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May - June 2021



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PT 365 UPDATED 2

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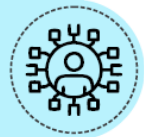
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Note:

- We will be releasing a PT 365 Extended covering the current affairs for the months of July and August, 2021.

- In our endeavour to further enhance the document in the interest of the aspirants, following additions have been incorporated:

1. Different colours have been used in the document for easy classification and recollection of a variety of information.
2. QR based Smart quiz has been added to test the aspirant's learnings and understanding.
3. Infographics have been added to ease understanding, provide for smoother learning experience and ensure enhanced retention of the content.

**SMART QUIZ**

You can scan this QR code to practice the smart quiz at our open test online platform for testing your understanding and recalling of the concepts.



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NOTE - Students can watch LIVE video classes of our COURSE on their ONLINE PLATFORM at their homes. The students can ask their doubts and subject queries during the class through LIVE Chat Option. They can also note down their doubts & questions and convey to our classroom mentor at Delhi center and we will respond to the queries through phone/mail.

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1. POLITY AND GOVERNANCE

1.1. TRIBUNALS

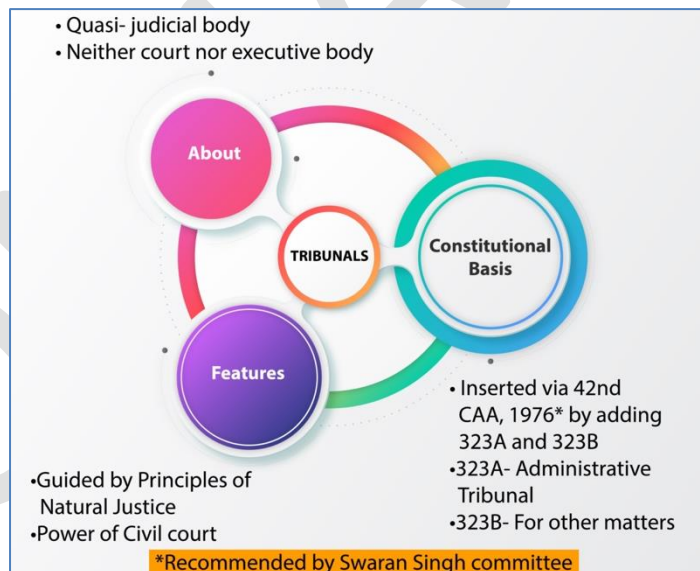
Why in news?

Recently, Centre promulgated the **Tribunals Reforms (Rationalization and Conditions of Service) Ordinance, 2021** which **abolished several appellate tribunals and authorities** and transferred their jurisdiction to other existing judicial bodies.

About the ordinance

The **Ordinance has amended the Finance Act 2017** (under which, the **number of tribunals was reduced to 19 from 26 by abolishing or merging of tribunals** with functional similarity) to include provisions related to the composition of search-cum-selection committees, and term of office of members in the Act itself. **This Ordinance has currently been challenged in the Supreme Court.**

- **Search-cum-Selection Committee:** Chairperson and Members of the Tribunals will be appointed on the recommendation of a Search-cum-Selection Committee which is **headed by the Chief Justice of India** or a **Judge of Supreme Court** nominated by him as the Chairperson. The **Committee will consist of:**
 - Two Secretaries nominated by the central government.
 - The sitting or outgoing Chairperson, or a retired Supreme Court Judge, or a retired Chief Justice of a High Court.
 - The Secretary of the Ministry under which the Tribunal is constituted (with no voting right).
- **Term of office:** The Ordinance specifies that the **Chairperson of a Tribunal** will hold office for a **term of 4 years or till he attains the age of 70 years**, whichever is earlier.
 - Other Members will hold office for a term of 4 years or till they attain the age of 67 years, whichever is earlier.
 - It also states that a person who has not completed the **age of fifty years shall not be eligible** for appointment as the Chairperson or a Member.



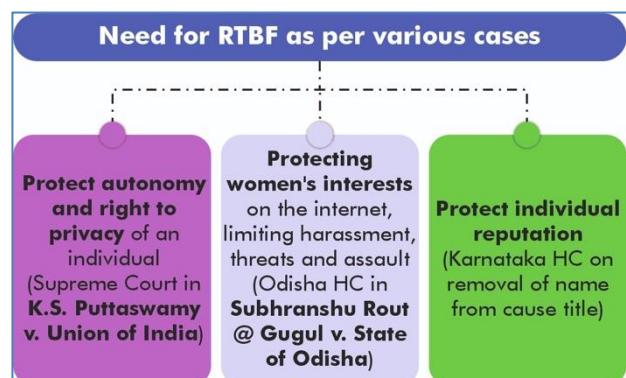
1.2. RIGHT TO BE FORGOTTEN (RTBF)

Why in news?

Delhi High Court upholds Right to be forgotten (RTBF) of an Individual.

About RTBF

- RTBF is the **right to have personal information removed** from publicly available sources, including the internet and search engines, databases, websites etc. once the personal information in question is no longer necessary, or relevant.
- Presently, India lacks statutory provisions regarding RTBF.
- Though the **Personal Data Protection Bill, 2019** includes it but it lacks specific **right to erasure of data (or RTBF)** as given by the **European GDPR's (General Data Protection Regulation) Article 17**, outlining the circumstances under which individuals can exercise their right to be forgotten or right to erasure.



- **RTBF could not be exercised where the information in question was necessary for**
 - exercising the right of freedom of expression and information;
 - compliance with legal obligations;
 - the performance of a task carried out in public interest, or public health;
 - archiving purposes in the public interest;
 - scientific or historical research purposes or statistical purposes; or
 - the establishment, exercise or defence of legal claims

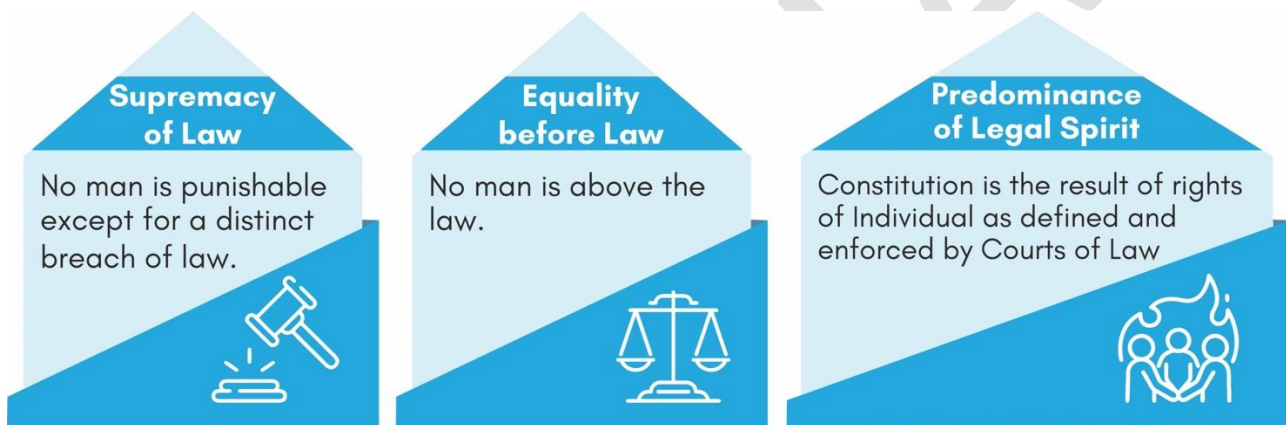
1.3. RULE OF LAW

Why in news?

Recently, Chief Justice of India delivered a lecture on Rule of Law and he advocated that, “**the story of ‘Rule of Law’ is nothing but the story of civilization of humans.**”

What is Rule of Law?

- According to **A.V. Dicey**, the rule of law means the **absolute supremacy or predominance of the regular law as opposed to the influence of arbitrary power** and excludes the existence of arbitrariness or even wide discretion in the hands of the authority.
- Only a State that is **governed by law imbining ideals of justice and equity** can be said to have the ‘Rule of Law’. According to Prof. Dicey, **Rule of law contain three principles:**



- The origins of the **Rule of Law theory** can be traced back to the Ancient Romans during the formation of the first republic; it has since been championed by several medieval thinkers in Europe such as **Hobbes, John Locke, and Rousseau** through the social contract theory.
- Indian philosophers such as **Chanakya** have also espoused the rule of law theory by maintaining that the state is governed, not by the ruler or the nominated representatives of the people but by the law. The expression '**Rule of Law**' has been derived from the French phrase '**la principe de legalite**', i.e., a **government based on the principles of law.**

Rule of Law Vs Rule by Law

In essence, the **Rule of Law is to control the unlimited exercise of the power by the supreme lawmaking authority of the land** while the **Rule by Law is laid down by the supreme lawmaking authority of the land.**

Simply, **Rule of law** is upheld when the laws are guided by the ideals like Justice and Equity. For example, as per Article 14 of the Indian Constitution, the State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India and discrimination on grounds of religion, race, caste, sex, or place of birth is prohibited

On the other hand, **Rule by law** can embody ethical as well as unethical laws. For example, the apartheid regime in South Africa was justified based on enacted laws.

Key Principles that emphasize the Rule of Law

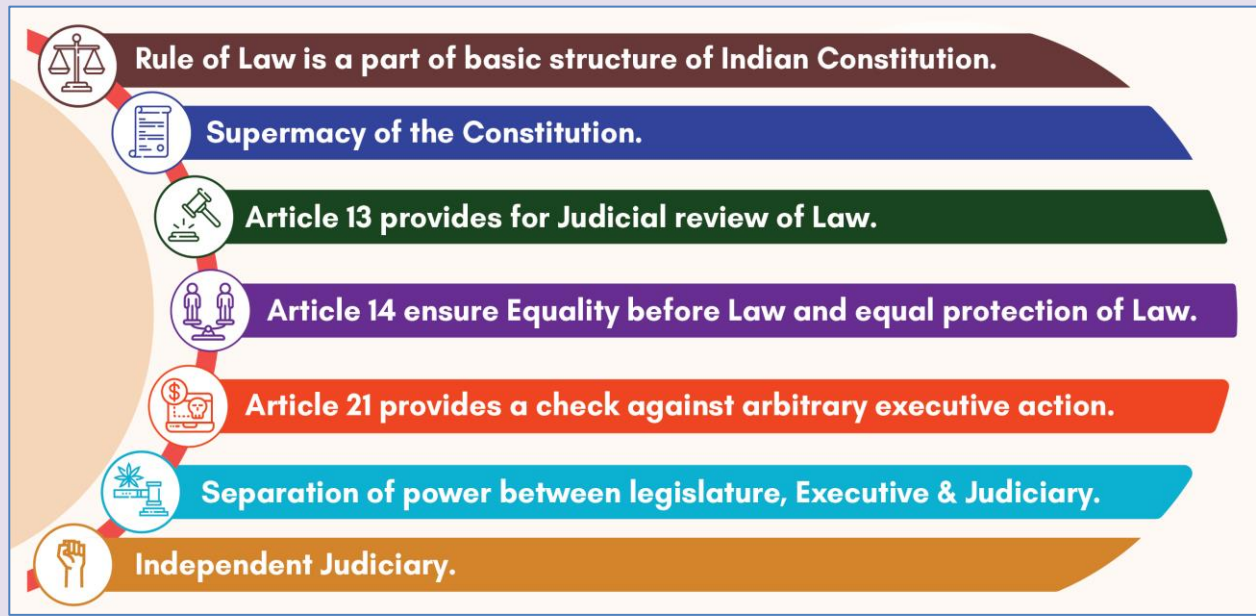
- **Laws must be clear and accessible:** Laws are expected to be obeyed and for that people at least ought to know what the laws are. Hence, laws need to be worded in **simple & unambiguous language.**
- **Equality before the law:** Important aspects of equality before law are having **equal access to justice & ensuring Gender Equality.**
 - Equal access to justice forms the bedrock of the Rule of Law.

- **Right to participate in the creation and refinement of laws:** The very essence of a democracy is that its citizenry has a role to play, whether directly or indirectly, in the laws that govern them.
 - In India, it is done through elections, where the people get to exercise their universal adult franchise to elect the people who form part of the Parliament, which enacts laws.
- **Strong independent judiciary:** The judiciary is the primary organ which is tasked with ensuring that the laws which are enacted are in line with the Constitution.
 - So, judicial review of laws is one of the main functions of the judiciary.



Rule of Law & Indian Constitution

Rule of law is a foundational pillar of Indian Constitution and is embedded in different provisions of the Indian Constitution.



1.4. CITIZEN'S CHARTER

Why in news?

Recently, the **Ministry of Panchayati Raj (MoPR)** in collaboration with **National Institute of Rural Development and Panchayati Raj (NIRDPR)** has released a **Model Panchayat Citizens Charter framework**.

Model Panchayat Citizens Charter

Panchayats in India constitute the **third tier of government in the rural areas**. They are **responsible for delivery of basic services as enshrined under article 243G** of the Constitution of India, specifically in the areas of Health & Sanitation, Education, Nutrition, and Drinking Water.

- **The basic objective** of the Gram Panchayat Citizen Charter is to empower the citizens in relation to public services and to **improve the quality of services without any prejudice**, and in accordance with the **expectations of the citizens**.
 - It **brings professionalism in Panchayat functioning** and helps to reach out to all sections of community without any discrimination.
 - The standards committed by the Panchayats are **useful yardsticks for monitoring and evaluation of service delivery**.

- It will help in making the **citizens aware of their rights** on the one hand, and to **make the Panchayats and their elected representatives directly accountable to the people**, on the other hand.
- It has been prepared for **delivery of the services across the 29 sectors**, aligning actions with localised **Sustainable Development Goals (SDGs)**.
- It would **ensure transparent and effective delivery of public services** for sustainable development and enhanced citizen service experiences, **deepening inclusive and accountable Local Self Governments** by incorporating diverse views while designing and delivering services.

National Institute of Rural Development and Panchayati Raj (NIRDPR)

- It is an **autonomous organization** under the Ministry of Rural Development and a premier **national centre of excellence in rural development** and Panchayati Raj.
- It is recognized internationally as one of the **UN-ESCAP (Economic and Social Commission for Asia and the Pacific) Centres of Excellence**.
- Its vision is to **focus on the policies and programmes that benefit the rural poor**, strive to energise the **democratic decentralization processes**, improve the operation and efficiency of rural development personnel, **promote transfer of technology** through its social laboratories, **technology parks** and create environmental awareness.
- It **studies the functioning of the Panchayati Raj Institutions (PRIs)** and rural development programmes across the States.

How did the concept of Citizen charter evolve?

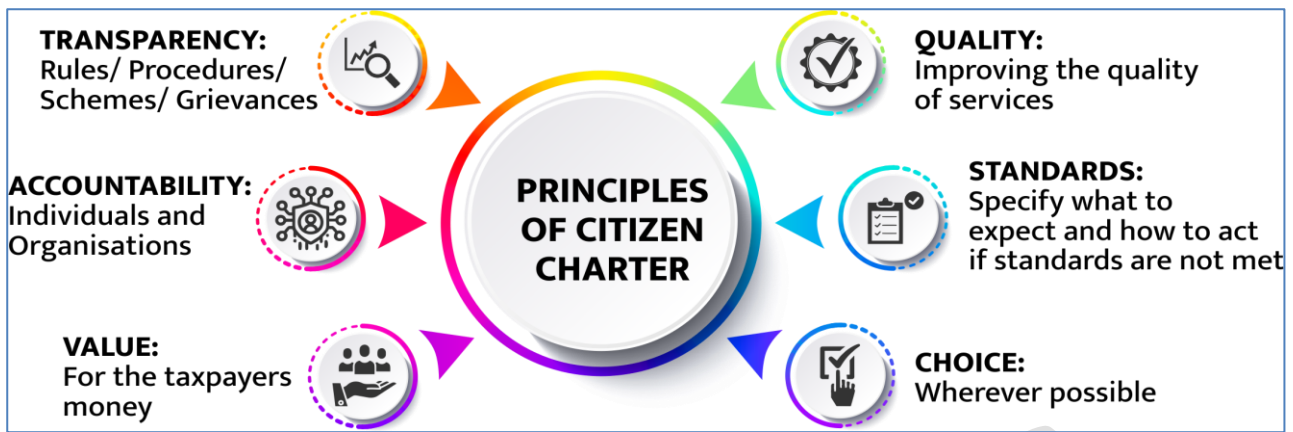
- The concept was **first articulated and implemented in the United Kingdom in 1991** with an aim to improve the quality of public services for the people of the country.
- Originally, **six principles of the Citizens Charter movement** are framed. (Refer infographic)
- **India adopted citizen's charter in 1997** at Conference of Chief Ministers of various States and Union Territories held in New Delhi.
 - The **Department of Administrative Reforms and Public Grievances (DARPG)** initiated the task of coordinating, formulating and operationalising Citizen's Charters.
 - The **Right of Citizens for Time Bound Delivery of Goods and Services and Redressal of their Grievances Bill, 2011 (Citizens Charter)** seeks to create a mechanism to ensure timely delivery of goods and services to citizens. However, it lapsed due to the dissolution of the Lok Sabha in 2014.

What is Citizen Charter and why is it significant?

- Citizens' Charters initiative is a response to the quest for solving the problems **which a citizen encounters** on a daily basis while dealing with the organizations providing public services.



- **Key features of citizen charter:**
 - It is a **written, voluntary declaration by service providers** about service standards, choice, accessibility, non-discrimination, transparency, and accountability.
 - It is **not legally enforceable** and, therefore, is **non-justiciable**.
- **Significance of Citizen Charter**
 - It is a **tool to achieve good governance**. The three essential aspects emphasized in good governance are **transparency, accountability and responsiveness** of the administration.
 - It **provides services to the people in a time bound manner, redressing their grievances** and improving their lives.
 - It **enshrines the trust between the service provider** and its users and empowers the citizen in relation to public service delivery.



1.5. OTHER IMPORTANT NEWS

<p>Official language</p>	<ul style="list-style-type: none"> Recently, Tulu speakers demand for official language status, inclusion in Eighth Schedule. Tulu is a Dravidian language spoken mainly in two coastal districts Dakshina Kannada and Udupi of Karnataka and Kasaragod of Kerala. Part XVII of the Indian Constitution deals with the official language in Articles 343 to 351. The Constitutional provisions relating to the Eighth Schedule occur in Article 344 (1) and 351 (Part XVII) of the Constitution. Languages are added through Constitutional Amendments. Constitution does not specify the official language of different states and at present, there is no such criterion for languages to be included in Eighth schedule. <ul style="list-style-type: none"> Article 345 of the Constitution says “the Legislature of a State may by law adopt any one or more of the languages in use in the State or Hindi as the language or languages to be used for all or any of the official purposes of that State”. List of 22 languages in eighth schedule: Assamese, Bengali, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Malayalam, Manipuri, Marathi, Nepali, Oriya, Punjabi, Sanskrit, Sindhi, Tamil, Telugu, Urdu, Bodo, Santhali, Maithili and Dogri. (infographic) Significance of inclusion under Eighth schedule: <ul style="list-style-type: none"> Recognition as official language of the nation. Sahitya Academy will start recognizing the language and books would be translated into other recognized Indian languages. MPs and MLAs could speak in this language in Parliament and State Assemblies, respectively. Candidates could write all-India competitive examinations like Civil Services Exams in a scheduled language.
<p>Formation of New Districts</p>	<ul style="list-style-type: none"> Recently, Punjab Government created Malerkotla as the 23rd district of the State The power to create new districts or alter or abolish existing districts rests with the State governments, done either through executive order or through state assembly. <ul style="list-style-type: none"> When a State wants to change the name of a district or a railway station, it requires a no-objection certificate from several Central ministries and agencies such as the Ministry of Earth Sciences, Intelligence Bureau, Department of Posts etc.
<p>Citizenship</p>	<ul style="list-style-type: none"> Ministry of Home Affairs (MHA) has issued a notification under the 2009 rules of the Citizenship Act, 1955 which empowered non-Muslims belonging to Afghanistan, Bangladesh and Pakistan and residing in 13 districts of five states namely Gujarat, Rajasthan, Chhattisgarh, Haryana and Punjab to apply for Indian citizenship. <ul style="list-style-type: none"> Non-Muslims include Hindus, Sikhs, Jains, Parsi, Christian and Buddhists This notification intends to benefit legal migrants (who entered on passport/visa) from Pakistan, Bangladesh and Afghanistan who have already applied for Citizenship under Section 5 (by registration) and Section 6 (naturalisation) of the Citizenship Act, 1955. Citizenship is a Central subject and the MHA periodically delegates powers to States through gazette notification under Section 16 of the Citizenship Act, 1955. <ul style="list-style-type: none"> Citizenship Act, 1955 provides for the acquisition of Indian citizenship viz. birth (section 3), descent (section 4), registration (section 5), and naturalization (section 6). Citizenship Act, 1955 prescribes 3 ways of losing Indian citizenship viz. Renunciation, Termination, and Deprivation. This notification is not related to the Citizenship (Amendment) Act (CAA), 2020 that is yet to come into effect.

<p>Digital Media Content Regulatory Council (DMCRC)</p>	<ul style="list-style-type: none"> DMCRC has been created by the Indian Broadcasting and Digital Foundation (IBDF) as an industry-led Self-Regulatory Body (SRB) for digital OTT (over-the-top) platforms. It is formed as per the mandate of the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021. It is the second-tier mechanism (refer to the infographics) at the appellate level and is similar to Broadcast Content Complaint Council (BCCC). <ul style="list-style-type: none"> The BCCC, is the independent self-regulatory body for non-news general entertainment channels set up by the Indian Broadcasting Foundation (IBF) in June 2011. It is expected to create a credible, robust and practical code for content, with an inclusive and fair governance structure. Indian Broadcasting and Digital Foundation (IBDF) <ul style="list-style-type: none"> Recently, the Indian Broadcasting Foundation (IBF) was renamed as IBDF as it expands its purview to bring the broadcasters and OTT platforms under one roof. The IBF was established in 1999 and until now represented television broadcasting. Its members provide channels and programmes that deliver about 90% of television viewership in India. <p><i>For more information, kindly refer to article on Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, PT 365 Updated Part 1</i></p>
<p>Cable Television Networks (Amendment) Rules, 2021</p>	<ul style="list-style-type: none"> Centre has amended the Cable Television Network Rules to provide statutory mechanism to redress citizen's grievances relating to content broadcast by television channels. <ul style="list-style-type: none"> Television media in India is governed under the Cable Television Networks Regulation Act 1955. At present, there is an institutional mechanism by way of an Inter-Ministerial Committee to address the grievances of citizens relating to the violation of the Programme/Advertising Codes under the Rules, but it does not have statutory backing. Cable Television Networks (Amendment) Rules, 2021 provides for a three-level grievance redressal mechanism, similar to the complaint redressal structure under the new social media rules framed under the IT Act.

Three-Tier Grievance redressal Mechanism	
Ministry of I&B	Level III: Central Government Oversight
Self-regulating Bodies	Level II: Self-Regulation
Publishers	Level I: Grievance Redressal by Publisher

<p>SMART QUIZ</p>	<p>You can scan this QR code to practice the Smart Quiz of Polity at our open test online platform for testing your understanding and recalling of the concepts.</p>	
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2. INTERNATIONAL RELATIONS

2.1. INDIA'S PALESTINE POLICY

Why in news?

Recently, violent clashes erupted between **Israeli and Palestinian factions** in the **Gaza Strip** which have ended with **Israel and Hamas** agreeing to an **Egypt-mediated ceasefire**.



What has been India's Israel-Palestine Policy?

- **Initial Phase:**
 - India voted against the creation of Israel in historic Palestine in 1947 in the UN General Assembly, and hence opposed the partition of Palestine.
- **Cold War Phase:**
 - During the Cold War period, India remained a strong supporter of Palestinian freedom, taking a moral and legal position against the Israeli occupation, in line with international laws and norms.
 - When Israel seized 78 % territories during the six days war of 1967, India supported the **creation of an independent, sovereign Palestine state** based on the 1967 border and with **East Jerusalem** as its capital that lives alongside Israel thereby supporting **Two State Solution**.
- **Madrid Peace Conference**
 - India established **full diplomatic relations with Israel in 1992**, in the context of improving Israel-Palestine ties after the **Madrid Conference of 1991** (where a **Two State Solution** was agreed upon) and



the changes in the global order following the disintegration of the Soviet Union, but never abandoned the Palestinians.

- **Contemporary Phase:**
 - In 2018, India adopted **de-hyphenation policy** which simply means that **India's relationship with Israel would stand on its own merits, independent and separate from India's relationship with the Palestinians.**
 - In the aftermath of recent violence between Israel and Palestine (Hamas), **India at UN reiterated its strong support for the just Palestinian cause and its unwavering commitment to the two-state solution.**

What is the two-state solution?

- It means that an independent, sovereign **Palestine state** and an independent, sovereign **Israeli state** would coexist in peace
- The first proposal for the creation of Jewish and Arab states in the British Mandate of Palestine was made in the **Peel Commission report of 1937** which proposed that Palestine be partitioned into three zones: **an Arab state, a Jewish state, and a neutral territory containing the holy places.**
- It was also reflected in **United Nations Partition Plan for Palestine of 1947** but was **rejected by Arabs** at that time.
- It was only in 1991 when **Two State Solution** was agreed upon during US mediated **Madrid Peace Conference.**
- **India supports the Two State Solution** aimed at addressing the legitimate aspirations of Palestinians for Statehood and Israel's security concerns.

Religious Significance of Jerusalem:

- Jerusalem contains sites sacred to Judaism, Islam and Christianity like:
 - **Al Aqsa mosque**, the world's third holiest site in Islam.
 - **Western Wall**, a place sacred to the Judaism.
 - **Church of the Holy Sepulchre**, a church built on the traditional site of Jesus' Crucifixion and burial, is sacred to Christianity.

2.2. INDIA-UK RELATIONS

Why in News?

India-UK virtual summit was held recently.

More on News

- During the summit, 'Roadmap 2030' was adopted to **elevate bilateral ties to a 'Comprehensive Strategic Partnership'**.
 - Roadmap will pave the way for a deeper and **stronger engagement** over the next ten years in the **key areas of people-to-people contacts, trade and economy, defence and security, climate action and health.**
 - Earlier, in 2004, India and the United Kingdom upgraded their bilateral relationship to that of Strategic Partnership.

Roadmap 2030				
Connecting countries and people	Trade and Prosperity	Defence and Security	Climate	Health
<ul style="list-style-type: none"> • Strengthen cooperation and coordination at multilateral fora such as G-20, WTO etc. • Implement the comprehensive Migration and Mobility Partnership • Explore partnership around the future of work. • Implement 'India-UK Together' ('SAATH-SAATH' in Hindi) (a cultural 	<ul style="list-style-type: none"> • Launching an Enhanced Trade Partnership (ETP), which includes intent to negotiate a comprehensive Free Trade Agreement. • Increase exchanges and cooperation in the services sector such as IT and digital tech, healthcare etc. • Encourage UK companies to invest in India's manufacturing sector taking advantage of the 	<ul style="list-style-type: none"> • Expand cooperation under the Defence and International Security Partnership (DISP) agreed in 2015. • Promote freedom of navigation and open access, and improve maritime cooperation through a partnership in the Western Indian Ocean. • Promote international security and stability in cyberspace including through bilateral cooperation on critical national infrastructure, 	<ul style="list-style-type: none"> • Launch a global Green Grids Initiative at COP26, to include a political declaration by national leaders and increased technical, financial and research cooperation to help deliver India's vision of One Sun One World One Grid. 	<ul style="list-style-type: none"> • Develop the India-UK partnership on Vaccines, Therapeutics and Diagnostics and expand the UK-India Vaccines Hub to develop distribution policy, clinical trials, regulation, research and innovation related to Covid-19, helping guarantee equitable global supply by April 2022.

exchange programme) to celebrate India's 75th anniversary of Independence.	Production Linked Incentive Scheme.	healthcare vaccines etc.	and		
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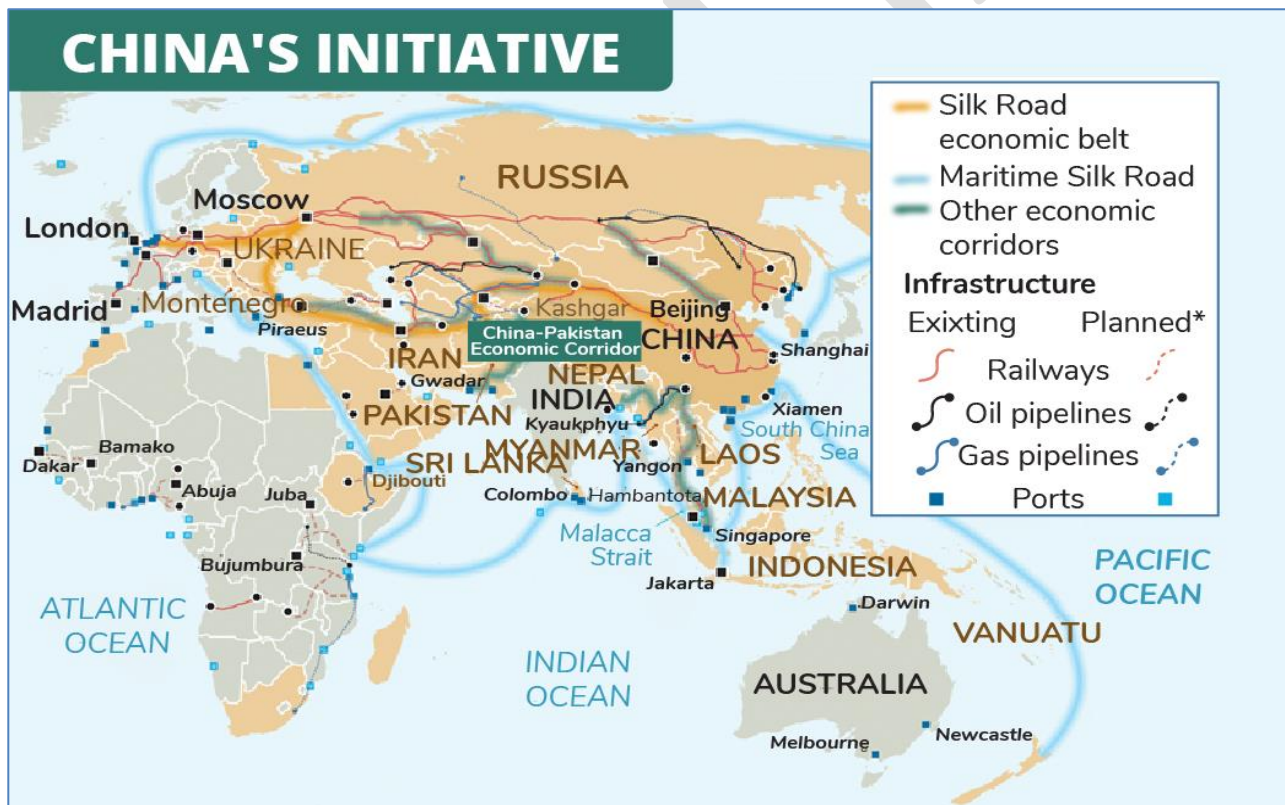
2.3. DEBT TRAP DIPLOMACY

Why in News?

