checkbox"/> The Assam Rifles (AR) is responsible for guarding India's borders with Myanmar. <input type="checkbox"/> The Indo-Tibetan Border Police (ITBP) is responsible for guarding India's border with China. <input type="checkbox"/> The Sashastra Seema Bal (SSB) is responsible for guarding India's borders with Nepal and Bhutan. 	<ul style="list-style-type: none"> <input type="checkbox"/> The NSG: The NSG is a commando trained force Organisation in India and are used for special operations. <input type="checkbox"/> The CISF: The CISF provides security and protection to industrial undertakings and vital installations. <input type="checkbox"/> The CRPF: The CRPF is deployed in aid of civil power in matters relating to maintenance of law and order, internal security and counterinsurgency.
<p>They function under the administrative control of Ministry of Home Affairs. Though the AR functions under the administrative control of the MHA, its operational control rests with the Ministry of Defence.</p>	

WHAT ARE THE VARIOUS ISSUES FACED BY THE CENTRAL ARMED POLICE FORCES (CAPFs)?

- Working Conditions:** The Standing Committee on Home Affairs in the year 2017 had expressed concern over the working conditions of personnel of the border guarding forces.
 - The Committee observed that they had to work 16-18 hours a day, with **little time for rest or sleep.**
 - The personnel were also not satisfied with **medical facilities** that had been provided at border locations.
 - In addition, the Standing Committee observed that personnel of the CAPFs **have not been treated at par** with the Armed Forces, in terms of pay and allowances.
- Poor Infrastructure:** Lack of electricity at several installations of **Border Out Posts (BOPs)**, seriously affects the working conditions of the personnel as well as operations of the CAPFs.
 - Also, there is an **acute shortage of housing** in the forces.
 - These affect the **overall moral of the forces** leaving them psychologically vulnerable. Often incidences of suicides and shooting down of the colleagues come in the light.
- Ineffective Coordination Between State Police and The CAPF Leadership:** States are **overdependent on the CRPF** for maintaining various law and order situations. The continuous deployment of training companies affects the **operational efficiency** of the CRPF, as well as denies them training and rest.
- Vulnerability to attacks:** The **deployment levels** of CRPF personnel are **high** and they are **overstretched**, leading to compromised training and vulnerability to attacks.
 - On **February 14, 2019**, a **terror attack** was carried out in **Pulwama in Jammu and Kashmir** by a suicide bomber resulting in the death of 40 CRPF personnel.
- Bureaucratization of the forces:** Majority of the higher posts of the top hierarchy are filled by **deputations (IPS officers)**, who most of the times failed to take adequate steps for the welfare of the cadre officers.
- Left Wing Extremism (LWE):** Casualty of security forces in LWE affected areas are taking place due to mine blasts. There is non-availability of technology to detect deeply planted mines.

WAY FORWARD

In 2018, a report by the **Standing Committee on Home Affairs** on 'Working Conditions in Central Armed Police Forces' has suggested the **following recommendations:**

- Ending IPS hegemony:** The nature of duty of CAPF is more similar to that of the Armed Forces and it would make more sense to bring more officers from the **Armed Forces on deputation**. However, MHA has contested the same by justifying that the presence of IPS officers in every CAPF **increases inter-departmental coordination between various CAPFs and State** and therefore IPS officers are best suited to lead and provide supervisory directions to any CAPFs in an **effective, efficient and impartial manner**.
- Modernization of the Force** must be given utmost priority as this Force not only has to face any enemy from across the border but also vagaries of nature.
- Issue specific Counter Plan rather than One-Size Fits All Approach:**
 - **For J&K:** MHA should adopt a **multi-pronged strategy** that prevents youth from joining militancy, curbs their financing, and simultaneously launch counter-insurgency operations.
 - **For Left Wing Area:** MHA should make efforts to procure **mine-resistant vehicles**. This could be done through import or domestic manufacturing under the '**Make in India**' programme,
- Cadre Review:** Expedite Cadre Review of these forces as it's essential to **maintain their organizational structure** and ensures completion of project in a **time-bound manner**.
 - **Joshi Committee** recommended that **top positions** should be filled from the **respective cadre of the CAPF**.
- Setting up Dedicated Research and Development (R&D) Wing:** It recommended that due to the unique issues faced by the CRPF, such as large size and areas of deployment, creation of a **dedicated R&D unit** of its own should be explored, to deal with issues peculiar to the CRPF such as **Improvised Explosive Devices (IEDs)**, and **bullet proofing of vehicles**.

PARLIAMENTARY PANEL REPORT ON CYBER SECURITY IN INDIA

CONTEXT

The Parliamentary Standing Committee on Finance, in its report, highlighted the need to establish a Cyber Protection Authority to tackle the rising instances of white-collar crimes in cyberspace.

RECOMMENDATIONS OF THE REPORT

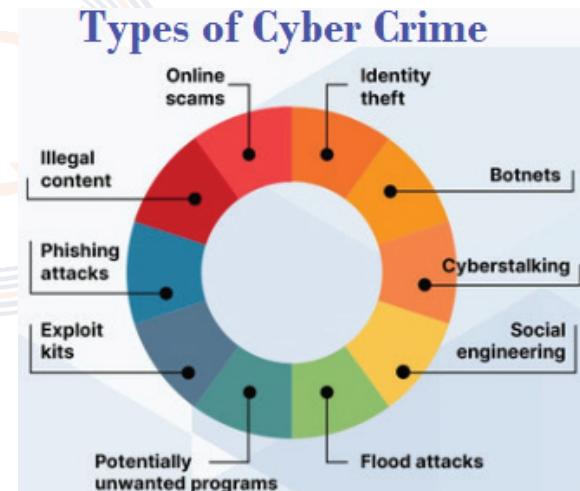
- Establish a Centralised ‘Cyber Protection Authority’:** The committee has proposed the creation of a centralized and empowered ‘cyber protection authority’, similar to the Directorate General of Civil Aviation (DGCA), specifically **aimed at safeguarding the financial services ecosystem**. This authority would be responsible for tackling the increasing instances of white-collar crimes in cyberspace.
- Regulate Third-Party Service Providers:** This regulation aims to ensure that these service providers adhere to security standards and share comprehensive metadata about their apps with relevant authorities for security checks.
- Implement a White-Listing Framework for Digital Lending Agencies:** This framework would involve a thorough evaluation of these agencies to ensure regulatory compliance, operational transparency, and adherence to ethical practices.
- Adopt an Automatic Compensation System:** The committee proposes the implementation of an automatic compensation system as designed by the Reserve Bank of India (RBI). Financial institutions would be solely responsible for promptly compensating affected customers in case of cybercrime incidents, without requiring the victims to prove a direct connection between the cybercrime and the financial loss.
- Enhance Enforcement Capabilities and Collaboration:** The committee emphasizes the need to enhance enforcement capabilities in the realm of cyber security. Additionally, they recommend collaborating with international counterparts to adopt best practices and ensure a proactive approach to global cyber security regulations.

WHAT IS CYBER SECURITY?

- Cybersecurity refers to the practice of **protecting computers, servers, networks, electronic systems, and digital data** from unauthorized access, theft, damage, or disruption.
- It involves implementing measures and **employing technologies** and processes to ensure the **confidentiality, integrity, and availability** of information and systems.
- Cybersecurity is necessary to protect **sensitive data**, preserve **operational continuity**, and **mitigate financial risks** posed by evolving **cyber threats and crimes** in the digital landscape.

VARIOUS ELEMENTS OF CYBER SECURITY

- Application security:** Applications play an essential role in business ventures; that is why every firm needs to focus on web application security. Web application security is important in order to protect customers, their information and interests.
- Information security:** Information includes business records, personal data, customer’s data, intellectual property etc; hence, it is important for a corporation to have strong cyber security for information to prevent its leakage.
- Network Security:** Network security consists of protecting the usability and reliability of network and data. Measures to secure networks, including firewalls, intrusion detection and prevention systems (IDPS), virtual private networks (VPNs), and network segmentation.
- Disaster Recovery/ Business continuity planning:** It is about being prepared for any kind of interference or cyber threat by identifying threats to the systems on time and analyzing how it may affect the operations and methods to counter that threat.
- Operational security (OPSEC):** It is used to protect organization functions. It identifies important information and assets to track down threats and vulnerabilities that exist in the functional method.
- End-user education:** It is important for an organization to train their employees about cyber security because human error is one of the major causes of data breaches.



WHY INDIA NEEDS TO SECURE ITS CYBER SPACE?

- Increasing cybercrimes:** As per the NCRB data from "Crime in India, 2020", Cybercrimes have increased four times or 306 percent in the past four years and rate of cybercrime (incidents per lakh population) increased in 2020.
 - India saw a 53 per cent increase in ransomware incidents in 2022 (year-over-year), according to the "**India Ransomware Report 2022**" published by the CERT-In.
- Digital India:** According to a report, the value of digital payments in India will grow close to 1 trillion dollars in FY26 from **300 billion dollars in FY21**.
- Critical Infrastructure:** India's critical infrastructure, including power plants and power distribution, healthcare, railways and banking, have **witnessed increasing cyberattacks**, allegedly from Chinese state-sponsored groups.
- Cyber Defense:** Presently, the nature of the war in Ukraine indicates that India needs to review its cyber-defence policies. India also needs to give equal attention to building a **deterrent cyber-offensive capability**.
 - Offensive cybersecurity strategies **preemptively identify vulnerabilities** and security weaknesses before an attacker exploits them.
- Terrorism:** As per a report by the **International Institute for Counter Terrorism**, hacktivism activities have **increased in Southeast Asia**, including website defacement, distributed denial-of-service (DDoS) attacks and information leaks. Such threats will increase in the coming times.

CURRENT CYBER SECURITY ARCHITECTURE IN INDIA

- National Cyber Security Policy, 2013:** It was the first comprehensive document brought out by the government to create a secure and resilient cyberspace ecosystem and strengthen the regulatory framework.
 - It aims to protect information infrastructure in cyberspace, **reduce vulnerabilities**, build capabilities to prevent and **minimize damage** from cyber incidents through a combination of **institutional structures, people, processes, technology and cooperation**.
- National Cyber Security Strategy 2020:** It was conceptualized by the National Security Council Secretariat to ensure a safe, secure, trusted, resilient and **vibrant cyberspace for Nation's prosperity**.
 - **Pillars of strategy** are Secure (the National Cyberspace), Strengthen (Structures, People, Processes, Capabilities), and Synergise (Resources including Cooperation and Collaboration).
- Institutional mechanism:**
 - **Indian Cyber Crime Coordination Centre (I4C):** It was rolled out by the Ministry of Home Affairs for the period 2018-2020 to combat cybercrime in the country, in a coordinated and effective manner.
 - **Indian Computer Emergency Response Team (CERT-In):** It serves as national agency for responding to cyber security incidents as per provisions of IT Act, 2000. It issues alerts and advisories regarding latest cyber threats/vulnerabilities and countermeasures to protect computers and networks on a regular basis.
 - **Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre):** It has been launched for detection of malicious programs and provides free tools to remove the same.
 - **National Cyber Crime Reporting Portal:** It caters to complaints pertaining to cybercrimes only with special focus on cybercrimes against women and children.
 - **National Cyber Coordination Centre (NCCC):** It is a multi-stakeholder cybersecurity and e-surveillance agency, under CERT-In. It generates situational awareness of existing and potential cyber security threats and enables timely information sharing for proactive, preventive and protective actions by individual entities.
 - **National Critical Information Infrastructure Protection Centre (NCIIPC):** It is created under IT Act, 2000 (amended 2008) and designated as National Nodal Agency to facilitate safe, secure and resilient information infrastructure for critical sectors of the Nation.

CHALLENGES AND CONCERNs IN INDIA'S PREPAREDNESS OF CYBER WARFARE

- Lack of comprehensive strategy:** Unlike the US, India still lacks a comprehensive, modern, and updated cyber warfare strategy. In the present capacity, India can only address cybersecurity attacks and not cyber warfare.
- Lack of Strong Security Culture:** India lacks a strong security culture which is quite imperative in the cyber security domain.
- Lack of Awareness:** Women and children are increasingly becoming victims of cybercrimes such as pornography, stalking, cheating, and hacking.

- "Whack-a-mole" approach:** India's current approach adopts a reactionary "whack-a-mole" approach rather than creating deterrence.
 - "Whack – a – Mole' approach is a style of managing or leading others where a **manager waits for something he/ she believes to be wrong** to happen, and "whacks" the behavior with words and/or actions.
- Shortage of Technical Staff for the Investigation of Cybercrime:** There have been half-hearted efforts by the States to recruit technical staff for the investigation of cybercrime.
 - A **regular police officer** may be unable to understand the nuances of the working of a computer or the Internet.
 - It is only a **technically qualified staff** who could acquire and analyze digital evidence.

WAY FORWARD

- National Cybersecurity Strategy:** The Union Government is in the process of formulating a National Cyber Security Strategy which will holistically look at addressing the issue of security of national cyberspace.
- Increased Participation and Awareness:** There needs to be enhanced private and public sector participation along with data protection efforts to prevent frequent cyberattacks.
- Technological Updation:** India also needs to study the evolving tactics, techniques, and procedures (TTPs) of hackers and criminals to be able to prevent these attacks. The cyber forensic laboratories of States must be upgraded with the advent of new technologies.
- Data localisation:** Most cyber crimes are trans-national in nature with extra-territorial jurisdiction. The collection of evidence from foreign territories is not only a difficult but also a tardy process.
 - Therefore, 'data localisation' must feature in the proposed Personal Data Protection law so that enforcement agencies are able to get timely access to the data of suspected Indian citizens.
- Human Resource Development:** There is a need to introduce new courses, curriculum and academic institutions in the field of cyber security, ethical hacking, cryptology etc. to boost human resource in the field of cyber warfare.
- Synergy and Coordination:** There is a need for coordination, planning, understanding and synergy of efforts amongst all civil, military, intelligence, law enforcement and educational organizations responsible for cyber security, information assurance, cyber warfare and perception management.
- Budget Allocation:** A Parliamentary Standing Committee has recently recommended that funds for cyber security may be increased on a year on basis to forestall any failures in this domain for sheer lack of funds.

ENVIRONMENT

CLIMATE CHANGE IMPACTS INCREASE IN ASIA

CONTEXT

According to a new report by the World Meteorological Organization (WMO), Asia is the world's most disaster-prone region and it experienced 81 weather, climate and water-related disasters in 2022.

KEY HIGHLIGHTS OF THE REPORT

Warming in the Region	<ul style="list-style-type: none"> <input type="checkbox"/> The mean temperature over Asia for 2022 was the second or third warmest on record and was about 0.72 °C above the 1991–2020 average. <input type="checkbox"/> The mean temperature over Asia in 2022 was about 1.68 °C above the 1961–1990 average.
Disasters	<ul style="list-style-type: none"> <input type="checkbox"/> There were 81 weather, climate and water-related disasters in Asia in 2022, of which over 83% were flood and storm events. <input type="checkbox"/> More than 5 000 people lost their lives, more than 50 million people were directly affected and there were more than US\$ 36 billion in economic damages, according to the report. <input type="checkbox"/> In addition, a large part of arid Asia experienced severe dust storms. Several severe dust storm events in western Asia affected civil lives in the region. <input type="checkbox"/> Droughts: <ul style="list-style-type: none"> – Drought affected many parts of the region, reducing water availability. – The economic losses in 2022 as a result of the drought in China, for example, were estimated to exceed US\$ 7.6 billion. <input type="checkbox"/> Floods: <ul style="list-style-type: none"> – Severe flooding hit Pakistan, causing significant loss of life and economic damage. – Pakistan received 60% of its normal total monsoon rainfall within just three weeks of the start of the monsoon season in 2022. – According to the National Disaster Management Authority (NDMA), more than 33 million people, almost 14% of Pakistan's 2022 population, were affected.
<p style="text-align: center;">Overview of 2022 disasters in the Asia region</p>	
Glacial Melting	<ul style="list-style-type: none"> <input type="checkbox"/> Glaciers in the High Mountain Asia region have lost significant mass over the past 40 years, and the loss is accelerating. <input type="checkbox"/> In 2022, exceptionally warm and dry conditions exacerbated the mass loss for most glaciers. <input type="checkbox"/> Urumqi Glacier No. 1 in the eastern Tien Shan recorded the second highest negative mass balance of -1.25 metre water equivalent since measurements began in 1959.
Ocean Warming	<ul style="list-style-type: none"> <input type="checkbox"/> The region shows an overall surface ocean warming trend since the time series began in 1982. <input type="checkbox"/> In the north-western Arabian Sea, the Philippine Sea and the seas east of Japan, the warming rates exceed 0.5 °C per decade, which is about three times faster than the global average surface ocean warming rate.

Economic Losses	<input type="checkbox"/> Economic losses in 2022 due to disasters relating to floods exceeded the average for the 2002–2021 period. <input type="checkbox"/> The most significant losses of this type were in Pakistan (over US\$ 15 billion), followed by China (over US\$ 5 billion), and India (over US\$ 4.2 billion). <input type="checkbox"/> Economic losses in 2022 associated with droughts were the next largest category, causing US\$ 7.6 billion in damages (mainly in China) ; this exceeds 2002–2021 average (US\$ 2.6 billion) by nearly 200%.
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ABOUT THE WORLD METEOROLOGICAL ORGANIZATION (WMO)

- The World Meteorological Organization (WMO) is an **intergovernmental organization** with a membership of **193 Member States and Territories**.
 - **India is a member** of WMO.
- It originated from the **International Meteorological Organization (IMO)**, the roots of which were planted at the **1873 Vienna International Meteorological Congress**.
- Established by the ratification of the **WMO Convention on 23 March 1950**, WMO became the **specialized agency of the United Nations** for meteorology (weather and climate), operational hydrology and related geophysical sciences a year later.
- The Secretariat, **headquartered in Geneva**, is headed by the Secretary-General. Its **supreme body is the World Meteorological Congress**.

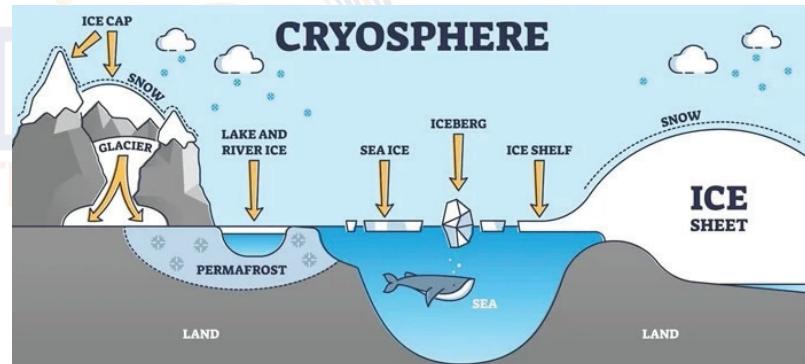
IMPACT OF CLIMATE CHANGE ON CRYOSPHERE

CONTEXT

In light of the rapid depletion of the cryosphere caused by climate change, the World Meteorological Organization (WMO) calls for urgent action, increased global investment, research collaboration, and data exchange.

WHAT IS THE CRYOSPHERE?