Montenegro is struggling to pay off Chinese loan for a highway project, which has put the country in a dire financial situation.

More on the News

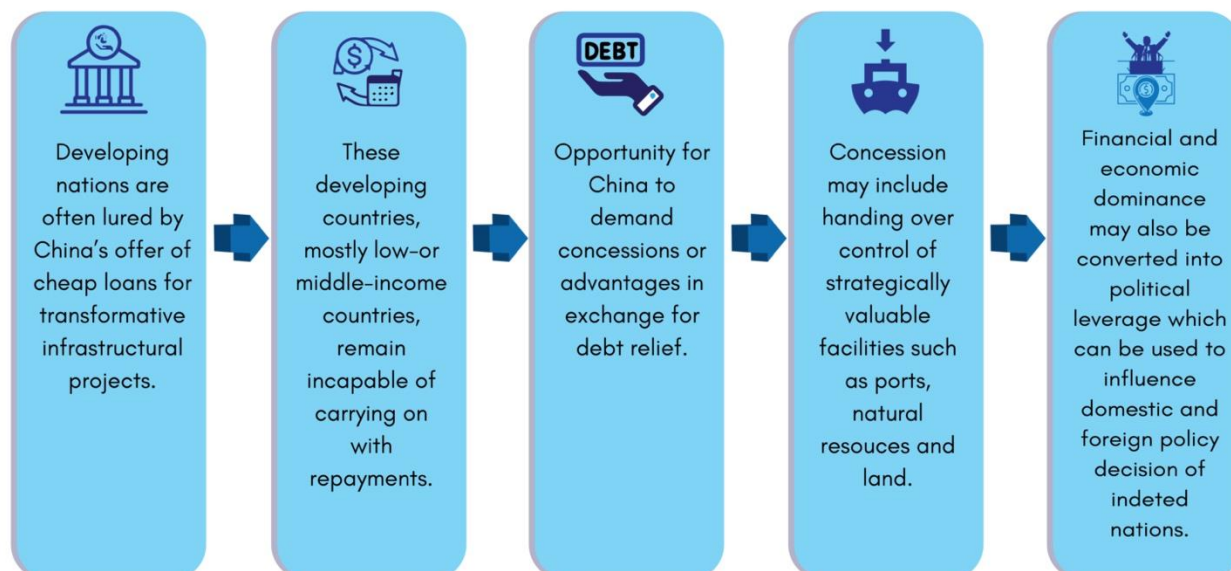
- In 2014, Montenegro signed an agreement to take out a \$944 million loan from China's Exim Bank for the construction of a motorway that would link the port of Bar to the border with Serbia.
 - Presently, Montenegrin debt is around 65.9% of its GDP **with China holding 25% of its public debt.**
- Several other countries such as Laos, Kyrgyzstan, Maldives etc. are presently facing debt distress owing sizable portion of the debt to China. This has raised concerns regarding use of debt trap diplomacy.
- In 2018, a report by the Center for Global Development highlighted eight Belt and Road Initiative (BRI) recipient countries at a high risk of debt distress due to BRI loans. These countries included **Djibouti, Laos, the Maldives, Mongolia, Montenegro, Pakistan, Kyrgyzstan, and Tajikistan.**
 - They are highly prone to the mounting debt-to-GDP ratios beyond 50 percent, and a significant portion of their external debt is owed to China.



About Debt Trap Diplomacy

- The term was coined by Indian geo-strategist Brahma Chellaney in 2017. This type of diplomacy refers to offering projects/loans on terms that end up being too difficult for countries to repay, eventually compelling them to accept political or economic concessions.
- It has been witnessed that developing nations are often lured by China's offer of **cheap loans for transformative infrastructural projects**, which require a considerable investment.

Creation of Debt Trap Diplomacy



Other Global initiatives for Infrastructure financing

- **Blue Dot Network:** The initiative gathers financial institutions from the US (U.S. International Development Finance Corporation), Japan (Japan Bank for International Cooperation) and Australia (Department of Foreign Affairs and Trade), it will work as a **certification body that will evaluate infrastructure construction projects in the Indo Pacific region.**
- **Coalition for Disaster Resilient Infrastructure (CDRI):** It is a partnership of national governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and knowledge institutions that aims to promote the resilience of new and existing infrastructure systems to climate and disaster risks in support of sustainable development.
- **Asia-Africa Growth Corridor:** The Asia-Africa Growth Corridor (AAGC) is an economic partnership agreement between **India and Japan.** It intends to improve infrastructure and digital connectivity in Africa within Indo-Japan collaboration.
- **European Union's new connectivity strategy:** In September 2018, the EU adopted a joint communication on 'Connecting Europe and Asia – Building blocks for an EU strategy'. The strategy proposes that the EU engage with its Asian partners through a sustainable, comprehensive and rules-based approach to connectivity, exploiting existing and planned EU networks.
- **Trans-European Transport Network (TEN-T) policy:** It addresses the implementation and development of a **Europe-wide network** of railway lines, roads, inland waterways, maritime shipping routes, ports, airports and railroad terminals.
- **Global Infrastructure Facility (GIF):** It is an **initiative of G20 countries.** It is a global collaboration platform that integrates efforts to boost private investment in sustainable, quality infrastructure projects **in developing countries and emerging markets.**
- **Build Back Better World (B3W) Partnership:** Launched by G7, It is a new global infrastructure partnership led by major democracies to help narrow the over 40 trillion Dollar infrastructure need in the developing world, which has been exacerbated by the COVID-19 pandemic.

2.4. NUCLEAR DISARMAMENT

Why in news?

According to recently released **Stockholm International Peace Research Institute (SIPRI) 2021 report**, the overall number of nuclear warheads in global military stockpiles now appears to be increasing.

More about the report

- **Indian nuclear warheads** increased from 150 at the start of 2020 to 156 at the start of 2021.
- **Pakistan and China's nuclear warheads** have also increased.
- **Russia and the U.S.** together possessed over 90% of global nuclear weapons.

What is Nuclear Disarmament?

- Nuclear disarmament is the act of **reducing or eliminating nuclear weapons**. It aims towards achieving a state where nuclear weapons are eliminated. The term **denuclearization** is also used to describe the process leading to complete nuclear disarmament.
- UN sought to eliminate nuclear weapons in the first resolution adopted by UN General Assembly in 1946.

Steps taken till now to achieve nuclear disarmament

Key Treaties for Nuclear Disarmament, Arms Control and Non-Proliferation	Mandate of the treaty
Partial Test Ban Treaty (PTBT), 1963	It prohibits testing of nuclear weapons in the atmosphere, in outer space, under water, or in any area within a state's territory that would cause radioactive fallout outside the state's territory.
Treaty on the Non-Proliferation of nuclear weapons (NPT), 1970	It seeks to prevent the spread of nuclear weapons , to promote peaceful uses of nuclear energy and to move towards nuclear disarmament. ✓ It is the only binding commitment in a multilateral treaty to the goal of disarmament by the nuclear-weapon States.
Comprehensive Nuclear-Test-Ban Treaty (CTBT)	It is an international treaty that bans all nuclear explosions in all environments. It opened for signature in 1996 but has not yet entered into force.
Treaty on the Prohibition of nuclear weapons (TPNW)	It is a legally binding instrument to prohibit nuclear weapons, leading towards their total elimination. ✓ It includes a comprehensive set of prohibitions on participating in any nuclear weapon activities which include undertakings to develop, test, produce, acquire, possess, stockpile, use or threaten to use nuclear weapons. ✓ It entered into force on 21st January 2021 .

THE NON-PROLIFERATION REGIME

NON-PROLIFERATION

Obliging non-nuclear weapons states to never acquire them and accept full-scope safeguards.

DISARMAMENT

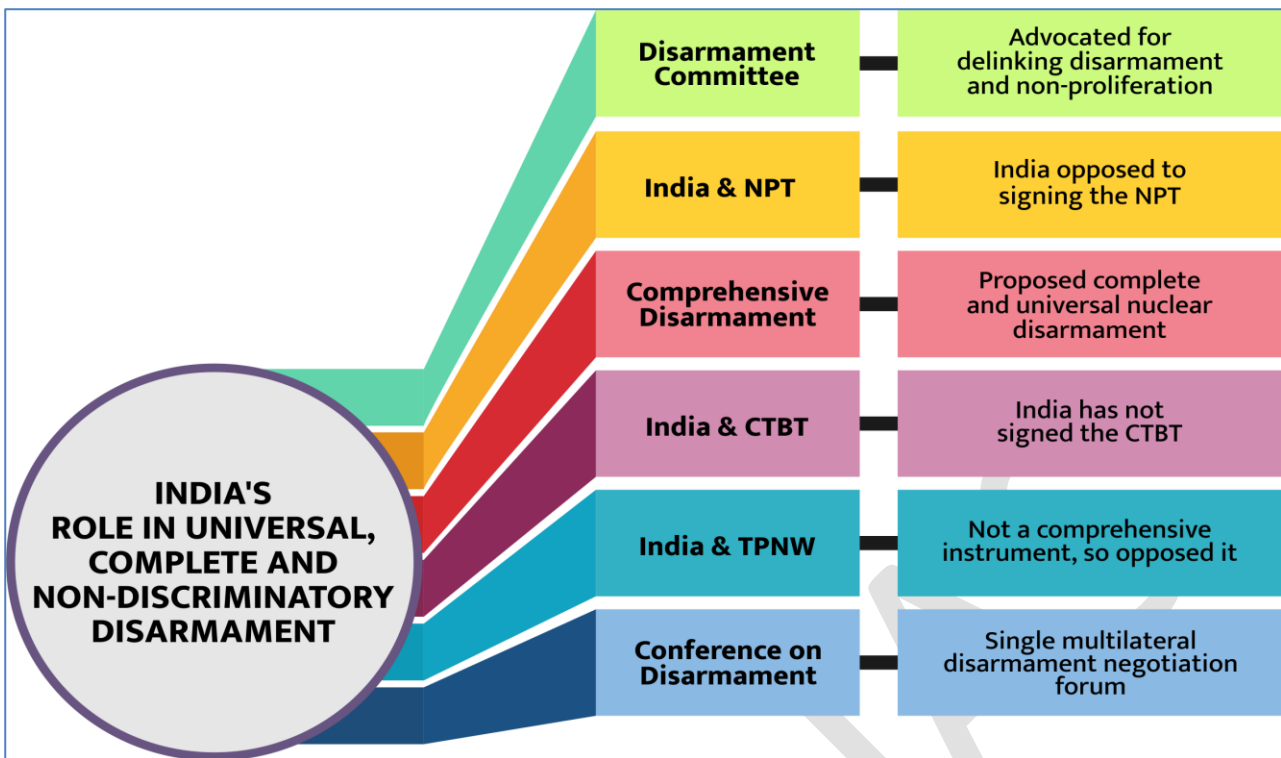
Requiring the five countries with nuclear weapons (the U.S., China, France, the Soviet Union, and the U.K.) to negotiate the reduction and eventual elimination of their nuclear weapons.

PEACEFUL USE OF NUCLEAR ENERGY

Guaranteeing non-nuclear weapons states full access to peaceful applications of nuclear science and technology

India's role in global nuclear disarmament

India has always been an **ardent supporter** of multilateral nuclear disarmament and non-proliferation efforts.



Conference on Disarmament (CD)

- It was formed in 1979 as the **single multilateral disarmament negotiation forum** of the international community, after agreement was reached among Member States during the first special session of the UN General Assembly (UNGA) devoted to disarmament (1978).
- Since the conclusion of the negotiation of the CTBT in 1996, the CD remains deadlocked and has not been able to reach consensus on a programme of work and thus to commence substantive deliberations.

India's nuclear doctrine

- Building and maintaining a **credible minimum deterrent**.
- A posture of "**No First Use**". Nuclear weapons will only be used in retaliation against a nuclear attack on India.
- Nuclear retaliation to a first strike will be massive and designed to inflict **unacceptable damage**.
- Non-use of nuclear weapons against non-nuclear weapon states.
- Continued commitment to the goal of a **nuclear weapon free world**, through global, verifiable and non-discriminatory nuclear disarmament.

2.5. INDIA'S CIVIL NUCLEAR ENERGY COOPERATION

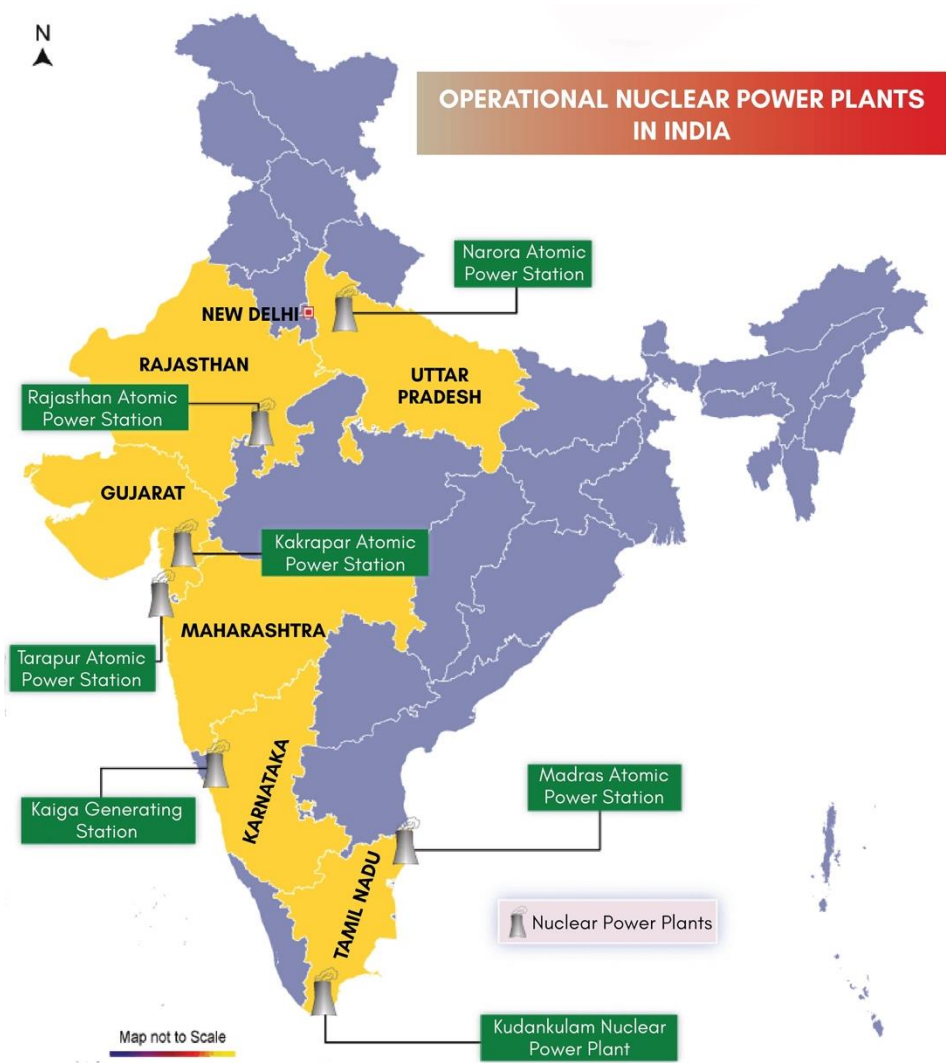
Why in news?

Recently, Russian nuclear major **Rosatomb** began construction of **Kudankulam Nuclear Power Plant (NPP) Unit 5** in India in cooperation with **Nuclear Power Corporation of India Ltd (NPCIL)**, a PSU under the **Department of Atomic Energy (DAE)**.

About India's Nuclear Energy Architecture

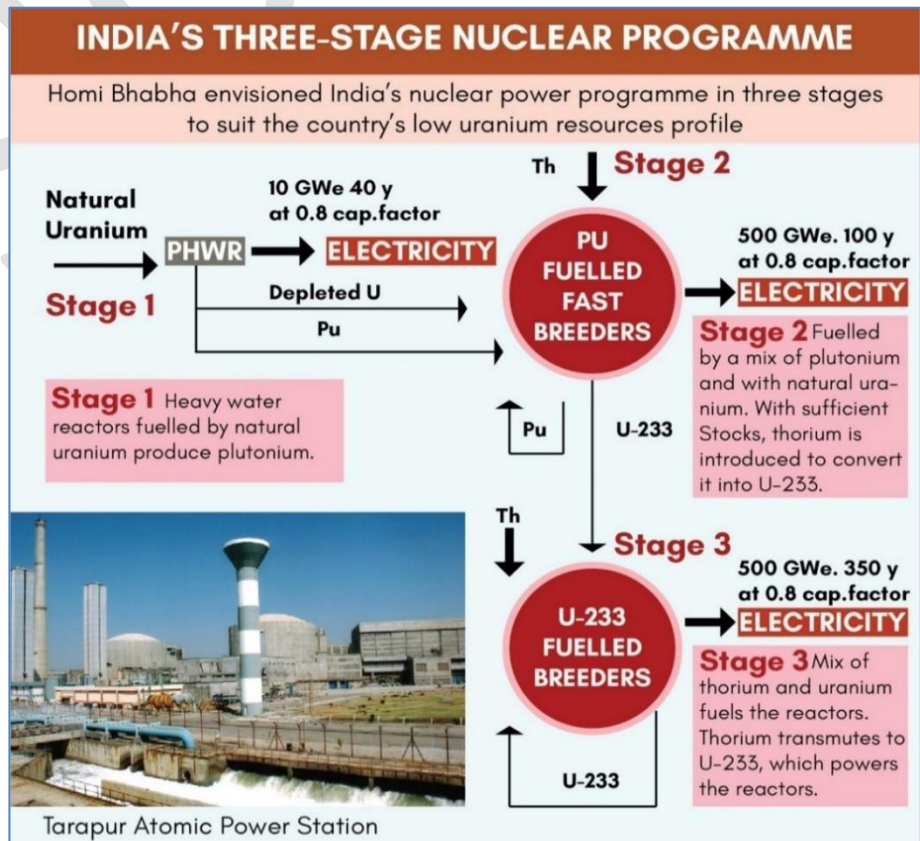
- At present, India has civil nuclear agreements with 14 countries, namely Argentina, Australia, Canada, Czech Republic, France, Japan, Kazakhstan, Mongolia, Namibia, Russia, South Korea, United Kingdom, US and Vietnam.
 - This is despite India **not being a signatory to the Non-Proliferation Treaty** and operating outside the ambit of the **Nuclear Suppliers Group**.
- A central tenet of these agreements is the focus on the **peaceful purposes of nuclear power** which entails the use of information, nuclear material, equipment, or components in such fields as research, power generation, medicine, agriculture, and industry.
- India has observed a **self-moratorium on conducting nuclear tests** after the second round of Pokhran in 1998 and has abided by the **principles of the NPT** far better than even some of its signatories.
- India has a 3-stage nuclear energy program which is based on a closed nuclear fuel cycle-

- **Stage-I:** Natural uranium fuelled Pressurised Heavy Water Reactors (PHWRs).
- **Stage-II:** Fast Breeder Reactors (FBRs) utilising plutonium-based fuel.
- **Stage-III:** Advanced nuclear power systems for utilisation of thorium.



Nuclear Suppliers Group (NSG)

- It was established in 1974 as a result of successful nuclear test conducted by India (Operation Smiling Buddha or Pokhran-I).
- It is a group of nuclear supplier countries that seeks to contribute to the non-proliferation of nuclear weapons through the implementation of guidelines for nuclear exports and nuclear-related exports.
- **India is not a member of this group.**



2.6. INTEGRATED THEATRE COMMANDS

Why in news?

Recently, the Chief of Defence Staff (CDS) chaired a meeting with the Vice Chiefs of the three Services among others, in the backdrop of concerns about the proposed model of the Integrated Theatre Commands.

Current system of military commands in India

- Since 1947, the three services have been functioning separately and there has been proven cooperation between them but no integration per se.
- The **Indian Army, Navy and Air Force each has multiple commands that are vertically split** in terms of their command structure.
 - There are **17 single service commands**, seven of the Army and the Air Force each and three of the Navy, leading to **wastage and duplication of resources**.
- Apart from these, there are **tri-service commands** i.e., **Andaman and Nicobar Command (ANC)** and the **Strategic Forces Command (SFC)** for nuclear assets.
- There are **four tri-service institutions** i.e., Defense Intelligence Agency, Defense Space Agency, Cyber Agency, and Armed Forces Special Operations Divisions, established in 2019.

DIFFUSED STRENGTH

Seventeen existing Commands of the Indian Armed Forces.

About Integrated Theatre Commands

- An integrated theatre command envisages a **unified command of the three Services, under a single commander**, for geographical theatres that are of security concern.
 - The commander of such a force will be able to bring to bear all resources at his disposal — from the IAF, the Army and the Navy — with seamless efficacy.

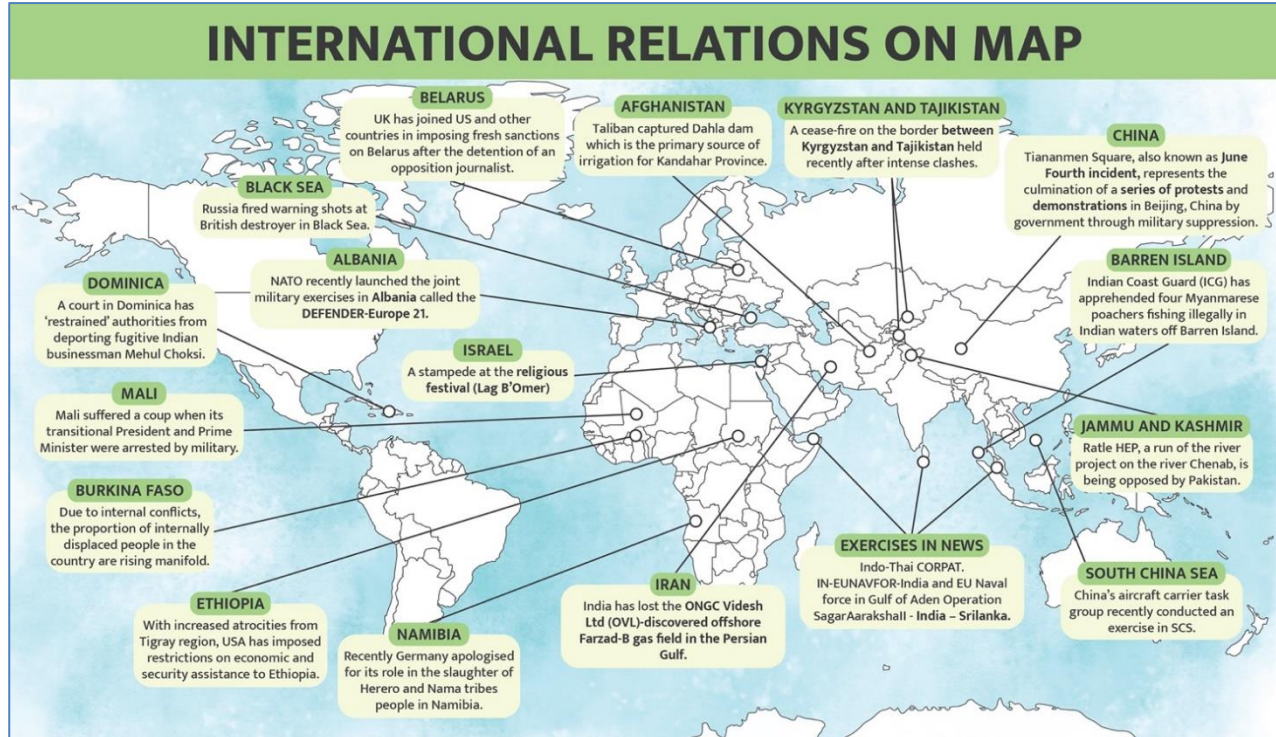


- The idea of Integrated Theatre commands has been proposed by both the Kargil review committee as well as D B Shekatkar committee.
 - Shekatkar committee in 2016 recommended creating 3 integrated theatre commands:
 - Northern command for the China border,
 - Western command for the Pakistan border and
 - Southern command for the maritime borders.
- Related information**

Integrated Theatre Command in other countries

 - More than **32 countries in the world already have** some form of theatre or joint command in place for better integration among the branches of the military. Notable among such countries are the US and China. According to a report, **the US was the first to come up with a theatre command system** and "presently possesses six geographical and four functional commands".
 - Russia** is said to have commenced with the restructuring of its armed forces in 2008 and "**has now created four theatre commands**".

- The current theaterisation model under consideration seeks to set up **at least six new integrated commands**.
- The theaterisation model will have the **inbuilt flexibility to fall back on current command and control structures** to eliminate the possibility of the country getting caught off guard by its adversaries during the crucial transition phase.
- India's **Chief of Defence Staff has been given the mandate to steer the theaterization drive**. It is expected that jointness among three services would be rolled out by 2023.



SMART QUIZ

You can scan this QR code to practice the Smart Quiz of International Relations at our open test online platform for testing your understanding and recalling of the concepts.



फाउंडेशन कोर्स सामान्य अध्ययन

प्रारंभिक एवं मुख्य परीक्षा 2022

इनोवेटिव क्लासरूम प्रोग्राम

कक्षाएं ऑनलाइन आयोजित की जाएंगी। ऑफलाइन कक्षाएं सरकारी नियमों और छात्रों की सुरक्षा के अधीन उपलब्ध होंगी।

- प्रारंभिक परीक्षा, मुख्य परीक्षा और निबंध के लिए महत्वपूर्ण सभी टॉपिक का विस्तृत कवरेज
- मौलिक अवधारणाओं की समझ के विकास एवं विश्लेषणात्मक क्षमता निर्माण पर विशेष ध्यान
- एनीमेशन, पॉवर प्वाइंट, वीडियो जैसी तकनीकी सुविधाओं का प्रयोग
- अंतर - विषयक समझ विकसित करने का प्रयास
- योजनाबद्ध तैयारी हेतु करंट और फुटरेड अप्रोच
- नियमित क्लास टेस्ट एवं व्यक्तिगत मूल्यांकन
- सीसेट कक्षाएं
- PT 365 कक्षाएं
- MAINS 365 कक्षाएं
- PT टेस्ट सीरीज
- मुख्य परीक्षा टेस्ट सीरीज
- निबंध टेस्ट सीरीज
- सीसेट टेस्ट सीरीज
- निबंध लेखन - शैली की कक्षाएं
- करंट अफेयर्स मैगजीन

DELHI: 15 July | 5 PM | 23 March | 1:30 PM

JAIPUR 28 June | 4 PM

3. ECONOMY

3.1. FISCAL POLICY

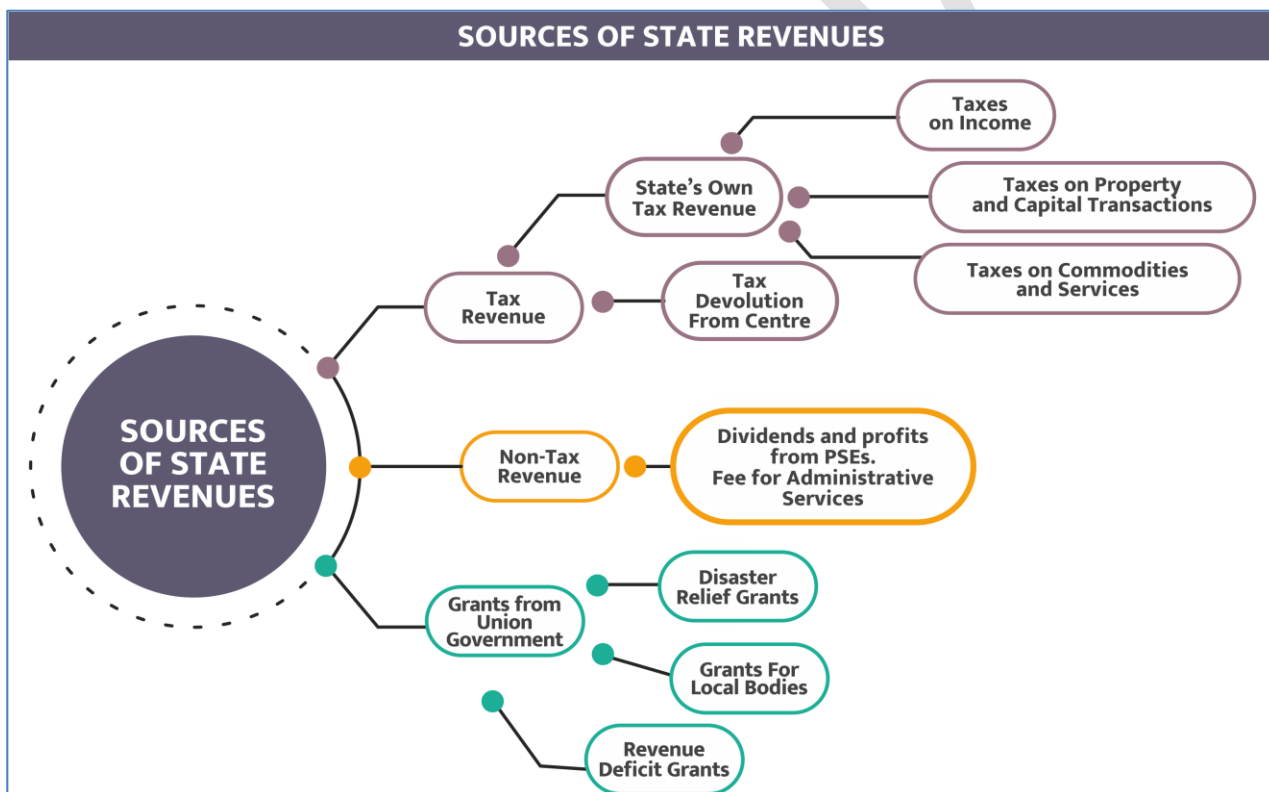
3.1.1. STATE FINANCES

Why in news?

Recently, Government has issued fresh guidelines on the ‘Scheme of Financial Assistance to States for Capital Expenditure’ for the financial year 2021–22.

More on news

- Under the Scheme, **financial assistance is provided to the State Governments** in the form of **50-year interest free loan**.
 - An amount not exceeding Rs.12,000 crore was earmarked for the scheme for the financial year 2020-21.
 - This helped to **sustain state level capital expenditure** in the pandemic year.
 - **Capital expenditure creates employment**, especially for the poor and unskilled, has a **high multiplier effect**, enhances the future productive capacity of the economy, and results in a **higher rate of economic growth**.
- Central Government has now decided to continue the scheme in the year 2021-22.

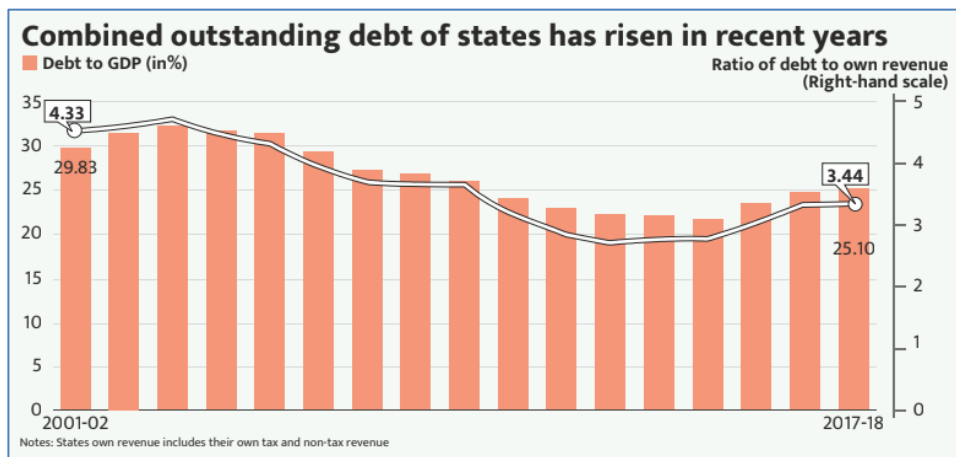


Importance of State Finance

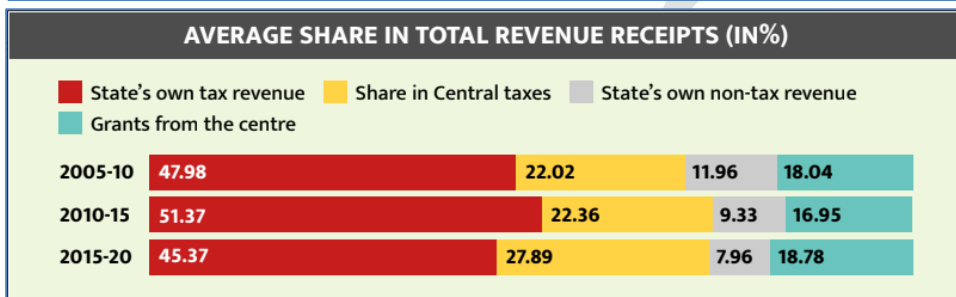
- **Employment:** States now spend one-and-a-half times more than the Union government and **employ five times more people** than the Centre. Not only do states have a greater role to play in determining India’s GDP than the Centre, but **they are also the bigger employment generators**.
- **Macroeconomic Stability:** Amid the pandemic, states have heavily borrowed from market and **high borrowings by states** has serious implications on the interest rates charged in the economy, the availability of funds for businesses to invest in new factories, and the ability of the private sector to employ new labor.
- **Debt Sustainability:** In wake of **high debt-to-GDP ratio** amidst Pandemic, inability of states to raise revenue could start a vicious cycle wherein states end up paying more and more towards interest payments instead of spending their revenues on creating new assets that provide better education, health and welfare for their residents.

Issues with State Finance

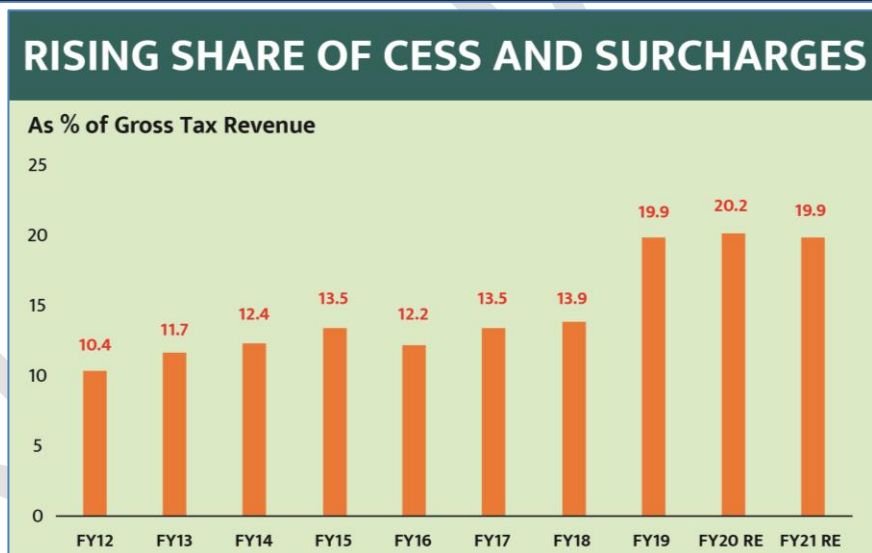
- Shortfall in tax collections:** Data suggest that there is fall in **gross tax collections** of Union Government by 1.5% of gross domestic product. Within this, states are hit harder with the **shortfall in tax revenues for states.** (Refer infographic).



- Goods and Services Tax (GST),** the main source of tax revenue for the states, have witnessed a 15-25 per cent lower tax revenue collection in 2020-21.



- Lowering Share of States in divisible pool:** Due to over-reliance of Centre on **Cess and Surcharges**, the share of states in the **Centre's gross tax revenue (GTR)** fell sharply from 36.6% in FY19 to 32.4% in FY20.



- Increased reliance on borrowing:** During the 2015-21 period, **20% of the total expenditure** of states has been met through **borrowings** with some states like Punjab (45%), Haryana (30%), and West Bengal (30%) relying heavily on borrowings to meet their expenses.

- Recently, **Reserve Bank of India** has warned about rising public debt at state-level. **Public debt as a share of states' own revenue has increased since 2014.**

These issues were compounded due to the outbreak of the pandemic and the associated economic recession.

Steps taken to improve State Finance in the wake of COVID-19

- Raised Borrowing Limits:** The Centre has raised borrowing limits for states for the current fiscal to **5% of gross state domestic product (GSDP) from 3% at present**, allowing them fiscal headroom of around Rs. 4 trillion, subject to their carrying out specific reforms.
 - Incremental borrowing beyond 3.5% of GSDP is linked to reforms undertaken by the states, **including universalization of 'One Nation, One Ration card,' ease of doing business and power distribution reforms, and steps recommended by the 15th Finance Commission.**
- RBI measures:** To enable the State Governments to better manage their fiscal situation in terms of their cash-flows and market borrowings, certain relaxations are being permitted with regard to availment of **Overdraft (OD) facilities.**
 - Accordingly, the **maximum number of days of OD in a quarter is being increased from 36 to 50 days** and the number of consecutive days of OD from 14 to 21 days.
 - The **Ways and Means Advance (WMA) limits** of states have been enhanced.

- **Health Sector:** The Central government has released around **Rs. 80,000 crore** to the States under **National Health Mission (NHM)** as grants.

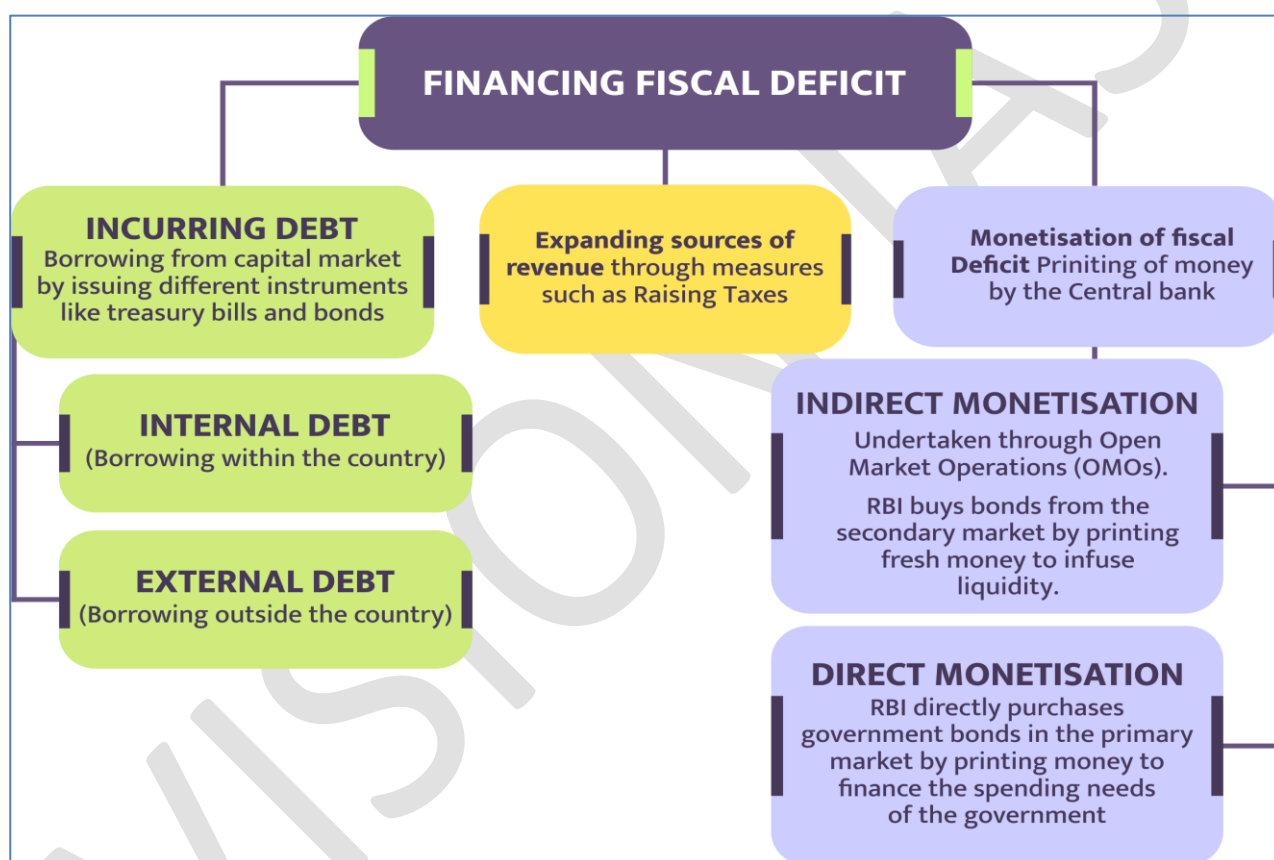
3.1.2. DIRECT MONETISATION OF THE FISCAL DEFICIT

Why in news?

There is a debate whether India should undertake direct monetisation of the deficit by Reserve Bank of India (RBI), given the hurt to its economy caused by second wave of Covid-19 infections.

More on the news

- India has recorded a fiscal deficit of 9.3% of GDP in 2020-21 and for 2021-22, the deficit has been put at 6.8 per cent of the GDP.
 - This is mainly due to rise in expenditure to mitigate the fallout of pandemic and moderation in revenue and low tax collection due to COVID 19 induced economic slowdown.
- Thus, there have been debates on how to finance the growing fiscal deficit given the need to provide additional stimulus to the Indian economy amid the ongoing pandemic.



About Direct Monetisation of deficit

- It refers to a scenario where a central bank prints currency to the tune of accommodating massive deficit spending by the government. It happens when the government privately places its bonds with the Central bank i.e., the central bank purchases government bonds in the primary market.
 - Direct monetisation may not necessarily involve actual printing of currency as the central bank could simply credit the Government’s account with itself through an electronic accounting entry.
- The exercise leads to an increase in total money supply in the system.
- Direct monetisation of deficit is also referred to as **helicopter money** when large sums of new money are printed to stimulate an economy during a crisis — like a recession.

Direct Monetisation of Deficit in India	
Until 1997: Automatic monetisation of deficit	<ul style="list-style-type: none"> • India’s deficits were automatically monetised until 1997. <ul style="list-style-type: none"> ○ Ad-hoc treasury bills (non-marketable short term debt instruments issued by the Government of India), were automatically issued by the RBI on behalf of the Centre to itself at a fixed rate, to replenish the central government’s cash balances.

	<ul style="list-style-type: none"> An agreement was signed between the RBI and the Government of India in 1997 completely phasing out funding through ad hoc treasury bills and the practice was replaced with a system of ways and means advances (WMA) from April 1, 1997.
1997-2006: RBI participating in primary issuance of Government securities	<ul style="list-style-type: none"> Even after a cessation of automatic monetisation, monetisation continued in another form as the RBI continued to subscribe to the primary issuances of Government securities (G-secs).
2006-2018: Complete prohibition on direct monetisation	<ul style="list-style-type: none"> Fiscal Responsibility and Budget Management Act (FRBM Act), 2003, was enacted which completely barred RBI from subscribing to the primary issuances of the government from April 1, 2006.
Since 2018: Direct monetisation allowed on certain grounds	<ul style="list-style-type: none"> FRBM Act was amended in 2017 adding an escape clause which permits monetisation of the deficit under special circumstances. <ul style="list-style-type: none"> RBI can subscribe to the primary issue of central government securities in case the government exceeds the fiscal deficit target on grounds such as national security, act of war, national calamity, collapse of agriculture severely affecting farm output and incomes etc.

Reasons behind demand of Direct monetization

- Financing recovery programmes:** Monetization can solve several problems for a government during the COVID-19 crisis as it can provide easy liquidity to the government to directly cover some of the costs of extraordinary recovery programs.
- Mitigating deflation and stimulating moderate inflation:** Printing money can ensure that the money reaches the masses which can then lead to higher spending. This provides an opportunity for the government to boost overall demand at the time when private demand has fallen.
 - If money printing leads to an increase in demand, Indian manufacturing companies can increase production quickly, without having to increase prices.
- Maintaining financial stability:** Since savings in an economy are limited, financing large deficits through issuance of G-Secs can substantially increase interest rates and cost of borrowing for the Government. This could increase the probability of default, threatening financial stability of the national economy.
- Infusion of liquidity:** Direct monetisation can provide liquidity in the financial system when interest rate cuts are not possible due to inflationary concerns.
- Keeping interest rates low:** Printing money ensures that there is enough money going around in the financial system and in the process, interest rates continue to remain low.
 - Lower interest rates allow the Government to borrow and invest in productive assets such as roads, hospitals etc., corporates to borrow and expand, and people to borrow and spend leading to economic revival.
 - It can reduce the value of a government's outstanding obligations to some extent by increasing inflation.

Concerns regarding use of Direct monetisation in India

- High inflation:** Monetisation of the government's fiscal deficit may give rise to unproductive spending and may lead to higher inflation.
- Erodes the credibility of RBI:** The quantum and timing of money to be printed being decided by the government's borrowing requirement rather than the RBI's monetary policy.
- May hurt fiscal prudence:** Direct monetisation can disincentivize fiscal consolidation activities of the Government. India has already repeatedly pushed back its target of achieving 3% fiscal deficit.
- Fiscal dominance:** The lack of fiscal discipline in the long run affects the independence of the central bank as it will be forced to monetize an unsustainable, out-of control deficit to avoid negative economic outcomes leading to fiscal dominance.
- Ineffective to increase liquidity:** Money extended by a fiscal program inevitably ends up in the banking system. This can increase the amount of bank reserves at the central bank as in times of stress banks are usually reluctant to lend, so they are likely to keep these excess reserves at the central bank and earn interest on them.
- Depreciation of currency:** The supply-demand imbalance in the currency market can cause the Indian rupee to depreciate.

3.1.3. GLOBAL MINIMUM CORPORATE TAX RATE

Why in News?

Recently, Finance Ministers from the Group of Seven (G7) nations reached a landmark accord on backing a global minimum corporate tax rate of at least 15%.

How a global minimum corporate tax works?

- Suppose a company headquartered in Country A is reporting income in **Country B, where the rate is 11%**.
- With a global minimum rate of 15% in effect, **Country A would “top up” the tax and collect another 4%** of the company’s profit from Country B representing the **difference between Country B’s rate and the global minimum rate.**

About Global Minimum Corporate Tax

- Governments have long grappled with the **challenge of taxing global companies** (such as Google, Amazon, and Facebook) **operating across many countries.**

Other Significant outcomes of the G7 summit (Carbis Bay Declaration)

- **G7 to secure a further 1 billion COVID-19 vaccine doses** (over next 12 months) either through donating surplus supplies or providing further finance to Covax, UN-backed scheme to distribute vaccines to low- and middle-income countries.
- **G7 to increase their climate finance contributions** and meet an overdue spending pledge of \$100 billion a year to help poorer countries cut carbon emissions.
- **Build Back Better World (B3W) Partnership**, a values-driven, high-standard, and transparent infrastructure partnership led by major democracies to help narrow the \$40+ trillion infrastructure need in the developing world, which has been exacerbated by the COVID-19 pandemic.
 - Infrastructure plan aims to rival China's Belt and Road Initiative.

- Such companies generate huge revenues but **pay very little tax because they set up offices for tax purposes in low-tax jurisdictions** (tax havens).
- Also, **income from intangible sources** such as drug patents, software and royalties on intellectual property has migrated to these jurisdictions, allowing companies to avoid paying higher taxes in their traditional home countries.

- Global Minimum Corporate Tax is an **additional tax imposed on large multinational companies** (MNCs), potentially forcing them to pay taxes to countries based on where their goods or services are sold, **regardless of whether they have a physical presence in that nation.**
- It will **undercut any advantage of shifting to lower-tax places** and pressures countries to conform to the global norm.

Possible Impact on India

- India is likely to benefit as the **effective domestic tax rate is above the threshold**, and the country would continue to attract investment.
 - In 2019, India **announced a sharp cut in corporate taxes for domestic companies** to 22% and for new domestic manufacturing companies to 15%.
 - The cuts effectively brought India’s headline corporate tax rate broadly **at par with the average 23% rate in Asian countries.**
- In respect of outbound investments, it **will prevent base erosion of tax in the country** as the government will be able to claw back any shortfall in tax paid below 15% by an overseas business owned by an Indian resident
- India has **already been proactively engaging with foreign governments in double taxation avoidance agreements**, tax information exchange agreements, and multilateral conventions to plug loopholes. This proposal of a common tax rate, thereby, adds no further benefits to India.



- From 2000-2018, US companies booked half of all foreign profits in just seven low-tax jurisdictions: Bermuda, the Cayman Islands, Ireland, Luxembourg, the Netherlands, Singapore and Switzerland.

Need for a Global Minimum Corporate Tax Rate

- **Bringing uniformity:** It is aimed at ending a decades-long "race to the bottom" in which countries have competed to attract corporate giants with ultra-low tax rates and exemptions.
- **Check on tax havens:** It neutralizes the low tax incentive and will discourage multinationals from shifting profits - and tax revenues - to low-tax countries regardless of where their sales are made.
- **Additional tax revenue to fight pandemic:** According to estimates, governments lose \$245 billion annually to tax havens. If that money were instead available to governments, they could use it for, among other things, managing their heavy costs for pandemic relief.
- **Boost to global economy:** by leveling the playing field for businesses and encouraging countries to compete on positive bases, such as educating and training their work forces and investing in research and development and infrastructure.
- **Allow taxing global digital MNCs:** It will be giving a right to tax a slice of profits of large digital MNCs and will put an end to various digital taxes that have proliferated around the world, similar to equalization levy in India.

OECD and Global Minimum Tax

- **Under the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS),** 139 countries and jurisdictions are **collaborating to put an end to tax avoidance strategies** that exploit gaps and mismatches in tax rules to avoid paying tax.
 - BEPS refers to **tax planning strategies used by multinational enterprises (MNEs) that exploit gaps and mismatches in tax rules** to artificially shift profits to low or no-tax locations where there is little or no economic activity, resulting in little or no overall corporate tax being paid.
- OECD/G20 Inclusive Framework on BEPS is **working to improve the coherence of international tax rules, ensure a more transparent tax environment and address the tax challenges arising from the digitalisation of the economy.**
- Recently, **130 countries, including Switzerland, China and India, have joined a new two-pillar plan to reform international taxation rules** and ensure that multinational enterprises pay a fair share of tax wherever they operate.
 - **Pillar One** ensures that large MNEs, including digital companies, **pay tax where they operate and earn profits.**
 - **Pillar Two** seeks to ensure that **large MNEs pay at least a Global Minimum corporate tax rate**, currently proposed at 15%, regardless of the jurisdiction where profits may be recorded.

Income Tax Department sets threshold for Significant Economic Presence (SEP)

- Income Tax Department notified a threshold for **Significant Economic Presence (SEP)** to come into effect from April 1, 2022.
- The **notified thresholds are:**
 - **Transaction Threshold:** Any non-resident whose revenue exceeds Rs 2 crore for transactions in respect of goods, services, or property with any person in India.
 - **User Threshold:** Any entity that systematically and continuously does business with more than 3 lakh users in India.
- In 2016, **India introduced Equalization Levy or 'Google Tax'** applicable to **payments for digital advertisement services received by non-resident companies** without a permanent establishment (PE) here if these exceeded ₹1 lakh a year.
 - It was later expanded to non-resident e-commerce operators with the levy at the rate of 2%.
 - The idea was to **tax profits of those online and offline businesses** that don't have a physical presence in India but derive significant economic value from the country.
- Later, SEP was introduced **through Finance Act, 2018 to enlarge the scope of income of non-residents** that accrues or arises in India, by establishing a 'business connection' of foreign entities in India.

3.2. BANKING AND MONETARY POLICY

3.2.1. MICROFINANCE REGULATIONS

Why in news?

The Reserve Bank of India (RBI) has proposed a new regulatory regime for microfinance with uniform set of guidelines for all lenders.

About Microfinance

Microfinance is a form of financial service which provides small loans and other financial services to poor and low-income households to enable borrowers to work their way out of poverty by undertaking income generating activities.

CORE FEATURES OF MICROFINANCE:

- 1 Lending of small amounts of loans
- 2 to borrowers belonging to low-income groups
- 3 without collateral
- 4 with flexible repayment schedules

MICROFINANCE IS DELIVERED IN INDIA THROUGH:

- 1 Scheduled commercial banks (SCBs) (including small finance banks (SFBs) and regional rural banks (RRBs))
- 2 Cooperative banks
- 3 Non-banking Financial Companies (NBFCs)
- 4 Microfinance Institutions (MFIs) registered as NBFCs (NBFC-MFIs)

Microfinance in India

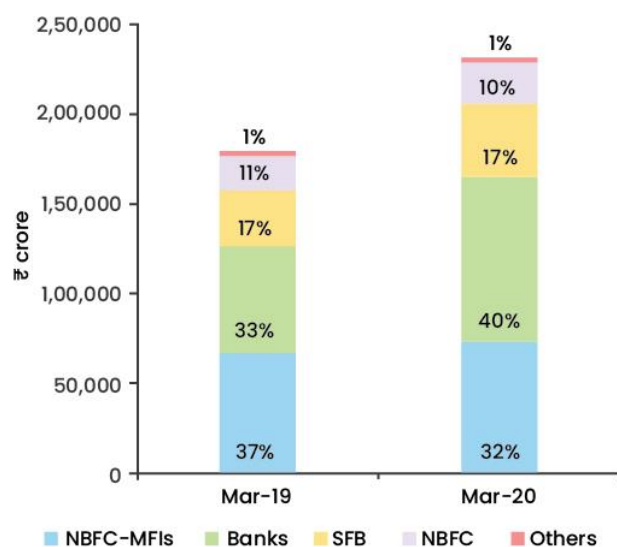
- India involved its public banks network with their unparalleled geographical spread and functional reach to provide micro finance.
 - In this experiment, there exists a link between SHGs, NGOs and Banks. The SHGs are formed and nurtured by NGOs and only after accomplishing a certain level of maturity in terms of their internal thrift, they are entitled to seek credit from the banks.
- The SHG-Bank linkage programme, which was undertaken since 1992 in India, has now metamorphosed into the world's largest microfinance movement that financed more than 100 lakh SHGs with a credit outstanding of more than Rs. 1 lakh crore.
- The micro finance experiment in India has been described by NABARD as relationship banking rather than parallel banking elsewhere in the world.



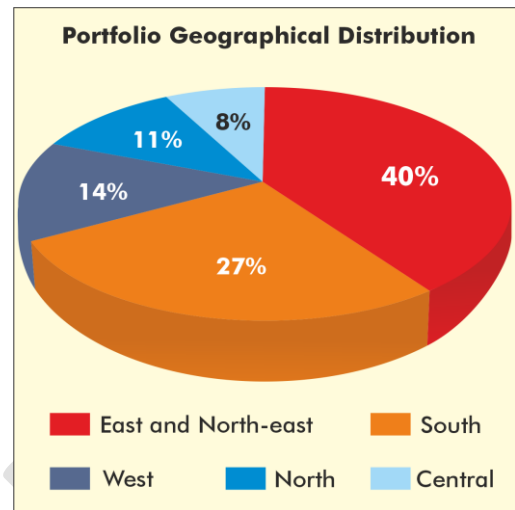
Overview and background

- Indian microfinance sector has witnessed phenomenal growth over past two decades in terms of increase in both the number of institutions providing microfinance and quantum of credit made available to the microfinance customers.
 - Currently it is serving around 102 million accounts of the poor population of India.
- However, as the sector grew, certain inadequacies and failures became apparent culminating in the Andhra Pradesh microfinance crisis in 2010.
 - This crisis was attributed to the irrational exuberance of some MFIs who, in their eagerness to grow business, had given a go by to the conventional wisdom and good practices such as due diligence in lending and ethical recovery practices.

CHART 1: GROSS LOAN PORTFOLIO OUTSTANDING



- In the wake of this crisis, RBI constituted **Y H Malegam Committee** to study issues and concerns in the MFI sector.
 - Based on the recommendations of the Malegam Committee, RBI introduced a **comprehensive regulatory framework for NBFC-MFIs in 2011.**
 - An **NBFC-MFI has been defined as**
 - ✓ a **non-deposit taking NBFC,**
 - ✓ with **minimum net owned fund of ₹5 crore** (₹2 crore for NBFC-MFIs registered in the North Eastern Region) and,
 - ✓ having **minimum 85 per cent of its net assets** (assets other than cash, bank balances and money market instruments) **in the nature of 'qualifying assets'.**



This comprehensive regulatory framework is however, applicable only to NBFC-MFIs, whereas other lenders, which comprise of around 70 per cent share in the microfinance portfolio, are not subjected to similar regulatory conditions.

The RBI is therefore now proposing a **single uniform set of regulations for all Regulated entities (REs)** of RBI operating in the microfinance sector.

Regulation of MFIs

Parameters	Existing Regulatory framework for NBFC-MFIs	Proposed changes in regulatory framework
Definition of Microfinance borrower	A microfinance borrower is identified by annual household income not exceeding ₹1,25,000 for rural and ₹2,00,000 for urban and semi-urban areas.	<ul style="list-style-type: none"> • Same criteria shall be extended to all REs for the purpose of the common definition. <ul style="list-style-type: none"> ○ All REs shall have a Board approved policy enumerating factors considered for assessment of household income.
Limits on household indebtedness	Total indebtedness of the borrower does not exceed ₹1,25,000 (excluding loan for education and medical expenses);	<ul style="list-style-type: none"> • Link the loan amount to household income in terms of debt-income ratio. <ul style="list-style-type: none"> ○ Accordingly, all lending institutions has to ensure that the EMI a household has to pay does not exceed 50 per cent of its income.
Nature of loans	Collateral free loans without any prepayment penalty	The collateral free nature of microfinance loans shall be extended to all REs.
Limit on number of loans, loan amount and tenure	<ul style="list-style-type: none"> • Loan amount limit of ₹1,25,000 (₹75,000 in first cycle and exclusion of loans for meeting education and medical expenses from loan limit); • Minimum tenure of 24 months for loans above ₹30,000 • No more than two NBFC-MFIs can lend to the same borrower. • Minimum 50 per cent of loans to be given for income generation activities 	All limits shall be withdrawn
Repayment periodicity	Microfinance borrowers of NBFC-MFIs are permitted to repay weekly, fortnightly or monthly instalments as per their choice.	All REs shall have a Board approved policy to provide the flexibility of repayment periodicity to microfinance borrowers as per their requirement.
Pricing of micro loans	Maximum interest charged by an NBFC-MFI shall be the lower of – <ul style="list-style-type: none"> • the cost of funds plus a margin cap of 10% for MFIs with loan portfolio of ₹100 crore or above and 12% for others; • The average base rate of the five largest commercial banks by assets multiplied by 2.75. 	No ceiling prescribed for the interest rate of NBFC-MFIs. <ul style="list-style-type: none"> • The Board of each NBFC-MFI shall adopt an interest rate model taking into account relevant factors such as cost of funds, margin and risk premium and determine the rate of interest to be charged for loans and advances. • NBFC-MFIs, like any other NBFC, shall be guided by fair practices code and would ensure disclosure and transparency of interest rates.

<p>Exemptions to not-for-profit companies</p>	<p>Exemption from registration requirements to those ‘not for profit’ microfinance companies (registered under Section 25 of the Companies Act, 1956 (Section 8 of the Companies Act, 2013)) which are:</p> <ul style="list-style-type: none"> engaged in providing credit not exceeding ₹50,000 for a business enterprise and ₹1,25,000 for meeting the cost of a dwelling unit to any poor person and not accepting public deposits. 	<p>Exemption to those ‘not for profit’ microfinance companies which are-</p> <ul style="list-style-type: none"> engaged in providing collateral-free loans to households with annual household income of ₹1,25,000 and ₹2,00,000 for rural and urban/semi urban areas respectively, EMLs of loans does not exceed 50 per cent of the household income having asset size of less than ₹100 crore.
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3.2.2. RBI SURPLUS TRANSFER

Why in News?

Recently, the Reserve Bank of India (RBI) approved the transfer of ₹99,122 crore as surplus (excess of income over expenditure) to the central government from its reserves.

How does RBI generate surplus?

RBI's Income	RBI's Expenditure
<p>Major Income heads</p> <ul style="list-style-type: none"> Interest from foreign sources (41%) Interest from domestic sources (33%) Other income from domestic sources (7%) 	<p>Major Expenditure heads</p> <ul style="list-style-type: none"> Provisions (63%) (contribution to CF and ADF) Printing of Notes (12%) Agency charges (15%) Commission to bank, primary dealers etc Employee cost (10%)
<p>RBI's income primarily comes from:</p> <ul style="list-style-type: none"> Return from domestic sources which includes interest on Loans and Advances, interest on Liquidity Adjustment Facility (LAF) operations etc. Other income from domestic sources including Profit/Loss on sale and redemption of Rupee securities, Commission among others. Return from foreign sources which includes interests from foreign currency deposits, interest on Repo/Reverse Repo transactions etc. Other income from foreign sources including Profit/Loss on sale and redemption of foreign securities, Gain/Loss from forex transactions among others. 	<p>RBI's expenditure primarily happens on:</p> <ul style="list-style-type: none"> Provisioning of risks in RBI's reserves: Contingency Fund (CF) and Asset Development Fund (ADF). <ul style="list-style-type: none"> Contingency Fund (CF): It is the second biggest fund designed to meet contingencies from exchange rate operations and monetary policy decisions. <ul style="list-style-type: none"> It is funded in large part from the RBI's profits. Asset Development Fund (ADF): It represents provisions made towards investments in subsidiaries and associated institutions and to meet internal capital expenditure. Printing of notes. Agency charges which includes commission to banks, primary dealers etc. Employee cost.
<p>Overall</p> <ul style="list-style-type: none"> RBI's total expenditure is only about 1/7th of its total net interest income, thereby generating surplus. 	