- The cryosphere refers to the **portion of the Earth's surface and atmosphere that is composed of frozen water**.
- The term “cryosphere” comes from the **Greek word “kryos,” meaning cold or frost**.
- Ice and snow on land are **one part of the cryosphere**.
 - This includes the largest parts of the cryosphere, the **continental ice sheets** found in Greenland and Antarctica, as well as **ice caps, glaciers, and areas of snow and permafrost**.
 - When continental ice flows out from land and to the sea surface, we get **shelf ice**.
- The **other part of the cryosphere is ice that is found in water**.
 - This includes **frozen parts of the ocean**, such as waters surrounding Antarctica and the Arctic.
 - It also includes **frozen rivers and lakes**, which mainly occur in polar areas.



SIGNIFICANCE OF THE CRYOSPHERE

- Climate Regulation:** The primary role of the cryosphere in the **global climate system** is known as ‘Albedo’.
 - The albedo is the process through which **solar rays are reflected back to space** from the shiny white surfaces of the cryosphere.
 - **The high albedo of ice and snow prevents the absorption of solar energy**, which helps maintain **cooler global temperatures**.
- Source of Freshwater:** The cryosphere contains approximately **69% of the world's freshwater**, primarily stored in glaciers, ice caps, and ice sheets.

- Thus, it plays a crucial role in **maintaining global water availability**, and serves as a primary source of freshwater for **drinking, agriculture**, and other human activities.
- Carbon Storage:** Arctic permafrost stores **twice the carbon in the atmosphere** today, amounting to about 1400-1600 billion tons of carbon.
 - Permafrost is the **land that remains frozen** for at least two years.
- Ecosystems:** The cryosphere supports **diverse ecosystems**, especially in polar regions.
 - For instance, the Arctic holds more than **14,000 terrestrial species** including its flora and fauna.
- Achieving SDGs:** The cryosphere is intricately linked to several United Nations Sustainable Development Goals (SDGs), including
 - **SDG 13 (Climate Action)** due to its role as a critical indicator and driver of climate change,
 - Its impact on freshwater resources (**SDG 6**), and biodiversity (**SDG 15**).

IMPACTS OF CLIMATE CHANGE ON CRYOSPHERE

- Cryosphere loss due to global warming:** The cryosphere is sensitive to the changing climate, especially global warming, due to greenhouse gases.
 - The **IPCC Special Report on the Ocean and Cryosphere** in a Changing Climate states that "over the last decades, global warming has led to widespread shrinking of the cryosphere".
 - According to the **WMO's State of global climate report 2022**, cumulative thickness of glaciers around the world has plummeted by 30 meters since 1970.
 - Similarly, **Antarctic sea ice** plummeted to the lowest level ever recorded and is 1 million kilometer² below the long-term mean (from 1991 to 2020).
 - The **Arctic sea ice** has also recorded the lowest monthly ice extent in satellite records.
 - Also, the glaciers in the **Hindu-Kush Himalayan (HKH) region** are retreating at an alarming rate.
- Sea level rise:** The melting of glaciers and ice sheets, along with the **thermal expansion of seawater** as it warms, leads to rising sea levels, posing threat to coastal communities.
 - WMO says, sea level rise has touched a new **record high in 1993-2022**.
 - The mean sea level rise **doubled from the decade 1993-2002** (2.27 millimetres per year) to the last one, 2013-2022 (4.62 millimetres per year).
 - **Glaciers, Greenland and Antarctica ice sheet** melting accounts for about 50% of the global sea level rise.
- Thawing of Permafrost:** WMO terms the permafrost as the **sleeping giant of greenhouse gases**.
 - The **melting of Arctic permafrost** (which stores double the carbon as in the atmosphere) increases the risk of releasing the gases and hence causing cascades of natural hazards.
 - The melting of the permafrost, in the range of **1.5-degree Celsius temperature rise** (as per the Paris Agreement), is estimated to cause **carbon dioxide emission of 150-200 gigatonnes**.
- Climate Feedback Loop:** As ice and snow melt, darker surfaces like open water and exposed land are revealed, initiating a **climate feedback loop** where these surfaces **absorb more sunlight** and heat, thus **further accelerating warming**.
- Changes in Ocean Circulation:** The melting of ice, especially from glaciers and ice sheets, contributes to changes in ocean circulation patterns.
 - This can affect global ocean currents, which play a vital role in **distributing heat around the planet** and influencing regional climates.
- Socio-Economic Impacts:** Loss of mountain glaciers and snow, especially in mid-latitude and tropical regions, impact more than three billion people.
 - Changes are especially acute in the **northern Andes, western U.S., Scandinavia, and the Alps**; where economic activities such as **agriculture, power generation and tourism** depend on a rapidly shrinking mountain cryosphere.
 - Changes in the **Hindu Kush Himalaya** have negative direct and indirect impacts on over two billion people; ranging from changes in **water availability**, to **flooding and landslides** from a deadly combination of **extreme rainfall** and heightened meltwater, especially in the spring and summer months.

INITIATIVES FOR CRYOSPHERE

Global initiatives <ul style="list-style-type: none"> <input type="checkbox"/> International Cryosphere Climate Initiative (ICCI): <ul style="list-style-type: none"> – Formed in 2009 following COP-15 in Copenhagen, ICCI is a network of senior policy experts and researchers working with governments to preserve as much of the Earth's cryosphere as possible. – ICCI programs target the unique climate dynamics at work in the cryosphere, while at the same time lending increased urgency to global climate efforts. <input type="checkbox"/> Global Cryosphere Watch (GCW): <ul style="list-style-type: none"> – GCW is a joint initiative of the World Meteorological Organization (WMO) and other partners. – It aims to enhance the systematic observation and monitoring of the cryosphere, providing essential data for assessing cryosphere changes and their impacts. <input type="checkbox"/> The Arctic Council: <ul style="list-style-type: none"> – The Arctic Council is a high-level intergovernmental body set up in 1996 by the Ottawa declaration to promote cooperation, coordination and interaction among the Arctic States. – It is mandated to protect the Arctic environment and promote the economies and social and cultural well-being of the indigenous people.
Initiatives by India <ul style="list-style-type: none"> <input type="checkbox"/> The National Mission for Sustaining the Himalayan Ecosystem (NMSHE): It is one of the eight missions under NAPCC, and encompasses conservation measures for sustaining and safeguarding the Himalayan ecosystems. <ul style="list-style-type: none"> – The Government has launched the National Action Plan on Climate Change (NAPCC) in June 2008 to achieve its goals and to deal with the issues related to climate change. – NAPCC comprises eight missions in specific areas of solar energy, enhanced energy efficiency, sustainable habitat, water, sustaining Himalayan ecosystems, Green India, sustainable agriculture and strategic knowledge for climate change. <input type="checkbox"/> PACER scheme: <ul style="list-style-type: none"> – All the scientific and logistic programs in multiple polar domains were amalgamated as a Central Sector umbrella scheme named "Polar Science and Cryosphere Research (PACER)". – It comprises four elements that are the Antarctic program, the Indian Arctic program, the Southern Ocean program, and Cryosphere and Climate program. – It is implemented successfully through the National Centre for Polar and Ocean Research (NCPOR), an autonomous institute under the Ministry of Earth Sciences.

WAY FORWARD

- Need for global efforts:** Protecting the cryosphere through vigorous climate action is not a matter for mountain and polar nations alone: it is a matter of urgent global concern, because the greatest impacts on human communities lie well outside these regions.
- Limiting the global temperature rise:** Limiting global warming to 1.5°C is our best option to limit cryosphere losses and the resulting chain of potential catastrophes.
- The need to make **pre-2030 emissions reductions** a matter of urgency is an imperative for the benefit of all our societies.

PACIFIC DECadal OSCILLATION (PDO)

CONTEXT

A study published in the journal Nature Communications suggests that a combination of global warming and a cyclical phenomenon called the **Pacific Decadal Oscillation (PDO)** could make **equatorial-origin tropical cyclones** more frequent in the coming years.

MORE ON THE NEWS

- Majority of the **tropical cyclones** generally form around the **equator at 5 ° - 30 °**.
 - However, tropical cyclones generally **do not form on the Equator** or in the area that is located **within five degrees** of latitude from the Equator because the **Coriolis forces** at the equator are **too small to generate a vortex** powerful enough to form a cyclone.

- According to the study, the Pacific Decadal Oscillation (PDO) can influence **low-latitude cyclones** by increasing **low-level vorticity**, thereby aiding **cyclone genesis**.
- Cyclones are generally rare to form near the equator, but when the **waters warm**, they can gain **more moisture and increase in intensity**, the study noted.
- Between **1981-2010**, equatorial-origin cyclones decreased by 43% compared to 1951-1980 due to the '**warmer**' positive phase of PDO.

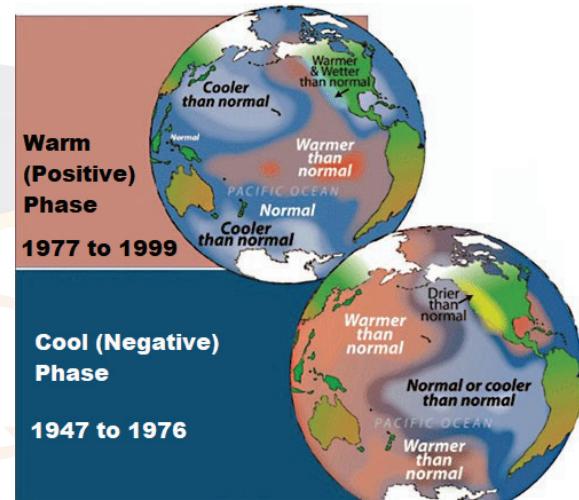
WHAT IS THE PACIFIC DECADAL OSCILLATION?

- The Pacific Decadal Oscillation (PDO) is a **long-term climate pattern** that affects the **temperature of the Pacific Ocean** and the weather patterns around it.
- The PDO is a naturally occurring phenomenon that **shifts between warm and cool phases**, with each phase lasting around **20-30 years**.
- The Pacific Decadal Oscillation can **strongly impact global weather** and is important in long-range weather forecasting.

PHASES OF PACIFIC DECADAL OSCILLATION

Positive Phase (Warm Phase):

- During the positive phase of the PDO, the **sea surface temperatures in the central and eastern Pacific** are **warmer than average**, while the **western Pacific** tends to be **cooler**.
- A 'warm' phase of PDO occurred from **1977 to 1999 (22 years)**.
- This warmer-than-normal condition can lead to various **effects on weather and climate**, such as:
 - Increased likelihood of **wetter and cooler conditions** along the **western coast of North America**.
 - **Warmer and drier conditions** in the western Pacific, including **Australia and parts of Asia**.
 - Altered atmospheric circulation patterns, affecting **storm tracks** and **precipitation patterns**.



Negative Phase (Cool Phase):

- During the negative phase of the PDO, the sea surface temperatures in the **central and eastern Pacific** are **cooler than average**, while the **western Pacific** is relatively **warmer**.
- A 'cool' phase of PDO occurred from **1947 to 1976 (29 years)**.
- This phase also has significant **impacts on weather and climate**:
 - Increased likelihood of **drier and warmer conditions** along the **western coast of North America**.
 - **Cooler and wetter conditions** in the western Pacific, affecting regions like **Australia and parts of Asia**.
- As of May 2023, the Pacific Decadal Oscillation is in a **negative phase**. It began in late 2019 and has remained in a negative phase for approximately **2.5 years**.

CAUSES OF PDO

- The cause of changes in the PDO has **yet to be identified** and it may even be due to a **combination of factors** including:
 - long-lasting **fingerprints of El Nino and La Nina events** in the tropical Pacific Ocean;
 - changes in **atmospheric pressure** the northern Pacific;
 - the impact of **industrial pollution**; and
 - **natural variability**.

PDO AND ENSO

- Both ENSO and the PDO are important **sea surface-based phenomena** that influence weather conditions in the Pacific basin.

- **Time scale:** PDO is a pattern of Pacific climate variability similar to El Niño-Southern Oscillation (ENSO) in character, but which varies over a much longer time scale.
 - The PDO can remain in the same phase for **20 to 30 years**, while ENSO cycles typically only last **6 to 18 months**.
- **Impact of PDO on ENSO:** PDO can intensify or diminish the impacts of ENSO according to its phase.
 - If both ENSO and the PDO are in **the same phase**, it is believed that El Niño/La Niña impacts may be magnified.
 - Conversely, if ENSO and the PDO are **out of phase**, it has been proposed that they **may offset one another**, preventing "true" ENSO impacts from occurring.

ABOUT EL NIÑO–SOUTHERN OSCILLATION (ENSO)

- The ENSO is a **recurring climate pattern** involving changes in the **temperature of waters** in the **central and eastern tropical Pacific Ocean**.
- On periods ranging from about **three to seven years**, the surface waters across a large swath of the tropical Pacific Ocean warm or cool by anywhere from **1°C to 3°C**, compared to normal.
- This oscillating **warming and cooling pattern**, referred to as the ENSO cycle, directly affects rainfall distribution in the tropics and can have a **strong influence on weather across the world**.
- **ENSO has three phases:** El Niño, La Niña, and neutral, which are associated with **different temperature and atmospheric conditions**.
 - **El Niño** occurs when the surface water temperature in the **eastern Pacific Ocean** becomes **warmer than usual**, and this warming can last for several months to a few years.
 - **La Niña** occurs when the surface water temperature in the **eastern Pacific Ocean** becomes **cooler than usual**, and this cooling can also last for several months to a few years.
 - **Neutral conditions** occur when the sea surface temperatures in the eastern Pacific Ocean are close to average, with **no significant warming or cooling**.

DIFFERENCE BETWEEN EL NIÑO AND LA NIÑA

El Niño v/s La Niña		
Basis of comparison	El Niño	La Niña
Meaning	El Niño means Little Boy, or Christ Child in Spanish.	La Niña means Little Girl in Spanish.
Sea surface temperature	It represents the above-average sea-surface temperatures that periodically develop across the east-central equatorial Pacific.	It represents the periodic cooling of sea-surface temperatures across the east-central equatorial Pacific.
Pressure	It is laden with high air surface pressure in the western Pacific .	It contains low air surface pressure in the eastern Pacific .
Mechanism	During El Niño, trade winds weaken . Warm water is pushed back east, toward the west coast of the Americas, resulting in a weaker Walker cell.	During La Niña events, trade winds are even stronger than usual , pushing more warm water toward Asia, resulting in a stronger Walker cell.

El Niño v/s La Niña		
Period of occurrence	Typically occur every 3-5 years and lasts 9-12 months.	Typically occur every 3-5 years and lasts 1-3 years.
Impacts	<input type="checkbox"/> Droughts in eastern Australia <input type="checkbox"/> Flooding in western South America <input type="checkbox"/> Weak upwelling over the west coast of South America.	<input type="checkbox"/> Excessive rainfall in the eastern Australia <input type="checkbox"/> Drought conditions prevail in the South America <input type="checkbox"/> Strong upwelling over the west coast of South America.
Impact on Indian Monsoon	The monsoon is affected so heavily that 70% reduction of the rainfall is expected. The winds doesn't carry the moisture towards Indian landmass during El Niño causing deficiency in rainfall.	La Niña causes high temperatures over the Indian Ocean, off the Somalian coast and a comparatively better monsoon rains in India.

PLASTIC POLLUTION

CONTEXT

The Prime Minister has called on the G-20 nations to work constructively for an effective, **international legally binding instrument** to end plastic pollution.

WHAT IS PLASTIC POLLUTION?

- Plastic is a **synthetic organic polymer** made from petroleum with properties ideally suited for a wide variety of applications, including **packaging, building and construction**, household, electronics, agriculture etc.
- It is **non-biodegradable in nature** and persists in the environment, for hundreds or even thousands) of years.
- Plastic pollution** is caused by the accumulation of this plastic waste in the environment.
- It can be categorized as **primary plastic wastes** such as cigarette butts and bottle caps, or **secondary plastic wastes** that are formed by the degradation of the primary ones.
- As per the UN, over **300 million tons of plastic are produced every year** and India generates 46 million tonnes of plastic waste annually, of which 40% remains uncollected and 43% is used for packaging, most of which are of single-use plastic.

Types of Plastic Waste

- Microplastics** are small plastic pieces of less than five millimeters in size.
 - Microplastic **includes microbeads** (solid plastic particles of less than one millimeter in their largest dimension) that are used in cosmetics and personal care products, **industrial scrubbers** which are used for aggressive blast cleaning, microfibers used in textiles and virgin resin pellets used in plastic manufacturing processes.
- Single-use plastic** is a disposable material that can be used only once before it is either thrown away or recycled, like plastic bags, water bottles, soda bottles, straws, plastic plates, cups, most food packaging and coffee stirrers are sources of single use plastic.
 - India has **announced its commitment to eliminate single-use plastic by 2022** at Confederation of Indian Industry's Sustainability Summit in New Delhi.

SOURCES OF PLASTIC POLLUTION

- The main sources of **marine plastic are land-based, from urban and storm runoff**, sewer overflows, beach visitors, inadequate waste disposal and management, industrial activities, construction and illegal dumping.
- Ocean-based plastic originates mainly from the **fishing industry, nautical activities** and aquaculture.
- Under the influence of solar UV radiation, wind, currents and other natural factors, plastic fragments into small particles, termed **microplastics (particles smaller than 5 mm)** or **nanoplastics (particles smaller than 100 nm)**.

CURRENT STATE OF PLASTIC POLLUTION

- As per the **2023 Plastic Overshoot Day Report** released by Swiss-based research consultancy Earth Action (EA):
 - On **July 28, 2023**, the Earth saw its first **Plastic Overshoot Day** and **India** saw its Plastic Overshoot Day on **6 th January 2023**.

- ✓ **Overshoot Day** is the day when the generation of plastic waste exceeds the capacity of waste management, leading to environmental pollution.
- ✓ It is based on the **country's Mismanaged Waste Index (MWI)**, i.e., the mismanaged and total waste ratio.
- India is among the **12 countries responsible for 52%** of the world's mismanaged plastic waste.
- According to the **Central Pollution Control Board (CPCB)**, India generates close to 26,000 tonnes of plastic a day and over 10,000 tonnes a day of plastic waste remains uncollected.
- According to a **Federation of Indian Chambers of Commerce and Industry (FICCI)** study the plastic processing industry is estimated to grow to 22 million tonnes (MT) a year by 2020 from 13.4 MT in 2015 and nearly half of this is single-use plastic.
- India's per capita plastic consumption of less than **11 kg**, is nearly a tenth of the United States of America (109 kg).

Plastic Life-Cycle Report by Centre for Science and Environment (CSE)

As per the report,

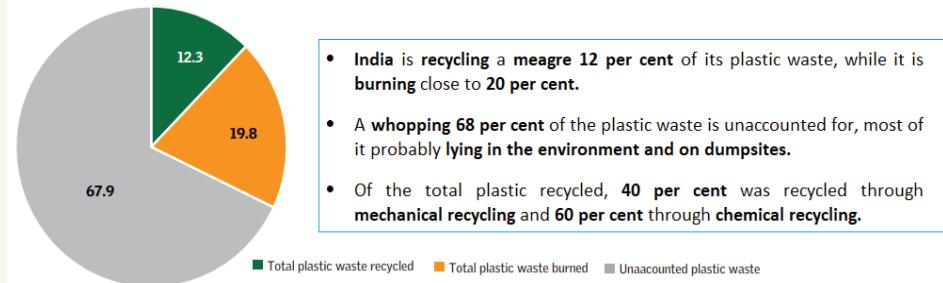
The landscape of plastic waste pollution and management

Global scenario:

- The global production of plastic **increased by 79 per cent** within a decade and a half (between 2000 and 2015).
- Roughly 80 per cent** of all the plastics ever produced continues to **remain in the environment**.
- Total mass of plastics on our planet is now **twice the mass of all living mammals**.
- If the plastic industry were a country, it would be the **fifth largest greenhouse gas emitter** on Earth.