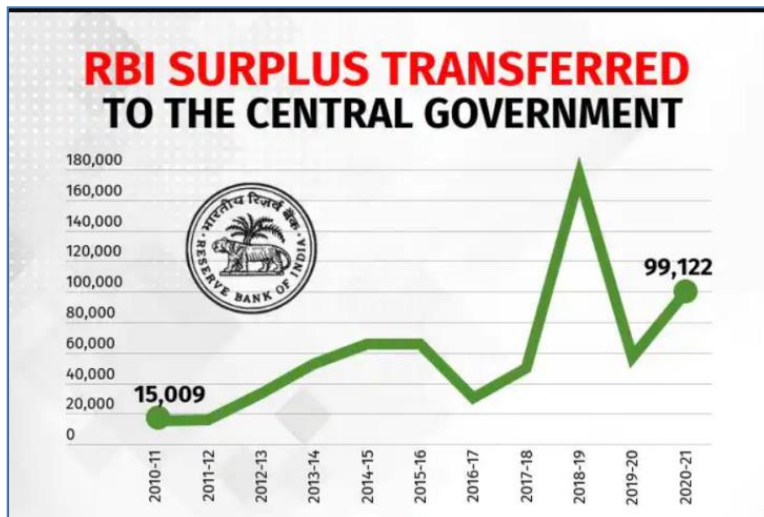
How does RBI transfer surplus to the government?

- As RBI is not required to pay income tax, it transfers the surplus amount to the government.

- RBI transfers the surplus in accordance with Section 47 (Allocation of surplus profits) of the Reserve Bank of India Act, 1934.
- In the past, various committees have been formed to decide the ideal amount of surplus that should be transferred to the Central Government. These committees were headed by V Subrahmanyam in 1997, Usha Thorat in 2004 and Y H Malegam in 2013 and Bimal Jalan in 2018.
- Earlier, RBI used to keep a major chunk of this surplus for its CF and ADF. However, after the Malegam Committee (2013) recommendations its transfer of surplus to government increased.
- Later, the Bimal Jalan committee provided a revised Economic Capital Framework or ECF. ECF provides a methodology for determining the appropriate level of risk provisions and profit distribution to be made under Section 47 of the RBI Act, 1934.

○ As per this revised ECF the amount of surplus that the RBI must transfer to the Centre is determined based on two factors

- ✓ **Realized equity** (essentially existing amount in CF): The CF be maintained within a range of 6.5% to 5.5% of the RBI's balance sheet and the excess amount is to be transferred to the government.
- ✓ **Economic capital** (essentially CGRA): It should be kept in the range of 20-24.5% of the balance sheet and rest should be transferred to government.



Why RBI surplus has gone up sharply this year?

- **Lower expenditure due to reduction in Provisioning amount** is one of the major reasons for higher surplus.
 - This time round, by announcing that it had decided to maintain CF at 5.5%, **RBI has chosen to maintain the lowest required buffer** while passing on to the government the maximum possible surplus.
- Rise in the RBI's surplus could also be linked to **higher income from its Open Market Operations as well as the sizeable rise in forex reserves.**
- Another reason could be the **targeted long term repo operations (TLTROs).**
 - TLTROs refer to targeted long-term repo operations **used to infuse cash in the banking system** for on-lending to specific sectors.

3.3. PAYMENT SYSTEMS AND FINANCIAL MARKETS

3.3.1. SOCIAL STOCK EXCHANGE

Why in News?

Recently, Securities and Exchange Board of India (SEBI) made public the Technical Group (TG) report on Social Stock Exchange (SSE).

About Social Stock Exchanges (SSE)

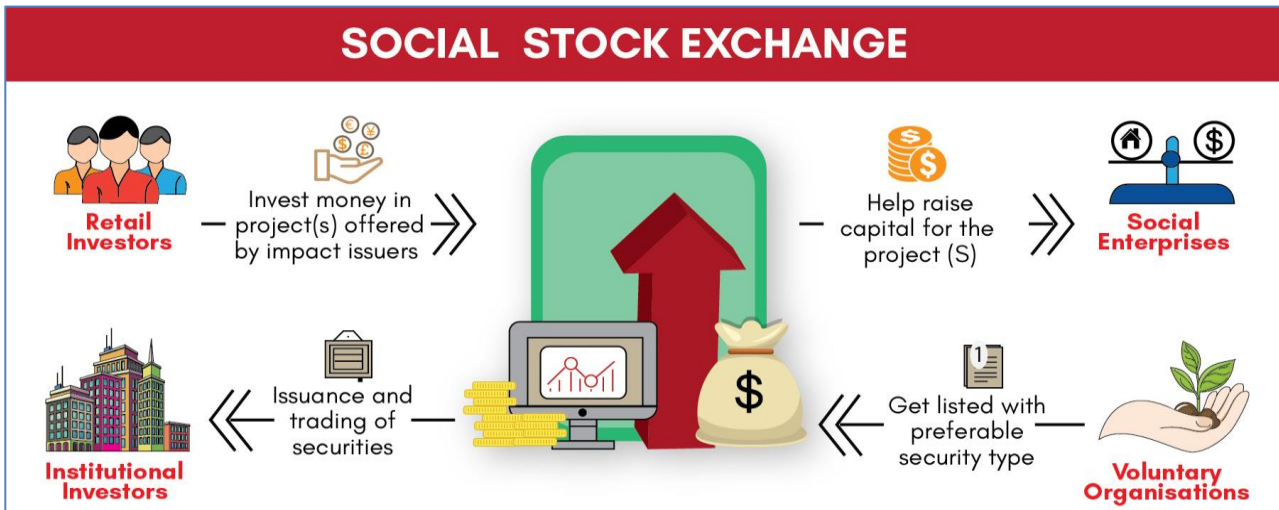
- SSE functions as a **regulated funding platform** to allow For-Profit Social Enterprises (FPEs) and not-for-profit organizations (NPO) with a social purpose, to raise funds.
 - At present, avenues through which the social sector (FPEs

Key recommendations of Technical Group

- **Corporate foundations, political and religious organizations should be made ineligible** to raise funds using the SSE mechanism.
- **Both FPEs and NPO should be allowed to tap the SSE** provided they are able to demonstrate that social intent and impact.
- Depending on the type of organisation, **SSEs shall allow a variety of financing instruments for NPOs and FPEs.**
 - **Modes available for fundraising for NPOs** shall be equity, zero coupon zero principal bond (ZCZP), development impact bonds, social impact fund, currently known as social venture fund (SVP) with 100% grants-in grants out provision, and donations by investors through mutual funds.
 - **Modes available for FP enterprises** will be equity, debt, development impact bonds, and social venture funds.
- **Capacity building fund for SSE** should have a corpus of Rs 100 crore.
- Drawn a **list of broad activities** based on those identified by Niti Aayog under sustainable development goals **that SEs can engage in.**
 - These include **eradicating hunger, poverty malnutrition and inequality; promoting gender equality by empowerment of women and LGBTQIA+ communities;** training to promote rural sports; and slum area development, affordable housing.

and NPO) receive funding include Corporate Social Responsibility (CSR), impact investing, philanthropic/Government grants etc.

- It **brings together social organizations (FPEs and NPO) and impact investors**, especially institutional investors whereby latter can buy stake in the form of bonds from listed organizations.
- It provides a mechanism to **preserve the social and environmental mission of the organizations**, giving the **investors opportunities to mitigate socio-economic problems** through investments that also have the potential to produce financial returns.
- **Some of the most prominent SSEs are:** UK (Social Stock Exchange), Canada (Social Venture Connexion), South Africa (South African Social Investment Exchange), Singapore (Impact Investment Exchange).

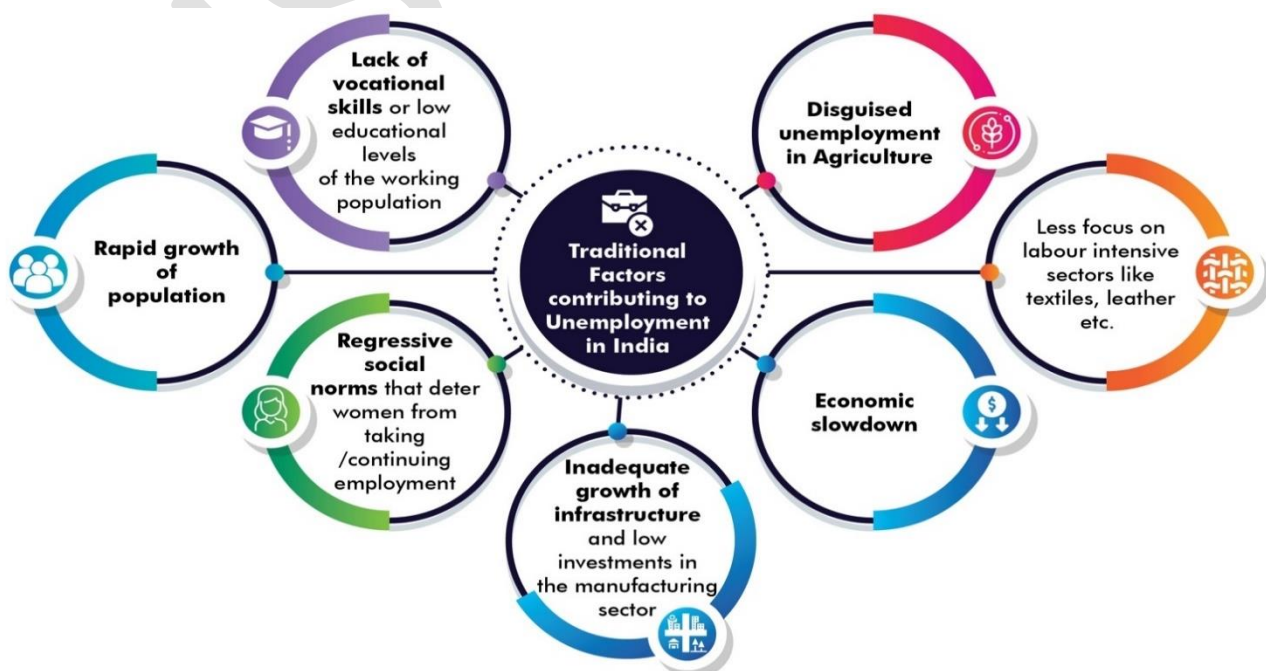


3.4. LABOUR, EMPLOYMENT, SKILL DEVELOPMENT AND ENTREPRENEURSHIP

3.4.1. UNEMPLOYMENT IN INDIA

Why in news?

India's unemployment rate rose to 7.11% in the year 2020 (highest in three decades), according to the International Labour Organization (ILO).



Measures taken by the government

- **Fiscal and income support :**
 - **Economic stimulus package** was announced as part of the Pradhan Mantri Garib Kalyan package and subsequent Atmanirbhar Bharat package (Self-Reliance Mission) amounting to INR 20 trillion, around 10 per cent of GDP which included measures to **contain the adverse impact on livelihood.**
 - To support income, **female Jandhan account holders were paid Rs. 500 per month** for three months and funds collected under BOCW's cess were utilised by the states for cash benefits for the construction workers.
 - **Increased allocation of MGNREGS** to Rs. 40000 crore along with an increase in wages under the Scheme.
 - **More focused Garib Kalyan Rojgar Abhiyan** was launched in 116 most affected districts of selected states to **boost employment for migrants.**
 - **Unemployment allowance** under Atal Beemit Vyakti Kalyan Yojna (ABVKY) **has been enhanced** from 25% of the average salary drawn to 50%.
- **Pension fund, tax support and credit** – Support was also given to formal sector workers and employers through payment on behalf of the employers' and employees' contributions, 12% each, under EPF.
- **Relief measures announced by States:** Bihar, for example, has announced that it would add an equal measure to the Centre's distribution from the State's resources for free distribution via the Public Distribution System. Tamil Nadu has announced a ₹4,000 handout per ration card. Kerala announced free food kits to ensure that no family would go hungry in the State.
- **Online public employment services:** Many services for workers seeking employment or retraining have moved online. For instance,
 - The **National Career Service**, India's public employment agency, encourages work from home and offers a number of online options.
 - All **job fairs and events have been moved online** to bridge the gap between jobseekers as well as employers by maintaining social distancing.
 - Other services include **online training for jobseekers**, the creation of a video profile (a video CV), and online career counselling, all of which are free of charge.

3.5. AGRICULTURE




3.5.1. FERTILISER SUBSIDY

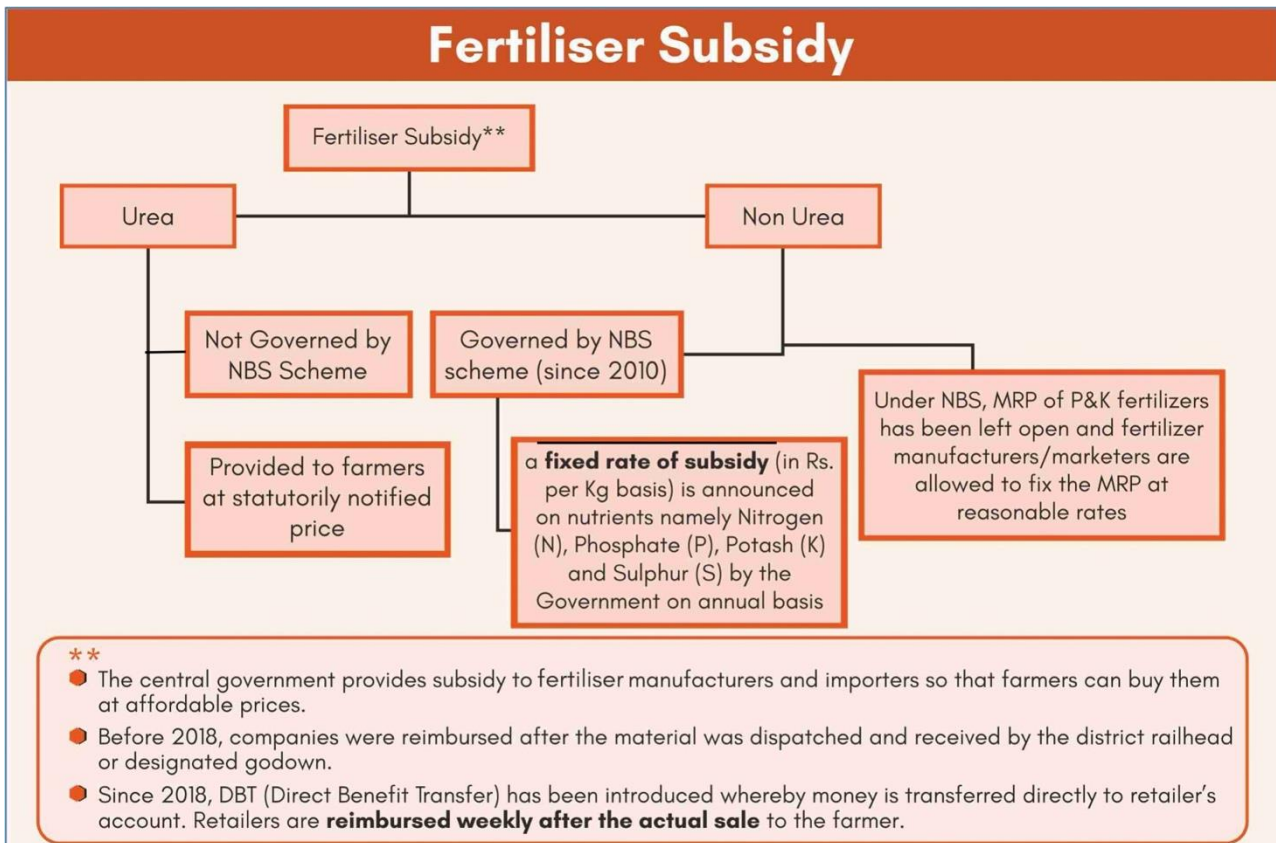
Why in News?

Recently, the subsidy for Diammonium phosphate (DAP) fertiliser was increased from Rs. 500 per bag to Rs. 1200 per bag, an increase of 140%.

Fertilizers in India

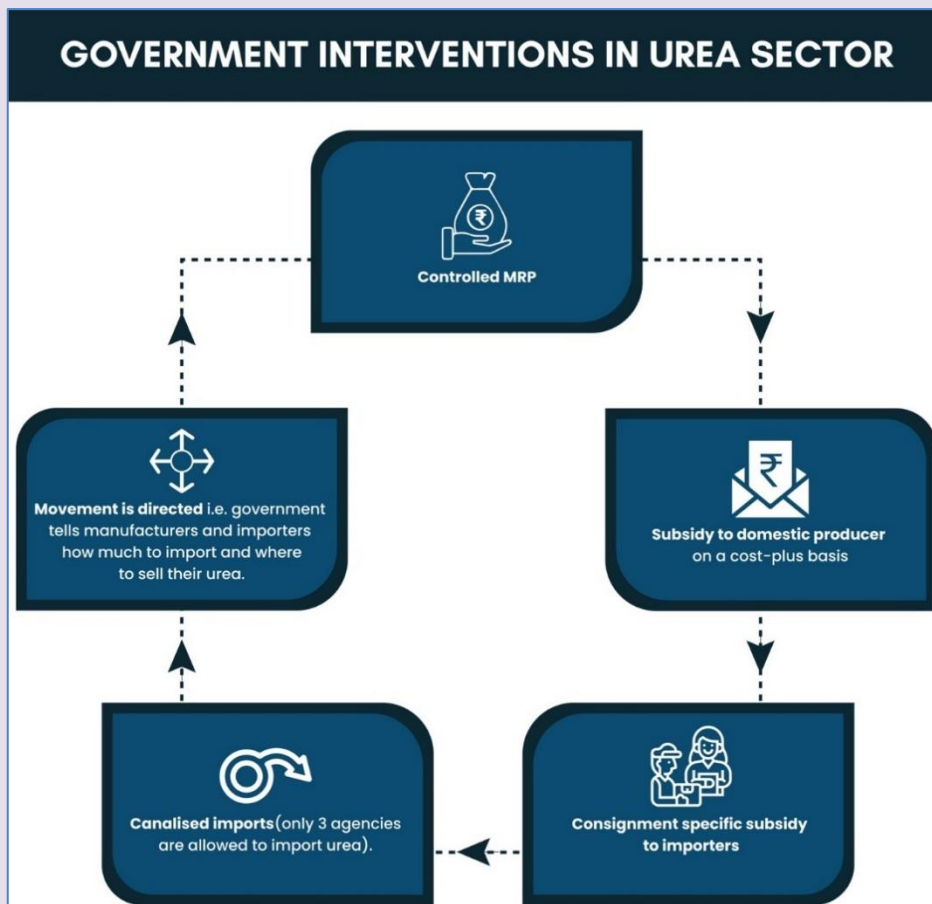
- The Indian fertilizer industry can broadly be divided into **two categories**, depending on the nutrient composition: (i) **nitrogenous fertilizers** and (ii) **phosphatic and potassic (P&K) fertilizers.**
- According to a SBI report, Indian fertilizer industry is **third largest in the world in terms of production and second largest in terms of consumption.**
- India fertilizers market is projected to register a **CAGR of 11.9%** during the forecast period (2021-2026).

Categories of Fertilizers	
 Nitrogenous Fertilizers	Urea Calcium Ammonium Nitrate (CAN) Ammonium Nitrate Ammonium Sulfate Anhydrous Ammonia Other Nitrogenous Fertilizers
 Phosphatic Fertilizers	Mono-Ammonium Phosphate (MAP) Di-Ammonium Phosphate (DAP) Triple Superphosphate (TSP)
 Potash Fertilizers	Muriate of Potash (MOP) Other Potash Fertilizers



Issues specific to Urea

- Urea receives the **largest subsidy**, in **outlay terms** (accounting for nearly 70 per cent of total fertiliser's subsidy) and as **proportion of actual cost of production** (75 per cent per kg, compared with about 35 per cent for DAP and MOP).
- Urea is also the **most physically controlled** fertiliser. Government intervenes in Urea sector in five ways:



- Economic survey 2015-16 pointed out that as much as **24% of the urea subsidy is spent on inefficient producers**, **41% is diverted to non-agricultural uses** including smuggling to neighbouring countries, and **24% is consumed by larger, presumably richer farmers**.
- **Defies One Product-One Price principle** (the intuition that products which are essentially the same should be charged essentially the same price). The 75 per cent subsidy on agricultural urea creates a large price wedge which feeds a **thriving black market**. Black market prices are, on average, about 61 per cent higher than stipulated prices.

Steps taken:

- **New Urea Policy-2015 (NUP-2015)** with the objective of **maximizing indigenous urea production**, promoting **energy efficiency** in urea production and **rationalizing subsidy** burden on the government.
- **Neem Coated Urea (NCU):** With the objective of promoting the **balanced use of fertilizers**, it has been made **mandatory for all the domestic producers** of urea to produce 100% as NCU.
- **Gas Pooling:** Pooling of domestic gas with Re-gasified Liquefied Natural Gas (R-LNG) to provide natural gas at uniform price to all-natural gas grid connected Urea manufacturing plants.
- **Soil Health Card (SHC):** Card contain the status of soil with respect to 12 parameters, namely N, P, K (Macro-nutrients); S (Secondary- nutrient); Zn, Fe, Cu, Mn, Bo (Micro - nutrients); and pH, Electrical Conductivity (EC), Organic Carbon (OC) (Physical parameters). It **indicates dosage of fertilizers and other soil amendments** needed to maintain soil health in the long run.

Related News

Scientists identify genes to improve fertiliser nitrogen use efficiency (NUE) in rice

- Indian researchers have narrowed down some high priority target genes for their potential to improve NUE in rice.
- NUE is the **fraction of applied nitrogen that is absorbed and used by the plant**.
 - A higher number denotes low wastage.
 - Plants need nitrogen **to grow, develop and produce usable products**.
 - Nitrogen is made available through fertilizers or from soil as **plants cannot use nitrogen available in the environment**.
- **NUE for cereal production** (wheat, rice, maize, barley, sorghum, millet, oat and rye) is **as low as 33%**.
 - **Cereal crops account for over 69% of the total consumption of N fertilisers** in the country with rice topping the list at 37%, followed by wheat (24%).

3.5.2. INDIA'S AGRICULTURAL EXPORT

Why in news?

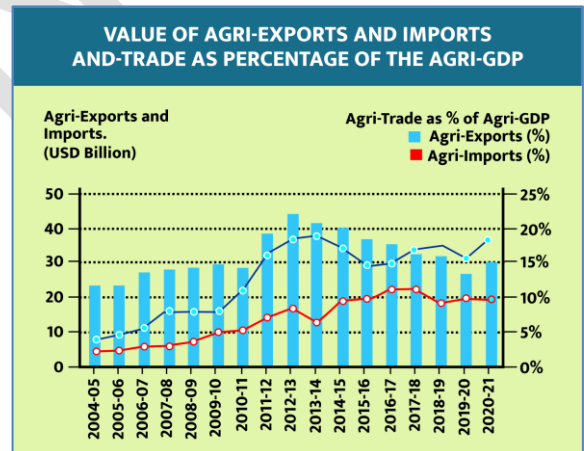
Agri-exports touched \$41.8 billion in FY 2020-21, registering a growth of 18 per cent over the previous year.

India's agri-export ecosystem

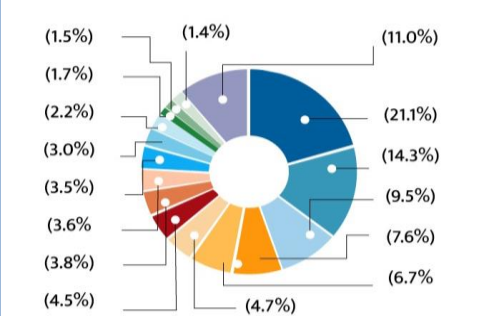
- India has been a **net exporter of agri products since the economic reforms began in 1991**.
- India occupies a leading position in global trade of agricultural products.
- However, its **total agricultural export basket accounts for a little over 2.5% of world agricultural trade**.
- The **major export destinations were USA, Saudi Arabia, Iran, Nepal, and Bangladesh**.
- Among the key agriculture commodities exported from India were **marine products, basmati rice, buffalo meat, spices, non-basmati rice, cotton raw, oil meals, sugar, castor oil and tea**.

Interventions that promoted recent spike in India's agricultural export

- **Policy-level interventions: Pesticide residue problems have affected exports of basmati rice** key traditional export product **to the EU** due to stringent norms imposed for chemicals such as Tricyclazole and Buprofezin, extensively used in rice cultivation in India.
- **Expansion of products into new markets:** Demand for Indian cereals was robust in 2020-21, with **shipments sent to**



AGRI-EXPORTS FROM INDIA (FY2020-21)



Value of Total Agri-Exports=41.8 Billion

■ RICE ■ MARINE PRODUCTS ■ SPICES ■ BUFFALO MEAT
■ SUGAR ■ PROCESSED PRODUCTS ■ COTTON RAW INCLUDING WASTE
■ OIL MEAL ■ F&V ■ TEA & COFFEE ■ OTHER OILSEEDS
■ CASTOR OIL ■ OTHER CEREALS ■ CEREALS PREPARATIONS
■ VEGETABLE OIL ■ OTHER AGRI-COMMODITIES

several countries for the first time, such as rice to countries like Timor-Leste, Puerto Rico, and Brazil; wheat to Yemen, Indonesia, and Bhutan, etc.

- **Opportunities that Covid-19 offered:** The sharp rise in exports of non-basmati rice can be attributed to **lower prices compared to that of major rice exporters**, Thailand and Vietnam, and also because these countries stopped exports due to the lockdown.
- **Rise in demand of organic products:** Organic exports that include products such as cereals and millets, spices and condiments, tea, medicinal plant products, dry fruits, and sugar grew 51 per cent year on year. The growth can also be attributed to demand for such products due to the outbreak of the pandemic.

Related information
Agriculture Export Facilitation Centre (AFEC), Pune

- It is India's first AFEC established by the **Mahratta Chamber of Commerce Industries and Agriculture (MCCIA)** in association with the National Bank for Agriculture and Rural Development (**NABARD**).
- **It aims at boosting the agricultural and food exports of Maharashtra** by disseminating need-based information, providing timely guidance and organising training courses for all stakeholders.
- It will serve as a **one-stop destination to provide exporters all possible assistance**.

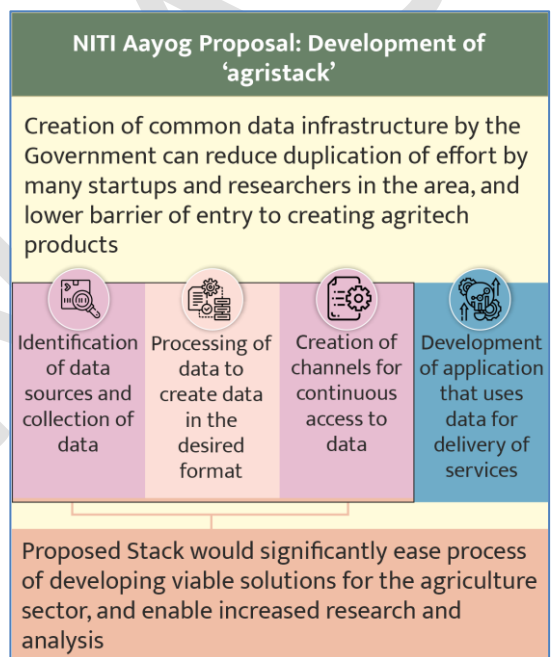
3.5.3. AGRISTACK

Why in News?

Recently, many organisations that work for farmers' rights and digital rights flagged concern over government's plan of creating 'AgriStack'.

About Agristack

- AgriStack is a **collection of technologies and digital databases** proposed by the Union government that focuses on farmers and the agricultural sector.
- AgriStack may have a **Farmers' Stack, a Farm Stack and a Crop Stack** integrated on a technology platform linking existing digital land records, cadastral maps of farms and information.
 - **Farmers' Stack can consist of farmer data with Aadhaar** as unique identifier, Farm Stack can have geospatial information on each farm (with a farm identity) owned by a farmer with cadastral maps, and **Crop Stack can contain crop data linked to farms**.
- Data would be **interlinked to land registration, cadastral maps and satellite images** from state government departments and public entities.
- Government's schemes such as **Pradhan Mantri Fasal Bima Yojana (PMFBY), PM-KISAN and Soil Health Card will be integrated through a common database** along with land record details over a period of time.
- The Department of Agriculture, Cooperation and Farmers Welfare, recently entered into a Memorandum of Understanding (MoU) with Microsoft Corporation to create a 'Unified Farmer Service Interface' through its cloud computing services.
 - The MoU will start as a pilot project in 100 villages of Uttar Pradesh, Madhya Pradesh, Gujarat, Haryana, Rajasthan and Andhra Pradesh.
 - This sets in motion the ministry's plan of creating '**AgriStack**'.
- Also, four other MoUs were signed — with Star Agribazaar, Patanjali Organic Research Institute for agricultural management and services, Amazon Internet Services, and Esri India for different operations under AgriStack such as issuance of pre- and post-harvest advisories, creation of national agriculture geo hub etc.
- Also, government is **preparing a centralised farmers database** and formulating various services based on it in order to create a digital ecosystem for agriculture.
 - This database will be linked with the land records of farmers across the country and **unique farmer IDs will be generated**.
 - With an **integrated database for farmers**, information related to all benefits and assistances provided through various schemes can be kept at one place.



Other government efforts towards digitisation in Agriculture

- **AI-Sowing App:** Microsoft has developed this app in collaboration with International Crops Research Institute for the Semi-arid Tropics (ICRISAT). This application sends advisory to the farmers regarding the optimal date of seed-sowing.
- NITI Aayog has partnered with IBM to develop a **crop yield prediction model** backed by AI to provide real-time data and communicate the required advisory to farmers.
- **Kisan Suvidha:** It is an omnibus smartphone app that helps farmers by providing them relevant information regarding weather, dealers' market prices, plant protection, agro advisories, IPM practices etc.
- **MKisan App:** This app enables farmers and stakeholders to obtain advisories and other information being sent by experts and govt. officials through mkisan portal without registering on the portal.
- **Farm-o-pedia:** Developed by CDAC Mumbai, this is a multilingual Android app that targets the farmers of rural Gujarat. The major functionalities of this app are, it helps farmers get suitable crops as per soil and season, helps farmers get crop-wise information, weather monitoring and cattle management.
- **Crop Insurance App:** is used to calculate Insurance Premium for notified crops based on area, coverage amount and loan amount.
- **Shetkari App:** helps download Shetkari Masik an Agriculture magazine & there is no requirement of internet to read it.
- **Agri Market app:** provides information of market price of all crops at the markets located within 50 kilometre radius of the device's location.
- **Pusa Krishi app:** provides information about various types of crops.

3.5.4. HORTICULTURE**Why in News?**

Recently, Union Agriculture Minister launched **Horticulture Cluster Development Programme (CDP)** to ensure holistic growth of horticulture.

More on news

- It is a **central sector programme**, implemented by **National Horticulture Board**, starting with pilot phase in **12 horticulture clusters** (out of total 53 clusters) covering nearly **10 lakh farmers from 11 States/UTs**.
- It will leverage **geographical specialisation** and promote **integrated and market-led development**; making Indian horticulture clusters globally competitive.
- Ministry of Agriculture and Farmers Welfare has also provided an **enhanced allocation of Rs. 2250 Crore for the year 2021-22** for 'Mission for Integrated Development of Horticulture' (MIDH).