Indian scenario:

- Plastic consumption:** A whopping 18.45 million metric tonne (MMT) of plastic was consumed in India in the year 2018-19; **59 percent of this went into packaging**.
- Multi-layered plastics:** Which are non-recyclable at a commercial scale, made up **35 percent of all plastic waste**, and 40 per cent of all branded plastic waste.
- Plastic waste recycling:**



IMPACT OF PLASTIC POLLUTION

- Economic Losses:** Plastic waste along shoreline has a negative impact on tourism revenue (creates an aesthetic issue). For example, the **Andaman and Nicobar Islands** are facing the aesthetic issue because of the international dumping of plastic waste at the island.
- Impact on Animals:** Plastic wastes have profoundly affected animals in aquatic, marine, and terrestrial ecosystems.
 - Plastic ingestion upsets or fills up the digestive systems of the animals thus contributing to their death due to intestinal blockage or starvation.
- Impact on Human Health:** The chemicals leached from the plastics contain compounds, like polybrominated diphenyl ether (anti-androgen), bisphenol A (mimics the natural female hormone estrogen) and phthalates (also known as anti-androgens), impact human health leading to various hormonal and genetic disorders.
- Land Pollution:** Plastics leach hazardous chemicals on land, resulting in the destruction and decline in quality of the earth's land surfaces in term of use, landscape and ability to support life forms.
- Air Pollution:** Plastic burning releases poisonous chemicals into the atmosphere impacting general well-being and causing respiratory disorders in living beings.

- Groundwater Pollution:** Whenever plastics are dumped in landfills, the hazardous chemicals present in them seep underground when it rains. The leaching chemicals and toxic elements infiltrate into the aquifers and water table, indirectly affecting groundwater quality.
- Water Pollution:** In 2014, United Nation report estimated the annual impact of plastic pollution on oceans at US\$ 13 billion.
- Interference with the Food Chain:** When the smaller animals (planktons, mollusks, worms, fishes, insects, and amphibians) are intoxicated by ingesting plastic, they are passed on to the larger animals disrupting the interrelated connections within the food chain.

SHORTCOMINGS IN HANDLING PLASTIC POLLUTION IN INDIA

- Weak waste management systems:** Lagging to meet the growing needs.
- Insufficient data and reporting:** as the products are scattered into diverse sectors.
- Use of Single-Use Plastics** which has short lifespan and widespread use.
- Poor implementation of policies:** Like Plastic Waste Management Amendment Rules, 2021.
- Consumer's behaviour:** which are currently aligned with the usage of plastic disposables.
- Lack of a suitable alternative:** which are either too costly or difficult to produce in mass.

INITIATIVES

Global Initiatives

- The 1972 Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (or the **London Convention**).
- The 1996 Protocol to the London Convention (the **London Protocol**).
- The 1978 Protocol to the International Convention for the Prevention of Pollution from Ships (**MARPOL**).
- The **United Nations Environment Program (UNEP)** considers plastic marine debris and its ability to transport harmful substances as one of the main emerging issues affecting the environment.
- GloLitter Partnerships (GLP):** It is a project launched by the International Maritime Organization (IMO) and the Food and Agriculture Organization of the United Nations (FAO) and initial funding from the Government of Norway.
- Clean Seas Campaign:**
 - The **United Nations Environment Programme** launched the Clean Seas Campaign in **2017** to reduce the use of unnecessary, avoidable and problematic plastics including single-use plastics and phase out intentionally added microplastics.
 - The Campaign contributes to the goals of the **Global Partnership on Marine Litter and the New Plastics Economy Global Commitment**.
- UNEA's Resolution to "End Plastic Pollution":** 175 countries have endorsed the UN Environment Assembly (UNEA-5) resolution in Nairobi to End Plastic Pollution and forge an international legally binding agreement by 2024.

Indian Initiatives

- The **Plastic Waste Management Rules, 2016** clearly stipulate that urban local bodies (ULBs) should ban less than 50 micron thick plastic bags and not allow usage of recycled plastics for packing food, beverage or any other eatables.
 - The Rules also require that local bodies should provide separate collection, storage and processing of plastic waste in their areas.
- Plastic Waste Management (Amendment) Rules, 2021:**
 - Prohibits the manufacture, import, stocking, distribution, sale and use of single-use plastics.
 - The thickness of plastic carry bags increased from 50 to 75 microns from 30th September 2021 and to 120 microns with effect from 31st December 2022.
 - **Extended Producer Responsibility guidelines** made applicable to plastic producers.
- India is a **signatory to MARPOL** (International Convention on Prevention of Marine Pollution).
- Plastic Waste Management (Amendment) Rules, 2022:** To strengthen the circular economy of plastic packaging waste and development of recycling infrastructure for plastic packaging waste.
- India Plastic Pact:** It is the **first of its kind in Asia**. The Plastics Pact is an ambitious and collaborative initiative to bring stakeholders together to reduce, reuse and recycle plastics within the material's value chain.

WAY FORWARD

- Incentivize Recycling:** Offer incentives for plastic recycling and recovery.
- Raise Awareness:** Educate the public about plastic pollution's impact.
- Enforce Regulations:** Strengthen enforcement of plastic pollution rules.
- Empower Pollution Control:** Enhance Pollution Control Board's capabilities.
- Circular Economy:** Implement circular economy practices for plastics.
- Identify Hotspots:** Pinpoint plastic leakage areas for targeted action.
- Promote Alternatives:** Replace plastics with recyclable or biodegradable materials.
- Oxo-Biodegradable Plastics:** Encourage faster biodegradation plastics.
- Plastic-Eating Bacteria:** Harness plastic-digesting bacteria for waste reduction.
- Recycling Innovation:** Develop technologies like plastic-based tiles.
- Plastic-Free Workplaces:** Ban single-use plastics in workplaces.
- Collaboration:** Engage government, industry, NGOs, and volunteers.



WILD FIRES

CONTEXT

For the past one month, wildfires have been rampant in several countries including Canada, China, Croatia, Greece, Portugal, Spain, Syria, the U.S. (Hawaii and Washington), and Turkey.

WHAT ARE WILD FIRES?

- Wild fires, also known as **forest fires** or **bush fires**, are an unplanned, uncontrolled and unpredictable fire in an area of **combustible vegetation**.
- Wild fires are **both natural and man-made**. They are sometimes a way of regulating native vegetation, animals, and ecosystems.

VARIOUS REASONS FOR OCCURRENCE OF WILD FIRES

Natural Causes	Anthropogenic Causes
<ul style="list-style-type: none"> <input type="checkbox"/> Lightning strikes: Lightning strikes on trees can trigger wild fires. <input type="checkbox"/> Volcanic eruption: The extreme heat of lava, as a result of volcanic eruption, may cause vegetation to catch fire and spread, resulting in a wild fire. <input type="checkbox"/> Friction between trees or rocks: Rubbing of trees with each other may generate sparks that can easily ignite dry grasses. Similarly, falling of rocks may trigger sparks to cause wild fires. <input type="checkbox"/> Spontaneous combustion: Prolonged dry spell, followed by unprecedented high temperatures and low humidity can make vegetation so dry that sun rays can also trigger wild fires. 	<ul style="list-style-type: none"> <input type="checkbox"/> Agriculture expansion: Slash and burn agricultural practice is one of the main reasons for spread of wild fires across the world. <input type="checkbox"/> Poaching: Poachers in many parts of the world use fires to catch animals. Such fires may intensify and turn into wild fires. <input type="checkbox"/> Recreation: Smoking and campfires have the capability to trigger wild fires. Studies have found that cigarette residue is the main cause of man-made wild fires. <input type="checkbox"/> Electric spark: Overhead electric cables may sometimes burn as a result of overheating. This can trigger fires in areas where vegetation is already dry.

CONNECTION BETWEEN CLIMATE CHANGE AND WILD FIRES

- Global warming:** Climate change and global warming has increased temperatures, leading to longer dry spells. This facilitates drying of vegetation, making them vulnerable.

- Decline in duration of rainy season:** Even though the intensity of rains has increased, it is concentrated within a short period. Increase in dry season has allowed vegetation to turn into tinder box.
- Increase in lightning:** Studies have indicated that there will be more frequent incidences of lightning due to climate change. Such lightning incidents can trigger forest fires.
- Heatwaves:** Heatwave incidents have drastically increased across the world because of climate change. Heatwave conditions are optimal for forest fire incidents.

TACKLING WILD FIRES

- Controlled burning:** Vulnerable areas must be mapped and preemptively burnt in a controlled manner. This will save larger areas that may have been burnt in case of forest fires.
- Water buffers:** Water channels must be constructed within large parcels of vulnerable land (especially grasslands and shrubs) to prevent spread of fires.
- Awareness creation:** Forest dwelling communities must be sensitized about the effects of intentional burning. Reducing human-caused ignitions may be the most effective means of reducing unwanted wildfire.
- Stringent laws:** Stringent laws must be introduced that penalizes intentional forest fires. This can act as a deterrent against such actions.

INDIA STATE OF FOREST REPORT (ISFR) 2021

- More than 36% of India's forest cover is vulnerable to frequent forest fires, 6% is 'very highly' fire-prone, and almost 4% is 'extremely' prone.
- The normal season of forest fires extends from **November to June**, and majority of fires are caused by man-made factors.
- Madhya Pradesh saw the highest number** of fire incidents, followed by Chhattisgarh, Maharashtra, Odisha and Andhra Pradesh, between November 2021 and June 2022.

IMPACT OF FOREST FIRES

ADVERSE IMPACT OF FOREST FIRES

- Loss of valuable timber & medicinal plants.
- Degradation of water catchment areas due to loss of moisture.
- Depletion of wildlife in the area.
- Release of greenhouse gasses such as carbon dioxide, accentuating climate change.
- Increase in soil erosion due to evaporation of moisture.
- Impact on human health due to emission of harmful gases.

POSITIVE IMPACT OF CONTROLLED FOREST FIRES

- Removes invasive species completely from the area.
- It helps prevent ecological succession, especially in grasslands.
- Reduces combustible materials from forest floor.
- Forest fires can provide nutrients for the growth of new plants, which can help sustain larger population of herbivores.

FOREST FIRE MANAGEMENT UNDER NATIONAL FOREST POLICY

- The policy aims to prepare a **strong data base / network on forest fires** and evolve an appropriate method to deal with the forest fire situation in more effective manner.
- Under the policy, an **Early Warning Fire Forecasting System** utilizing satellite data and Fire Danger Rating System for early detection of forest fire has been introduced.
- Some actions suggested under the policy:**
 - **Preventive actions:** A preventive program consisting of zoning, danger rating, early warning and real time monitoring must be developed and implemented.
 - **Inter-agency coordination:** Forest department needs to coordinate with National Remote Sensing Agency, Forest Survey of India, the Meteorological Department, the All-India Radio and the State-owned television to plan their actions in the fire season.
 - **Increase vigilance:** Vigilance must be increased in vulnerable areas. For that adequate number of firewatchers must be appointed.
 - **Communication network:** Accessibility to vulnerable areas must be enhanced so as to enable quick transport of human and materials from one area to another.
 - **Awareness campaign:** An awareness campaign involving schools, Joint Forest Management (JFM) committees, NGOs and other groups must be initiated to handle fire damage, prevention, detection and communication and suppression.
 - **Training:** Training must be provided to fire managers, including trainers at JFM unit levels. This will empower them to take effective actions during forest fires.

SCIENCE AND TECHNOLOGY

AI AND ITS REGULATION

CONTEXT

Addressing the B20 Summit India in New Delhi, the Indian Prime Minister called for a global framework to ensure the ethical use of artificial intelligence.

WHAT IS ARTIFICIAL INTELLIGENCE?

- AI is the branch of computer science concerned with developing machines that can complete tasks that typically require human intelligence.
- The goals of artificial intelligence include computer-enhanced learning, reasoning, and perception.
- Artificial intelligence is based on the principle that human intelligence can be defined in a way that a machine can easily mimic it and execute tasks, from the simplest to those that are even more complex.

SOME APPLICATIONS OF AI

- Healthcare:** Companies are applying machine learning to make better and faster medical diagnoses than humans.
 - Other AI applications include using online virtual health assistants and chatbots to help patients and healthcare customers find medical information, schedule appointments etc.
- Business:** Machine learning algorithms are being integrated into analytics and customer relationship management (CRM) platforms to uncover information on how to better serve customers.
- Education:** In classrooms and training centers, AI-powered adaptive learning tailors' educational content to each student's needs, while plagiarism detection ensures academic integrity.
- Agriculture:** Farmers and scientists are using AI to monitor crops, predict yields and check pests.
 - AI-enabled precision farming helps farmers make data-driven decisions so they can optimize irrigation, improve fertilization and reduce waste.
- Security:** Law enforcement agencies and cybersecurity firms can use AI for facial recognition, surveillance and threat detection. These technologies enhance public safety and combat cybercrime by identifying and neutralizing potential threats in real time.
- Space Exploration:** Scientists are already using AI for spacecraft navigation, satellite imaging, mission planning and identifying new astronomical phenomena.



VARIOUS CONCERNs ASSOCIATED WITH THE AI

- Unpredictable nature:** Some AI tools are so complicated that they are like a "black box."
 - This means that even the people who create them can't fully understand how they work and how they come up with certain answers or decisions.
- Errors in outcome:** AI tools have already caused problems such as mistaken arrests due to Facial Recognition Software, unfair treatment due to biases built into AI systems.
- Inaccurate content:** Chatbots are based on large language models like GPT-3 and 4, thus creating content that may be inaccurate or use copyrighted material without permission.
- Emergence of deepfakes:** The emergence of easy-to-use AI tools that can also generate realistic-looking synthetic media known as deepfakes.
- Misuse:** AI systems can be purposefully programmed to cause death or destruction, either by the users themselves or through an attack on the system by an adversary.
- Cyber security concerns:** AI could potentially be hacked, enabling bad actors to interfere with energy, transportation, early warning or other crucial systems.
- Associated emissions:** Training a single AI system can emit over 250,000 pounds of carbon dioxide.

- Job Losses:** AI is resulting in more automation, which will eliminate jobs in almost every field.
 - According to the **World Economic Forum (WEF)**, AI would likely take away 85 million jobs globally by 2025.
- Ethical issues:** Currently, AI powered weapons and vehicles have some sort of human control. This is going to change in future when whole decision-making will be made by machines.

WHY GLOBAL REGULATION OF AI IS A CHALLENGE?

- Lack of legal definition:** To regulate AI well, we must define AI and understand anticipated AI risks and benefits.
 - Legally defining AI is important to identify what is subject to the law but **AI technologies are still evolving**, so it is hard to pin down a stable legal definition.
- Weighing risk-benefits:** Understanding the risks and benefits of AI is also important. Good regulations should maximize public benefits while minimizing risks.
 - However, **AI applications are still emerging**, so it is difficult to know or predict what future risks or benefits might be.
- Adaptability:** Lawmakers are often too slow to adapt to the rapidly changing technological environment. Without new laws, regulators have to use old laws to address new problems.

GLOBAL REGULATIONS FOR AI

European Union	<ul style="list-style-type: none"> <input type="checkbox"/> The European Union (EU) is considering a new legal framework that aims to significantly bolster regulations on the development and use of artificial intelligence. <input type="checkbox"/> The proposed legislation, the Artificial Intelligence (AI) Act, focuses primarily on strengthening rules around data quality, transparency, human oversight and accountability. <input type="checkbox"/> It also aims to address ethical questions and implementation challenges in various sectors ranging from healthcare and education to finance and energy.
India	<ul style="list-style-type: none"> <input type="checkbox"/> India currently has no specific regulatory framework for AI systems. <input type="checkbox"/> However, NITI Aayog has issued some guiding documents on AI issues such as the National Strategy for Artificial Intelligence and the Responsible AI for All report. <input type="checkbox"/> Emphasis is on social and economic inclusion, innovation, and trustworthiness.
United Kingdom	<ul style="list-style-type: none"> <input type="checkbox"/> It has outlined a light-touch approach, asking regulators in different sectors to apply existing regulations to AI. <input type="checkbox"/> Published a white paper outlining five principles companies should follow: <ul style="list-style-type: none"> – Safety – Security and robustness – Transparency – Fairness – Accountability and governance; and – Contestability and redress.
United States	<ul style="list-style-type: none"> <input type="checkbox"/> The US has come out with a Blueprint for an AI Bill of Rights (AIBoR), outlining the harms of AI to economic and civil rights and lays down five principles for mitigating these harms.
China	<ul style="list-style-type: none"> <input type="checkbox"/> In 2022, China came out with some of the world's first nationally binding regulations targeting specific types of algorithms and AI. <input type="checkbox"/> It enacted a law to regulate recommendation algorithms with a focus on how they disseminate information.

AI LAWS IN INDIA

- India **does not have any specific law** regarding application of AI.
- The **Ministry of Electronics and Information Technology (MeitY)** is the regulatory body of AI in India.
 - It has the responsibility for development, **implementation and management** of AI laws and guidelines in India.
- There are certain provisions mentioned under **Intellectual Property Law** and several provisions as **Section 43A & 72A of Information Technology Act, 2000** which implies that if anyone commits crime by using AI, then he will be liable under IT Act, criminal law and other cyber law.

- Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021** obligates the social media platforms to exercise greater diligence regarding content on their platforms.
- In 2018, the **planning commission of India** came up with the **National Strategy on Artificial Intelligence (NSAI)** considering setting up a panel consisting ministry of corporate affairs & the department of Industrial policy 7 promotion to look over the regulation.
- Niti Aayog also worked towards the establishment of **AIRAWAT– AI Research, Analytics and knowledge Assimilation platform**. AIRAWAT considers the requirements for better use of AI.
- In 2020, Niti Aayog drafted documents based on launching an oversight body and enforcement of **responsible AI principles (Safety & rehabilitee, equality, inclusivity, non-discrimination, privacy & security, transparency, accountability, protection & reinforcement of human values)** for Inspection of principles, formation of legal and technical work, creation of new techniques and tools of AI and representation of India at Global standard.

WAY FORWARD

- A regulation that enables AI to be used in a **way that helps the society**, while preventing its misuse will be the best way forward for regulating this **dual-use technology**.
- In this regard, **producer responsibility** will be the best way to regulate AI. Companies must take active measures to prevent misuse of their product.
- Regular audits of AI systems** must be conducted to ensure that they are aligned with ethical principles and values.
- Over 70% of Indian companies started using AI** in their machinery for effective work with fewer work forces. Therefore, with the **increasing use of AI in all sectors**, there is a need to **regulate AI** as we know that AI has very potential and power then it may cause risk to privacy and humanity.

NAVIC NAVIGATION SYSTEM

CONTEXT

The Department of Space (DoS) stated that the Navigation with Indian Constellation or NavIC, will soon be integrated into Aadhaar enrolment devices across the country.

MORE ON NEWS

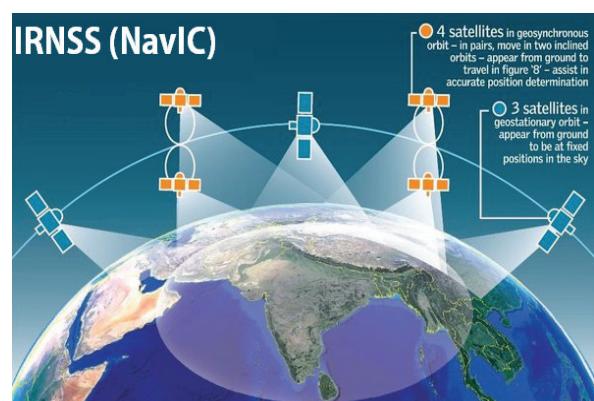
- NavIC is India's own satellite navigation system, similar to the American GPS, designed to provide **accurate positioning and timing information**.
- The integration of NavIC with Aadhaar enrolment devices is **to enhance the accuracy and reliability of location-based services** during the Aadhaar enrolment process. This could lead to improved authentication and verification of individuals' personal details.
- Presently, the Aadhaar enrolment kits utilize GPS (Global Positioning System) for location-based information and thus this **integration represents a step towards leveraging indigenous technology** in India.

WHAT ARE NAVIGATIONAL SYSTEMS?

- Navigational Systems are satellite constellations **that broadcast positioning, navigation and timing data** over a region or completely across the globe.
- Majority of these constellations **make use of radio frequencies in the L-Band** to transmit their signals to receivers on the ground.

WHAT IS THE NAVIC NAVIGATION SYSTEM?

- About:** The Indian Regional Navigation Satellite System (IRNSS), with an operational name of NavIC, is an independent stand-alone navigation satellite system developed by the ISRO.
- Timeline:** NavIC was originally approved in 2006. It was expected to be completed by late 2011, but only became operational in 2018.



- Constellation:** It consists of a constellation of 8 satellites located at a distance of approximately 36,000 Km. Currently, 7 satellites are active.
- Coverage:**
 - **Primary service area:** This region extends up to 1500 kms from the boundaries of Indian landmass. In this region, it provides accurate position information service accuracy of better than 20 m.
 - **Extended Service Area:** Lies between primary service area and area enclosed by the rectangle from Latitude 30° S to 50° N, Longitude 30° E to 130° E.
- Services:** IRNSS will provide two types of services:
 - **Standard Positioning Service (SPS):** which is provided to all the users.
 - **Restricted Service (RS):** which is an encrypted service and much more accurate (in the range of 1 to 5 meters), and meant for defence applications and use by armed forces.

Applications of NavIC

Civil applications:

- Positioning through mobile phones:** Many Smartphone chipsets have integrated NavIC receivers, which can effectively replace the existing GPS for positioning services.
- Logistics sector:** NavIC would revolutionize the logistics sector in India as it would help with better optimization and route suggestions. Route optimization will reduce cost and also pollution.
- Promote startups:** There is ample scope for startups to emerge by keeping navigation services at the core of their business. This will also reduce cost for companies that utilize GPS navigational services.
- Fleet tracking:** Fleet tracking is very useful during mining and transport operations to reduce cost and optimize resources.
- Navigation services:** NavIC can provide navigational services to aerial, marine and terrestrial transports due to its better accuracy.

Military applications:

- Enemy positions:** A domestic navigational system such as NavIC will help India track enemy positions during war.
- Border security:** The borders of the country can be kept under vigilance using an indigenous tracking system. It will prevent surprise attacks by enemies.
- Weapon tracking:** Navigational systems can also be used to track fired weapons and also the current position of our military assets.
- Drone technology:** Drones can be controlled and tracked using such navigational satellites, improving their military capabilities tremendously.

FEATURES OF NAVIC

- Higher accuracy:** NavIC open signals have accuracy of up to 5 metres and restricted signals will be even more accurate. GPS by comparison is accurate up to around 20 metres.
- Range:** NavIC navigation system provides coverage over the Indian landmass and up to a radius of 1,500 km around it.
- Can work in hard-to-reach areas:** In its range area, NavIC signals will be available in even hard-to-reach areas.
- Geo-stationary orbit:** NavIC uses satellites placed in high geo-stationary orbit, allowing them to move at a constant speed relative to Earth, so that they can look over the same region on Earth.
- Optimal signal receiving:** NavIC signals in India are received at a 90-degree angle, making it easier for them to reach devices located even in congested areas, dense forests, or mountains.
- Current usage:** Currently, NavIC's use is limited. It is being used in public vehicle tracking in India, for providing emergency warning alerts to fishermen venturing into the deep sea where there is no terrestrial network connectivity, and for tracking and providing information related to natural disasters.



COMPARISON OF NAVIC WITH OTHER GLOBAL NAVIGATION SYSTEMS

NavIC v/s GPS

- **Coverage:** GPS caters to users across the globe and its satellites circle the earth twice a day, while NavIC is currently for use in India and adjacent areas.
- **Satellite constellation:** GPS requires 24 Satellites to be operational and has around 31 satellites in orbit. All of these are Geosynchronous Satellites. On the other hand, NavIC has 3 Geostationary satellites and 4 geosynchronous satellites, and these satellites are situated in much higher orbit (signal is less prone to obstructions).
- **Accuracy:** NavIC satellites use dual frequency bands (L5-band and S-band), which is why the system is relatively more accurate than GPS (that uses a single band and makes compensation for error due to signal deterioration by the atmosphere).
- **Interoperability:** NAVIC's interoperability with GPS can ensure the minimization of technical snags when used complementarity with existing GPS-enabled solutions.

OTHER NAVIGATION SYSTEMS

- Global Positioning System (GPS):** GPS is operated by the U.S. Space Force. Its first satellite was launched in 1978, and its first series of satellites became fully operational by 1993. GPS consists of 31 satellites.
- GLONASS:** Russian-owned GLONASS is operated by Roscosmos State Corporation for Space Activities, a department of the Russian government.
 - It was launched fully in 1995, with full satellite coverage over Russia in 2010. The constellation consists of 24 satellites.
- Galileo:** Owned by the European Global Navigation Satellite Systems Agency, Galileo consists of 26 satellites in orbit, with a plan to reach 30 satellites by 2021.
- BeiDou:** Launched first in 2000, BeiDou is owned by China National Space Administration (CNSA). Currently, it has 48 satellites in orbit.
- QZSS:** Launched first in 2010, the Quasi-Zenith Satellite System (QZSS) is operated by the Japan Aerospace Exploration Agency (JAXA).
- It does not provide global coverage but instead maintains Asia-Oceania regional coverage between Japan and Australia.

IRNSS, India's answer to Global Positioning System, will cover a radius of 1,500km with India at the centre. Here is where India stands in a comity of space-faring nations	
GPS	GALILEO
Country US	Region European Union
No. of Satellites 31	No. of satellites 40 (10 in orbit now)
Coverage Global	First launch 2011
First satellite launch 1978	Area of coverage Global
Lifetime of each satellite 10 years	Lifetime of each satellite 12 years
Precision 5m	Precision 10m for public and 10cm for military
GLONASS	IRNSS
Country Russia	Country India
No. of satellites 24	No. of satellites 7(5 in orbit)
Coverage Global	Area of coverage Radius of 1500km
First satellite launch October 1982	First satellite launch 2013
Lifetime of each satellite 10 years	Lifetime of each satellite 12 years
Precision 5m to 10m	Precision 20m for civilian, 10m for military
BEIDOU	
Country China	
Has two separate satellite constellations- limited test system and full-scale global navigation system	

SIGNIFICANCE OF NAVIC FOR INDIA

- Strategic significance:** It will help to reduce dependence on foreign satellite systems for navigation services, particularly for strategic sectors. It will make the Indian **Armed Forces self-reliant**.
- Neighbourhood relations:** With the provision of extended coverage, one of the stated future use of the project includes sharing of the project with the SAARC nations. This will help in integrating the regional navigation system further and strengthening our "**Neighbourhood First**" policy.
- Net security provider:** Having a global navigation system bolsters the ability of a nation to serve as a net security provider.
 - E.g. GPS played a significant role in relief efforts post disasters such as the **tsunami in the Indian Ocean region in 2004** and the **Pakistan-India earthquake in 2005**, and has delivered significant strategic and economic benefits to the US.
- Food and livelihood security:** Through **land-area mapping, yield monitoring and precision-planting of crops**, NAVIC allows for the development of civic capabilities in food and livelihood security.
- Scientific advancement:** In addition to its civilian and military applications, it will contribute to the advancement of science and technology.

SPACE DEBRIS

CONTEXT

The Australian Space Agency has confirmed that a **large object** found off the coast of western Australia is debris from an Indian Space Research Organisation (ISRO) rocket.

WHAT IS SPACE DEBRIS?

- Space debris, also known as **space junk**, refers to **man-made objects** that are **no longer operational and orbit Earth**.
- These objects include **defunct satellites, spent rocket stages, fragments** from spacecraft collisions, and other discarded hardware from past space missions.
- Space debris is a consequence of **decades of human space exploration**. As more satellites and rockets have been launched into space, and some of them have reached the **end of their operational life**, they become space debris.

CURRENT STATE OF SPACE DEBRIS

- According to the NASA, there are approximately **23,000 pieces of debris larger than a softball** orbiting the Earth.
 - They travel at **speeds up to 17,500 mph**, fast enough for a relatively small piece of orbital debris to damage a satellite or a spacecraft.
- There are half a million pieces of **debris the size of a marble or larger** (up to 0.4 inches, or 1 centimeter), and approximately 100 million pieces of debris **about .04 inches** (or one millimeter) and larger.
- There is even smaller **micrometer-sized** (0.000039 of an inch in diameter) debris.
- The number of satellites orbiting Earth** is expected to reach **60,000 by 2030**, up from the current 9,000, and the amount of untracked debris is a cause for concern.

IMPACTS OF SPACE DEBRIS

- Threat to Operational Satellites:** Space debris can collide with operational satellites and spacecraft, causing damage or destruction. This can lead to the loss of critical communication, navigation, weather monitoring, and remote sensing services that rely on satellites.
- Chain Reaction (Kessler Syndrome):** A major collision between large objects could trigger a chain reaction known as the Kessler Syndrome, where the resulting debris creates more collisions, leading to a self-sustaining cascade that significantly increases the amount of debris in orbit.
- Risk to Human Spaceflight:** Space debris poses a risk to crewed spacecraft and astronauts on the International Space Station (ISS) and other future crewed missions. Even small debris fragments can cause severe damage to spacecraft hulls and vital systems.
- Reduction of Orbital Slots:** The accumulation of space debris in specific orbital regions can limit the availability of desirable orbital slots for future missions.
- Impact on Earth from Re-Entry:** When larger objects or satellites re-enter the Earth's atmosphere, some parts may survive the heat of re-entry and reach the surface. While most of the Earth's surface is water, there is still a risk of debris hitting populated areas.
- International Tensions:** As more countries engage in space activities, disputes may arise concerning responsibility for space debris mitigation and liability for damages caused by collisions involving spacecraft from different nations.

MEASURES TO CONTROL SPACE DEBRIS

India	<ul style="list-style-type: none"><input type="checkbox"/> Project NETRA: It is an early warning system in space to detect debris and other hazards to Indian satellites.<ul style="list-style-type: none">- Once operational, it will give India its own capability in Space Situational Awareness (SSA) like the other space powers.- Under NETRA, the ISRO plans to put up many observational facilities: connected radars, telescopes, data processing units and a control centre.- NETRA can spot, track and catalogue objects as small as 10 cm, up to a range of 3,400 km and equal to a space orbit of around 2,000 km.<input type="checkbox"/> System for Safe and Sustainable Operations Management (IS 4 OM): Setup by the ISRO in 2022, to continually monitor objects posing collision threats, predict the evolution of space debris, and mitigate the risk posed by space debris.<input type="checkbox"/> ISRO has also set up a Centre for Space Debris Research to monitor and mitigate the threat of space debris.
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Global	<ul style="list-style-type: none"><input type="checkbox"/> The Liability Convention: The Convention on International Liability for Damage Caused by Space Objects, commonly known as the “Liability Convention,” is an international treaty that was adopted in 1972, by the United Nations General Assembly.<ul style="list-style-type: none">- The convention addresses the issue of liability for damages caused by space objects to other states or their space objects on Earth and in outer space.- The Convention makes the launching country “absolutely liable” to pay compensation for any damage caused by its space object on the earth or to a flight in air.- The country where the junk falls can stake a claim for compensation if it has been damaged by the falling object.<input type="checkbox"/> The Inter-Agency Space Debris Coordination Committee (IADC): It is an international governmental forum, was established in 1993 to coordinate efforts between spacefaring nations to address the issue of space debris.<input type="checkbox"/> Clean Space initiative: The European Space Agency (ESA) has launched the Clean Space initiative, aimed at reducing the amount of space debris and promoting sustainable space activities.
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WAY FORWARD

- Debris Mitigation Guidelines:** Develop and implement debris mitigation guidelines and standards for spacecraft and rockets.
 - These guidelines should include measures to **minimize the creation of new debris**, such as designing satellites with propulsion systems to deorbit them at the end of their operational life.
- Active Debris Removal:** Research and develop technologies for actively removing space debris from orbit.
 - This can involve using **robotic spacecraft** to capture and deorbit defunct satellites or debris objects.
- Space Situational Awareness (SSA):** Enhance SSA capabilities to track and catalog space debris more effectively. This information is vital for space traffic management and collision avoidance efforts.
 - **SSA refers to the capability to monitor, track, and understand** the space environment, including the location and behavior of space objects such as satellites, spacecraft, and space debris.
- Gravitational Disposal:** By using the gravity of the Moon or Earth to guide debris to crash into a designated uninhabited region or safely burn up in the atmosphere, the risk of future collisions can be reduced.
- Satellite End-of-Life Disposal:** Require satellite operators to plan for and execute end-of-life disposal maneuvers to remove satellites from operational orbits and move them to graveyard orbits or safely deorbit them.
- International Cooperation:** Establish agreements and guidelines that promote responsible behavior in space and address issues related to liability for space debris.
- Reusable Launch Vehicles:** Switching from single-use rockets to reusable launch vehicles will help cut down on the amount of new debris produced during launches.

SOCIAL ISSUES

CASTE BASED CENSUS

CONTEXT

The Supreme Court is scheduled to hear a batch of petitions challenging the verdict of the Patna High Court, which upheld the Bihar government's ongoing caste-based census survey.

WHAT IS CASTE BASED CENSUS?

- Caste based census or the Socio-Economic and Caste Census (SECC)** is a comprehensive study that examines the **socio-economic status** of rural and urban households, and it also gather information about the caste **distribution** within the population.
- Historical background:**
 - Every Census in independent India from **1951 to 2011** has published data on **Scheduled Castes and Scheduled Tribes**, but not on other castes.
 - Before that, **every Census until 1931** had data on caste.
 - However, in **1941**, caste-based data was collected but **not published**.
 - **SECC 2011** was the **first caste-based census since 1931 Census of India**.
- Difference between Population Census and SECC:**
 - The Census provides a **portrait of the Indian population**, while the SECC is a tool to identify **beneficiaries of state support**.
 - Since the Population Census is carried out under **Census Act, 1948**, all the population data under it is considered **confidential**. Whereas, personal information given in the **SECC** is **open for use by Government departments** to grant and/or restrict benefits to households.
- About SECC-2011:**
 - **Ministry of Rural Development** commenced the SECC 2011 on 29th June, 2011 through a comprehensive **door to door enumeration** across the country.
 - **Components:** SECC 2011 has **three census components**, but under the overall coordination of Department of Rural Development.
 - ✓ **Census in Rural Area** has been conducted by the **Department of Rural Development**.
 - ✓ **Census in Urban areas** is under the administrative jurisdiction of the **Ministry of Housing and Urban Poverty Alleviation (MoHUPA)**.
 - ✓ **Caste Census** is under the administrative control of **Ministry of Home Affairs**: Registrar General of India (RGI) and Census Commissioner of India.
 - SECC 2011 is also the **first paperless census in India** conducted on **hand-held electronic devices**.
 - However, SECC 2011 **did not publish the caste data**. The SECC data excluding caste data was finalized and published in 2016.
 - ✓ The government has said this entire **data set is flawed** and the **census is unreliable**, rendering it **unusable for the purposes of reservations and policy**. For these reasons, it has refused to make public even the raw caste data of the SECC-2011.

ARGUMENTS FOR AND AGAINST CASTE BASED CENSUS

Arguments For	Arguments Against
<ul style="list-style-type: none"><input type="checkbox"/> Better picture: Caste based census would provide valuable information on the socio-economic status of different caste groups in India.	<ul style="list-style-type: none"><input type="checkbox"/> Discrimination: The collection of data on caste can create further divisions within society and may lead to increased caste-based discrimination.

Arguments For	Arguments Against
<ul style="list-style-type: none"> <input type="checkbox"/> Reservations: Caste based census would help tailor the reservation policy to ensure equitable representation of all of them. <input type="checkbox"/> Identifying Marginalized Groups: A caste census reveals marginalized individuals, their occupations, and the influence of caste, aiding targeted interventions. <input type="checkbox"/> Informed Policy Making: Data justifies caste-based affirmative action and welfare programs, guiding anti-poverty initiatives via accurate identification. 	<ul style="list-style-type: none"> <input type="checkbox"/> Political exploitation: The caste data may be used to politically exploit certain groups and create further divisions within society. <input type="checkbox"/> Expensive: The data collection process may be costly and may divert resources away from other important programs or initiatives. <input type="checkbox"/> 50% Reservation Breach: It is believed that Caste census will not do much and Socio-Economic Caste Census (SECC) is the only way to rationalize the Indian Reservation System.

GOVERNMENT'S STAND ON THE INCLUSION OF CASTE IN THE REGULAR 2021 CENSUS

- The government has cited numerous **administrative, operational and logistical reasons** to argue that collecting caste data during the 2021 census is unfeasible and attempting it could **endanger the census exercise itself**.
- Secondly, the preparatory work for a census starts three to four years earlier. As for the census, the **questionnaires have already been finalized and field-tested**. It is, therefore, not possible to add additional questions about caste now.
- Thirdly, unlike in the case of the SCs and the STs, there is **no constitutional mandate for the Registrar-General and Census Commissioner of India**, to provide the census figures of the OBCs and the BCCs.

CENTRE VS STATES ON EDUCATION

CONTEXT

The Chief Minister of Tamil Nadu urged the President of India to transfer education to the state list of the Constitution, escalating the tussle with the Centre over the NEET Exam.

MORE ON THE NEWS

- In September 2021**, the Tamil Nadu Assembly passed a bill seeking to **exempt students in the state from NEET**, for which the governor's assent is still pending.
 - NEET is the **National Entrance cum Eligibility Test** conducted in India for admission to undergraduate medical courses.
 - It is an **all-India examination** that is taken by students who have completed **Class 12th or equivalent**.
 - NEET was introduced from the academic year **2013-14** and has replaced the **All-India Pre-Medical Test (AIPMT)**.
- Why is Tamil Nadu against NEET?**
 - Critics argue that NEET's **mechanical focus on marks** disregards the importance of student quality and aptitude.
 - The introduction of NEET has also dismantled the **state's in-service quota for medical graduates in the government sector**, which, according to critics, has undermined quality healthcare.
 - Critics also argued that NEET has **favored mainly the affordable and affluent sections** of the society and thwarting the dreams of underprivileged social groups.
 - Also, Tamil Nadu opposes NEET by saying that it **undermined the diverse societal representation** in MBBS and higher medical studies.
- Can any state legislate against NEET?**
 - **Admissions to medical courses** are traceable to **entry 25 of Concurrent List, Schedule VII of the Constitution**.
 - Therefore, the **State can also enact** a law regarding admission and amend any Central law on admission procedures.