Mission for Integrated Development of Horticulture (MIDH)

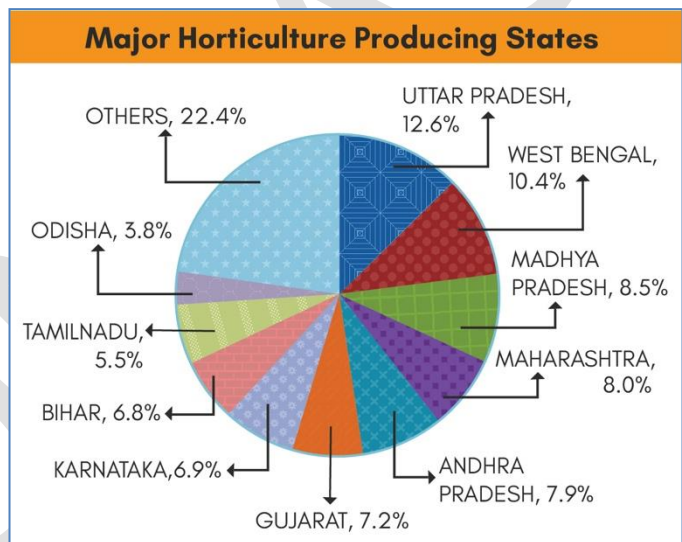
- It is a **Centrally Sponsored Scheme** for the **holistic growth of the horticulture sector**.
- Under MIDH, Government of India (GOI) **contributes 60%, of total outlay for developmental programmes in all the states except states in North East and Himalayas**. In the case of North Eastern States and Himalayan States, GOI **contributes 90%**.
- MIDH also provides **technical advice and administrative support** to State Governments/ State Horticulture Missions (SHMs) for the Saffron Mission and other horticulture related activities Rashtriya Krishi Vikas Yojana (RKVY)/National Mission on Sustainable Agriculture (NMSA).
- **Strategies under the mission:**
 - Promote R&D technologies
 - Adopt an end-to-end holistic approach covering pre-production, production, post harvest management
 - Improve productivity through diversification, extension of appropriate technology etc.
 - Improve post harvest management, processing for value addition and marketing infrastructure.
 - Promote partnership, convergence and synergy among R&D, processing and marketing agencies.
 - Promote FPOs
 - Support capacity-building and Human Resource Development
- **Schemes under MIDH:**

Schemes under MIDH	
Sub Scheme	Target group / area of operation
NHM-National Horticulture Mission	All states & UTs except states in NE and Himalayan Region.
HMNEH- Horticulture Mission for North East & Himalayan States	All states in NE and Himalayan Region.
NBM-National Bamboo Mission	All states & UTs
NHB- National Horticulture Board	All states & UTs focusing on commercial horticulture.
CDB-Coconut Development Board	All states & UTs where coconut is grown.
CIH- Central Institute for Horticulture	NE states, focusing on HRD and capacity building.

- CHAMAN 'Coordinated Programme on Horticulture Assessment & Management using geoinformatics' was initiated in 2014 under MIDH for better horticulture assessment and development through remote sensing, GIS and field survey.

About Horticulture in India

- Horticulture includes production, utilisation and improvement of horticultural crops, such as **fruits and vegetables, spices and condiments, ornamental, plantation, medicinal and aromatic plants.**
- Horticulture crops are characterised by **high-value crops, higher productivity** per unit of area and lower requirement of irrigation and input cost.
- The **diverse agro-climatic conditions and rich diversity in crops and genetic resources** enable India to produce a wide range of horticultural crops round the year
- India accounts for **13% of the global production of fruits and 21% of vegetables**, making it the **second largest producer**, after China. India also **ranks at first position** in the production of Banana, Mango, Lime and Lemon, Papaya and Okra.
 - Fruits and vegetables account for **nearly 90% of total horticulture production** in the country.



	2018-19	2019-20*	2020-21**
Area (in mn hectares)	25.74	26.46	27.17
Production (in mn tonnes)	311.05	320.77	326.58

*Final Estimates **First Estimates

3.5.5. COTTON CULTIVATION

Why in News?

Recently, two reports were released by Cotton 2040 titled "Physical Climate risk assessment for global cotton production" and "Physical Climate Risk and vulnerability Assessment for India".

Physical Climate Risk and vulnerability Assessment for India

This report is the **first-ever detailed physical climate risk and vulnerability assessment** for India's cotton value chain.

Physical Climate risk assessment for global cotton production Key Findings:

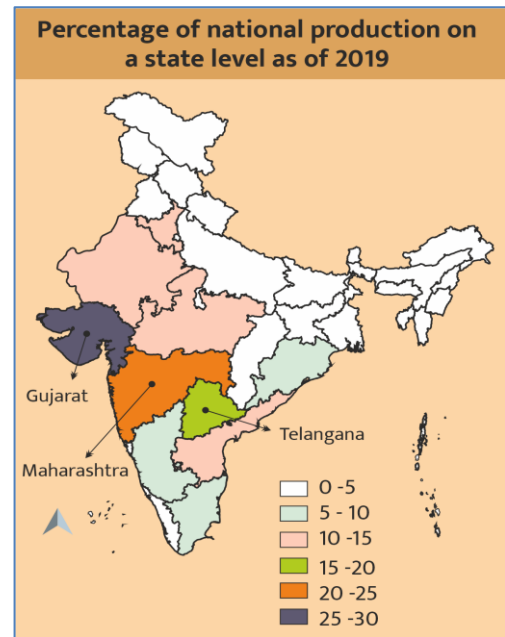
- All global cotton-growing regions will be exposed to **increased risk from at least one climate hazard.**
- All six highest cotton-producing countries – India, USA, China, Brazil, Pakistan and Turkey – are exposed to increased **climate risk, particularly from wildfire, drought and extreme rainfall.**

Cotton 2040

- Cotton 2040 is a platform that envisages a **sustainable global cotton industry** by bringing together leading international brands and retailers, traders, farmers and other stakeholders across the value chain
- It is facilitated by **Forum for the Future**, a leading international sustainability **non-profit.**

Key Findings:

- Climate change could expose **one third of India's cotton growing regions to high risks** from temperature increases, changes to rainfall patterns and extreme weather events by 2040.
- In the 2040s, cotton-growing regions across India will be subject to **greater heat stress** than under present-day conditions.
- In some regions, this increase in temperature is projected to be coupled by an **increase in water stress**.
- All districts are projected to experience an **increase in the number of days at which labour productivity significantly decreases**.
- Common areas of vulnerability across all studied Cotton growing districts include **multidimensional poverty, low female work participation rates, low male and female literacy rates, and limited access to banking services, technology and information**.



Cotton Cultivation in India

- Cotton is a **Kharif crop** and grows well in **black cotton soil** (high water retention capacity) of deccan plateau.
- Annual temperature requirement is **20-28 degree Celsius** and **rainfall of 55-110 cm** is ideal. It requires **minimum 180 frost-free days**.
- The majority of cotton cultivation comes from **ten major cotton growing states**, which are grouped into three diverse agro-ecological zones (Refer Fig).

Northern Zone - Punjab, Haryana and Rajasthan at 16.8% of national production	Central Zone - Gujarat, Maharashtra and Madhya Pradesh at 54.6%	Southern Zone - Telangana, Andhra Pradesh, Karnataka and Tamil Nadu at 26.9%
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KEY FACTS ABOUT COTTON CULTIVATION IN INDIA

<p>Largest Producer</p>	<ul style="list-style-type: none"> • India is the highest cotton producing country in the world (as of 2020) and ranks at first place in terms of land area under cotton cultivation (38% of global cotton area). • India is second largest consumer of raw cotton, after China.
<p>Cotton Species</p>	<ul style="list-style-type: none"> • Indian farmers grow four species of cultivated cotton; <i>Gossypium arboreum</i> (desi cotton) and herbaceum (Asian cotton), <i>Gossypium barbadense</i> (Egyptian cotton) and <i>Gossypium hirsutum</i> (American upland cotton). • Currently, more than 80% of cotton grown in India are Bt cotton hybrids of the upland variety <i>G. hirsutum</i>.
<p>Livelihood</p>	<ul style="list-style-type: none"> • Roughly 60 million people are engaged directly or indirectly in the cotton value chain, with about 40-50 million people employed in the cotton trade and its processing. • The cotton textile industry employs the highest number of people in the country after agriculture and contributes about 4% to the country's GDP.
<p>Exports</p>	<ul style="list-style-type: none"> • In 2018-19, textile and clothing constituted 12% of India's total exports, a large share of which was cotton yarn. • In 2019-20, India produced 6,000 metric tonnes of cotton lint out of which 900 metric tonnes was exported.

3.6. INDUSTRY AND INFRASTRUCTURE

3.6.1. SEMICONDUCTOR MANUFACTURING IN INDIA

Why in News?

Government is reportedly working on a plan to offer around \$1 billion in cash to every company that sets up a Semiconductor chip manufacturing unit in India.

About Semiconductor

- A semiconductor is a **physical substance designed to manage and control the flow of current in electronic devices and equipment**. It either doesn't allow a freely flowing electric current or repels the current completely.
- Semiconductors are an **essential component of electronic devices, enabling advances in communications, computing, healthcare, military systems, transportation, clean energy, and countless other applications**.
- It's generally created using silicon, germanium, or other pure elements. Semiconductors are created by adding impurities to the element.
 - The conductance or inductance of the element depends on the type and intensity of the added impurities.
- There are **two basic types of semiconductors**.
 - An N-type semiconductor is used when its conductance is higher, or there is a large number of free electrons.
 - A P-type semiconductor is used when its inductance is higher, and there are less free electrons.
- Global semiconductor industry is **dominated by the US, South Korea, Japan, and Taiwan**. The US leads the market with a 47% share, followed by South Korea at 19%.

Why is India trying to facilitate Semiconductor manufacturing?

- **To tackle global shortage:** resulting from a surge in demand for electronic items after the outbreak of the COVID-19 pandemic last year, is pushing several countries to have their own chip-making facilities to bring down their dependency on the global supply chain.
- **Electronics manufacturing:** India is the second-largest smartphone manufacturer in the world after China, and chips are at the center of these devices. Further, several new-age technologies, like 5G, Internet of Things (IoT), and artificial intelligence (AI), are likely to drive the demand for chips in the years to come.
- **Strategic requirement:** Semiconductor manufacturing also has strategic advantages, as countries don't want to depend on their imports for essential infrastructure like defence and power.
- **Reducing import bill:** As of now, India is dependent on imports to meet the demand for chips. India consumed around \$21 billion worth of semiconductors in 2019, according to India Electronics and Semiconductor Association (IESA).
- **Fostering innovation:** production and exports of electronic goods at large scale will expose the Indian industry to foreign competition and ideas, which will help in improving its capabilities to innovate for the future.

Initiatives taken

- **100 per cent Foreign Direct Investment (FDI) allowed** under the automatic route in Electronics Systems Design & Manufacturing sector.
- **National Policy on Electronics launched in 2012** to attract global and domestic companies to invest towards the growing **Electronics System Design & Manufacturing (ESDM)** sector in India
- **Union Budget 2017-18 increased the allocation for incentive schemes** like the **Modified Special Incentive Package Scheme (M-SIPS)** and the **Electronic Development Fund (EDF)** for providing a boost to the semiconductor as well as the electronics manufacturing industry.
- **Electronic Manufacturing Clusters Scheme** which provides 50% of the cost for development of infrastructure and common facilities in Greenfield clusters and 75% of the cost for Brownfield clusters
- Union Cabinet has reconstituted an **empowered committee on setting up semiconductor wafer fabrication manufacturing** facilities in the country.
- According to IESA, ESDM industry will benefit from the government's "Make in India" campaign and is **projected to see investment proposals worth Rs 10,000 crore (US\$ 1.5 billion)** over the next two years.

3.6.2. FOOD PROCESSING INDUSTRY

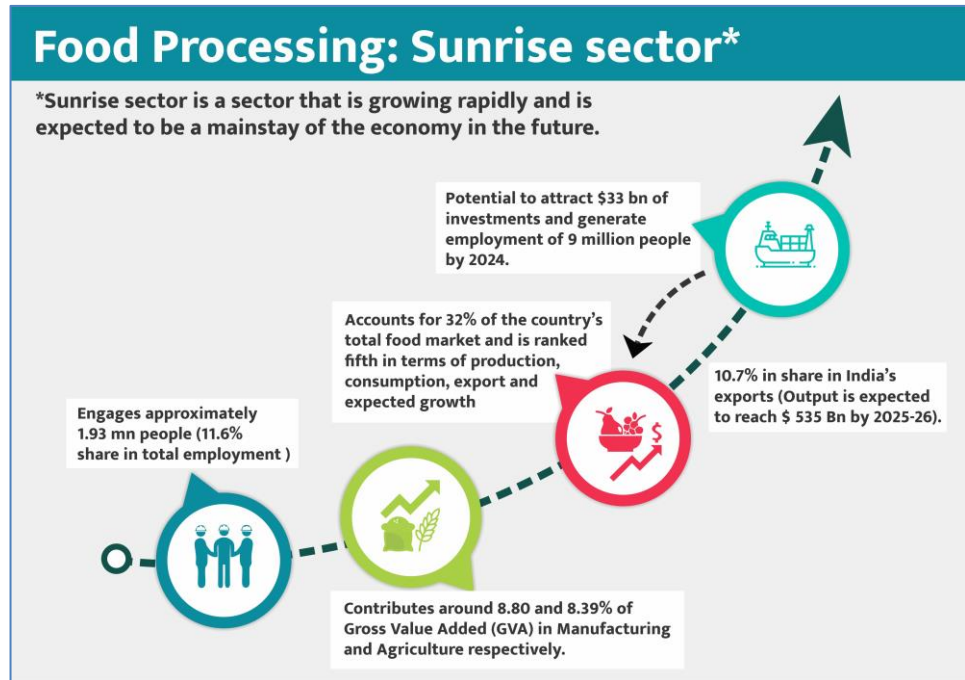
Why in news?

The Ministry of Food Processing Industries (MoFPI) has launched an online portal for '**Production Linked Incentive Scheme for Food Processing Industry**' (PLISFPI).

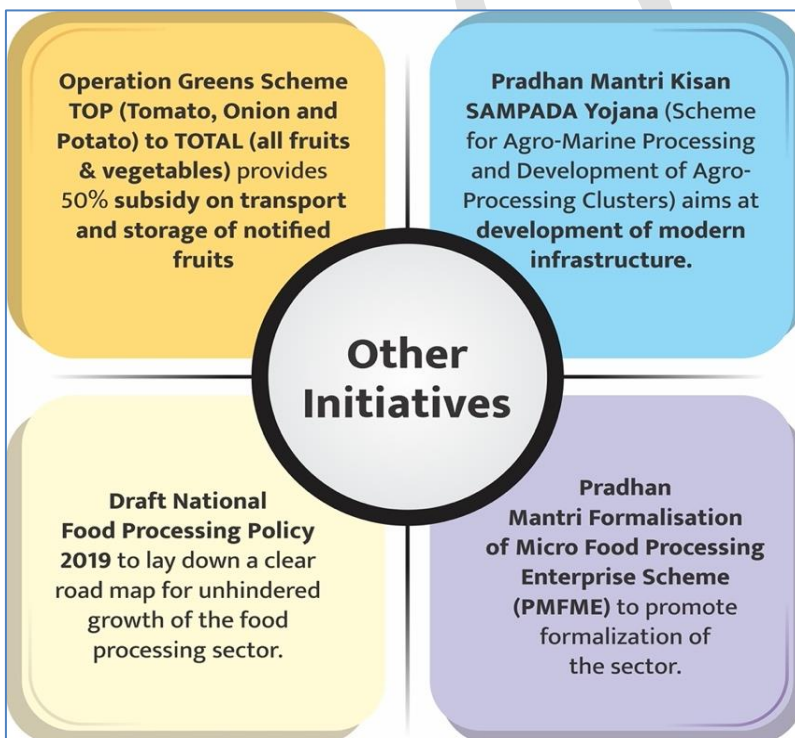
About PLISFPI

- **Objective:** To support creation of **global food manufacturing champions** commensurate with India's natural resource endowment and support **Indian brands of food products in the international markets**.

- It is a **Central Sector Scheme** with an **outlay of Rs. 10900 crores**.
- Scheme will be implemented **over a six-year period** from 2021-22 to 2026-27.
- It has two main Components:
 - **Incentivizing manufacturing** of four major food product segments: Millets based products, Processed Fruits & Vegetables, Marine Products, Mozzarella Cheese.
 - Support for **branding and marketing** abroad.
- Innovative/ Organic products of SMEs including Free Range - **Eggs, Poultry Meat, Egg Products** in these segments are also covered under above component.
- **Scheme is open to:**
 - Proprietary Firm or Partnership Firm or Limited Liability Partnership (LLP) or a Company registered in India
 - Co-operatives
 - SME and making an application for seeking approval for coverage under the Scheme.
- Coverage under the PLI Scheme will **not affect eligibility** under any other scheme and vice versa.



3.7. TOURISM SECTOR IN INDIA

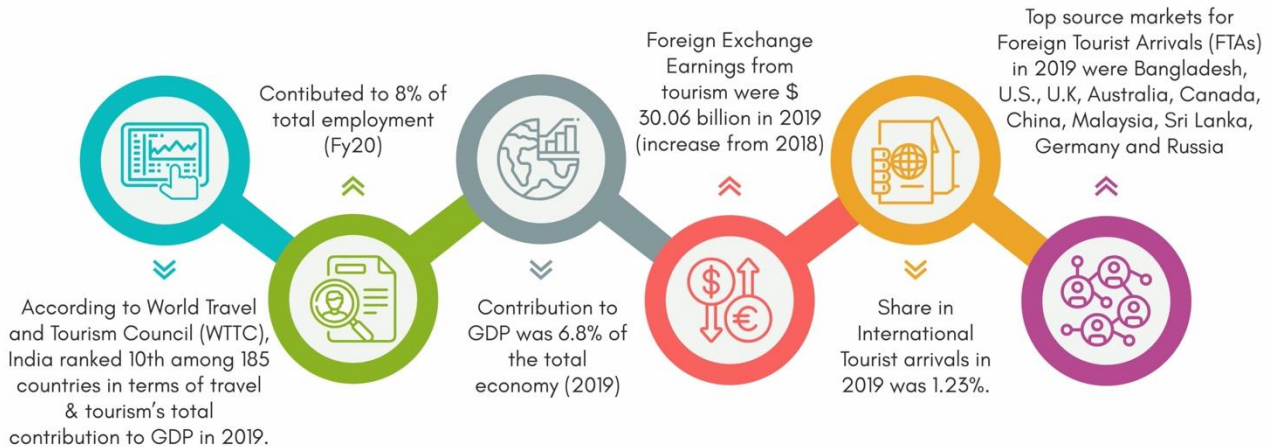


Schemes under SAMPADA Yojana
<ul style="list-style-type: none"> ● Mega Food Parks (to provide modern infrastructure facilities for the food processing along the value chain from the farm to the market); ○ About 22 mega food parks are operational out of 37 approved across the country as on February 2021.
<ul style="list-style-type: none"> ● Integrated Cold Chain and Value Addition Infrastructure;
<ul style="list-style-type: none"> ● Creation/Expansion of Food Processing & Preservation Capacities (Unit Scheme);
<ul style="list-style-type: none"> ● Infrastructure for Agro-Processing Clusters;
<ul style="list-style-type: none"> ● Creation of Backward and Forward Linkages;
<ul style="list-style-type: none"> ● Food Safety and Quality Assurance Infrastructure;

Why in News?

Recently, Ministry of Tourism has formulated several Draft National Strategies and Roadmaps for development and promotion of tourism in the country.

OVERVIEW OF TOURISM IN INDIA



About Ministry of Tourism

- It is the **nodal agency to formulate national policies and programmes** for the development and promotion of tourism.
- Ministry also has the following autonomous institutions:**
 - Indian Institute of Tourism and Travel Management (IITTM).
 - National Council for Hotel Management and Catering Technology (NCHMCT); and the Institutes of Hotel Management (IHMs).
 - Indian Culinary Institute (ICI).
- India Tourism Development Corporation (ITDC) is the only public sector undertaking** under the charge of the Ministry of Tourism.

Recent initiative taken to promote tourism

- e-visa facility has been extended to the nationals of 169 Countries under 5 sub-categories** i.e e-Tourist visa, e-Business visa, e-medical visa, e-Medical Attendant Visa and e-Conference Visa.
 - Triple entry is permitted** for e-Medical Visa and for e-Medical Attendant Visa.
- Ministry of Tourism has **two major schemes for development of tourism infrastructure** in the country including historical places and heritage cities:
 - Swadesh Darshan - Integrated Development of Theme-Based Tourist Circuits.**
 - Under the scheme, fifteen thematic circuits have been identified for development, namely: North-East India Circuit, Buddhist Circuit, Himalayan Circuit, Coastal Circuit, Krishna Circuit, Desert Circuit, Tribal Circuit, Eco Circuit, Wildlife Circuit, Rural Circuit, Spiritual Circuit, Ramayana Circuit, Heritage Circuit, Tirthankar Circuit & Sufi Circuit.
 - PRASHAD- Pilgrimage Rejuvenation and Spiritual, Heritage Augmentation Drive**
 - Under the scheme, 51 sites have been identified at present in 28 States for development.
- Ministry of Tourism has **identified 17 iconic sites in the country for development under Iconic Tourist Sites Development Project.**
- "Incredible India 2.0" Campaign** of the Tourism Ministry marks a shift from the generic promotions being undertaken across the world to market specific promotional plans and content creation.
- Under RCS UDAN-3, connectivity is further improved** with 46 tourism routes included for better connectivity of important tourist places.
- Recently, **Centre announced free visas for 500,000 tourists and a loan guarantee scheme** to support recognised tour operators and tourist guides whose business has been disrupted due to Covid-19 pandemic.

3.8. ONE NATION ONE STANDARD

Why in News?

Recently, Research Design and Standards Organisation (RDSO) of Indian Railways has become the **first Institution to be declared Standard Developing Organization (SDO)** under "One Nation One Standard" mission of BIS (Bureau of Indian Standards).

More on News

- Partnership will help RDSO, the sole R&D wing of the railway ministry, **to realign its standard formulation procedures as per the code of good practices mentioned under the WTO-Technical Barriers to Trade (WTO-TBT).**

- RDSO took the initiative to seek recognition as a SDO **under the BIS SDO Recognition Scheme.**
 - Under the scheme, BIS envisages the recognition of the other SDOs **for attaining the vision of “One Nation One Standard”.**

About WTO-Technical Barriers to Trade (WTO-TBT)

- India is a signatory to WTO-TBT Agreement** under which it is to be ensured that the Central Government, State Government and non-Governmental Standardisation Bodies operating within India as well as regional standardisation bodies within India accept and comply to the Code of Good Practice for the Preparation, Adoption and Application of Standards provided in the Annex 3 of the WTO-TBT Agreement.

About One Nation, One Standard (ONOS)

- Aim is to synergize standards adopted by various SDOs in the country. The idea is **to develop one template of standard for one given product instead of having multiple agencies set it.**
- Currently, **BIS is the only national body that frames standards.** But different Institutions and PSUs also develop standards in their specific domains.
 - For example, the Food Safety and Standards Authority (FSSAI) set standards on food, while Automobile Research Organisation of India makes standards for the automobile sector.

Related News




Mandatory Hallmarking of Gold Jewellery

- It has come into force from June 16** in a phased manner and **jewellers will be allowed to sell only 14, 18 and 22 carats of gold jewellery.**
 - Government has exempted mandatory hallmarking gold on watches, fountain pens and special types of jewellery like Kundan, Polki and Jadau.
- Gold hallmarking is **a purity certification and has been voluntary in nature** so far.
 - Bureau of India Standards has been running a hallmarking scheme for gold jewellery since 2000. **Around 40% of gold jewellery is being hallmarked currently.**
- Benefits of hallmarking:** will enhance the credibility of jewellery, protect the public against lower caratage (purity of gold) etc.

Initiatives taken for standardisation in India

- Indian National Strategy for Standardization:** It considers the current state of development across sectors, the existing quality infrastructure and the policy directions in relation to domestic economic developments and for trade in goods and services.
- Formulation of Indian Standards is one of the core activities of BIS.** The activity is done through 17 Division Councils representing diverse areas of economy and technology such as Civil engineering, Electrotechnical, chemical, services etc.
- Pahchan Initiative:** To organize and standardize the Indian Handicrafts, Government has registered approximately 22.85 lakhs artisans under Pahchan initiative.
- Quality Control Orders (QCOs):** For ensuring availability of quality products to consumers, QCOs are issued by various Ministries/ Departments.

Some standards applied in India

Mark 	Certifying Agency 	Description 
ISI mark	BIS	It is mandatory for a number of products, especially electronic goods. But in cases of other manufactured products, it is voluntary.
BIS Hallmark	BIS	It verifies that the jewellery conforms to the standards which are set by BIS.
Fruit Products Order (FPO) mark	Ministry of Food Processing Industries	It is a certification mark mandatory on all processed fruit products sold in India following the Food Safety and Standards Act of 2006.
Indian Organic certification	Agricultural and Processed Food Products Export Development Authority (APEDA).	It is a certification mark for organically farmed food products manufactured in India.
Agricultural Marketing (AGMARK)	Directorate of Marketing and Inspection	It is legally enforced in India by the Agricultural Produce (Grading and Marking) Act of 1937 (and amended in 1986).



3.9. ECONOMIC CONCEPTS IN NEWS

Alternate Investment Fund (AIF)	<ul style="list-style-type: none"> Labour ministry has notified that Employees Provident Fund Organisation can invest up to 5% in AIF to support infra push. AIF means any fund established or incorporated in India which is a privately pooled investment vehicle which collects funds from sophisticated investors, whether Indian or foreign, for investing it in accordance with a defined investment policy for the benefit of its investors. SEBI categorises AIF into <ul style="list-style-type: none"> Category I AIF like Venture Capital Funds. Category II AIF like Private Equity (PE) Funds. Category III AIF like Hedge Funds.
Escrow Account	<ul style="list-style-type: none"> Recently, Securities and Appellate Tribunal (SAT) allowed National Stock Exchange (NSE) to withdraw Rs 6,085 crore deposited by it in an escrow account. About Escrow Account <ul style="list-style-type: none"> It is an account where funds or assets are held in trust by a third party whilst two or more parties complete a transaction. It offers benefits like overcoming uncertainty on ability to meet obligations and facilitating custody of cash, securities and other collaterals based on the transaction type.
Ricochet Impact	<ul style="list-style-type: none"> IMF has warned for Ricochet impact on advanced economies as the Emerging-market nations struggle to claw out of the pandemic-induced economic crisis can spill over to hurt the developed world Ricochet Impact, also known as transfer effect, refers to the negative impact on the one who helps others. <ul style="list-style-type: none"> Today, the risks of increase in interest rates with little or no growth among the emerging nations, can limit their ability to service debt thereby hurting the developed nations as well as global supply chains.
Anchor Investor	<ul style="list-style-type: none"> Life Insurance Corp. of India (LIC) is looking to raise upto 25000 crore from anchor investors. Anchor investors are institutional investors who are invited to subscribe the shares before the Initial Public Offers (IPOs). <ul style="list-style-type: none"> Each anchor investor needs to invest a minimum of Rs 10 crore. Anchor investors are essentially brought in to enhance the confidence of investors and gauge the demand for the IPO in the market.

3.10. ECONOMIC INSTITUTIONS IN NEWS

Network for Greening the Financial System	<ul style="list-style-type: none"> The Reserve Bank of India (RBI) has joined the Central Banks and Supervisors Network for Greening the Financial System (NGFS) as a Member. About NGFS: <ul style="list-style-type: none"> The NGFS is a group of Central banks and supervisors willing to share the best practices and contribute to the development of the environment and climate risk management in the financial sector. The System was launched at the Paris One Planet Summit in December 2017.
Enforcing Contracts Portal	<ul style="list-style-type: none"> Portal, launched by Department of Justice, aims to promote ease of doing business and improve Contract Enforcement Regime in country. <ul style="list-style-type: none"> Portal is envisioned to be a comprehensive source of information pertaining to legislative and policy reforms being undertaken on “Enforcing Contracts” parameters (was ranked 163 in 2019 rankings). It will provide easy access to latest information on commercial cases in Dedicated Commercial Courts of Delhi, Mumbai, Bengaluru and Kolkata. Portal to also provide access to repository of commercial laws for ready reference.
Tax Without Borders (TIWB)	<ul style="list-style-type: none"> Bhutan’s TIWB programme was launched in partnership with India. It aims to aid Bhutan in strengthening its tax administration and focus of the programme will be in the area of International Taxation and Transfer Pricing. TIWB is a joint initiative of the United Nations Development Programme (UNDP) and the Organisation for Economic Cooperation and Development (OECD) to enable sharing of tax audit knowledge and skills with tax administrations in developing countries.

Business responsibility and sustainability report (BRSR)	<ul style="list-style-type: none">• Securities and Exchange Board of India (SEBI) issued a circular notifying new disclosure norm on sustainability related reporting for the top 1,000 listed companies by market cap by FY23.<ul style="list-style-type: none">○ The reporting will be under a new BRSR format.• BRSR is a notable departure from the existing business responsibility report and a step towards bringing sustainability reporting at par with financial reporting.<ul style="list-style-type: none">○ Now, companies will need to provide an overview of their material environmental, social, governance (ESG) risks and opportunities and approach to mitigate or adapt to the risks along with financial implications.
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 SMART QUIZ	You can scan this QR code to practice the Smart Quiz of Economics at our open test online platform for testing your understanding and recalling of the concepts.	
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**ALL INDIA
CSAT PRELIMS
OPEN MOCK TEST-4**

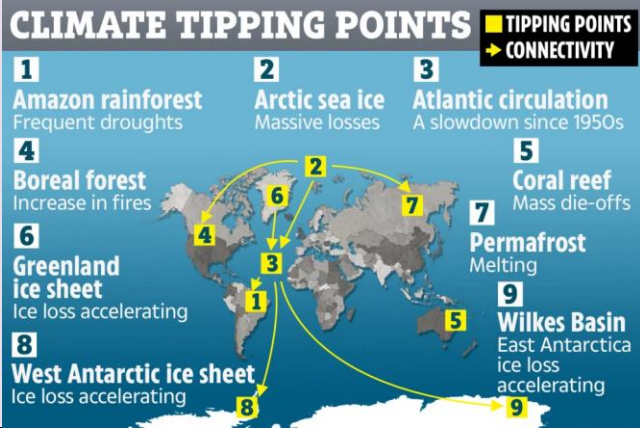
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4. ENVIRONMENT

4.1. CLIMATE CHANGE

<p>Tipping points</p>	<ul style="list-style-type: none"> • These are thresholds where a tiny change could push a system into a completely new state. <ul style="list-style-type: none"> ▪ Globally, there are nine “tipping points” where a changing climate could push parts of the Earth system into abrupt or irreversible change. • Nine tipping points- 
<p>Forest Carbon Credit Stamps</p>	<ul style="list-style-type: none"> • China has issued its first batch of forest carbon credit stamps to use market mechanisms to reduce carbon emissions. • Forest carbon credits stamps are permits for companies to emit a certain amount of carbon dioxide. They are converted from added forest areas and the amount of carbon they can capture. • These credits can also serve as collateral for bank credit and loans. • The forest carbon credit system harbors great potential amid China's pursuit of peaking carbon emissions by 2030 and achieving carbon neutrality by 2060.
<p>Network for Greening the Financial System</p>	<ul style="list-style-type: none"> • The Reserve Bank of India (RBI) has joined the Central Banks and Supervisors Network for Greening the Financial System (NGFS) as a Member. • About NGFS: <ul style="list-style-type: none"> ○ The NGFS is a group of Central banks and supervisors willing to share the best practices and contribute to the development of the environment and climate risk management in the financial sector. ○ The System was launched at the Paris One Planet Summit in December 2017.
<p>The Leaf Coalition</p>	<ul style="list-style-type: none"> • The LEAF Coalition was launched by an initial group of governments (Norway, UK, US) and leading companies (like Amazon, Nestle etc.) to mobilise finance for protection of tropical forest. • The LEAF (Lowering Emissions by Accelerating Forest finance) coalition aims to mobilize at least \$1 billion in finance to support tropical and subtropical forest countries to move rapidly towards reducing emissions from deforestation. • It is expected to become one of the largest public-private efforts that support countries in achieving their Nationally Determined Contributions (NDCs) under the Paris Agreement and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism. • Reductions in emissions are to be made through programs that involve all key stakeholders, including Indigenous peoples and local communities.

4.2. INITIATIVES/MEASURES TO COMBAT POLLUTION

<p>United Nations Global Compact's CEO Water Mandate</p>	<ul style="list-style-type: none"> • NTPC Ltd has become a signatory to the prestigious United Nations Global Compact's CEO Water Mandate. <ul style="list-style-type: none"> ○ The Mandate was formed in 2007 to mobilize business leaders to advance water stewardship, sanitation, and the Sustainable Development Goals in partnership with United Nations, governments, peers, civil society, and others.
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	<ul style="list-style-type: none"> The Mandate develops tools and resources, convenes stakeholders, and facilitates meaningful partnerships and on-the-ground collective actions that improve conditions in at-risk river basins around the world.
AIM-ICDK Water Innovation Challenge	<ul style="list-style-type: none"> Atal Innovation Mission (AIM), NITI Aayog in partnership with Innovation Center Denmark (ICDK) concluded the global finals of the Next Generation Water Action (NGWA) Water Innovation Challenge. Innovative ideas were invited in following challenge areas: <ul style="list-style-type: none"> Digital water management solutions, Solutions for monitoring and prevention of leakage in city water supply, Waste water management across rural belts and urban settlements, Rainwater harvesting in rural and urban settlements, and Safe and sustained drinking water.
Ethanol Blending	<p>Central government has advanced the target of 20% ethanol blending in petrol (also called as E20), by five years to 2025, from 2030.</p> <ul style="list-style-type: none"> The Government has also released an expert committee report on the ‘Roadmap for Ethanol Blending in India by 2025’. <ul style="list-style-type: none"> It proposes a gradual rollout of ethanol-blended fuel to achieve E10 fuel supply by April 2022 and phased rollout of E20 from April 2023 to April 2025. Earlier, National Biofuel Policy 2018 had envisaged an indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel by 2030. <ul style="list-style-type: none"> In 2020, India had set a target of 10% ethanol-blending in petrol by 2022, 20% ethanol-blending in petrol by 2030 and 10% ethanol-blending in diesel by 2030. It also recommends introducing vehicles that are compatible by rolling out of E20 material-compliant and E10 engine-tuned vehicles from April 2023 and production of E20-tuned engine vehicles from April 2025.
Ethanol-based 'flex-fuel' vehicles	<ul style="list-style-type: none"> An FFV is a modified version of vehicles that could run both on gasoline and doped petrol with different levels of ethanol blends. <ul style="list-style-type: none"> These are currently being used successfully in Brazil, giving people the option to switch fuel (gasoline and ethanol). Government plans to issue guidelines for 'flex-fuel' vehicles (FFV) by October. <ul style="list-style-type: none"> The government is also working on an incentive scheme to promote manufacture and use of flex engines in vehicles. For auto companies, introduction of FFVs will pose another challenge that they are already facing with the fast adoption of electric vehicles. If standards on FFVs are made mandatory, it would require additional investment in production lines and technology transfers to change the character of the vehicles.

4.3. BIODIVERSITY

4.3.1. MAHSEER

Why in News?

The Blue-Finned Mahseer, which was on the International Union for Conservation of Nature’s (IUCN) red list as ‘**critically endangered**’, has now moved to the ‘**least concern**’ status.



About Mahseer

- The Mahseer (roughly translates as **mahi – fish and sher – tiger**, is also referred as “**tiger among fish**”). It is **important indicator** of freshwater ecosystems.
- Out of **47 subspecies** of Mahseer **15 are found in India** and rest in other range countries in South Asia.
- Mahseer **prefers clean, fast flowing and well oxygenated waters** for breeding and migration.
- They are **omnivor**ous.
- Threats faced**:
 - Sensitive to dissolved oxygen levels, water temperature and sudden climatic changes
 - Pollution, habitat loss, over-fishing, construction of dams (impacting migration patterns) etc.
 - Wildlife (Protection) Act 1972 **does not explicitly draw attention to fish** under the **definition of ‘wild animal’**.









• Major Types of Mahseer

Golden Mahseer	Found in the Himalayan streams and rivers. Its IUCN status is 'Endangered'.
Blue Fin / Deccan Mahseer	Found in rivers of Deccan Plateau and South India.
Red Finned Mahseer	Found in the rivers of central India.
Chocolate Mahseer	Found in the North Eastern region
Orange-Finned /Humpback Mahseer	Found in Cauvery River and its tributaries. IUCN status is 'Critically endangered'

<p>Project Mahseer</p> <ul style="list-style-type: none"> It was started in 1971 as a collaborative effort between Tata Power and Central Institute of Fisheries Education. Around 5 lakh mahseer are bred at the Walvan Hatchery in Lonavala, Maharashtra. An artificial lake has been created for the purpose by the Walvan Dam project under Tata Power. The project has finally borne fruit after an effort spanning 50 years by getting the fish de-listed from Red list of IUCN.

4.3.2. OTHER FLORA AND FAUNA IN NEWS

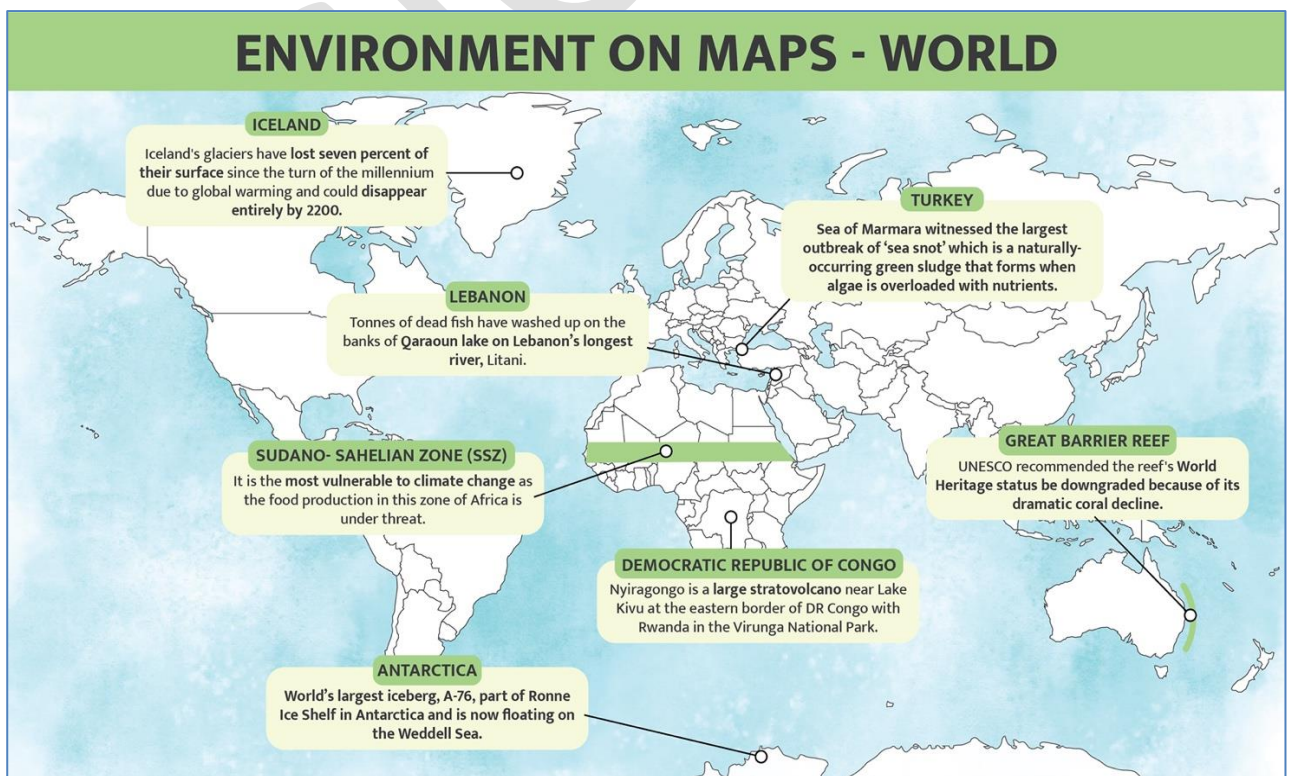
Species	Details
<p>Bharitalasuchus tapani</p> 	<ul style="list-style-type: none"> It is a carnivorous reptile species that lived 240 million years ago, and it might have been the largest predators in that ecosystem. It belongs to a genus and species previously unknown called Bharitalasuchustapani. <ul style="list-style-type: none"> In Telugu, Bhari means huge, Tala means head, and Suchus is the name of the Egyptian crocodile-headed deity. Fossils have been found on the rocks of the Yerrapalli Formation (Rock formation in the Pranhita–Godavari Basin in Telangana).
<p>Hoolock gibbon</p> 	<ul style="list-style-type: none"> A study led by Centre for Cellular and Molecular Biology (CCMB), Hyderabad scientists states that India has only western hoolock gibbon (another species known as eastern hoolock gibbon is not found in India). Hoolock gibbons are small apes and the only apes present in India. They are found in Arunachal Pradesh and Assam. IUCN Red List: Endangered 
<p>Blackbuck</p> 	<ul style="list-style-type: none"> Odisha's blackbuck population has doubled in the last six years. At present, Blackbucks are confined to Ganjam district in the southern part of the state. <ul style="list-style-type: none"> In India the species is wide spread in Rajasthan, Gujarat, Madhya Pradesh, Tamilnadu and other areas throughout peninsular India. Blackbuck is considered to be the fastest animal in the world next to Cheetah. <ul style="list-style-type: none"> It is the State animal of Andhra Pradesh, Haryana and Punjab It is in the Schedule-I of Wildlife (Protection) Act, 1972. IUCN status: Least Concerned (LC) 
<p>Coelacanth fish</p> 	<ul style="list-style-type: none"> Coelacanth is an extremely rare deep sea species of fish which has been found alive in the Indian Ocean. These were thought to have gone extinct with the dinosaurs 65 millions of years ago. There are only two known species of coelacanths: one lives near the Comoros Islands off the east coast of Africa, and other found in the waters off Sulawesi, Indonesia. IUCN Status: Critically Endangered. Sulawesi Coelacanth is listed as 'vulnerable'.

4.3.3. PROTECTED AREAS IN NEWS

Protected Area	Details
Andhra Pradesh	
Atapaka Bird Sanctuary	<ul style="list-style-type: none"> It is located in Kolleru lake on Krishna-West Godavari borders in Andhra Pradesh Kolleru lake is one of the largest freshwater lakes in India.
Assam	
Dihing Patkai National Park	<p>The Assam government has notified Dihing Patkai as the 7th National Park (NP) of the state.</p> <ul style="list-style-type: none"> Under the Wildlife Protection Act 1972, both the State (section 35) and Central (section 38) government can declare an area as National Park. Earlier, the State government has also notified Raimona Reserve Forest as the 6th National Park in western Assam's Kokrajhar district.

	<ul style="list-style-type: none"> ○ With Phipsoo wildlife sanctuary in Bhutan to its north, Buxa tiger reserve in West Bengal to its west and Manas national park in Assam to its east, it is home to the Golden langur, Clouded leopard and Indian gaur. ● Assam has five older National Parks- Kaziranga, Manas, Nameri, Orang and Dibru-Saikhowa. <ul style="list-style-type: none"> ○ Kaziranga and Manas are UNESCO World Heritage Sites. They are also tiger reserves along with Nameri and Orang. ● Assam (7) now has the third most National Parks after Madhya Pradesh (12) and Andaman and Nicobar Islands (9). <div data-bbox="523 432 1337 1037" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; background-color: #FFD700; margin: 0;">7 National parks of Assam</p> </div>
<p>Gujarat</p> <p>Banni Grassland Reserve</p>	<ul style="list-style-type: none"> ● Banni Grassland Reserve is in the Kutch district of Gujarat. <ul style="list-style-type: none"> ○ Banni region emerged from the sea as a result of tectonic activities, received soils from the rivers flown from Bhuj mainland which made the land of Banni richer to generate diverse grass species ● Maldhari tribe lives in the Banni Grasslands Reserve area, for the past thousand years. <ul style="list-style-type: none"> ○ Maldhari community is a tribe of herdsmen in Gujarat. They live in settlements called ness and make their living by selling milk from their water buffaloes. <div data-bbox="868 1077 1437 1534" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; background-color: #4CAF50; color: white; margin: 0;">BANNI GRASSLAND</p> </div>
<p>Madhya Pradesh</p> <p>KunoPalpur Wildlife Sanctuary</p>	<ul style="list-style-type: none"> ● Eight cheetahs from South Africa will be rehabilitated in the Kuno national park (MP). This is first time in the world that a large carnivore will be relocated from one continent to another. <ul style="list-style-type: none"> ○ Park is a part of KunoPalpur Wildlife Sanctuary (Sheopur-Shivpuri forested landscape) and is a suitable location due to favorable habitat, prey abundance etc. ● It was also the place prepared by MP to house Asiatic lions. ● About Cheetahs <ul style="list-style-type: none"> ○ IUCN status: <ul style="list-style-type: none"> ✓ African Cheetah- Vulnerable ✓ Asiatic Cheetah – Critically endangered.

	<ul style="list-style-type: none"> ○ Asiatic Cheetah (around 50-70) is only found in Iran while African Cheetah is found in wild in Africa. ○ Cheetahs don't need much water and can survive in dry forests, grasslands, open plains and desert regions.
Odisha	
Bhitarkanika Protected area	<ul style="list-style-type: none"> • Cyclone Yaas fells hundreds of trees in Bhitarkanika • Bhitarkanika National Park in Odisha's Kendrapara district is India's second-largest mangrove forest <ul style="list-style-type: none"> ○ However, mangroves which protected the region from cyclones were vanishing fast. ○ It lies in the estuarial region of Brahmani-Baitrani with Bay of Bengal lying in the East ○ The area was designated a national park in 1998 and a Ramsar site by UNESCO in 2002 • The Gahirmatha Beach which forms the boundary of the sanctuary in the east is the largest colony of the Olive Ridley Sea Turtles.
Rajasthan	
Ramgarh Vishdhari wildlife sanctuary	<ul style="list-style-type: none"> • Rajasthan is all set to get its fourth tiger reserve (TR) after Ramgarh Vishdhari wildlife sanctuary in Bundi received a nod from the National Tiger Conservation Authority (NTCA). <ul style="list-style-type: none"> ○ Other TR in Rajasthan: Ranthambore, Sariska, and Mukundra ○ It will be 52nd TR of India. • The sanctuary currently has leopards, sambhars, chitals, wildboars, smaller cats, caracals, chinkaras and nilgai.
Tamil Nadu	
Anamalai Tiger Reserve	<ul style="list-style-type: none"> • Anamalai Tiger Reserve is carved out of the Tamil Nadu portion of the Anamalais. <ul style="list-style-type: none"> ○ It lies South of the Palakkad gap in the Southern Western Ghats. ○ The Reserve falls within the Western Ghats mountain chain. • Anamalais is a home for six different indigenous people: <ul style="list-style-type: none"> ○ Malai Malasars ○ Kadar ○ Malasar ○ Muduvan ○ Pulayar ○ Eravallar



ENVIRONMENT IN NEWS - INDIA

Updated Classroom Study Material

CHAMBAL RIVER
Amid lockdown, population of Gangetic dolphins and gharial in the Chambal river increased significantly.

HIMACHAL PRADESH
Protests against Jangi Thopan Powari HEP. It is a run of River project located on River Satluj, Kinnaur district.

ASSAM
Located in Kokrajhar district, Raimona has become Assam's sixth national park and Dihing Patkai as the 7th.

INDIRA GANDHI CANAL (IGC)
Repair and relining of IGC was accomplished in a record time.

RAJASTHAN
Ramgarh Vishdhari Wildlife Sanctuary

MADHYA PRADESH
Kuno Palpur Wildlife Sanctuary

GUJARAT
Ministry of Culture and Ministry of Shipping signed a MoU for Development of National Maritime Heritage Complex at Lothal. Banni Grassland Reserve.

ODISHA AND WEST BENGAL
Odisha and West Bengal plans to plant mangroves along its coast to act as natural barrier against the strong winds during cyclones.

ODISHA
Bhitarkanika Protected area

ANDHRA PRADESH
Atapaka Bird Sanctuary

KARNATAKA
NGT formed a committee to investigate into the alleged violation of norms in the construction of Mekedatu Dam across the Cauvery river

TAMIL NADU
Anamalai Tiger Reserve

4.4. SUSTAINABLE DEVELOPMENT

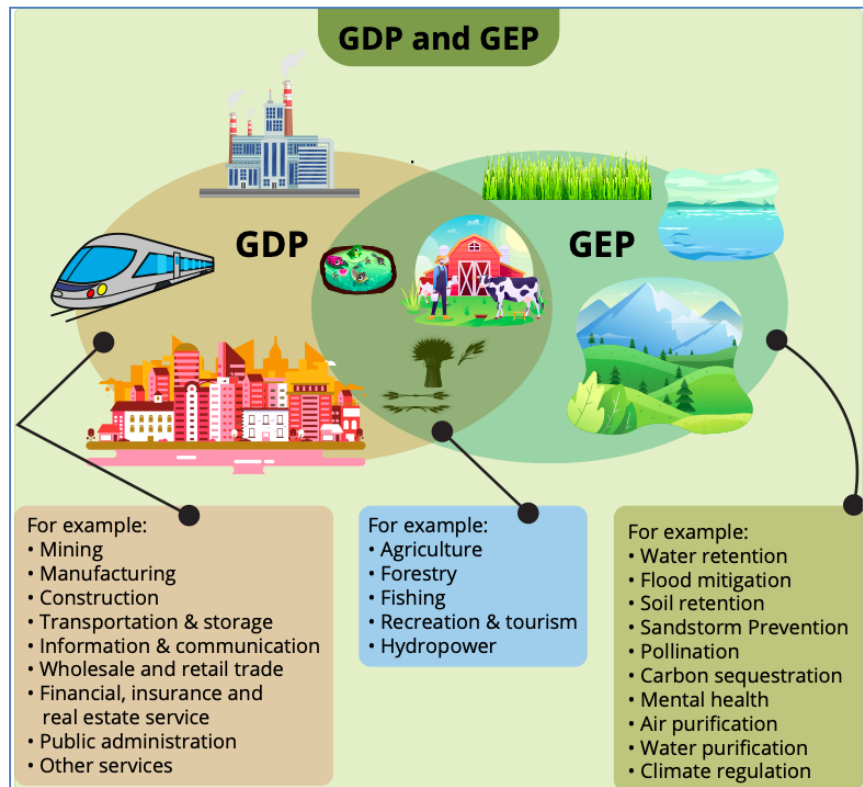
4.4.1. GROSS ENVIRONMENT PRODUCT

Why in news?

On World Environment Day (June 5), **Uttarakhand became the first state in India to take into account Gross Environment Product (GEP) while calculating its Gross Domestic Product (GDP).**

More in news

- **Four critical natural resources- Air, Water, Forest and Soil- will be assigned monetary values.** The **quality and quantity** of these natural resources would **determine the GEP of Uttarakhand.**
- Discussions on having a GEP in the state came after the Kedarnath disaster (2013) and were further accentuated by the acute water shortage in the state during summers.



What is GEP?

- It is the **total value of final ecosystem services supplied to human well-being in a region annually** and can be **measured in terms of biophysical value and monetary value.**
- It indicates the **overall health of the environment** as GEP measures prime indicators such as forest cover, soil erosion, air quality and dissolved oxygen in river water.
- **GEP monetizes the loss of biodiversity** and other environmental factors.
- **Unlike Green GDP** which is obtained after deducting the damage to the environment from the total production of the state, **GEP will assess the improvement in the environment components in a year.** Further it will tell **how much work the state has done in reducing the loss of the ecosystem** in environmental protection and resource use.

Other global standards /initiatives

- **System of Environmental and Economic Accounts (SEEA):** guidebook developed by the United Nations to provide standards for incorporating natural capital and environmental quality into national accounting systems.
- **China** (since 2004) has been undertaking studies to estimate the cost of various types of environmental damage which offsets its economic growth. China's investment in pollution control and renewable energy has been growing rapidly since then.
- The **Happy Planet Index (HPI)** created by the British New Economics Foundation (NEF) measures national welfare in the context of environmental sustainability.
- **Bhutan's Gross National Happiness (GNH)** has environmental preservation as one of the four policy objectives.
- **Sweden** (since 2003) has brought in various environmental indicators (like air emissions, waste etc.) as part of the government policy of achieving sustainable development

4.4.2. ECOSYSTEM RESTORATION

Why in news?

United Nations Environment Programme (UNEP) published "Ecosystem Restoration for People, Nature and Climate".

More on the news

- The report has been published in association with Food and Agriculture Organization (FAO) for **UN Decade on Ecosystem Restoration:2021-2030**.
 - Ecosystem Restoration **means assisting in the recovery of ecosystems** that have been degraded or destroyed, as well as conserving the ecosystems that are still intact.
- **Key findings**
 - **We are using the equivalent of 1.6 Earths** to maintain our current way of life, and ecosystems cannot keep up with our demands.
 - Every year **ecosystem services worth more than 10% of our global economic output is lost**.
 - **Around 1/3rd of the world's farmland is degraded**, about 87% of inland wetlands worldwide have disappeared since 1700, and **1/3rd of commercial fish species are overexploited**.
 - Degradation is already **affecting the well-being of 40% of the world's population**.
 - Countries need to deliver on their existing commitments **to restore 1 billion hectares of degraded land** and make similar commitments for marine and coastal areas.
 - **Restoration is essential for keeping global temperature rise below 2°C** among other benefits (refer to the box).
- **Recommendations:** Restoration (halting and reversing degradation) and avoiding degradation, large-scale investments in dryland agriculture, mangrove protection and water management will make a vital contribution.

4.4.3. VIRTUAL WATER ANALYSIS

Why in News?

IIT-Guwahati team recommends Virtual Water analysis for better water management policies in India

About Virtual Water

- Virtual Water (VW) is the **water involved in the production and trade of food and non-food commodities and services**. It is that “invisible” water that has been consumed throughout the lifecycle of the product or service.
 - For ex: On an average, **3000 liters of water is required for producing 1 kg of rice**.
- Owing to its sizable agricultural exports, **India has been losing water thereby putting its water sustainability at risk**. VW analysis could help India in defining its trade characteristics.
 - As per estimates, between 2006 and 2016 India **exported 26,000 million litres of VW on an average every year**.
- **Significance of the VW analysis**
 - **Optimizing domestic water use** through imports of water intensive agriculture products.
 - **Reducing pressure on freshwater resources** in water arid states by diversifying the production areas.
 - Help in **framing evidence-based water policies** and in establishing the link between the hydrological-economic-institutional aspects of water scarcity.
 - Will provide **alternative to mega project such as Interlinking of Rivers** to alleviate regional water scarcity.

4.4.4. USED COOKING OIL BASED BIODIESEL

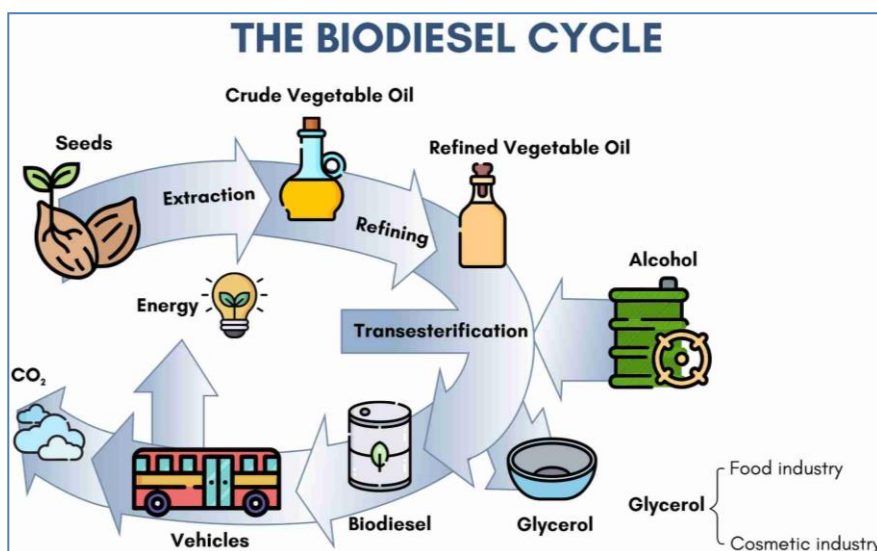
Why in News?

Recently, Indian Oil Corporation has kicked-off the supply of diesel that is blended with biodiesel made from used cooking oil.

About Used Cooking Oil (UCO)

- UCOs are oils and fats that have been used for cooking or frying in the food processing industry, restaurants, fast foods and at consumer level, in households.
 - UCO must contain only fats, oils, or greases **that were previously used for cooking or frying operations**.
- UCO is an **important source of raw material to produce biodiesel**.
- It is also used for making soap, cosmetics, cooking oil, and animal feed, etc.

- **Benefits of biodiesel made from UCO:** Cut reliance on imports, reducing carbon emissions, help to reach the target of 5% Biodiesel blending, help to divert the unhealthy used oil from the food chain to a more productive purpose, promotes circular economy, prevents clogging of drains from discarded UCO.



- During frying, **several properties of oil are altered**, total polar compounds are formed on repeated frying. The toxicity of these compounds is **associated with several diseases such as hypertension, atherosclerosis, Alzheimer's disease, liver diseases.**

Initiative taken to make biodiesel from UCO

- In 2019, Ministries of Petroleum and Natural Gas & Steel, along with Health & Family Welfare, Science & Technology and Earth Sciences, **had initiated Expressions of Interest for "Procurement of Bio-diesel produced from UCO"**
 - It aims to create an eco-system for collection and conversion of UCO into Biodiesel and developing entrepreneurship opportunities.
 - Under this initiative, OMCs offer periodically **incremental price guarantees for five years and extend off-take guarantees for ten years to prospective entrepreneurs.**
- **National Policy on Biofuels, 2018**, encourages setting up of supply chain mechanisms for **biodiesel production from non-edible oilseeds, Used Cooking Oil, short gestation crops.**
- **Food Safety and Standards Authority of India (FSSAI)** in association with the Biodiesel Association of India (BDAI) **launched 'Repurpose Used Cooking Oil (RUCO) project'** in 2019.
 - Project is aimed at purchasing used oils from hoteliers, caterers, snack makers and traders at a reasonable price and converting it into biodiesel at a plant.
- **RUCO sticker and a mobile phone application was launched** for collection of used cooking oil (UCO) to ensure that it does not come back to ecosystem.

Issues with RUCO

- At present, there is **no established chain of collection for UCO.**
- **Presence of impurities** like free fatty acid and water in UCO.
- RUCO require **large food business operators to store UCO separately**, which they can then sell to authorised UCO aggregators or collection agencies.

4.4.5. ORGANIC FARMING

Why in news?

About 14,491-hectare area in Andaman and Nicobar has been certified as organic under the Large Area Certification (LAC) Scheme of the PGS-India (Participatory Guarantee System) certification programme (the first large contiguous territory to be certified).

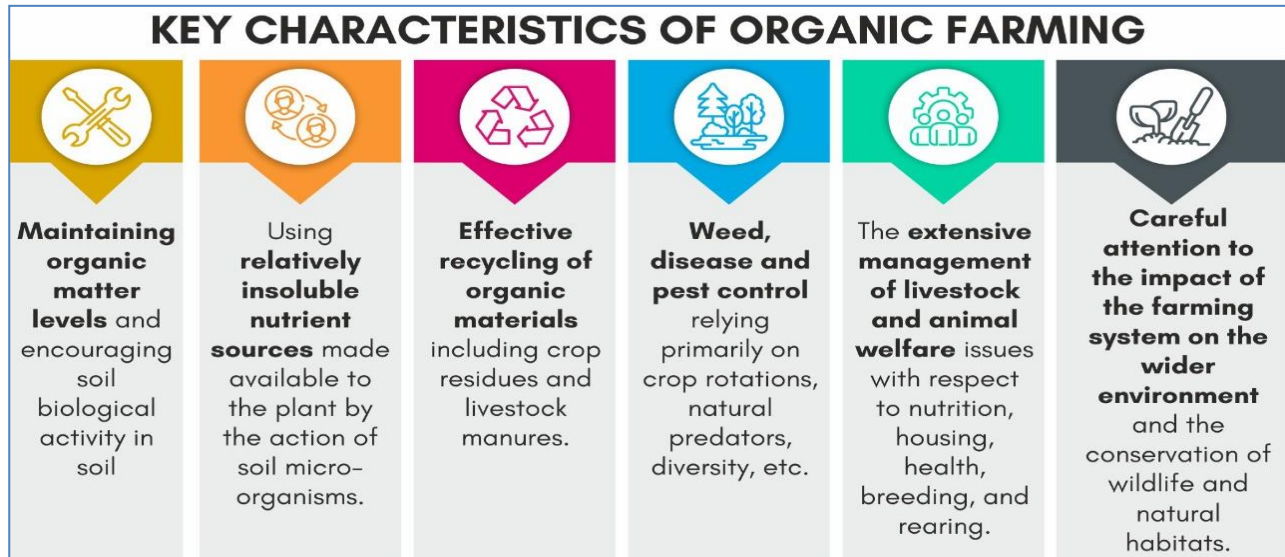
About LAC

- It is a unique quick certification programme to harness the potential areas of Organic farming in India.
- It was launched by the Department of Agriculture and Farmers Welfare under its flagship scheme of **Paramparagat Krishi Vikas Yojana (PKVY).**
- Under LAC, **each village in the area is considered as one cluster or group** and simple documentations are maintained village-wise.
- All farmers with their farmland and livestock need to adhere to the standard requirements and on being verified get certified en-mass without the need to go under conversion period.