EDUCATION IN THE INDIAN CONSTITUTION

- Article 45 under Directive Principles of State Policy:** It laid down the **foundation stone of free and compulsory education** in the country.
 - The article states that "the state shall endeavour to provide, within a **period of ten years from the commencement** of this constitution, for free and compulsory education for all children until they complete the age of fourteen years".

- Article 21A:** The Constitution (Eighty-sixth Amendment) Act, 2002 inserted Article 21-A in the Constitution of India to provide free and **compulsory education** of all children in the **age group of six to fourteen years** as a Fundamental Right in such a manner as the State may, by law, determine.
 - Accordingly, the Centre enacted **The Right of Children to Free and Compulsory Education (RTE) Act, 2009.**
- Education under Concurrent List:** In the **original Constitution**, education was placed under the **State List under the 7th schedule**, which meant that the responsibility for education primarily rested with the individual states.
 - Later, the **42nd Amendment to the Constitution** moved education from the State List to the **Concurrent List** and thus both the Parliament and the state assemblies can legislate upon it.

ROLE OF CENTER IN EDUCATION

- Policy Formulation:** The central government is responsible for formulating national-level policies and guidelines related to education.
 - **NEP 2020:** The central government approved the National Education Policy (NEP) 2020 which aims to bring about significant changes and improvements in various aspects of education, from school to higher education.
- Funding Allocation:** The central government allocates funds for various educational initiatives and programs.
 - **Sarva Shiksha Abhiyan (SSA):** SSA is a flagship program that aims to provide universal access to quality elementary education. The central government allocates funds to support infrastructure development, teacher training, free textbooks, and other educational resources for primary and upper primary schools.
 - **Mid-Day Meal Scheme:** The central government allocates funds for the Mid-Day Meal Scheme, which provides nutritious meals to schoolchildren to improve enrollment, attendance, and nutrition levels.
- Regulatory Framework:** The central government establishes regulatory bodies like the UGC and the AICTE to maintain and regulate the quality of higher education institutions and technical education programs across the country.
 - **University Grants Commission (UGC)** is a statutory body charged with coordination, determination and maintenance of standards of higher education in India.
 - **The All India Council for Technical Education (AICTE)** is a statutory body, and a national-level council for technical education, under the Department of Higher Education.
- National Curriculum Framework:** The central government, through bodies like the **National Council of Educational Research and Training (NCERT)**, develops a national curriculum framework that serves as a guideline for curriculum design in schools across the country.

ROLE OF STATES IN EDUCATION

- Implementation of Policies:** State governments implement the educational policies and guidelines formulated by the central government by tailoring them to suit the specific needs of their state.
- School Governance:** State governments oversee the management and governance of schools, including government schools and aided private schools.
- Curriculum Development:** While the central government provides a national curriculum framework, state governments have the authority to adapt and develop their own curriculum based on the needs of their students and the local context.
- Teacher Recruitment and Training:** State governments are responsible for recruiting and training teachers in government schools.

ADVANTAGES OF EDUCATION BEING IN THE CONCURRENT LIST

- National Integration:** While states have the flexibility to tailor education to their cultural and linguistic contexts, the central government's involvement ensures a certain level of uniformity and promotes national integration.
- Resource Sharing:** It facilitates resource, expertise and infrastructure sharing between the central and state governments.
- Best Practices Dissemination:** With education being in the Concurrent List, successful policies and practices implemented in one state can be observed and adopted by other states.
- Quality Standards:** The central government can set minimum quality standards for education, ensuring that even in diverse regions, certain fundamental educational benchmarks are met.
- Cross-State Mobility:** It allows students to easily move from one state to another without significant disruption in their education, as the basic curriculum and standards remain somewhat consistent.

- **Addressing Complex Challenges:** Issues that transcend state boundaries, such as promoting research and development in emerging fields or addressing environmental challenges, can be more effectively tackled with central coordination.

CHALLENGES AND CONCERNS ASSOCIATED WITH EDUCATION BEING IN THE CONCURRENT LIST

- **Policy Fragmentation:** Having education on the Concurrent List can result in fragmented policies that may not be fully aligned with the needs and aspirations of individual states.
- **Undermining diversity:** National-level policies like the National Education Policy (NEP) might not adequately consider the diverse regional and cultural contexts of individual states.
- **Adverse Impact on State Autonomy:** Education being on the Concurrent List might result in states feeling that their autonomy in education matters is compromised.
- **Coordination and Implementation Challenges:** Ensuring coordination between state and central policies can be challenging, leading to administrative and implementation difficulties.
- **Duplication of Efforts:** Both central and state governments might invest resources and efforts in similar areas of education, which can lead to duplication of projects and wastage of resources.

INDIA'S TB BURDEN

CONTEXT

Recently, the WHO recommended the use of molecular diagnostics as the initial test for tuberculosis (TB) as they are highly accurate, detect resistance to drugs, are cost-effective, and reduce treatment-related delay.

MORE ON THE NEWS

- Molecular diagnostic tests for tuberculosis involve techniques that **detect the genetic material (DNA or RNA)** of the **Mycobacterium tuberculosis** bacteria.
 - These tests are **highly accurate** and can rapidly identify the presence of TB bacteria in a patient's sample.
 - One common type of molecular test is the **Polymerase Chain Reaction (PCR)**, which amplifies and detects specific segments of the bacterial DNA.
 - These tests can also detect **drug resistance mutations in the bacteria**, helping in tailoring appropriate treatment regimens.
 - Examples of molecular tests for TB include **Xpert MTB/RIF** and **Xpert MTB/RIF Ultra**.
- However, last year in **India**, only about **23 per cent** of those presumed with TB underwent **molecular** diagnostics tests — the **traditional sputum smear microscopy** was the initial diagnostic investigation for **77 per cent** of the suspected patients.
 - In Sputum smear microscopy, a patient's **sputum (a mixture of saliva and mucus coughed up from the respiratory tract)** is collected and examined under a microscope after staining with a special dye.
 - The **presence of acid-fast bacilli (AFB)**, which include **Mycobacterium tuberculosis**, can be observed under the microscope.
 - While sputum smear microscopy is **simple and cost-effective**, it has **limitations**. It may not detect all cases of TB, especially in individuals with low bacterial loads, and it cannot determine drug resistance.

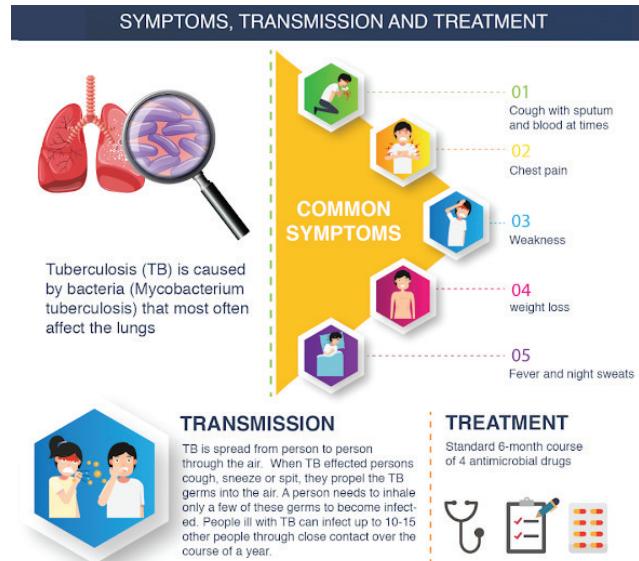
ABOUT TUBERCULOSIS (TB)

- **Tuberculosis (TB)** is a **bacterial infection** spread through inhaling **tiny droplets** from the coughs or sneezes of an infected person.
 - TB is caused by a **bacterium called Mycobacterium tuberculosis**, belonging to the Mycobacteriaceae family.
 - Worldwide, **TB is the 13th leading cause of death** and the second leading infectious killer after COVID-19 (above HIV/AIDS).
- **Transmission:** TB spreads from **person to person through the air**. When people with lung TB cough, sneeze or spit, they propel the TB germs into the air.
 - In humans, TB most commonly **affects the lungs (pulmonary TB)**, but it can also affect other organs (extra-pulmonary TB).
- **Cure:** TB is a treatable and curable disease.
- **Vaccine:** Currently, **Bacille Calmette-Guérin (BCG)** is the only licensed vaccine available for the prevention of TB.
 - BCG **works well in some geographic locations** and not so well in others.

- Generally, the **farther a country is from the equator, the higher is the efficacy.**
 - It has a **high efficacy in the UK, Norway, Sweden and Denmark**; and little or no efficacy in countries on or near the equator like India, Kenya and Malawi, where the burden of TB is higher.
- Drug-Resistant TB:** Sometimes drug-resistant TB occurs when bacteria become **resistant to the drugs used to treat TB**. This means that the drug can no longer kill the TB bacteria.

WHO GLOBAL TUBERCULOSIS REPORT 2022

- Diagnosis and Mortality Globally:** Around **10.6 million people** across the world were diagnosed with tuberculosis (TB) in 2021, an increase of 4.5% from 2020, while 1.6 million patients died of the bacterial disease.
- Of the total TB deaths, **187,000 patients** were also **positive for HIV** (human immunodeficiency virus).
 - **Nearly 82% of global TB deaths** among HIV-negative people occurred in the **African and South-East Asia regions**.
- India and TB:** With 28% cases, India was among the eight countries accounting for more than two-third (68.3%) of the total TB patients' count.
- **India accounted for 36% of the global TB related deaths** among **HIV negative people**.
 - **India was among the three countries** (along with Indonesia and the Philippines) that accounted for **most of the reduction** in 2020 (67% of the global) and made partial recoveries in 2021.
- Underreporting of Cases:** Underreporting is more of a problem in India; the country is among the top five contributors – India (24%), Indonesia (13%), the Philippines (10%), Pakistan (6.6%) and Nigeria (6.3%).
- Rise in Drug-Resistant TB:** The burden of drug-resistant TB (DR-TB) increased by 3% globally between 2020 and 2021, with 450,000 new cases of rifampicin-resistant TB (RR-TB) being reported in 2021.



About Drug-resistant tuberculosis (DR-TB)

- DR-TB refers to a form of tuberculosis where the bacteria causing the infection, ***Mycobacterium tuberculosis*, are resistant to one or more of the standard anti-TB drugs.**
- This resistance can occur due to factors such as **improper treatment, incomplete courses** of antibiotics, or exposure to TB drugs in **suboptimal conditions**.
- DR-TB is a **significant concern** because it complicates the treatment process and can lead to more severe forms of the disease that are harder to manage.
- There are two main categories of DR-TB:**
- **Multidrug-Resistant Tuberculosis (MDR-TB):**
 - ✓ MDR-TB refers to tuberculosis that is resistant to **at least two of the most effective first-line drugs** used in TB treatment, namely **isoniazid and rifampicin**.
 - ✓ Treating MDR-TB requires a **longer duration of treatment** with a more **complex regimen** that includes **second-line drugs**, which are often more expensive, have more side effects, and are less effective.
 - ✓ MDR-TB treatment **success rates are generally lower** compared to drug-sensitive TB.
 - **Extensively Drug-Resistant Tuberculosis (XDR-TB):**
 - ✓ XDR-TB is a **more severe form of DR-TB** that is resistant to the two most effective first-line drugs (isoniazid and rifampicin) **as well as to fluoroquinolones** and at least one of the three injectable second-line drugs (amikacin, kanamycin, or capreomycin).
 - ✓ XDR-TB is even **more challenging to treat than MDR-TB** due to the limited availability of effective drugs and higher rates of treatment failure.

GLOBAL INITIATIVES FOR TB

- Global Fund:** It is a worldwide movement to defeat HIV, TB and malaria.
 - Global Fund has become the **single largest channel** of additional money for global TB control.
- Stop TB Partnership:** It is a United Nations hosted organization that takes initiatives to serve the needs of the people, communities, and countries affected by TB.
 - It has **1500 partner organizations** which include international, non-governmental and governmental organizations and patient groups.
- Global Plan to End TB 2023-2030:** It maps out how to end TB as a public health challenge by 2030.
 - It focuses on the need to **invest in a new TB vaccine** and approve it by 2025.
 - It shall mobilize a **global investment of US\$250 billion** for diagnosis and treatment of 50 million people with TB.
- SDG Goal:** Ending the TB epidemic by 2030 is among the health targets of the United Nations Sustainable Development Goals (SDGs).

INDIA'S INITIATIVES FOR TB

Pradhan Mantri TB Mukt Bharat Abhiyaan	<ul style="list-style-type: none"> <input type="checkbox"/> The Ministry of Health and Family Welfare (MoHFW) is implementing this campaign. <input type="checkbox"/> Objectives: <ul style="list-style-type: none"> – Provide additional patient support to improve treatment outcomes of TB patients. – Augment community involvement in meeting India's commitment to end TB by 2025. – Leverage Corporate Social Responsibility (CSR) activities. <input type="checkbox"/> Components: <ul style="list-style-type: none"> – Ni-kshay Mitra Initiative: It is to ensure additional diagnostic, nutritional, and vocational support to those on TB treatment. – Ni-kshay Digital Portal: It will provide a platform for community support for persons with TB.
Ni-kshya Poshak Yojana	<ul style="list-style-type: none"> <input type="checkbox"/> It is a centrally sponsored scheme under National Health Mission (NHM), where a financial incentive of Rs 500/- per month is provided for nutritional support to each notified TB patient for duration for which the patient is on anti-TB treatment.
National TB Elimination Programme (NTEP)	<ul style="list-style-type: none"> <input type="checkbox"/> It aims to strategically reduce TB burden in India by 2025, five years ahead of the Sustainable Development Goals.
National Strategic Plans for TB	<ul style="list-style-type: none"> <input type="checkbox"/> It was launched to achieve the target of ending TB by 2025 in a mission mode. <input type="checkbox"/> The requirements for moving towards TB elimination in India have been arranged in four strategic areas of Detect, Treat, Prevent & Build.
TB Harega Desh Jeetega Campaign	<ul style="list-style-type: none"> <input type="checkbox"/> It has three strong pillars which include clinical approach, public health component and active community participation.

INDIA'S ROLE IN ENDING TB BY 2030

- Development of Adult TB Vaccine:** The current vaccine, delivered at birth and useful particularly for children, is 100 years old. India should make efforts for a new vaccine like it did for the COVID 19.
- Anti-TB Drugs:** There are only a few new anti-TB drugs available that have high costs. There is a dire need to move to an injection-free and shorter duration of oral pills for TB.
- Diagnostics:** AI-assisted handheld radiology with 90-second reporting and 95% plus accuracy for diagnosing TB should be made available universally.
 - Confirmatory diagnosis using molecular tests should be done.

THE STATE OF ELEMENTARY EDUCATION IN RURAL INDIA REPORT

CONTEXT

Delhi-based Development Intelligence Unit (DIU), an initiative of Transforming Rural India Foundation (TRIF) has launched a report titled **the 'state of elementary education in rural India-2023'**.

ABOUT THE REPORT

- The report gathered **responses from 6,229 parents**, including those with school-going students, dropouts, and children who had never enrolled in school.
- The study was focused on **6 to 16-year-old children** in rural communities **across 20 states** in India.

KEY FINDING OF THE REPORT

- **Gender inclusivity:** The report noted that parents from rural communities firmly believe that a **child's gender**, whether a boy or a girl, **should not hinder their educational aspirations**.
 - In this study, it was revealed that a total of **78 per cent of parents of girls** and **82 per cent of parents of boys** wanted to educate their children to **graduation and above**.
- **Increased access to smartphones:** Nearly half, **49.3 percent of students** in rural India have access to smartphones.
 - However, a significant portion, 76.7 percent of these students primarily use their phones for **entertainment purposes**, such as playing video games and watching movies.
 - Only 34 percent of smartphone-accessible students use their devices for **study-related downloads**, while 18 percent access online learning through tutorials.
- **Learning environment at home:** The survey revealed that 40 percent of parents have **age-appropriate reading materials** available at home, beyond school books.
 - Additionally, only 40 percent of parents engage in **daily conversations with their children** about their school learning, while 32 percent have such discussions a few days a week.
- **Reasons for dropout and out-of-school children:** Among the parents of 56 students who dropped out of school, 36.8 percent mentioned that their daughters' dropout was due to the need to **contribute to the family's earnings**.
 - For boys, the primary reason for dropping out was **lack of interest in studies**, cited by 71.8 percent of parents.
- **Parental participation:** A positive aspect observed was that 84 percent of parents regularly attend parent-teacher meetings, demonstrating their **active involvement in their children's education**.

WHY IS IT IMPORTANT TO EDUCATE RURAL INDIA?

- **Growth of Agriculture:** As per the census 2011, about 54.6% of the country's population was engaged in agriculture and allied activities. Out of these, about 70% the total rural households were involved in agricultural activities; 82% of them being small and marginal farmers making it the largest source of livelihood in India. Thus, by improving rural education, agriculture sector can grow a lot with new technologies and knowledge.
- **Growth of MSME Sector:** Micro, Small and Medium Enterprises (MSME) sector is a huge contributor to the Indian economy making up about 30% of the country's GDP. With the sector employing about 50 million people in rural India, it is one of the most important sectors in the rural economy. Hence, education is important for the growth of the MSME sector.

INDIAN RURAL EDUCATION CHALLENGES

- **Inadequate number of schools:** The limited number of schools in rural areas creates a major barrier to education.
- **Poverty:** Poverty remains a significant obstacle to education in rural India. Many families lack the financial resources to afford schooling for their children, and private schools are often out of reach due to their high costs.

Aspiring for higher education

The table shows parental expectations of a child's educational attainment. About 78% of parents aspire for their girls to attain graduation or higher degrees



Expected level of education of child	Boy (%)	Girl (%)	Total (%)
Up to elementary	4.4	3.9	4
Up to secondary	2.4	2.8	3
Higher secondary	11.1	15.2	13
Graduation	49.6	50.3	50
Postgraduation/Ph.D.	32.5	27.8	30

■ About 80% of parents aspire for their children to become graduates or attain higher degrees
■ The survey included responses of 6,229 parents across 21 States of India.

Source: State of Elementary Education In Rural India report

- Bad Infrastructure:** Poor infrastructure in rural schools, including inadequate teacher-student ratios and lack of basic amenities like textbooks, drinking water, and libraries, undermines the quality of education. The absence of essential facilities hampers effective learning and teaching.
- Traditional Teaching Methods:** While urban schools have embraced modern teaching techniques, rural schools often rely on traditional methods. This outdated approach to education can hinder students' critical thinking skills and engagement with the subject matter.
- Lack of Technology:** In the 21st century, basic computer literacy is crucial for every child's future prospects. However, many rural schools lack access to technology and computer education, contributing to a digital divide that limits opportunities for rural students.
- Rural-Urban Divide:** The disparity between rural and urban education systems extends beyond infrastructure. Variations in teaching methods, subjects taught, and the quality of education create a substantial divide between rural and urban learners.
- Parents' Ignorance:** High dropout rates in rural schools, particularly before completing the 12th grade, often stem from parents' lack of awareness about the importance of education and their limited understanding of its long-term benefits.

GOVERNMENT INITIATIVES FOR RURAL EDUCATION

Samagra Shiksha	<ul style="list-style-type: none"><input type="checkbox"/> This is an integrated scheme for school's education launched in 2018-19 by the Indian government, covers pre-schools to class XII.<input type="checkbox"/> It aims to ensure an equitable quality of education at all levels of school education across India.<input type="checkbox"/> It works to strengthen infrastructure, gender equality, improving education quality, digital initiatives and the right to education for every child.
Shiksha Karmi Project	<ul style="list-style-type: none"><input type="checkbox"/> The project launched in 1987 in Rajasthan works for universalization of primary schools and socio economically backward villages in the state where the existing primary education is dysfunctional.<input type="checkbox"/> The project works to improve and adapt the type of education suiting the local needs and conditions.
Lok Jambish Pariyojana	<ul style="list-style-type: none"><input type="checkbox"/> The initiative, also formed in Rajasthan in 1992, works for universalization of elementary education through mass mobilization and participation of people.<input type="checkbox"/> It works to enroll children in regular schools and ensure they regularly attend.<input type="checkbox"/> The project also emphasizes on active learning, child centered process and women empowerment and equality through education.
Digital initiatives	<ul style="list-style-type: none"><input type="checkbox"/> To combat issues such as declining student attendance, lack of committed teachers, proper infrastructure and quality and access to education, the government has taken several digital initiatives.<input type="checkbox"/> These digital platforms, namely e-PATHSHALA, Diksha, MOOC, SWAYAM PRABHA, and National digital library can be accessed through any part of the country.

WAY FORWARD

- Equitable Resource Allocation:** Allocate resources equitably across rural schools to bridge the gap between urban and rural education facilities. This includes providing textbooks, teaching materials, and necessary infrastructure.
- Digitalization of Education:** Integrate technology into education by providing e-resources and online courses. Digital literacy is crucial in a technology-driven world, and it can improve access to quality educational materials, especially in remote areas.
- Community Engagement:** Involve parents, community members, and local leaders in supporting education initiatives. Building a strong community partnership can foster a sense of ownership and responsibility for the quality of education.
- Inclusive Education:** Implement measures to ensure education is accessible and inclusive for all, including children with disabilities or from marginalized communities.

TRADITIONAL MEDICINE

CONTEXT

The inaugural worldwide summit on traditional medicine by the World Health Organization (WHO) took place during the G-20 Health Ministers' meeting in Gandhinagar.

WHAT IS TRADITIONAL MEDICINE?

- Traditional medicine, as defined by the **World Health Organization (WHO)**, refers to the knowledge, skills, and practices that **various cultures** have developed over time to maintain health, prevent, diagnose, and treat physical and mental illnesses.
- It encompasses a wide **range of ancient and modern practices** used in different regions around the world.
- In India, traditional medicine includes various **indigenous practices and therapies** that have been part of the country's historical tradition.

TRADITIONAL MEDICINE SYSTEMS IN INDIA

- **Ayurveda:** Ayurveda is an ancient Indian system of medicine that focuses on balancing the body's energies (doshas) to promote health and prevent diseases. It includes herbal medicines, diet, lifestyle modifications, and therapies like massage and Panchakarma.
- **Yoga:** Yoga is a holistic practice that originated in ancient India and includes physical postures, breathing exercises, meditation, and ethical principles. It is not only a physical exercise but also a mental and spiritual practice to enhance overall well-being.
- **Siddha:** The Siddha system of medicine is practiced predominantly in Tamil Nadu and Kerala. It is an ancient medical system that originated in Tamil Nadu and is based on the concept of maintaining a balance between the five elements (earth, water, fire, air, and ether) in the body.
- **Sowa-Rigpa (Tibetan Medicine):** Sowa-Rigpa is a traditional medical system practiced mainly in the Himalayan regions such as Sikkim, Arunachal Pradesh, Darjeeling, Lahaul & Spiti, and Leh-Ladakh. It is influenced by both Ayurveda and traditional Tibetan medicine.
- **Homoeopathy:** While not originally part of Indian tradition, homoeopathy has become an integral part of India's traditional medicine practices over the years. Homoeopathy is based on the principle of "like cures like" and uses highly diluted substances to stimulate the body's healing response.

IMPORTANCE OF TRADITIONAL MEDICINE IN HEALTHCARE

- Cultural Wisdom:** Traditional medicine is deeply intertwined with cultural practices, beliefs, and experiences, making it a valuable repository of diverse healthcare insights.
- Holistic Approach:** Unlike some modern medical systems that focus solely on specific symptoms or diseases, traditional medicine emphasizes the interconnectedness of the body, mind, and spirit.
- Natural Remedies:** Traditional medicine often relies on natural ingredients such as herbs, plants, and minerals, which are gentler on the body and may have fewer side effects compared to synthetic drugs.
- Preventive Care:** Traditional medicine places great importance on prevention rather than just treatment.
- Accessible and Affordable:** Traditional medicine often uses locally available resources, making it more accessible and affordable, particularly in rural or underserved areas.
- Global Interest:** Traditional medicine has gained recognition on the global stage, leading to research and scientific validation of its effectiveness.

The Traditional Medicine Ecosystem in India

- The market for medicinal plants in India stood at **Rs. 4.2 billion (\$ 56.6 million)** in **2019** and is expected to increase at a CAGR of 38.5 percent to Rs. 14 billion (US\$ 188.6 million) by 2030.
- The export value of **ayurvedic and herbal products** amounted to about \$539 million from India in 2021.
- Overall, AYUSH exports have reached **\$18 billion** from \$3 billion before 2014. **AYUSH stands for** Ayurveda, Yoga, Naturopathy, Unani, Siddha and Homoeopathy.
- About **40,000 MSMEs** are active in the AYUSH sector.

MAJOR CONCERN WITH THE TRADITIONAL SYSTEMS OF MEDICINE IN INDIA

- Trust-Deficit:** There is a major trust-deficit in the soundness of Ayurvedic theories and the fruitfulness of its practices. Ayurveda is not the medical system of first choice for many people.
- Lack of Scientific Validation:** Ayurveda has failed to keep pace with the intellectual and scientific advances of the times. So, it has diminished evidence-based quality.

- Sub Standard Courses:** Ayurvedic practitioners' graduation courses are often substandard and the post-graduate courses offered at most of their institutes are of extremely poor quality.
- Lack of Practice:** While MBBS graduates and post-graduates from public hospitals have to mandatorily serve a specified bond period in rural areas, graduates and post-graduates from AYUSH public hospitals are not subjected to any such restrictions.
- Lack of Ecosystem:** Ayurveda lacks a vibrant ecosystem of science and research.
- Trial and Error Methods:** Ayurvedic practitioners have to discover treatments and approaches that actually work. It involves a lot of trial and error with patients and leads to an erosion of the practitioner's reputation.
- Lack of Investment:** Despite numerous efforts made by individuals and organizations to conduct research, the lack of investment into Ayurvedic research has been a major setback.
- Less Integration with Modern Medicine:** Ayurveda can be used safely and efficaciously only in about 60%-70% of primary-care illnesses. For rest, Ayurveda needs to be integrated with modern medicine.

INITIATIVES TO PROMOTE TRADITIONAL MEDICINE

- Ministry of AYUSH:** The Ministry of AYUSH was established in 2014 with a vision of reviving the profound knowledge of our ancient systems of medicine.
- National AYUSH Mission (NAM):** Government of India is implementing Centrally Sponsored Scheme of NAM in the country through State and UTs for promotion and development of AYUSH systems.
 - **Grant-in-aid** is being provided to **State Governments** for development and promotion of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy.
 - NAM also supports **cultivation of medical plants**, production of quality and standardized ingredient for supply of AYUSH, integration of medicinal plants in farming systems and increasing **export of value-added items** of medicinal plants.
- AYUSH Gram:** Under the concept of AYUSH Gram, **AYUSH based lifestyles** are promoted through behavioral change communication, training of village health workers towards identification and use of local medicinal herbs and provision of AYUSH health services.
- Global partnerships:** India has signed **MOUs with 23 countries** for cooperation in field of Traditional Medicine and Homoeopathy in areas such as research, education, training, and more.
 - **33 AYUSH Information Cell** have been set up in 31 countries to disseminate authentic information about AYUSH systems.
- WHO Global Centre for Traditional Medicine (GCTM):**
 - WHO GCTM was established in **Jamnagar, Gujarat**. It is the **first WHO GCTM** in the world.
 - The centre was established **to support WHO's efforts** to implement the **WHO Traditional Medicine Strategy 2014-2023**.
- Other Steps:**
 - The government has special **AYUSH Visa** category for foreign nationals, who want to come to India to take advantage of AYUSH therapy.
 - A special **AYUSH mark for AYUSH products** and network of AYUSH parks has been undertaken to encourage the promotion, research and manufacturing of AYUSH products in India.
 - A new category named '**AYUSH Aahar**' has been announced which facilitates the producers of Ayurvedic nutritional supplements.
 - **All India Institute of Ayurveda (AIIA)**, Goa, **National Institute of Unani Medicine (NIUM)**, Ghaziabad and the National Institute of Homoeopathy (NIH) have been set up.
 - Ministry of Electronics and Information Technology is providing **technical support for digitalisation of AYUSH Sector** under the AYUSH Grid project.

WAY FORWARD

- Enhance Scientific Research:** Government should invest in scientific research to validate the safety and efficacy of traditional medicine practices and remedies which will help build a stronger evidence base and increase confidence among both practitioners and the public.
- Quality Assurance:** Implement stringent quality control measures for traditional medicine products and treatment to protect the health of patients and consumers.

- Education and Training:** Improve the quality of education and training for traditional medicine practitioners by enhancing curriculum standards, and offering advanced courses etc.
- Integration with Modern Medicine:** Promote the integration of traditional medicine into the broader healthcare system to leverage the strengths of both systems.
- Regulation and Licensing:** There is a need to establish clear regulations and licensing requirements for traditional medicine practitioners to ensure quality services.
- Telemedicine and Digital Health:** Utilization of technology to expand the reach of traditional medicine.
- International Collaboration:** Collaborating with other countries and international organizations on research, education, and the promotion of traditional medicine.

WORLD BANK DIGITAL HEALTH REPORT

CONTEXT

The World Bank released a report titled 'Digital-in-Health: Unlocking the Value for Everyone', during the G20 Health Ministers Meeting in Gandhinagar.

KEY HIGHLIGHTS OF THE REPORT

Various Challenges faced by the Health Systems across the World

- Inequity in Health Care Delivery:** Health systems struggle with delivering high-quality care to all, leading to disparities in health outcomes.
- Inadequate Use of Evidence:** Only a portion of care is in line with evidence-based guidelines, leading to suboptimal and sometimes ineffective treatments.
 - Only **50 percent to 60 percent of care** is delivered in accordance with the **highest level of evidence** or consensus-based guidelines.
- Skilled Workforce Imbalance:** Some regions suffer from a shortage of skilled healthcare workers while others have an excess of underskilled ones.
- Access and Affordability:** Inequality persists in accessing and affording health services, making it difficult for everyone to use and value them.
- Private-Public Sector Divide:** Limited coordination between private and public sector providers hampers comprehensive care delivery.
- Slowly growing health crises:** Current health systems are facing threat from the slowly growing health crises such as:
 - The **impact of climate on health** (over 60 percent of all known human pathogens will be aggravated by climatic hazards);
 - The **rising shares of older people** with more complex, chronic medical needs;
 - Significant increases in the need for **mental health services**; and
 - The growing burden of **noncommunicable diseases**, the cause of 75 percent of all deaths in the world in 2022.

HOW DIGITAL TECHNOLOGY MAY HELP OVERCOME HEALTH SECTOR CHALLENGES AND BUILD VALUE?

- Strengthening Health Systems and Financing:** Experiences in countries have shown that digital technology strengthens health systems, improves health financing, makes public health more effective, and reaches underserved populations.
- Personalized Health Services and Cost Management:** Used effectively, digital technology makes health services more personal, prevents health care costs from increasing, reduces differences in care, and makes the provision of health services easier
- Advancing Universal Health Coverage (UHC):** Digital technology supports progress toward universal health coverage (see figure).
- Enhancing Efficiency and Cost Savings:** Digital technology and data can increase efficiency and save money.
 - For example, studies show that African economies like **Nigeria, Kenya, and South Africa** could save up to **15% of their health system costs** by implementing specific digital solutions.

APPLICATIONS OF DIGITAL TECHNOLOGY IN HEALTH AND HEALTH CARE



The report discusses the **evolution of digital technology in the health sector**, including the concepts of e-health, m-health, and digital health:

e-Health in the Early 2000s:

- E-health emerged in the early 2000s as an **expansion of medical informatics** to incorporate technology in healthcare delivery.
- E-health aimed to enhance health services and information **through the internet and related technologies**.
- The **focus was on delivering health services** and improving health care **through the use of technology**.

m-Health in the Late 2000s:

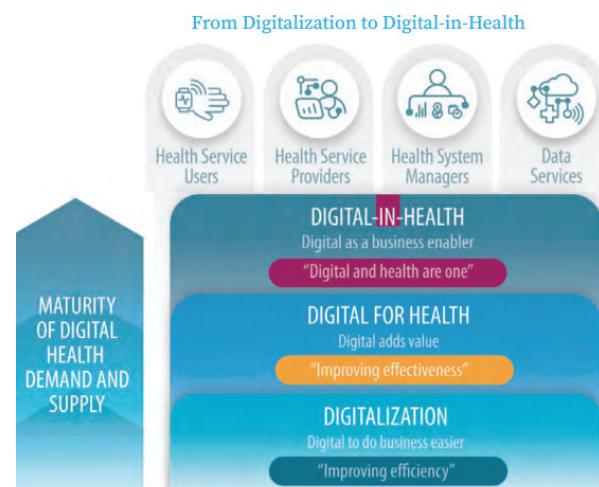
- M-health, or mobile health, gained prominence around 2008 with the **rise of mobile communication devices**.
- M-health referred to delivering health care services **through mobile technologies**.
- The term encompassed the **use of mobile devices to generate digital data** that required management through information systems.

Shift to Digital Health:

- Over time, the focus expanded to digital health, a **broader concept that encompasses various digital technologies** to improve health.
- Digital health includes **not only mobile technologies but also smart devices, connected equipment, IoT, AI, big data, and robotics**.
- The **goal of digital health** is to solve health system problems and enhance health outcomes.

THE CONCEPT OF “DIGITAL-IN-HEALTH” AS A TRANSFORMATIVE APPROACH

- The report discusses the **concept of “Digital-in-Health”** as a transformative approach to integrating digital technology and data into health systems.
- “Digital-in-Health” refers to a **transformative approach** in which **digital technology** and data are **deeply integrated** and



embedded within all aspects of the healthcare system to improve health service delivery, patient outcomes, and overall health management.

- It goes **beyond simply using technology** to support existing healthcare processes and services.
 - Instead, it **involves a fundamental shift** in the way healthcare is provided and managed, placing digital technology and data at the core of the entire health system.

WAY FORWARD

To help countries **embrace a digital-in-health approach**, the report proposes **three essential areas to guide investments**:

- Prioritise **evidence-based digital investments** that tackle the biggest problems and focus on the **needs of patients and providers**.
- Connect the **regulatory, governance, information, and infrastructure dots** so that patients know that data is safe and health workers can use digital solutions transparently.
- Scale **digital health for the long run** based on trust with sustainable financing, and **improved capacity and skills for digital solutions**.



AGRICULTURE

6TH CENSUS REPORT ON MINOR IRRIGATION SCHEMES

CONTEXT

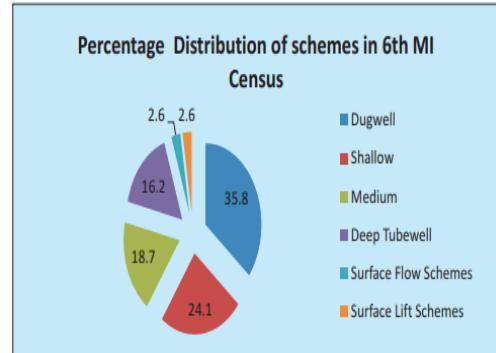
The Ministry of Jal Shakti released the report on the 6th census on minor irrigation schemes.

WHAT IS MINOR IRRIGATION (MI) SCHEMES?

- Minor irrigation (MI) schemes are defined as those structures either in ground water or in surface water category having **Culturable Command Area (CCA) up to 2,000 ha**.
 - **CCA** refers to the total area of land that can be effectively irrigated and cultivated using water from a specific irrigation project or scheme.
- **The Ground water schemes comprise** dug well, dug-cum-bore wells, shallow, medium and deep tubewells.
- **The surface water scheme** comprises **surface flow** schemes and **surface lift** irrigation schemes.
 - **The surface flow schemes** typically consist of tanks, check-dams, structures and can serve as water conservation cum ground water recharge scheme.
 - **Surface lift schemes** are generally built in regions where topography does not permit direct flow irrigation from rivers and streams and hence water has to be lifted into irrigation channels.

KEY HIGHLIGHTS OF THE REPORT

- As per the report, **23.14 million minor irrigation (MI) schemes** have been reported in the country, out of which 21.93 million (94.8%) are **Ground Water (GW)** and 1.21 million (5.2%) are **Surface Water (SW) schemes**.
- There has been **increase of about 1.42 million in MI schemes** during 6th MI census as compared to 5th Census. At the national level, both GW and SW schemes have **increased by 6.9% and 1.2%, respectively**.
- **Percentage Distribution of MI schemes by type:** During 6th MI census, dugwell schemes have major share followed by shallow tubewells (**depicted in the pie- chart**).
- **Ownership type:** 96.6% minor irrigation schemes continue to remain under private ownership whereas 3.4% are under public ownership.
 - This pattern is more dominant in **Ground water schemes** where almost all type of schemes (98.3%) has **private ownership**.
 - In Surface Water Schemes, 35.8% schemes are in **public ownership** and 64.2% are in **private ownership**
 - Out of all the individually owned schemes, 18.1% are **owned by women**.
- **Financing of MI schemes:** Around 60.2% schemes have single source of finance whereas 39.8% schemes have more than one source of finance.
 - In **single source of finance**, majority of schemes (79.5%) are being financed by own **savings of individual farmer**.
 - Other important sources of finance are **bank loan** (6.9%), **government fund** (4%) and **money lender** (1.3%).
- **Distribution of source of energy:** Majority of schemes (76%) utilize **electricity** as source of energy followed by **diesel** (22.2%).
 - Rest of the schemes (1.8%) use **windmill, solar pumps, manual/animal** and other sources of energy.
 - This clearly reveals that **98.2% schemes** are operated by either **electricity or diesel**.
- **Leading states in MI Schemes:** Uttar Pradesh possesses the largest number of MI schemes in the country (17.2%) followed by Maharashtra (15.4%), Madhya Pradesh (9.9%) and Tamil Nadu (9.1%).