- **Certification is renewed on annual basis** through annual verification by a process of **peer appraisals as per the process of PGS-India.**

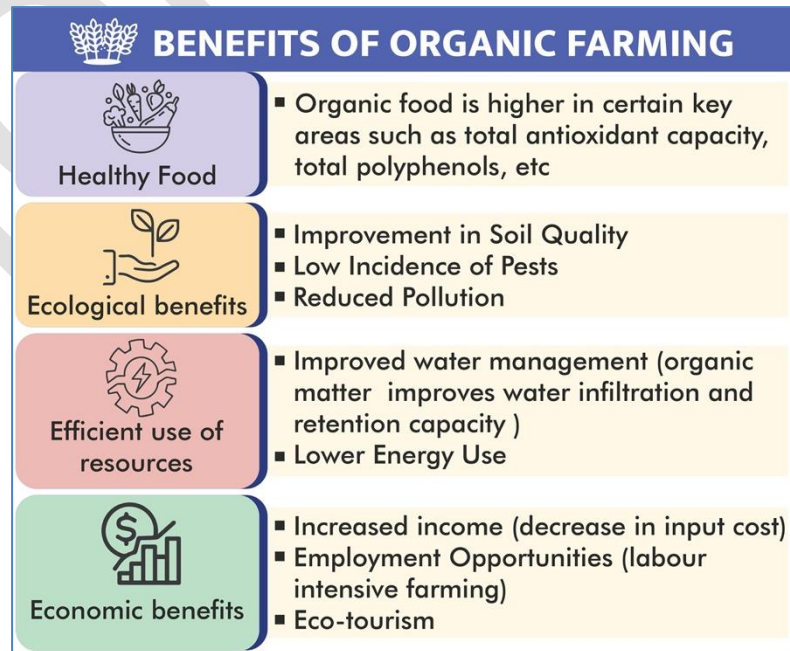
About Organic farming

- As per **Food and Agriculture Organisation** “Organic agriculture is a unique production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity, and this is accomplished by using on-farm agronomic, biological and mechanical methods in exclusion of all synthetic off-farm inputs”.
- Organic products are grown under a system of agriculture without the use of chemical fertilizers and pesticides with an environmentally and socially responsible approach.



Government Initiatives to promote Organic Farming in India

- **Paramparagat Krishi Vikas Yojana (PKVY):** It is a part of National Mission of Sustainable Agriculture (NMSA).
 - Under the scheme, Organic farming is promoted through adoption of organic villages by cluster approach and Participatory Guarantee System (PGS) certification.
- **Mission Organic Value Chain Development for North East Region (MOVCD):** It is a Central Sector Scheme which aims to develop certified organic production in a value chain mode to link growers with consumers and to support the development of the entire value chain.



- **Soil Health Card:** The scheme aims to improve Soil Health by providing nutrients information to the farmers. It has led to a decline of 8-10% in the use of chemical fertilizers and raised productivity by 5-6%.
- **Agri-export Policy 2018:** It focuses on marketing and promotion of organic agriculture products foods to aid organic farming in India.
- **Zero Budget Natural Farming:** Government is actively promoting Zero budget natural farming. It is a method of chemical-free agriculture drawing from traditional Indian practices.

CERTIFICATION CONFUSION

For any food to be sold as organic in India, whether fresh produce or packaged product, it must be certified via one of two systems. That road can be long, winding and often expensive.

NATIONAL PROGRAMME FOR ORGANIC PRODUCTION (NPOP)



Adopted in 2001 and administered by the Ministry of Commerce & Industry, it was originally meant for exports.



Under this programme, one of 28 third-party certifiers must check that a farm is free of manufactured chemicals (fertilizers, insecticides, herbicides hormones and pesticides).



In case of processed food, the certifier checks that the produce came from an NPOP certified farm and was processed by a NPOP-certified processor.



Certified foods carry the India Organic logo. The standards are recognized by the European Commission, America's USDA, and Switzerland.

THE CATCH

- **Third-party certification** is expensive and must be renewed annually.
- **So the programme** is restricted to big companies, ones that work with farmers over thousands of acres, and earn revenues largely from exporting non-perishables - oilseeds, processed food, cereals, tea, spices and pulses.

PARTICIPATORY GUARANTEE SYSTEM FOR INDIA (PGS-INDIA)

: It operates outside the framework of third-party certification.



Practised in 38 countries and recognized by the Union Ministry of Agriculture & Farmers Welfare since 2018, it certifies clusters of small farmer (two and five acres each)



Five or more growers who live close to each other form a group and get trained in organic farming under a government scheme.



Then, with help from Regional Councils (India now has 562), farmers inspect each other's holdings, Should a grower violate any norms, their produce is not sold through group.



India now has 6,646 PGS groups, covering about 2.1 lakh farmers.

THE CATCH

- **The system is poorly founded**, farmers are often trained badly and the system does little to create a long-term market for organic produce.
- **The PGS is not recognized** by the US and European Union, two big markets for organic food, So small farmers cannot sell their produce abroad.
- **They can't sell** their food to NPOP-certified processors either, This means they often have little incentive to stay organic.

4.4.6. OTHER IMPORTANT NEWS

<p>IREDA bags 'Green Urja Award'</p>	<ul style="list-style-type: none"> ● Indian Renewable Energy Development Agency Ltd. (IREDA) has been conferred with 'Green Urja Award' for being the Leading Public Institution in Financing Institution for Renewable Energy in 2021 by Indian Chamber of Commerce (ICC). ● IREDA is a Mini Ratna (Category - I) Government of India Enterprise under the administrative control of Ministry of New and Renewable Energy (MNRE). <ul style="list-style-type: none"> ○ It is a Public Limited Government Company established as a Non-Banking Financial Institution in 1987.
<p>Clean Energy Ministerial's (CEM) - Industrial Deep Decarbonization Initiative (IDDI)</p>	<ul style="list-style-type: none"> ● India and UK launched CEM-IDDI. ● IDDI is a global coalition of public and private organisations who are working to stimulate demand for low carbon industrial materials. <ul style="list-style-type: none"> ○ Coordinated by UNIDO, the IDDI is co-led by the UK and India. ○ Germany and Canada have also joined the initiative. ● It works to

- Standardise carbon assessments
- Establish ambitious public and private sector procurement targets
- Incentivise investment into low-carbon product development and design industry guidelines.
- It brings together a strong coalition of related initiatives and organizations to tackle carbon intensive construction materials such as steel and cement like
 - The Mission Possible Platform
 - The Leadership Group for the Industry Transition
 - The International Renewable Energy Agency (IRENA)

4.5. GEOGRAPHY

4.5.1. GLACIAL LAKE ATLAS OF GANGA RIVER BASIN

Why in News?

Recently, Ministry of Jal Shakti (MoJS) released an atlas of glacial lakes that are part of the Ganga River basin.

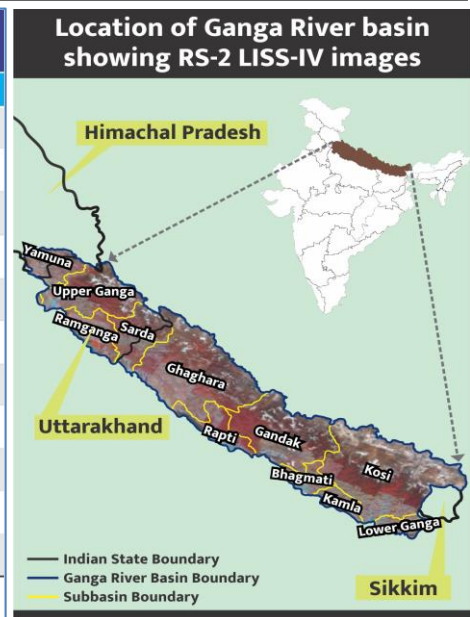
More on News

- Atlas is brought out under National Hydrology Project (NHP).
- In the present study, glacial lakes with water spread area ≥ 0.25 ha have been mapped using Resourcesat-2 satellite data.

About Ganga River Basin

- The Ganga River basin extends over Central Himalayas in India, Nepal, Tibet (China), and Bangladesh.
- It contains 9 of the 14 highest peaks in the world over 8,000 m in height, including Mt. Everest.
 - Other peaks over 8,000 m in the basin are Kanchenjunga, Lhotse, Makalu, Cho Oyu, Dhaulagiri, Manaslu, Annapurna, and Shishapangma.
- In this atlas, Ganga River basin has been divided into 11 subbasins (refer infographic) on the basis of confluence of major rivers contributing into the system viz., Yamuna joining on the right, whereas rivers like Sarada, Ghaghara, Gandak, and Kosi joining on the left.
- Climate over the Ganga River basin is mainly tropical and subtropical to temperate subhumid on the plains.

Details of subbasins of Ganga River basin			
S. No.	Subbasin	Area (Km) ²	Area (%)
1	Bhagmati	7,635	3.09
2	Gandak	36,465	14.76
3	Ghaghara	53,072	21.48
4	Kamla	6,106	2.47
5	Kosi	59,709	24.16
6	Lower Ganga	6,543	2.65
7	Ramganga	11,455	4.65
8	Rapti	11,423	4.62
9	Sarda	17,326	7.01
10	Upper Ganga	25,675	10.39
	Yamuna	11,701	4.73
	Total	2,47,110	100.00



About National Hydrology Project (NHP)

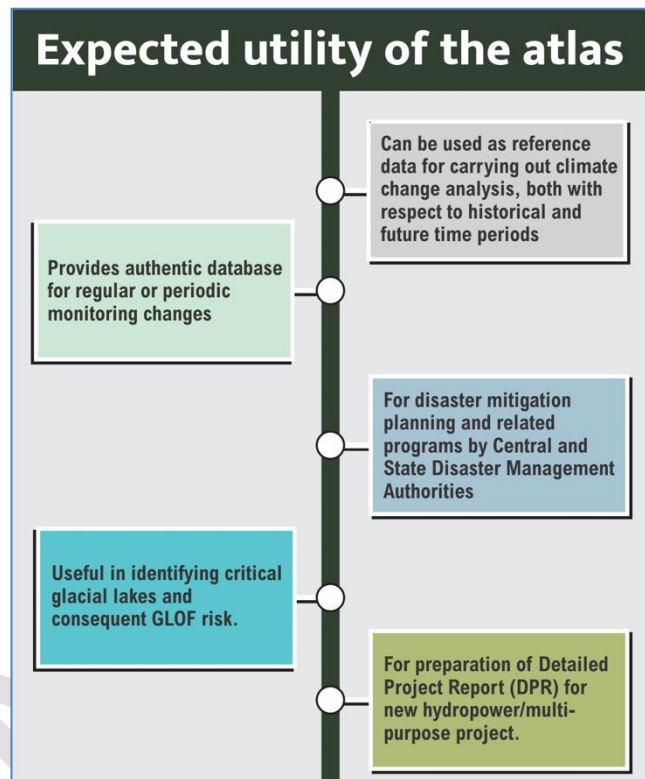
- NHP, under MoJS, aims to improve the extent, quality and accessibility of water resources information and to strengthen the capacity of targeted water resources management institutions in India.
- Under NHP, National Remote Sensing Centre (NRSC), ISRO, is carrying out hydrological studies using satellite data and geo-spatial techniques.
 - As part of this, detailed glacial lake inventory, prioritization for Glacial Lake Outburst Flood (GLOF) risk, and simulation of GLOF for selected lakes are taken up for entire catchment of Indian Himalayan Rivers covering Indus, Ganga, and Brahmaputra River basin.

About Glacial Lake

- It is defined as water mass existing in a sufficient amount and extending with a free surface in, under, beside, and/or in front of a glacier and originating from glacier activities and/or retreating processes of a glacier.
- As glaciers retreat, the formation of glacial lakes takes place behind moraine or ice 'dam'.
- These damming materials are generally weak and can breach suddenly due to various triggering factors, leading to catastrophic floods. Such outburst floods are known as GLOF.

Key Findings of the Atlas

- Based on its process of lake formation, location, and type of damming material, glacial lakes are identified in nine different types, majorly grouped into four categories viz.,
 - Moraine-dammed** (form during periods of glacier retreat from a moraine),
 - Ice-dammed** (when drainage is blocked by a glacier that advances or becomes thicker),
 - Glacier Erosion, and**
 - Other Glacial lakes.**
- A total of **4,707 glacial lakes have been mapped.**
 - Lakes with ≥ 5 ha in size are 672 (14.28%) contributing to 76.87% of total lake area in the basin.
 - More than half of the lakes are situated in the very high-altitude range of greater than 5,000 m and dominated by Other Moraine Dammed Lake type.
 - Out of 11 subbasins, **only 6 subbasins contain glacial lakes**, which are predominantly distributed in Kosi subbasin (51.77%) followed by Ghaghara subbasin (26.77%).
 - Minimum number of glacial lakes are present in Yamuna subbasin** and then in Sarda subbasin.
 - Glacier Ice-dammed Lake is only one in the entire Ganga River basin and is located in Gandak subbasin.
- Uttarakhand shares 93.50% of lake count**, followed by 6.50% in Himachal Pradesh.
- Each glacial lake has been given a 12 alpha-numeric unique glacial lake ID**, along with several attributes that include hydrological, geometrical, geographical, and topographical characteristics.



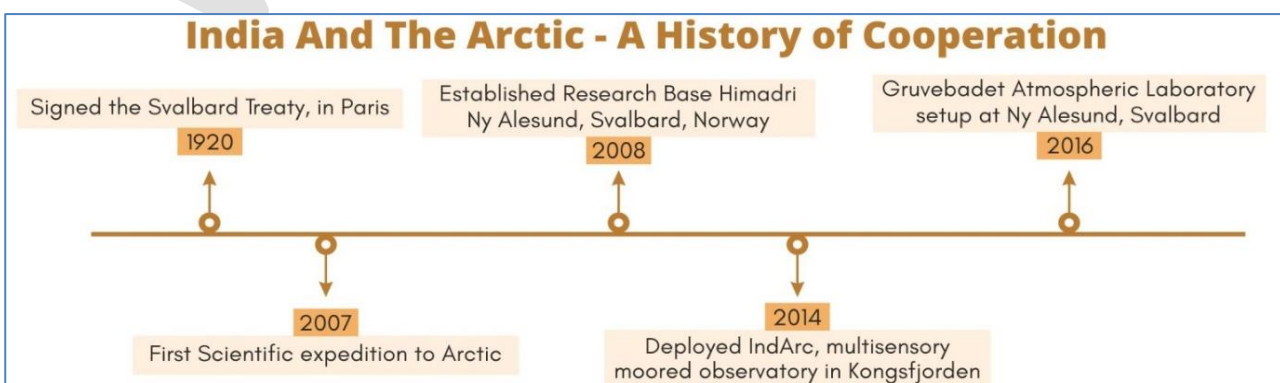
4.5.2. 3RD ARCTIC SCIENCE MINISTERIAL (ASM3)

Why in News?

India recently participated in the 3rd Arctic Science Ministerial (ASM3).

More on the news

- ASM3, **jointly organised by Iceland and Japan**, is the **first Ministerial meeting being held in Asia** to highlight the value of Arctic science research conducted by non-Arctic States.
 - ASM1 and ASM2 were held in the USA in 2016 and Germany in 2018, respectively.
- Objective:** To **provide opportunities to various stakeholders**, including academia, indigenous communities, governments and policymakers, to **enhance collective understanding of the Arctic region**, emphasize and engage in constant monitoring, and strengthen observations.



- **India's engagement with Arctic**
 - India enjoys 'Observer' status in the Arctic Council since 2013
 - ✓ Arctic council is a **high-level intergovernmental forum for Arctic cooperation** that was set up with the twin-mandate of **environmental protection and sustainable development**.
 - ✓ **Member state:** Canada, Denmark, Finland, Russia, US, Iceland, Norway, Sweden
 - Recently released a **draft Arctic Policy document** that outlines five pillars of India's Arctic policy: **scientific research, economics and human development; connectivity; global governance and international cooperation; and development of Indian human resource capabilities.**
 - **Arctic region** refers to the region above the Arctic Circle, north of latitude 66° 34' N, which **includes Arctic Ocean with North Pole at its centre.**

4.5.3. DEEP OCEAN MISSION

Why in News?

The Cabinet recently approved the Deep Ocean Mission.

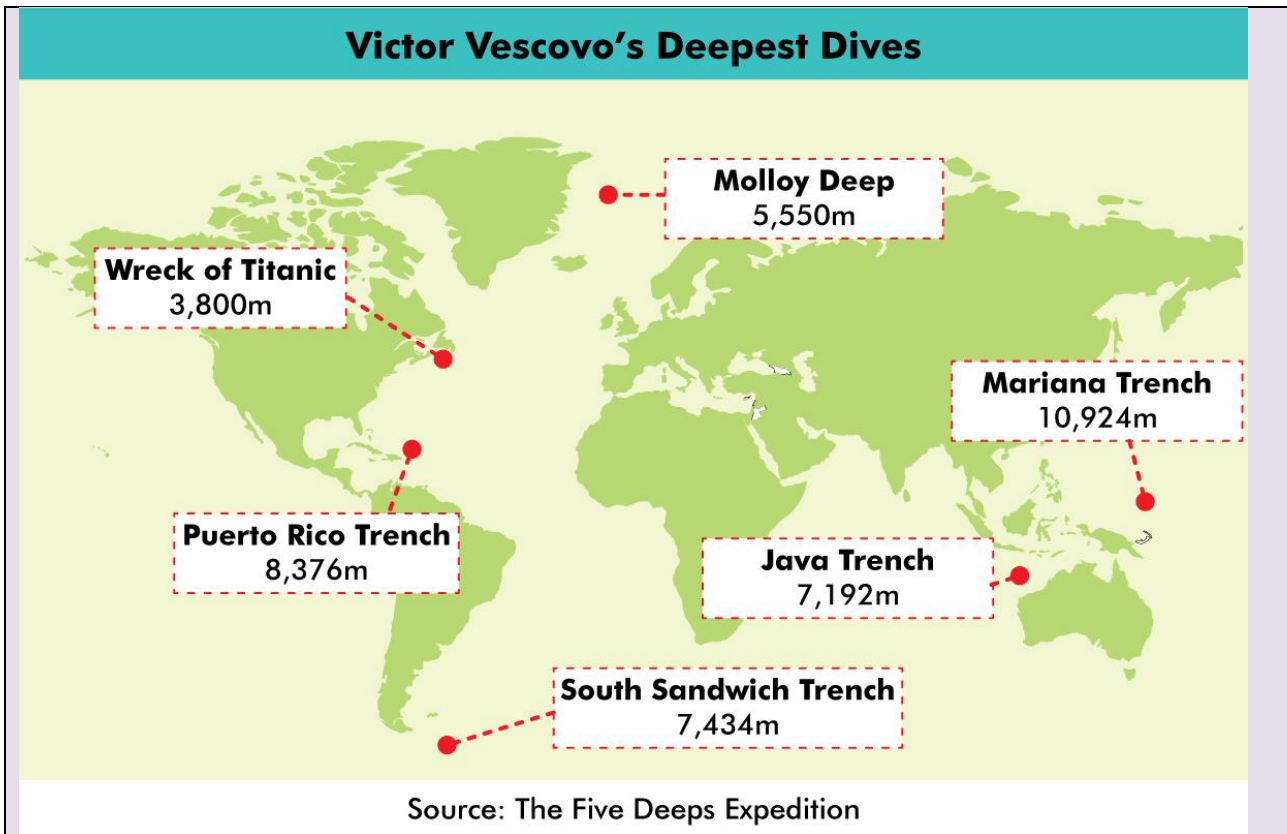
About the mission

- Mission aims to **explore Deep Ocean for resources and develop deep sea technologies** for sustainable use of ocean resources. It will be a **mission mode project to support Blue Economy Initiatives.**
 - Blue Economy is **sustainable use of ocean resources for economic growth, improved livelihoods, and jobs.** Its size in India is about 4% of the GDP.
- Mission will be implemented in a **phase-wise manner over a period of 5 years.** Ministry of Earth Sciences will be the nodal Ministry.
- **Major components** of the Mission:

Component	Objective
Development of Technologies for Deep Sea Mining, and Manned Submersible	<ul style="list-style-type: none"> • A manned submersible will be developed to carry three people to a depth of 6000 metres. • An Integrated Mining System for mining Polymetallic Nodules in the central Indian Ocean.
Development of Ocean Climate Change Advisory Services	<ul style="list-style-type: none"> • To understand and provide future projections of important climate variables on seasonal to decadal time scales.
Technological innovations for exploration and conservation of deep-sea biodiversity	<ul style="list-style-type: none"> • Bio-prospecting of deep sea flora and fauna including microbes and studies on sustainable utilization of deep sea bio-resources.
Deep Ocean Survey and Exploration	<ul style="list-style-type: none"> • To explore and identify potential sites of multi-metal Hydrothermal Sulphides mineralization along the Indian Ocean mid-oceanic ridges.
Energy and freshwater from the Ocean	<ul style="list-style-type: none"> • Studies and detailed engineering design for offshore Ocean Thermal Energy Conversion powered desalination plant.
Advanced Marine Station for Ocean Biology.	<ul style="list-style-type: none"> • Development of human capacity and enterprise in ocean biology and engineering. • Will translate research into industrial application and product development.

Related news: Five Deeps Expedition

- The Five Deeps Expedition is the **first manned expedition to reach the deepest points** in each of the world's five oceans.
- The Expedition is led by explorer and private equity investor **Victor Vescovo.**



4.5.4. OTHER IMPORTANT NEWS

Heat Dome in Northern America	<ul style="list-style-type: none"> • Heat dome is an area of high pressure that parks over a region like a lid on a pot, trapping heat. <ul style="list-style-type: none"> ○ They are more likely to form during La Niña years like 2021, when waters are cool in the eastern Pacific and warm in the western Pacific. ○ That temperature difference creates winds that blow dense, tropical, western air eastward. • Warm air gets trapped in the jet stream—a current of air spinning counter-clockwise around the globe—and ends up on the U.S. West Coast.
Turbidity Current	<ul style="list-style-type: none"> • A vast underwater avalanche (called turbidity current) occurred (in 2020) off West Africa, in a deep canyon leading away from Congo River. • Turbidity current is a rapid, downhill flow of water caused by increased density due to high amounts of sediment. <ul style="list-style-type: none"> ○ Turbidity is a measure of level of particles such as sediment, plankton, or organic by-products, in a body of water. • Turbidity currents can be caused by earthquakes, collapsing slopes, and other geological disturbances. • Once set in motion, turbid water rushes downward and can change physical shape of seafloor.
Southern Ocean: World's fifth ocean	<ul style="list-style-type: none"> • National Geographic Society has recognised the Southern Ocean (SO) as the world's fifth ocean in addition to the Pacific, Atlantic, Indian and Arctic Oceans. • It will constitute most of the waters that surround Antarctica out to 60° south latitude excluding the Drake Passage and Scotia Sea. • Unlike other oceans that are defined by the continents that fence them, the SO is defined by a current called Antarctic Circumpolar Current (ACC). • Significance includes climate regulation through heat distribution, supporting of cold fragile marine ecosystems etc.



Zero Shadow Day

- Recently, Odisha's Bhubaneswar witnessed Zero Shadow Day. It is a rare celestial phenomenon during which **no shadow** of an object or a being is observed.
- The phenomenon **occurs twice a year** when the **sun is at its highest point in the sky at all the regions between the Tropic of Cancer and the Tropic of Capricorn.**
- Due to the sun being exactly overhead, the **shadow of all beings or objects disappears**, resulting in Zero Shadow Day.

Lunar Eclipse and Super Moon

- A **Lunar eclipse occurs when the Sun, Earth and the Moon are in Straight line** in the plane of the ecliptic and Earth lies between the Sun and the Moon.
 - The Lunar Eclipse can be of three types:
 - ✓ **Total Lunar Eclipse:** When Moon is exactly in the plane of ecliptic with Umbra or inner part of earth shadow falling on Lunar Surface
 - ✓ **Partial Lunar Eclipse:** When Moon is close to the plane of ecliptic with Umbra covering only a part of Lunar Surface
 - ✓ **Penumbral Lunar Eclipse:** When moon passes through the partial shadow of the Earth, i.e., Penumbra
- Super Moon occurs when during the Full Moon or New Moon**, it is closest to the Earth in its perigee.



<p>Summer Solstice</p>	<ul style="list-style-type: none"> • It occurs when the sun is directly over Tropic of Cancer (between June 20-22), resulting in longest day of the year in Northern Hemisphere. • During the solstice, the Earth's axis is tilted in a way that the North Pole is tipped towards the sun and the South Pole is away from it. • Amount of incoming energy from the sun on this day is 30 per cent higher at the North Pole than at the Equator. <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>Seasonal configuration of Earth and Sun</p> </div> </div>

4.5.5. PROTECTED PLANET REPORT 2020

Why in News?

UN Environment World Conservation Monitoring Centre (UNEP-WCMC), the International Union for Conservation of Nature (IUCN) and the National Geographic Society released the report.

About the report

- Protected Planet Reports are biennial landmark publications that **assess the state of protected and conserved areas around the world.**
 - **Protected and conserved areas** collectively describe all sites in terrestrial and aquatic systems that aim to achieve, or are effective in achieving, conservation outcomes.
 - Protected areas can prevent species extinctions and experience lower levels of human pressure than external areas.
- The 2020 edition **provides the final report on the status of Aichi Biodiversity Target 11** and looks to the future as the world prepares to adopt a new post-2020 global biodiversity framework.
- It is the first in the series to **include data on other effective area-based conservation measures (OECMs)** in addition to protected areas.
 - **Other effective area-based conservation measures (OECMs)** are conservation designation for areas that are achieving the effective in-situ conservation of biodiversity outside of protected areas.
 - While protected areas must have conservation as a primary objective, **there is no restriction on the management objectives of OECMs**, provided those objectives result in effective long-term conservation outcomes for biodiversity.

KEY FINDINGS OF THE REPORT



Increase in the Protected Areas and OECMs

- ▶ About **82%** of countries and territories increased their share of protected area and coverage of OECM since 2010.
- ▶ Since 2010, protected areas covering almost **21 million km²** have been added to the global network.
- ▶ Of the area now covered **42%** was added in the past decade with greatest growth has been in marine and coastal areas.
- ▶ Connectivity among protected areas and OECMs is improving, facilitating the movement of species and maintenance of ecological processes.



Challenges Identified

- ▶ Data remain poor on the effectiveness of governance and management in protected areas and OECMs.
- ▶ Integrating protected areas and OECMs across landscapes and seascapes, and in development sectors, remains a crucial challenge for ensuring the persistence of biodiversity.
- ▶ Particular efforts are needed to expand marine protected and conserved areas beyond coastal waters.



Suggestions

- ▶ Greater application of the global standard for effectiveness, the IUCN Green List of Protected and Conserved Areas, will help to improve governance and management in protected areas and OECMs.
- ▶ Both protected areas and OECMs can have a variety of governance regimes: government, private, governance by indigenous peoples and local communities, or any combination of these.
- ▶ Investing in more effective national and global networks recognizing the role that protected and conserved areas can play as nature-based solutions to climate change and other global challenges.
- ▶ Protected and conserved area expansion can be achieved in part by recognising and accounting for the existing efforts of indigenous peoples, local communities and private actors.

About Aichi Biodiversity Targets

- In 2010, at Nagoya, Parties to the Convention on Biological Diversity (CBD) adopted the **Strategic Plan for Biodiversity 2011–2020**, a ten-year framework for action by all countries and stakeholders to safeguard biodiversity and the benefits it provides to people.
- As part of the Strategic Plan 20 ambitious but realistic targets, known as the **Aichi Biodiversity Targets**, were adopted.
 - Aichi Biodiversity Target 11 aims to conserve 17 per cent of land and inland water ecosystems and 10 per cent of its coastal waters and oceans by 2020.

4.6. REPORTS IN NEWS

4.6.1. GLOBAL ELECTRIC VEHICLES (EV) OUTLOOK

Recently, International Energy Agency (IEA) and Electric Vehicles Initiative (EVI) released the annual **Global EV Outlook 2021**.

Major Findings of the Report

- The world had **10 million electric cars** on roads at the end of 2020 (Close to **2.5% of the current market share**).
- If governments accelerate towards **Sustainable Development Scenario**, the global EV fleet will reach to a **market share of 12%**. Sustainable Development Scenario includes-
 - **Ensuring universal energy access** for all by 2030.
 - Efforts to bring about sharp **reductions in emissions of air pollutants**.
 - **Meeting global climate goals** in line with the Paris Agreement.
- Factors supporting EVs sale:
 - **Supportive regulatory frameworks**.
 - **Additional incentives to safeguard EV** sales from the economic fluctuations.
 - **Expanding number of EV models** with continuous **fall in battery cost**.
- **5 major barriers** to its adoption are-
 - Limitations of **Charging Infrastructure**.
 - Current varieties **do not satisfy the market demand**.
 - **Initial Cost** associated with EVs.
 - Operational issues like **long charging time**.
 - Uncertain/**underdeveloped policy landscape**.

About Electric Vehicles Initiative (EVI)

- It is a **multi-governmental policy forum** established in 2010 under the Clean Energy Ministerial (CEM).
- **Fifteen countries** are currently participating in EVI, including **India**, with IEA acting as the coordinator.
- It works towards **accelerating the introduction and adoption** of electric vehicles worldwide. This includes campaigns and programmes like-
 - **EV30@30-** to have at least 30% new electric vehicle sales by 2030.
 - **EVI Global EV Pilot City Programme (EVI-PCP)-** a platform for global cities to communicate and cooperate for increasing the uptake of electric mobility.

4.6.2. OTHER REPORTS

Report	Details and Key Findings
World Energy Investment Report 2021	<ul style="list-style-type: none"> • Published by: International Energy Agency (IEA). <ul style="list-style-type: none"> ○ IEA was created in 1974 to help co-ordinate a collective response to major disruptions in the supply of oil. • Key findings <ul style="list-style-type: none"> ○ In 2021, annual global energy investment is set to rise to USD 1.9 trillion, rebounding nearly 10% from 2020. ○ Renewables will dominate investment in new power generation and are expected to account for 70% of 2021's total of USD 530 billion spent on all new generation capacity. ○ Upstream investment in oil and gas is expected to grow 10 percent. ○ Global emission is set to grow by 1.5 billion tones.
State of Finance for Nature Report	<ul style="list-style-type: none"> • Published by: United Nations Environment Programme, the World Economic Forum and the Economics of Land Degradation (ELD). <ul style="list-style-type: none"> ○ ELD, a global strategy for sustainable land management, is a global initiative established in 2011 by United Nations Convention to Combat Desertification supported by a broad network of partners across diverse fields of knowledge. • Report highlights importance of investing in nature-based solutions (NBS) to meet global biodiversity and land degradation targets. <ul style="list-style-type: none"> ○ NBS are actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. • Key findings of the report <ul style="list-style-type: none"> ○ More than half of the world's total GDP is moderately/highly dependent on nature. Agriculture, food and beverages and construction are the largest sectors dependent on nature.

	<ul style="list-style-type: none"> ○ Approximately USD 133 billion per year currently flows into NBS (using 2020 as base year), with public funds making up 86% and private finance 14%. ○ Global biodiversity and land degradation targets can be met only if annual investments in NBS are tripled by 2030 and increased four-fold by 2050 from the current level of investments. ○ Currently, Public sector spending for NBS is dominated by the United States and China, followed by Japan, Germany and Australia.
Global Assessment Report on Disaster Risk Reduction (GAR)	<ul style="list-style-type: none"> ● Published by: UN Office for Disaster Risk Reduction (UNDRR). ● GAR Special Report on Drought 2021 explores the systemic nature of drought and its impacts on achievement of Sendai Framework for Disaster Risk Reduction, SDGs and human and ecosystems health and wellbeing. <ul style="list-style-type: none"> ○ UNDRR oversees the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030. ● Key highlights of the report: <ul style="list-style-type: none"> ○ 20 million people across Africa and middle east came to brink of starvation owing to droughts. ○ 700 million people are at a risk of being displaced as a result of drought by 2030. ○ Two third of the world will be under water stressed conditions by 2025. ● India specific findings <ul style="list-style-type: none"> ○ Effect of severe droughts on India's gross domestic product (GDP) is estimated at 2–5% ○ Deccan region sees the highest frequency (>6%) of severe droughts in all of India. Significant drought conditions are found once in every three years in Deccan plateau leading to large scale migration and desertification. ○ Overdependence on groundwater resources and lack of water-retaining structures have significantly increased vulnerability in Indian cities during severe drought events.