Leading States in number of Ground Water schemes
• Uttar Pradesh
• Maharashtra
• Madhya Pradesh
• Tamil Nadu
• Telangana

Leading States in number of Surface Water schemes
• Maharashtra
• Karnataka
• Telangana
• Odisha
• Jharkhand

Leading States in total number of schemes
• Uttar Pradesh
• Maharashtra
• Madhya Pradesh
• Tamil Nadu
• Telangana

Leading States in number of MI schemes by type:



AGROFORESTRY

CONTEXT

Ministry of Environment, Forest and Climate Change (MoEFCC) has released a **factsheet on agroforestry** listing **36 species** that can be grown in different **agro-climatic zones**.

MORE ON THE NEWS

As per the factsheet:

- **Trees suitable for rainfed areas:** Azadirachta indica, Pongamia pinnata, Ailanthus excelsa, Albizia lebbeck, Hardwickia binata, Pterocarpus marsupium, Pterocarpus santalinus, Santalum album, Syzygium cumini, Acacia nilotica, Acacia leucophloea, Ziziphus jujuba.
- **Tree crops suited for saline / sodic lands:** Eucalyptus, Casuarina, Pongamia pinnata, Azadirachta indica, Pithecellobium dulce, Salvadora oleoides, Salvador persica, Capparis decidua, Terminalia arjuna, Cordia rothii, Albizia lebbeck, Pongamia pinnata, Sesbania sesban, Butea monosperma and Acacia leucophloea.
- **Trees suitable for water logged areas:** Syzygium cumini, Pongamia pinnata, Michelia champaca, Terminalia arjuna, Holoptelea integrifolia, Thespesia populnea, Acacia nilotica, Calophyllum inophyllum, Lannea coromandelica, Casuarina and Eucalypts.

The factsheet also listed **State-wise List of Potential tree species for Agroforestry.**

WHAT IS AGROFORESTRY?

- Agroforestry is the collective term given to **land-use systems and technologies** in which **woody plants** are used on the same **land-management** units as **agricultural crops and/or animals**.
- Agroforestry includes both **ecological and economical interactions** between the different components.
- Major attributes of agroforestry systems:**
 - **Productivity:** production of preferred goods and increasing productivity of the land resources
 - **Sustainability:** conserving the production potential of the resource base
 - **Adaptability:** acceptance of the prescribed practice by the users or in line with existing regional practices

TYPES OF AGROFORESTRY

There are **three main types** of agroforestry systems:

- Agrisilvicultural systems** are a combination of crops and trees, such as alley cropping or home gardens.
- Silvopastoral systems** combine forestry and grazing of domesticated animals on pastures, rangelands, or on-farm.
- The three elements, namely trees, animals, and crops, can be integrated into what is called **agrosilvopastoral systems** and are illustrated by home gardens involving animals as well as scattered trees on croplands used for grazing after harvests.

AGROFORESTRY IN INDIA

- Spread:** Currently, agroforestry is practiced on 13.5 million hectares in India. About 65 per cent of the country's timber and almost half of its fuel wood come from trees grown on farms.
- Employment:** Agroforestry is currently generating 450 employment-days per hectare per year in India.
- Forest cover:** The forest cover in India has grown from 21% to 25%. This 4% growth has been contributed by agroforestry in recent years.

ADVANTAGES OF AGROFORESTRY

- Reduces pressure on forests:** Agroforestry will perform most of the functions of traditional forests, including fulfilling timber needs. This will reduce pressure on forests.
- Recycling of nutrients:** Agroforestry will help better manage nutrient cycle of the unit. Waste generated from one component can act as nutrient for another component.
- Support biodiversity:** Agroforestry supports greater range of biodiversity over conventional systems. This is because of variety in microclimate.
- Protect soil:** Trees grown on the land will protect top layer of soil, preventing erosion due to water or wind. This will conserve soil nutrients.
- Income augmentation:** Agroforestry provides opportunity for income augmentation, thereby reducing pressure on farming.
- Carbon sinks:** Forests act as carbon sinks. Agroforestry will act as artificial forests and can perform carbon storing functions.
- Pollution control:** Agroforestry helps in reducing dust, particulate matter as well as odour. It improves quality of air, soil and water.

CHALLENGES FOR AGROFORESTRY

- Lack of Knowledge and training:** Agroforestry is a specialized field that requires certain amount of knowledge in order to reap benefits.
- Long term benefits:** Agroforestry will start providing profits on the longer run. In short run, profits may decline due to reduction in cropping area.
- Stringent forest laws:** Indian forest laws are very stringent that prevents landowner from cutting trees grown on his/her land without multiple permissions.
- Food security:** Diverting agricultural land from cereal and commercial crops may create a scarcity of food and industrial raw material.
- Lack of dedicated agency:** Most of the countries, including India, do not have a dedicated agency to promote agroforestry in the country.
- Other constraints faced by the farmers while adopting agroforestry:**
 - **Trees interfering** with agricultural crop yield,
 - **Increased crop damage** from birds that trees attract and the pests that use trees as alternate hosts,
 - Release of some **allelochemicals** from some tree leaves that have an allelopathic effect on crop productivity,
 - Lack of **market mechanisms** for tree produce, and
 - **Dearth of remuneration** for undertaking tree cultivation under agroforestry systems.

GOVERNMENT INITIATIVES TO PROMOTE AGROFORESTRY

- Since the 1970s**, India has promoted **research in the field of agroforestry**.
- India is the first country** to develop and adopt an agroforestry policy - the **National Agroforestry Policy (NAP)**.
 - The policy was **announced by the Indian government in 2014** at the **World Congress on Agroforestry** in New Delhi, becoming the world's first nation to establish an agroforestry policy.
 - The policy contains framework to address **growth of agricultural livelihoods** and **minimizing climate change** by boosting agricultural production.
 - **Goals under the policy:**
 - ✓ Creation of a **national nodal body** to bring together various agroforestry projects, programmes, and policies of the government.

- ✓ Using **agroforestry techniques** to improve economic situation of small farmers.
 - ✓ **Protection of environment** and addressing the growing demand for wood and other agroforestry commodities.
 - ✓ **Expanding India's forest cover** through agroforestry.
 - ✓ The policy also aims to **reduce import of wood and wood products** to save **foreign exchange**.
- **A Sub-Mission on Agroforestry (SMAF)** under **National Mission for Sustainable Agriculture (NMSA)** was initiated by the Department of Agriculture, Cooperation & Farmers Welfare in 2016.
– The aim of the submission was to **expand the tree coverage on farmland** complementary with agricultural crops.
- **The “Har Medh Par Ped” scheme** was launched in 2016-17 to encourage **tree plantation on farmland along with crops/ cropping systems** to help the farmers get additional income and make their farming system more climate resilient and adaptive.

WAY FORWARD

- **Financial backing and promotion:** The concept of agroforestry needs to be financially backed and promoted with more zeal. Proper training and information should be given to the farmers for them to adopt the method scientifically.
- **Capacity building:** Farmer collectives like cooperatives, self-help groups, Farmer -Producer Organisations (FPOs) must be promoted for building capacities to foster the expansion of tree-based farming and value chain development.
- **Policy integration:** Policymakers should incorporate agroforestry in all policies relating to land use and natural resource management, and encourage government investments in agroforestry-related infrastructure.
- **MoEFCC’s Factsheet has suggested the following measures to scale up agroforestry in India:**
 - Development of **new agroforestry models** for different agro-climatic zones.
 - Ensuring the availability of **certified planting material** to the farmers and other users.
 - **Participatory research** on larger agroforestry models viable across different agroecological regions.
 - **Developing ideotypes** (specific tree varieties) suitable to various agroforestry systems.
 - Development of **industries** and/or **secondary processing units** near the agro forestry zones.
 - Introducing **innovative technologies** for an efficient and well managed agroforestry system.
 - **Improving market access** to farmers and incentivizing value-added agroforestry.
 - Research on **ecological and social impacts** on adoption of agroforestry.
 - **Decision Support Systems** for the selection and management of species in agroforestry systems.
 - Improve the **delivery of technology** know-hows to the farmers **through extension programmes** involving research institutions and industries.

CLIMATE PROOFING OF AGRICULTURE

CONTEXT

Given that Climate Change is posing a severe threat to agriculture and long-term food security, there is an urgent need to adopt measures.

HOW IS CLIMATE CHANGE IMPACTING AGRICULTURE?

- **Reduced crop yields:** Beyond a certain range of temperatures, warming tends to reduce yields because crops speed through their development, **producing less grain** in the process. And higher temperatures also interfere with the ability of **plants to get and use moisture**.
 - The **2022 heatwave** has resulted in an estimated **10-35 percent reduction in wheat yields** in **Punjab, Haryana and Uttar Pradesh**.
- **Impact on nutritional quality of crops:** Rising levels of atmospheric carbon dioxide reduce the concentrations of **protein and essential minerals** in most plant species, thereby reducing the nutritional quality of crops, which is a potential **threat to food security**.
- **Pest attacks and disease pressures:** Global warming leads to more incidence of insect transmitted plant diseases through **range expansion** and rapid **multiplication of insect vectors**.

- According to **World Economic Forum (WEF)**, with every increase in **one degree of global warming**, losses of crops to insects will **increase from 10% to 25%**.
- The warming of the Indian Ocean due to climate change is cited as the main reason for the **2019–2020 locust attacks across Rajasthan, Gujarat and Punjab**
- Livestock productivity:** Heat stress affects livestock both directly and indirectly.
 - Over time, heat stress can increase **vulnerability to disease**, reduce **fertility**, and reduce **milk production**.
 - **Drought** may threaten **pasture and feed supplies**. Drought reduces the amount of quality forage available to grazing livestock.
- Impact on fisheries:** In addition to warming, the **oceans** are gradually becoming **more acidic** due to increases in atmospheric carbon dioxide.
 - Due to ocean warming, there will be more **species migration** and **ranges of fish species** may change.
 - Higher water temperatures lead to more **marine disease outbreaks**.
 - Acidification also threatens **sensitive ecosystems** such as **coral reefs** upon which several species rely.
- Extreme events:** With the global warming, there has been an increase in the intensity and frequency of extreme events such as floods, droughts, heatwaves, and landslides etc., which can **destroy standing crops and reduce yields**.

Climate crisis has cost India 5 million hectares of crop area in 2021

- Cyclone Tauktae and Cyclone Yaas wreaked havoc in several states, especially in Odisha, West Bengal and Karnataka and resulted in widespread agricultural damage.
- In July 2021, floods in Maharashtra damaged standing crops.
- In October 2021, heavy rains destroyed harvest-ready crops in many districts of Kerala.
- Impact on farmer's income:** The Economic Survey 2017-18 highlighted that "Climate change could reduce annual agricultural incomes in the range of 15% to 18% on an average, and up to 20% to 25% for unirrigated areas".

What is Climate Proofing of Agriculture?

- Climate proofing of agriculture simply means 'making agriculture more **adaptive and resilient to climate variability** and **sustainable** in the long-run'.
- **According to FAO**, the world needs to produce **70% more food by 2050** to feed an estimated 9 billion population. Meanwhile, the climate change is impacting the agriculture more and more adversely. Hence, **climate proofing** of agriculture becomes the **need of the hour**.

IMPORTANT CLIMATE PROOFING SOLUTIONS FOR AGRICULTURE

- Climate smart agriculture (CSA):** It is an integrated approach to managing landscapes—cropland, livestock, forests and fisheries—that address the interlinked challenges of food security and climate change. The three pillars of CSA are as follows:
 - **Increased productivity:** Produce more and better food to improve food security and boost incomes.
 - **Enhanced resilience:** Reduce vulnerability to drought, pests, diseases and other climate-related risks and shocks.
 - **Reduced emissions:** Pursue lower emissions for each calorie or kilo of food produced, avoid deforestation from agriculture.
- Precision farming:** It is an approach where inputs are utilized in precise amounts to get increased average yields, compared to traditional cultivation techniques.
 - It is based on using **Information and Communication Technologies (ICTs)**. It will result in more efficient irrigation, high **Nutrition Use Efficiency (NUE)**, and less soil degradation etc.
- Other climate resilient agricultural practices:** Include Integrate crop livestock systems, Conservation Tillage, Adaptation of climate resilient crop varieties, agroforestry and agroecological practices such as intercropping, crop rotation, and organic farming, dryland agriculture etc.

INITIATIVES FOR CLIMATE PROOFING OF AGRICULTURE IN INDIA

- National Mission on Sustainable Agriculture:**
 - Launched in **2014-15**, it is one of the eight missions under the **National Action Plan on Climate Change (NAPCC)**.

- It seeks to transform Indian agriculture into a **climate resilient production system** through suitable adaptation and mitigation measures in the domain of crops and animal husbandry.
- National Innovations on Climate Resilient Agriculture (NICRA):** Initiated by the ICAR in 2011 to enhance resilience of Indian Agriculture to climate vulnerability through **strategic research and technology demonstration**.
- Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** envisages “Per Drop More Crop”, that is, promoting micro/drip irrigation to conserve water.
- ICRISAT (International Crops Research Institute for the Semi-Arid Tropics)** has also developed a pool of approaches for building **climate smart villages** such as:
 - **Watershed management approach** (improving rural livelihoods by rehabilitating natural ecosystems);
 - **Futuristic multi-model approach** (Customizing adaptation packages to enhance climate resilience);
 - **Digital technologies approach** (by integrating climate information and eco-conservation technologies);
 - **Meteorological advisory and farm systems approach** (building resilience agro-ecosystems by using climate information);
 - **Climate and crop-modelling approach** (cropping advisories based on seasonal forecasts).

CHALLENGES FOR CLIMATE PROOFING OF AGRICULTURE IN INDIA

- Small and fragmented land-holdings:** More than 58 per cent of operational holdings in the country have size less than one hectare, which acts as an impediment to adoption of technology into farms.
- Poor adoption of ICT in agricultural sector:** Due to poor connectivity and infrastructure in rural areas; lack of capacities of rural population to engage with ICTs; challenges in optimizing returns of investment in ICTs, etc.
- Rural divide:** Low levels of e-literacy, digital skills, affordability, infrastructure, as well as access to services in rural areas as compared to urban areas.
- Bias against small and marginal farmers:** Most of the commercial applications in agriculture, such as precision farming or drones, have not been designed to serve the needs of the most vulnerable i.e. the small farmers.
- Lack of synergy:** Among various levels of government regarding climate policy framework for agriculture. For E.g. there is a least appreciation of a changing climate at the level of local self-governments.

WAY FORWARD

- Capacity building:** Rationale of climate-smart agriculture (CSA) should be appreciated by decision makers at all levels. There should be **structured trainings** to officials of relevant Departments to sensitize them to understand diverse impacts of global climate change even at local levels.
- Localization of goals:** Allocations under **MGNREGA** can be purposefully utilized in climate-proofing projects such as farm ponds; **soil and water management** through participatory **watershed approaches**; plantation and **agro-forestry**; and many other **eco-friendly activities** that will adapt and build resilience to climate change.
- Funding:** Public investment in agricultural research, irrigation, extension services, and climate-smart agricultural practices should be increased.
- R&D:** Priority has to be accorded for upscaling research on **emerging areas of climate science** to develop technologies that must include pest-surveillance and **forewarning systems**; **simulation modelling** and **big data analytics**, etc.
- Access to knowledge:** Farmers must gain access to the rich scientific knowledge recommended by various research institutions/projects through efficient **dissemination of the climate-smart technologies**.

CONCLUSION

Climate proofing of agriculture is necessary for **reducing hunger and poverty** in the face of climate change, and to achieve **majority of the 17 SDGs**. The effects of climate change on the ‘**complex and risk prone**’ **farming systems of India** will be disastrous, if ‘**climate-wise**’ **development policies** are not implemented with focus and regularity.

DROUGHTS IN INDIA

CONTEXT

The Karnataka state government is likely to declare more than 100 taluks as drought-hit in view of a severe shortage of rainfall.

DROUGHTS

- Droughts are **prolonged periods of abnormally low rainfall** or water scarcity, leading to water shortages and adverse impacts on the environment, agriculture, and society.
- The India Meteorological Department (IMD)** defines drought in any area when the rainfall deficiency in that area is **≥26% of its long term normal**.
 - It is further classified into moderate and severe drought depending upon whether the deficiency is between **26 to 50% and more than 50% respectively**.
- For the country as a whole, the area-weighted rainfall having normal of 88 cm, also called **Indian summer monsoon rainfall (ISMR)**, is considered.
 - When the rainfall **deficiency exceeds 10%** and when the area under drought exceeds 20% of the total area of the plains in the country (which is 32,87,782 km²), such a situation is considered as drought for the country as a whole.

TYPES OF DROUGHTS

Meteorological Drought

- When **there is a prolonged period of inadequate rainfall** marked with maldistribution of the same over time and space it is called Meteorological Drought.
- Rainfall less than 90 percent of average** is categorized as meteorological drought.

Agricultural Drought

- Agricultural Drought is characterized by **low soil moisture** that is necessary to support the crops, thereby resulting in crop failures.
- If an **area has more than 30 percent** of its gross cropped area under irrigation, the area is excluded from the drought-prone category.
- An **extreme agricultural drought can lead to a famine**, which is a prolonged shortage of food in a restricted region causing widespread disease and death from starvation.
- The government also declares an area affected by drought, if more than 50 percent crop loss happens in an area due to meteorological conditions.

Hydrological Drought

- When the availability of water in different storages and reservoirs like aquifers, lakes, reservoirs, etc. falls below what the precipitation can replenish.

Ecological Drought

- When the productivity of a natural ecosystem fails due to shortage of water and as a consequence of ecological distress, damages are induced in the ecosystem.

CAUSES OF DROUGHTS

Droughts can result from a combination of natural and human-caused factors.

Natural Factors

- Erratic Monsoons:** The South-west monsoon, which brings the majority of India's annual rainfall, can be inconsistent. The failure of monsoons, often due to phenomena like El Niño, can lead to extended periods of reduced rainfall and drought conditions.
- Skewed Distribution of Monsoon:** Some regions, such as the leeward side of the Western Ghats, receive less rainfall due to the geographical distribution of monsoons. This chronic uneven distribution can make certain areas more prone to drought.
- Depletion of Water Resources:** Areas with low annual rainfall can experience a depletion of both surface and subsurface water resources. Inadequate rainfall doesn't recharge these resources sufficiently, leading to water scarcity.

Anthropogenic (Human-Caused) Factors

- Inappropriate Agricultural Practices:** Excessive water use in agriculture, particularly when cultivating water-intensive crops, can deplete local water supplies. Poor water management practices can worsen water scarcity.
- Deforestation and Wetland Encroachment:** Activities like deforestation and the encroachment of wetlands reduce the natural ability of the land to retain water. Trees and wetlands play crucial roles in retaining water in the ecosystem.

- Global Warming and Climate Change:** Human activities, such as the emission of greenhouse gases, contribute to global warming and changes in climate patterns. This can lead to fluctuations in monsoon patterns and exacerbate drought conditions.

Social and Economic Factors

- Population Growth:** As the population increases, the demand for water also rises. This can strain existing water resources, especially in areas with limited water availability.
- Urbanization:** Rapid urbanization can lead to increased water demand for industrial, residential, and commercial purposes, further stressing water resources.
- Water Management Policies:** Inefficient water management policies, including inadequate infrastructure for water storage and distribution, can contribute to water scarcity during periods of reduced rainfall.

IMPACT OF DROUGHTS

As per the Drought in Numbers 2022 Report,

- Water shortage:** By 2050, droughts may affect more than three-quarters of the world's population, with an estimated 4.8-5.7 billion people living in water-scarce areas for at least one month each year, up from 3.6 billion today.
- Migration:** By 2030, drought will displace an estimated 700 million people worldwide.
- Mortality:** Drought has killed over 10 million people over the last century. 90% of these deaths have occurred in developing countries.
- Poverty:** A 2006 study reported that nearly 13 million people in Chhattisgarh, Jharkhand and Odisha who live just above the poverty line have fallen below it due to drought-related income loss and lost nearly \$400 million during a severe drought year.
- Agriculture impact:** On India's primarily rainfed agriculture which accounts for 60% of the sown area on average.
- Food insecurity:** An IPCC assessment noted that India's rice output may decrease 30% and Maize production by 70 per cent if global warming rises to 4°C above pre-industrial levels and drought occurs due to the same.
- Economic impact:** The report also stated that India's GDP reduced by 2 to 5% between 1998 and 2017 due to severe droughts. Globally, droughts in the same period caused economic losses of approximately \$124 billion.
- Impact Fauna:** Australia's megadrought in 2019-2020 contributed to "megafires" resulting in about three billion animals being killed or displaced. On a related note, 84% of all terrestrial ecosystems are threatened by changing and intensifying wildfires.
- Impact Flora:** According to a 2017 report by FAO, the percentage of plants affected by drought has more than doubled in the last 40 years. Around 12 million hectares of land are lost each year due to drought and desertification.
- Gender-specific impact:** Women (72%) and girls (9%) are disproportionately affected by water scarcity.
- Affect children:** Almost 160 million children are exposed to severe and prolonged droughts due to water scarcity.

DROUGHT PRONE AREAS IN INDIA

- In India, around 68% of the country is prone to drought in varying degrees.
 - **35% which receives rainfall between 750 mm and 1125 mm** is considered drought prone while 33% receiving less than 750 mm is chronically drought prone.
- The Indian Meteorological Department (IMD) classifies drought-prone areas in India into three categories based on the probability of drought occurrence, as given below:
- Chronically drought affected areas:**
 - Areas having a probability of **drought exceeding 20%** has been defined as chronically drought prone.
 - In other words, such regions can expect at least one drought in 5 or 4 years.
 - Chronically drought prone areas in India mainly include **west Rajasthan and the entire State of Gujarat**.
- Frequently drought prone areas:**
 - Areas having drought probability **between 10% to 20%** have been assigned this category.
 - These areas are east Uttar Pradesh, Uttarakhand, Haryana, Punjab, Himachal Pradesh, east Rajasthan, west Madhya Pradesh, Marathwada, Vidarbha, Telangana, coastal Andhra Pradesh and Rayalseema and can expect drought once in 6 to 10 years.
 - These areas generally belong to **sub-humid climate zones (both dry & moist)**.
- Least drought affected areas:**
 - Areas having drought probability **less than 10%** belong to this category and comprise the rest of the country.

- Apparently, these pose no problem from rainfall point of view as they mostly belong to per-humid and humid regions climatic zones.

Drought in Numbers 2022 Report

According to the **15th Conference of Parties (CoP15)** to the United Nations Convention to Combat Desertification (UNCCD):

- Increase in area:** India's drought-prone area has increased by 57% since 1997. Drought affected nearly two-thirds of the country from 2020 to 2022.
- Increase in intensity:** Over the last decade, one-third of India's districts have experienced more than four droughts, and drought affects 50 million people each year.
- Comparison with Africa:** Drought vulnerability in India is comparable to that of Sub-Saharan Africa.
- ISRO evaluation:** According to the Desertification and Land Degradation Atlas of India, released in 2021 by the Space Applications Centre of ISRO, 97.85 million hectares i.e. Nearly 30% of the country's land was degraded during 2018-19.
- Flash Droughts:** According to the paper published recently in Nature Communications, India is a hotspot for flash droughts and this could have major implications on the country's crop production.
 - Flash droughts have been defined in two ways, either as a short-lived yet severe event where soil moisture completely depletes or a multi-week period of rapid intensification toward drought. It is sometimes also defined as a rapidly developing drought event.

GOVERNMENT INITIATIVES

- Drought Prone Areas Programme (DPAP):** Launched in the early 1970s, DPAP targeted the development of drought-prone areas by implementing measures to improve soil and water conservation, afforestation, and agricultural practices. It aimed at reducing the vulnerability of these regions to droughts.
- Desert Development Programme (DDP):** Similar to DPAP, DDP focused on addressing the challenges posed by desertification and ecological degradation in desert regions. It aimed at restoring and conserving the ecology of hot and cold deserts through sustainable practices.
- Watershed Development:** In response to the 1987 drought, the government shifted its focus to long-term solutions, particularly watershed development. DPAP and DDP were restructured to integrate watershed development as a primary unit for drought-proofing. This approach aimed to conserve rainwater, improve soil fertility, and enhance overall ecosystem health.
- National Watershed Development Programme for Rain-fed Areas (NWDPRA):** This program aims to develop rain-fed areas through integrated watershed management practices. It focuses on soil and water conservation, afforestation, and enhancing livelihoods for local communities.
- Watershed Development Programme for Shifting Cultivation (WDPSC):** This initiative addresses the challenges of shifting cultivation by promoting sustainable agricultural practices and watershed management in such regions.

NDMA GUIDELINES ON MANAGEMENT OF DROUGHT

The NDMA guidelines on management of drought were issued in 2010. It is observed in the guidelines that state intervention in drought management has a significant positive impact. Some of the recommendations in the guidelines are as follows:

- Separate Drought Monitoring Cells (DMCs)** should be created at the state level under the control of State Disaster Management Authorities which will prepare vulnerability maps in collaboration with the National Remote Sensing Centre.
- A control room should be established for drought management and specific guidelines should be issued for the **use of Information and Communication Technology (ICT) for real time information** related to droughts.
- The Government of India should undertake the **watershed development approach** through various programs.
- A cloud seeding policy** may be considered at the national level.
 - Cloud seeding, also known as a **weather modification technique** is an artificial way to induce moisture in the clouds so as to cause rainfall. In this process **silver iodide, potassium iodide or dry ice (solid carbon dioxide)** is dumped onto the clouds causing rainfall.
- Assessment of damage** must be done in terms of agricultural production, depletion of water resources, livestock population, land degradation and deforestation as well as human health.
- To support **income credit should be provided** promptly including consumption loan.
- Insurance products** will be developed for different agro-climatic zones providing coverage against drought.
- Afforestation** with subabul, seemaruba, casurina, eucalyptus and biodiesel plantation like jetropha and pongomia will be encouraged.

- A realistic national **training and capacity building programme** for drought management should be formulated and implemented.
- In case of late monsoons or dry spells, **seeds with short duration varieties** should be made available on subsidy. Inter-cropping, mulching, and weeding should be promoted.
- For animals, **creation of fodder banks, use of tank bunds**, undertaking market intervention to keep **fodder prices stable** must be done.

URBAN AGRICULTURE: THE SAVIOUR OF RAPID URBANIZATION

CONTEXT

According to a market research study, the global urban farming market size is expected to grow to US\$ 281.9 billion by 2030 from US\$ 137.5 billion in 2021, with a CAGR of 3.1%.

INTRODUCTION

Urban agriculture is a key solution to **rapid population growth, urbanization, food crisis and climate change**. According to reports of FAO, by 2050, **more than 6 billion populations** will be dwelling in **urban areas**, which is almost double the current population of 3.5 billion. **In case of India**, the reports by UN, **by 2030, 40.76% of country's population** will reside in **urban areas**. Considering these statistics, we can estimate the **burden on rural production system** to meet increasing food demand in urban markets. So, **urban agriculture** could be the **saviour to avoid food crisis**.

WHAT IS URBAN AGRICULTURE?

- Urban agriculture, also known as **urban farming, urban gardening**, refers to the practice of **cultivating, producing, and processing food** and other agricultural products **within or near urban areas**.
- This form of agriculture takes place in **urban environments** and **utilizes available spaces** such as rooftops, balconies, vacant lots, community gardens, and even indoor facilities for cultivation.
- Urban agriculture involves a variety of activities, including **growing crops, raising animals, keeping bees, and practicing aquaculture**.
- Its **primary goal** is to provide fresh and **locally sourced food** to urban communities while addressing challenges posed by **rapid urbanization, population growth, food insecurity, and climate change**.

TYPES OF URBAN AGRICULTURE

Urban agriculture can be classified into large number of types **based on area, type of commodity produced, multiple methods and medium used for cultivation**.

- Kitchen gardening:** Cultivation of vegetables and herbs in and around the domestic area for daily kitchen use.
- Rooftop Gardening:** Rooftop gardens involve growing plants on the rooftops of buildings. They can range from small container gardens to larger intensive systems.
- Community Gardens:** Community gardens are shared spaces where local residents come together to collectively cultivate plants.
- Vertical Farming:** Vertical farming involves growing crops in vertically stacked layers, often indoors, using controlled environments and artificial lighting.
- Hydroponics and Aquaponics:** Hydroponics is a soilless method of growing plants using nutrient-rich water solutions, while aquaponics combines hydroponics with fish farming.
- Container Gardening:** Container gardening involves growing plants in pots, containers, or other portable vessels.
- Street landscaping:** The vacant area alongside of the streets can be utilized for cultivation of vegetables.
- Green house gardening:** The large empty areas in and around the locality can be covered with the greenhouse for production of high value crops.
- Peri-urban farming:** Cultivation of crops in the city outskirts or perimeter of the urban areas is peri-urban farming.
- Urban beekeeping:** Maintaining bee colonies in and around urban gardens or peri-urban areas for pollination and for their honey is called urban beekeeping.

ADVANTAGES OF URBAN AGRICULTURE

- Food Security and Access:** Urban agriculture provides an opportunity to produce fresh and nutritious food locally, reducing the dependency on distant rural sources.
- Environmental Sustainability:** Urban agriculture contributes to creating green spaces in cities, which can help mitigate the heat island effect, improve air quality, and promote biodiversity.
- Climate Change Resilience:** Urban agriculture can enhance a city's resilience to climate change by improving water management, reducing soil erosion, and promoting sustainable land use practices.
- Social and emotional well-being:** Urban farming on community bases leads to social interaction among people of the locality, children can learn agriculture, people can share their produce with neighbours and social interactions will improve over time.
 - **Agriculture as a hobby** is a best mental and physical exercise to improve your emotional wellbeing.
- Economic benefits:** Urban agriculture provides employment and incomes for poor women and other disadvantaged groups.

DISADVANTAGES OF URBAN AGRICULTURE

- Lack of recognition:** Urban farming is unrecognized in agricultural policies and urban planning thus ignoring its importance in agriculture production system.
- Regulatory vacuum:** Growers often operate without permits. Since it is officially “invisible”, the sector receives no public assistance or oversight in many cities.
- Health and environmental risks:** Urban agriculture carries health and environmental risks – potential use of contaminated land and water and inappropriate use of pesticides, fertilizers and of raw organic manure that can leak into water sources.
- Groundwater depletion:** Drastic reduction in rainwater infiltration into the soil.
 - In Harare, Zimbabwe, it was noticed that there was 28.5% reduction in rainwater infiltration leading to depletion of groundwater.
- Other concerns:** The other challenges faced by urban farms are higher production costs, difficulty in managing pests and weeds and changing climatic scenario.
 - Operating urban farms within limited spaces can result in **higher production costs** due to the need for specialized equipment, irrigation systems, and controlled environments.
 - Urban agriculture may face challenges in **managing pests and weeds** in densely populated areas.
 - Urban areas may experience **microclimates** and **heat island effects** that differ from rural areas. This can affect plant growth, water requirements, and overall crop health.

SUCCESS STORIES OF URBAN AGRICULTURE IN INDIA AND WORLD

Cairo, Egypt	Development of rooftop gardens and cultivation of organic vegetables.
Queensland, Australia	Aquaponics and urban gardens are established.
Havana, Cuba	Urban gardens are established by Government agencies in collaboration with local residents to produce 90% of city's fresh vegetables.
Beijing, China:	<ul style="list-style-type: none"><input type="checkbox"/> The two-tier city farms are established by Chinese Government around 10 km away from city centre.<input type="checkbox"/> Wherein, first tier is located very near to city and produces perishable items and the second tier is located little farther, that produce hardier vegetables like, potatoes, carrots and onions.<input type="checkbox"/> This system allows producers to sell the produce in the city markets just few hours after harvest.
Yorkshire, United Kingdom	<ul style="list-style-type: none"><input type="checkbox"/> Yorkshire has established a successful urban agriculture model.<input type="checkbox"/> 17,000 inhabitants of the city voluntarily participate in farming and passers-by and visitors are allowed to pick and use the produce.<input type="checkbox"/> There are a total of forty gardens throughout the city and are named “propaganda gardens” as they promote growing local vegetables, to eat seasonal food, to consider provenance of food, and to enjoy fresh and healthy food.

Mumbai, India	<ul style="list-style-type: none"><input type="checkbox"/> Dr. Doshi's method of city gardening is famous in Mumbai, which emphasizes on pure organic production and waste recycling.<input type="checkbox"/> Locally available agriculture and household wastes like sugarcane waste, polyethylene bags, tires containers, cylinders and soil are used for crop cultivation.<input type="checkbox"/> This revolutionary method can be applied in reduced spaces as terraces, balconies and civil construction walls.
Hyderabad, India	<ul style="list-style-type: none"><input type="checkbox"/> Urban agriculture is a new form of agriculture that is gaining popularity in the city outskirts of Hyderabad wherein, more than 4,000 families are self-reliant for the vegetable needs of family.<input type="checkbox"/> The government is taking keen interest in promoting urban farming through providing subsidy kit worth 360 Rs to interested farmers dwelling in and around the city.

WAY FORWARD

The rapid increase in the population, excessive **immigration into urban areas** and increased demand for fruits and vegetables has caused frequent **food shortages**, inflations in food prices and sometimes **food crisis in Indian markets**. The saying "**agriculture is a gamble with climate**" suits the fluctuations in production and productivity in rural areas. Understanding these lacunas would suggest "**urban farming**" as a major solution.



ETHICS - CASE STUDY OF THE MONTH

CASE STUDY OF THE MONTH

Q1. You are the principal of a government funded school in the northern region of India. This region is culturally diverse and children from different communities come to this school to get education. The school is known for giving the best results in education as well as extra-curricular activities like sports, arts and music. One day a group of parents belonging to a mix of minority communities approaches you and gives an application regarding the stoppage of the compulsory recitation of Sanskrit shlokas, which have been derived from the scriptures of a religion different from theirs. The parents are of the view that these shlokas derived from some ancient sculptures violate not only the right to religion of minority communities but also the right of atheists, agnostics, sceptics, rationalists and others who did not agree with this system of prayers. As per these parents, such shlokas are also against the constitutional morality which calls for the secular nature of state funded institutions. When you discussed the matter with the teacher's union, they emphasized on recitation of these shlokas in the morning assemblies, as they connote "universal truths" and, hence, could not be categorized as religious in nature. Even Gandhi ji has emphasized the importance of religion in moral development of the children. Also, it will be difficult to teach morality to the children without touching any aspect of religion. Parents even don't have any authority to interfere in the curriculum of the school. Soon, parents from the majority community started pressing you to continue with the Sanskrit shlokas. They are threatening to change the school of their wards if any ban is made on Sanskrit shlokas. Everybody seems to be divided on this issue and you are afraid that soon it may take a communal turn. For More Study Material, Visit: studyiq.com Page no. 4 Analyze the whole issue from different perspectives and explain what is your take on this matter? Also explain what steps you can take to resolve the situation? (250 words, 20 Marks)

ANSWER

Such kind of situations are quite obvious for government institutions in India, where culture, philosophy and religion are intrinsically mixed with each other. The issue is very sensitive as any wrong word or deed may lead to divide among communities and also increase the number of school dropouts. Multi-dimensional analysis is required to resolve this situation.

DIFFERENT PERSPECTIVES

1. Students' context

- Value education is a must for them as it nourishes their soul
- Ancient text is an important medium to impart values to the students.
- They must develop pride in their culture and should understand the rich heritage of their culture.

2. Minority's context

- Sanskrit Shlokas violate their fundamental right to religion and consider it against the letter and spirit of the Constitution.
- It is against the principles of secularism. Reciting Sanskrit Shlokas in prayer amounts to promoting one religion.
- It is discriminatory and against the principles of equality.
- It could also impede development and growth of scientific temper in the young minds of students. So, they are opposed to recitation of the shlokas in the school.

3. Teachers' union context

- Sanskrit Shlokas are based on "Universal Truth" and promote universal values.
- These values are enshrined in the letter and spirit of the Constitution.
- The Sanskrit Shlokas are themselves secular in nature and promote universal human values like honesty, dignity for all, peace, harmony, compassion, trustworthiness, respectfulness, justice and equality.
- Continuing with these shlokas will make the students better human beings and ultimately help in making society a better place to live in.
- Understanding the true meaning of the shlokas will bring different communities together instead of creating a divide.

4. Majority community's context

- Recitation of shlokas will imbibe good universal values in their children.
- This value-based learning will help in developing fraternity and hence help in building communal harmony.
- This will also create interest of students in the Sanskrit language, which is one of our fully developed ancient languages.

5. Government's context

- It is important to maintain law and order and prevent any kind of communal tension.
- The district administration needs to be responsive to the views of all stakeholders.

MY OPINION

As per my opinion, religion is intrinsically linked with values. The essence of every religion is to follow the path of morality to realize the God. Thus, morality is implicit in every religion. In fact, there is no religion higher than Truth and Righteousness.

- Everything which is in Sanskrit is not necessarily religious in nature. Tomorrow, someone can claim that the phrase 'honesty is best policy', often taught in schools, being in English should be attributed to a religion.
- Yoga for example is a science even if it is related to one religion. It is akin to saying that gravity is related to another religion as it was discovered in the west.
- Sanskrit shlokas are even part of our judiciary. SC's emblem has a Sanskrit inscription, 'yato dharma stato jaya (where there is dharma, there will be victory)'

However, it is also true that secularism is part of constitutional morality, and every religion must be given equal consideration. The idea of "Sarva dharma sambhava" must be followed in this regard. All religions demand moral behavior from its followers. For instance –

- Bhagavat Gita says, 'compassion is the root of all dharma'.
- Islam makes charity compulsory in form of Zakat for its followers.
- Christianity teaches that 'God is love'.
- Buddhism and Jainism also lay down the ethical path for achieving Nirvana (liberation).

STEPS THAT CAN BE TAKEN

- My priority should be my students. It is my duty and responsibility to give them the best I can, in terms of education and values.
- A committee of teachers must be appointed to modify the curriculum so that thoughts from different religions can be included in the prayers. Debate competitions can be held in this regard.
- Festivals of different religions must be celebrated in school so that children from all the communities can get a sense of belongingness.
- Nothing shall be imposed on the students. I need to use techniques of persuasion to make the parents and children understand and come to a common solution.
- I must be emotionally intelligent to identify the emotional current and respond accordingly.

Gandhi ji has rightly said: - "As soon as we lose the moral basis, we cease to be religious. There is no such thing as religion overriding morality. Man, for instance, cannot be untruthful, cruel and incontinent and claim to have God on his side."