 SMART QUIZ	You can scan this QR code to practice the Smart Quiz of Environment at our open test online platform for testing your understanding and recalling of the concepts.	
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FAST TRACK COURSE 2021

GENERAL STUDIES PRELIMS

PURPOSE OF THIS COURSE

The GS Prelims Course is designed to help aspirants prepare for & increase their score in General Studies Paper I. It will not only include discussion of the entire GS Paper I Prelims syllabus but also that of previous years' UPSC papers along with practice & discussion of Vision IAS classroom tests. Our goal is that the aspirants become better test takers and can see a visible improvement in their Prelims score on completion of the course.

INCLUDES

- Access to recorded live classes at your personal student platform.
- Comprehensive, relevant & updated Soft Copy of the study material for prelims syllabus.
- Access to PT 365 classes
- Sectional mini test and Comprehensive Current Affairs.

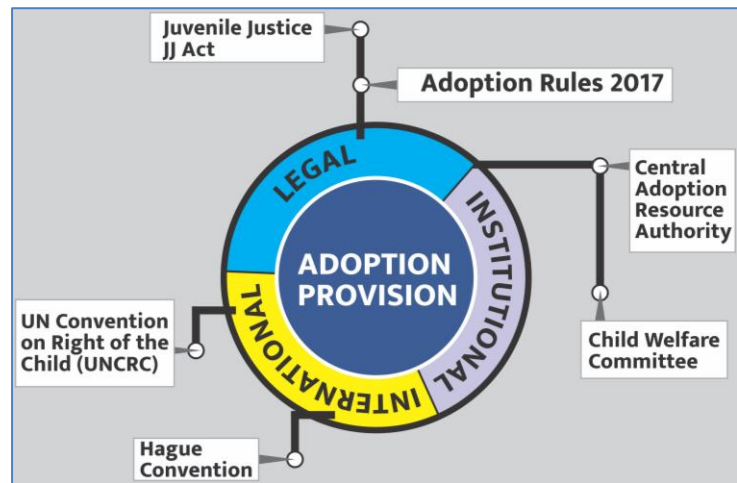
COURSE BEGINS	TOTAL NO OF CLASSES
Admission Open	60

5. SOCIAL ISSUES

5.1. CHILD ADOPTION

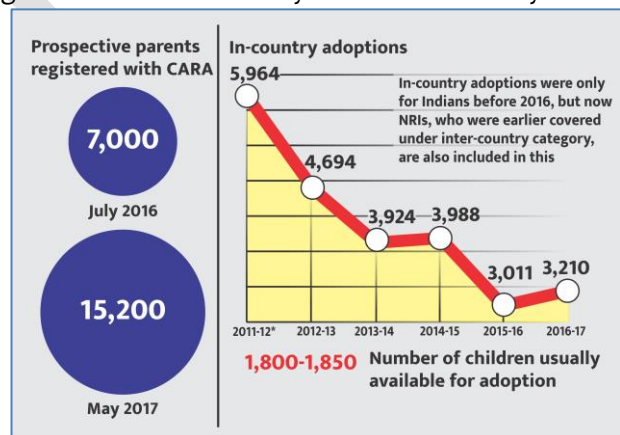
Why in news?

- The Ministry of Women and Child Development (MoWCD) has clarified that children who are rendered orphaned can be adopted only by following the procedure established by law.
 - It also asked Ministry of Health and Family Welfare to add a column in hospital admission forms asking patients to specify in whose custody their children can be left in case of any eventuality.



Adoption provisions in India

- When there is a child without a family, the State becomes the guardian. If procedure established by law is not followed in adoption, the government can take custody of the child.
 - Legal framework**
 - ✓ **Juvenile Justice (Care and Protection of Children) Act, 2015 (JJ Act):** It governs the whole adoption procedure in the country. It prohibits offering or receiving children outside the processes laid down under the Act as well as their sale and purchase. Such acts are punishable with **three to five years in jail or ₹1 lakh in fine.**
 - ✓ **Adoption Regulations 2017:** The regulation addresses the need for in-family adoptions, post-adoption support, child-centric provisions, time-limit on courts for disposing adoption deeds, consolidation of seniority list, and facilitating the root search even by children below 18 years of age.
 - Institutions**
 - ✓ **Central Adoption Resource Authority (CARA):** It is a **statutory body** (under the JJ Act) under the MoWCD. It primarily deals with adoption (including inter-country adoption) of orphan, abandoned and surrendered children through its associated /recognised adoption agencies.
 - ✓ **District Child Welfare Committee (CWC):** CWC is the final authority for exercising the powers and discharge duties in relation to children in need of care and protection **under the JJ Act.** The CWC is required to **conduct at least two inspection visits per month of residential facilities for children** in need of care and protection and make recommendations for improvement to District Child Protection Unit and the State Government.
 - International Conventions**
 - ✓ **UN Convention on the Rights of the Child (UNCRC) in 1992:** It prescribes standards to be adhered to by all State parties in securing the best interest of the child. It emphasizes social integration of child victims, without resorting to judicial proceedings.
 - ✓ **Hague Convention on Inter-country Adoption, 1993** establishes minimum standards for inter country adoption.



Steps taken to ease the child adoption

- CARA reduced the wait period:** In the past, parents were told about one to three adoptable children at a time depending on availability. Parents who rejected their choices lost their place in the order of priority. Now they are being ensured one option every three months over a nine-month span.

- **Online registration portal CARINGS:** Through **Child Adoption Resource Information and Guidance System (CARINGS)** all prospective parents could access one list of children available for adoption across states. This portal has streamlined the process of adoption.
- **Child Protection Services (CPS) scheme:** CPC scheme (erstwhile Integrated Child Protection Scheme) is a centrally sponsored scheme. It is being implemented by the MoWCD under the umbrella Integrated Child Development Services scheme for supporting the children in difficult circumstances in all the States/UTs. The scheme establishes a District Child Protection Unit to identify orphan, abandoned and surrendered children in the district and get them declared legally free for adoption by the Child Welfare Committee.
- **The 2021 amendment bill to the JJ Act, 2015:** It empowers District Magistrates (DMs) and Additional DMs to authorise orders of adoption and proposes that appeals on the orders of adoption are referred to a Divisional Commissioner.

5.2. HIGHER EDUCATION IN INDIA

Why in news?

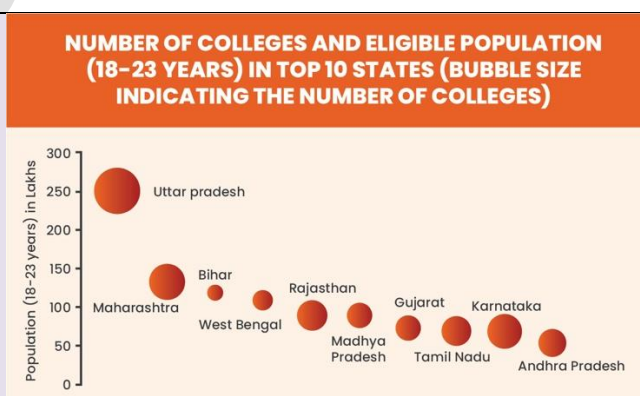
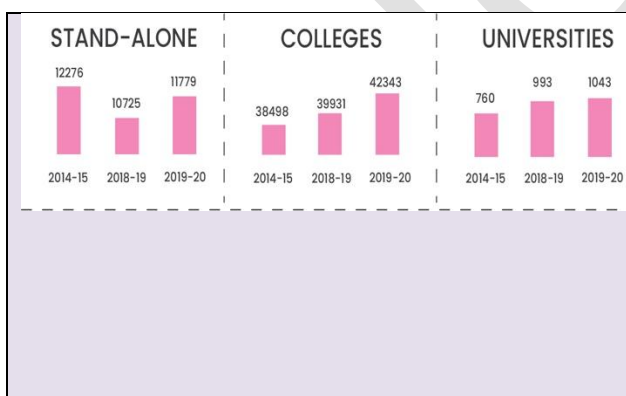
Recently, Ministry of Education released **All India Survey of Higher Education (AISHE) report** for the year 2019-20.

About AISHE

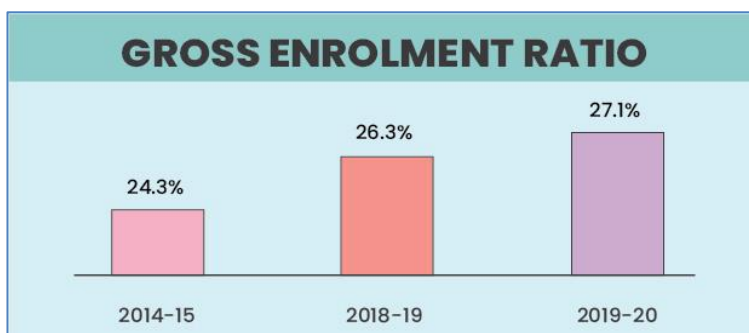
- All India Survey on Higher Education (AISHE) is an **annual web-based survey** conducted since 2010-11 by the erstwhile Ministry of Human Resource Development **portraying the status of higher education in the country.**
- The survey is being **conducted under** the central sector scheme **Higher Education Statistics and Public Information System (HESPIS).**
- Survey is **based on voluntary uploading of data by institutions of Higher Education** and covers all higher education institutions in the country, which are **categorised into 3 broad categories:**
 - **Universities**
 - **Colleges/Institutions**
 - **Stand-alone Institutions** (not affiliated with Universities and are not empowered to provide degree, therefore run Diploma Level Programmes.)

Key findings of AISHE 2019-20

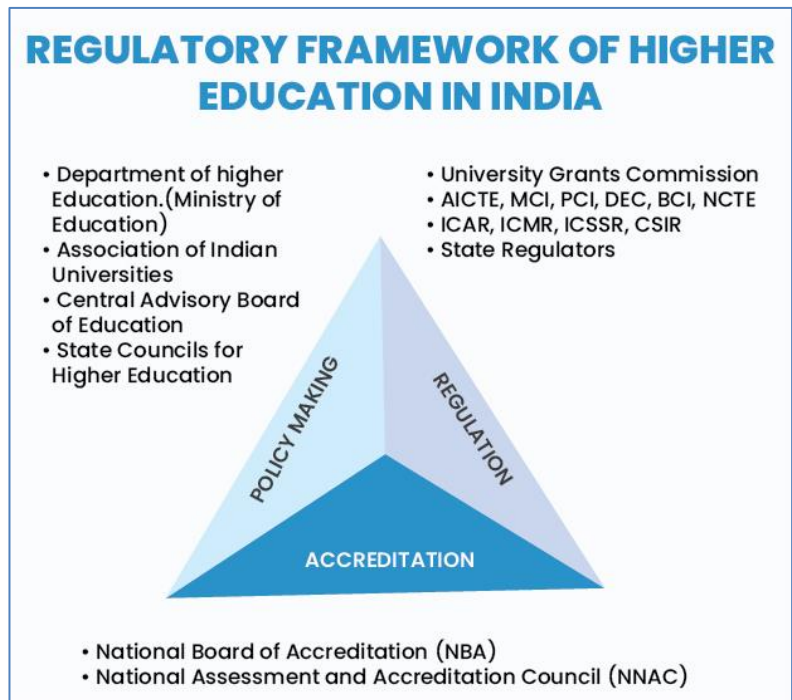
- **Distribution of higher education institutions:**



- **Enrolment in Higher Education: Gross Enrolment Ratio (GER) in higher education** in India has risen marginally.
 - **Gross Enrolment Ratio (GER)** is the percentage of students belonging to the eligible age group (18 to 23 years) enrolled in Higher Education.
- **Gender Parity:** The GER for women in 2019-20 is 27.3% as compared to 26.9% for men.



- Consequently, **Gender Parity Index (GPI)** in Higher Education in 2019-20 is 1.01 against 1.00 in 2018-19 indicating an improvement in the relative access to higher education for females of eligible age group compared to males.
- A GPI of 1 indicates parity between the sexes; and a **GPI greater than 1 indicates a disparity in favour of females.**
- **Pupil Teacher Ratio (PTR)** (number of students for every teacher): in Higher Education is 26 and there are large variations among the States.
- **Preferred Educational Streams:** Nearly 85% of the students (2.85 crore) were enrolled in the six major disciplines such as Humanities, Science, Commerce, Engineering & Technology, Medical Science and IT & Computer.
- **Share of foreign students:** The total number of foreign students enrolled in higher education is 47,427. Highest share of foreign students come from the neighbouring countries of which Nepal is 26.88% of the total, followed by, Afghanistan (9.8%), Bangladesh (4.38%), Sudan (4.02%), Bhutan constitutes (3.82%) and Nigeria (3.4%).

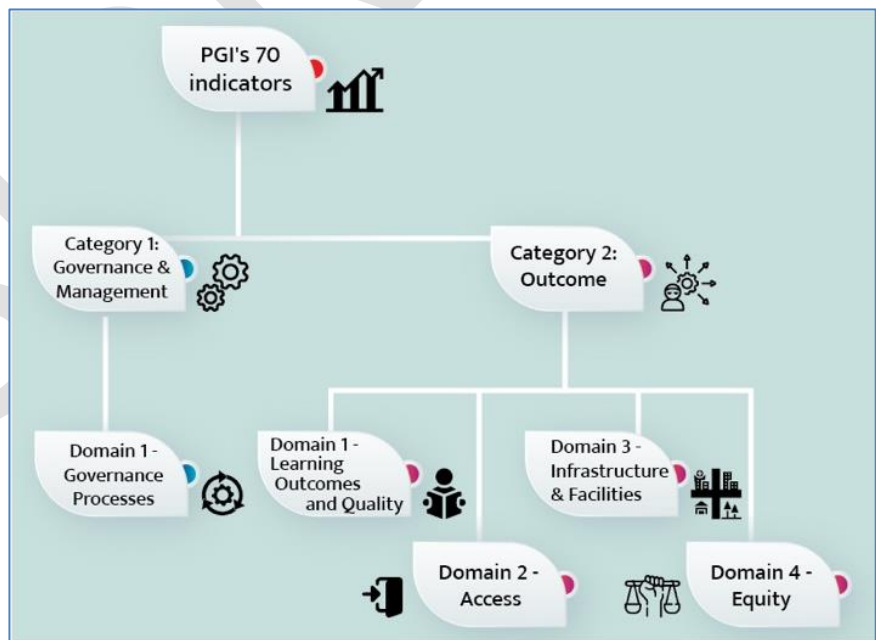


5.3. PERFORMANCE GRADING INDEX (PGI) 2019-20

Why in news?
Performance Grading Index (PGI) 2019-20 was released recently.

More on news

- The PGI (by Department of School Education and Literacy, **Ministry of Education**) comprises **70 indicators** to catalyse transformational change in the field of school education.
 - These are classified in **two categories** with a **maximum score of 1,000.**
- It provides **grades to the states and Union territories**, as opposed to ranks.
 - **Grading**, by allowing several states and Union territories to be considered at the same level, **eliminates the phenomenon of one improving only at the cost of others**, which casts a stigma of underperformance on the latter.
 - It would also help them **pinpoint the gaps and accordingly prioritise areas for intervention** to ensure that the school education system is robust at every level.
 - **Punjab, Tamil Nadu, and Kerala topped** with Meghalaya and Ladakh at the bottom.



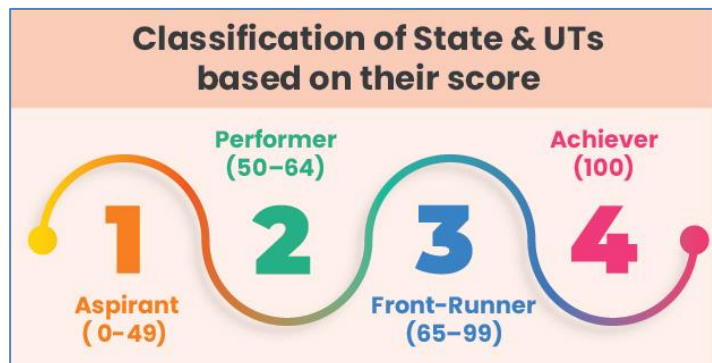
5.4. SDG INDIA INDEX 2021: NITI AAYOG

Why in news?

Recently, the third edition of the report titled 'Sustainable Development Goals (SDG) India Index and Dashboard 2020–21: Partnerships in the Decade of Action' was released by NITI Aayog.

Key Findings of the report

- India's overall score across SDGs improved marginally from 60 in 2019 to 66 in 2021 on accounts of improvement in performance in providing facilities including clean water and sanitation (Goal 6), affordable and clean energy (Goal 7) among others.
 - However, there has been a **major decline in the areas of industry, innovation and infrastructure** as well as **decent work and economic growth**.
- Kerala retains top rank** followed by Himachal Pradesh and Tamil Nadu while **Bihar is at bottom** followed by Jharkhand and Assam.
- Chandigarh maintained its top spot among the UTs** followed by Delhi.
- Mizoram, Haryana, and Uttarakhand are the top gainers** in 2020–21 in terms of improvement in score from 2019.
- In 2019, 10 states and UTs belonged to the **category of Front-Runners** while in 2021, 12 more states and UTs made it to the category.



What is SDG India Index?

- It was **first launched by NITI Aayog in 2018**. The index has become the **primary tool for monitoring progress of India's states and its Union territories (UTs) towards the SDGs for 2030**. It provides a holistic view on the social, economic and environmental status of the country and its States and UTs.
 - The Index for SDGs **evaluates progress of states and Union Territories (UTs) on various parameters** including health, education, gender, economic growth, institutions, climate change and environment.
- Methodology of SDG India Index:**
 - The SDG India Index **computes goal-wise scores on the 16 SDGs** for each State and UT.
 - Overall **State and UT scores are generated from goal-wise scores** to measure aggregate performance of the sub-national unit based on its performance across the 16 SDGs.
 - These **scores range between 0–100**, and if a State/UT achieves a **score of 100**, it signifies it has **achieved the 2030 targets**.
 - The **higher the score of a State/UT**, the **greater the distance to target achieved**.



Significance of the Index

- The index is developed in **collaboration with the United Nations** in India.
- It has **fostered competition among the states and UTs** by ranking them on the global goals.
- It tracks the progress of all states and UTs on **115 indicators aligned with the National Indicator Framework (NIF)** of the Ministry of Statistics and Programme Implementation (MoSPI).
 - NIF aims to give appropriate direction to the policy makers and the implementers of various schemes and programs.

- The 115 indicators incorporate **16 out of 17 SDGs**, with a **qualitative assessment on Goal 17**, and cover 70 SDG targets.

Limitations of the Index

- The Index **does not measure indicators of SDG 17** owing to the **unavailability of suitable data** at the State/UT level. However, a qualitative assessment of the progress under SDG 17 has been included.
- The **full set of the NIF could not be included** due to the unavailability of data at the State/UT level.
- The indicators and **data from State/UT statistical systems and non-government sources have not been included.**
- **For some indicators, data for all States/UTs are not available.** In computing the Index, ‘Null’ has been assigned to these States/ UTs and they have not been included in the computation.

Global Ranking of India vis-à-vis SDGs

I. Sustainable Development Report 2021 (Sustainable Development Solutions Network (SDSN))

- It ranked all the UN member states based on their performance against the 17 SDGs.
- **India is ranked at 120th out of 165 countries** with a country **score of 60.1**
- SDSN was **set up in 2012** under the aegis of the UN Secretary-General and mobilizes global scientific and technological expertise to **promote practical solutions for sustainable development**, including the implementation of SDGs.

II. State of India’s Environment Report 2021 (Centre for Science and Environment (CSE))

- India’s rank has **slipped by two places** from 2020 to **117** on the 17 SDGs.
- **India ranked below four South Asian countries** — Bhutan, Nepal, Sri Lanka, and Bangladesh.
- Overall **SDG score of India is 61.9** out of 100.
- CSE is a public interest research and advocacy organisation based in New Delhi.

5.5. MODEL TENANCY ACT 2021

Why in News?

The Union Cabinet has **approved the Model Tenancy Act** for circulation to all States / Union Territories for adaptation by way of enacting fresh legislation or amending existing rental laws suitably.

About Model Tenancy Act 2021

Objectives: To **regulate renting** of residential and commercial premises and **protect and balance the rights** of landlords and tenants.

Key Features of the Model Act

Another scheme to promote rental housing: Affordable Rental Housing Complexes (ARHCs)

- **ARHCs):** ARHCs for urban migrants / poor is a sub-scheme under Pradhan Mantri Awas Yojana -Urban (PMAY-U).
- **AHRCs will be implemented under two models:**
 - **Model 1: Utilizing existing Government funded vacant houses** to convert into ARHCs through Public Private Partnership or by public agencies for a period of 25 years.
 - **Model 2: Construction, Operation and Maintenance of ARHCs** by Public/ Private Entities on their own available vacant land for a period of 25 years.

Definitions	Provides clear definition of landlord, local authority, premises, property manager, rental agent, tenant, sub tenant and so on.
Rights and Obligations of Landlord and Tenant	Provides clarity regarding various aspects like <ul style="list-style-type: none"> • Retention of original tenancy agreements, • Rent and other charges payable and receipt, • Deposit of rent with Rent Authority, • Repair and maintenance of the property, • Entry of landlord into premises, • Duties of a property manager and consequences of violation of duties.
Non-applicability to certain premises	Does not apply to certain premises like <ul style="list-style-type: none"> • Hotel, lodging house, inn etc. • Premises owned or promoted by Central or State Government or UT Administration or local authority or a statutory body or Cantonment Board, • Premises owned by a company, University or organisation given on rent to its employees as part of service contract, • Premises owned by religious or charitable institutions and • Premises owned by auqaf registered under the Waqf Act, 1995 or by any trust registered under the public trust law of State/UT. • Building or category of buildings specifically exempted by notification by State Government/UT Administration. <p>However, if the owner and tenant of above premises (from 2-6) agrees, the tenancy agreement may be regulated under the provisions of this Act</p>

<p>Dispute adjudication mechanism</p>	<p>Provides three-tier quasi-judicial dispute adjudication mechanism (Refer Fig)</p> <ul style="list-style-type: none"> • No civil court will have jurisdiction over matters pertaining to provisions under Act. • Rent Authorities and Rent Courts may be established by the District Collector with the approval of the state government. The state or union territory government may establish a Rent Tribunal after consulting with the jurisdictional High Court. • Specifies timelines for adjudication of certain cases. 	
<p>Other Features</p>	<ul style="list-style-type: none"> • Tenancy agreement: Landlord and tenant to sign a written agreement which specifies the rent, period of tenancy and other related terms. • Security deposit: Capped at two months' rent for residential premises, and six months' rent for non-residential premises. • Tenancy period: Renewal or extension with tenant's requests and enhanced rent if tenancy period has ended and not been renewed, or fails to vacate the premises at the end of such tenancy. • Eviction: Conditions for eviction include refusal to pay rent, failure to pay rent for more than two months, occupation of part or whole of premises without written consent and misuse of premises despite a written notice. • Sub-letting: Prohibits sub-letting unless allowed through a supplementary agreement. The landlord and tenant must jointly inform the Rent Authority about the sub-tenancy. 	

5.6. TOBACCO USE IN INDIA

Why in news?

A WHO study titled **“Economic Costs of Diseases and Deaths Attributable to Tobacco Use in India”** estimated that the economic burden of diseases and deaths attributable to use of tobacco in India, **amounted to approximately 1% of GDP.**

Tobacco uses in India

- Tobacco is the foremost preventable cause of death and disease in the world today, killing half of the people who use it.
- As per **Global Adult Tobacco Survey-India (GATS2)** India is home to **over 27 crore tobacco users** and globally it is the second largest producer and consumer of tobacco products.
 - However, prevalence of tobacco use has **reduced from 34.6% to 28.6%** during the period from 2009-10 to 2016-17
- The prevalence of current tobacco use **among men is 42.4% as compared with 14.2% among women.**
- Among both men and women, the prevalence of tobacco use is **higher in rural as compared to urban areas.**

Initiatives taken in India

- India became a **Party to the WHO Framework Convention on Tobacco Control (FCTC)** in 2005.
 - FCTC, the first international treaty negotiated under the auspices of WHO, **was developed in response to the globalization of the tobacco epidemic.**
 - WHO FCTC **asserts the importance of both demand reduction strategies as well as supply issues** to address addictive substances issues.
- **Cigarettes and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade, Commerce, Production, Supply and Distribution) Act (COTPA), 2003** which aims to provide smoke free public places and also places restrictions on tobacco advertisement and promotion.

Tobacco Cultivation in India

- In India, **tobacco is grown on 0.45 M ha of area** (accounting for only 0.31% of net cultivated area in the country) with 750 M kg production.
 - India stands **second in tobacco production and exports in the world.**
- It is a **drought tolerant, hardy and short duration crop** which can be grown on soils where other crops cannot be cultivated profitably.
- There are **ten distinct tobacco types grown in around 15 states of the country** which include cigarette (FCV, Burley, Oriental) and non-cigarette types (Bidi, Chewing, Hookah, Natu, Cheroot, Cigar and HDBRG).
- **Types of Tobacco**
 - **FCV (Flue Cured Virginia) Tobacco:** Andhra Pradesh & Karnataka
 - **Bidi Tobacco:** Gujarat & Karnataka
 - **Cigar & Cheroot:** Tamil Nadu & West Bengal
 - **Hookah Tobacco:** Assam, West Bengal, Bihar & U.P.
 - **Chewing & Snuff:** Tamil Nadu, West Bengal, Bihar, Assam & U.P.
 - **Natu, Burley, Lanka, HDBRG:** Andhra Pradesh.

- **National Tobacco Control Programme (NTCP)** was launched in 2007-08 with objective of ensuring effective implementation of the provisions under COTPA, 2003 to create awareness about the harmful effects of tobacco consumption etc.
- **Juvenile Justice Act, 2015** provides for strict punishment against giving tobacco products to children.
- **National Health Policy 2017** has set an ambitious **target of reducing tobacco use by 30% by 2025**.
- **National level tobacco cessation quit-line** to provide tobacco cessation counseling services to the community through a toll-free number.
- **Pictorial Health Warnings** to cover **85% of the front and back panels** of the tobacco product package.
- **Prohibition of Electronic Cigarettes Act, 2019** which prohibits Production, Manufacture, Import, Export, Transport, Sale, Distribution, Storage and Advertisement of e-Cigarettes.

5.7. GLOBAL REPORT ON FOOD CRISES

Why in news?

Global Network against Food Crises has recently released 'Global Report on Food Crises'.

About the report

- It provides **estimates for populations in countries/territories based on the Integrated Food Security Phase Classification (IPC)** and Cadre Harmonisé (CH) or comparable sources.
- The report focuses on **55 countries** that account for **97% of humanitarian assistance**.

Key findings of the report

- Around **1.3 lakh people** were in the **most severe phase – Catastrophe**– in **Burkina Faso, South Sudan and Yemen** and needed urgent action to prevent widespread death and total collapse of livelihoods.
 - **Forecast for 2021** puts this figure at around **1.5 lakh people**.
- In 2020, over **15.8 million children under 5 years old** living in the 55 food crises were **suffering from wasting**.
 - **Nigeria, Ethiopia, the Democratic Republic of the Congo and Sudan** accounted for **more than one-third** of all children affected by wasting.



Global Network against Food Crises

- It was founded by the **European Union, Food and Agriculture Organization (FAO) and World Food Programme (WFP)** at the 2016 World Humanitarian Summit.
- It seeks to
 - **Reduce vulnerabilities** associated with acute hunger
 - **Achieve food security** and improved nutrition
 - **Promote sustainable agriculture** and food systems, using a '3x3 approach' (refer infographic).

About Integrated Food Security Phase Classification

- It is an **innovative multi-partner initiative for improving food security and nutrition analysis** and decision-making.
- It was **originally developed in 2004** to be used in Somalia by FAO's Food Security and Nutrition Analysis Unit.

About Cadre Harmonisé

- It is a unifying tool that helps to produce **analyses of current and projected food and nutrition situations**.



Related News:

Global Food Price Index Soars To 10-Year Peak



- UN Food and Agriculture Organization's (FAO) Food Price Index (FPI) **rose in May at their fastest monthly rate in a decade** even as world cereal production is on course to reach a new record high.

- FPI, released by Food and Agriculture Organization (FAO) is a measure of the monthly change in international prices of a basket of food commodities.
 - It consists of the average of five commodity group price indices - cereals, oilseeds, dairy products, meat and sugar, weighted with the average export shares of each of the groups.
- Reasons underscoring such inflation includes
 - Renewed demand in some countries and a backlog of low production.
 - Market and supply disruptions due to restrictions on movement have created local shortages and higher prices.

5.8. OTHER IMPORTANT NEWS

<p>‘Vital Statistics of India Based on the Civil Registration System (CRS)’ report.</p>	<ul style="list-style-type: none"> • The Office of the Registrar General of India (Ministry of Home Affairs) brought out the annual ‘Vital Statistics of India Based on the Civil Registration System (CRS)’ report. • CRS is the unified process of continuous, permanent, compulsory and universal recording of vital events (births, death, stillbirths) and characteristics thereof. <ul style="list-style-type: none"> ○ The Registration of Births and Deaths Act, 1969 provides for the compulsory registration of births and deaths. ○ Births and deaths are registered only at the place of their occurrence within 21 days of occurrence of the event • Key Findings: <ul style="list-style-type: none"> ○ Level of birth and death registration increased from 87.8% in 2018 to 92.7% in 2019 and 84.6% to 92% in 2019 respectively. ○ 14 States/Union Territories achieved 100% level of birth registrations while 19 States/Union Territories achieved the same level in cases of death. ○ Highest Sex ratio at birth was reported by Arunachal Pradesh (1,024), followed by Nagaland (1,001) and Mizoram (975). The lowest SRB was reported by Gujarat (901) followed by Assam (903) Madhya Pradesh (905), and Jammu & Kashmir (909). <ul style="list-style-type: none"> ✓ Sex ratio is used to describe the number of females per 1000 of males.
<p>‘Extension of Hospitals’ Project</p>	<ul style="list-style-type: none"> • Union Government has started project ‘Extension of Hospitals’ in various states to plug health infrastructure gap in India's fight against COVID-19, especially in rural areas and smaller towns. • Under this, modular hospitals are set up as an extension of hospital infrastructure and can be built adjacent to an existing hospital building. • Office of the Principal Scientific Adviser (PSA) has invited private sector companies, donor organizations, and individuals to support the initiative.
<p>Surakshit hum surakshit tum abhiyaan</p>	<ul style="list-style-type: none"> • Surakshit hum surakshit tum abhiyaan launched in 112 aspirational districts. • The Abhiyaan (by NITI Aayog and Piramal Foundation) aims to assist district administrations in providing home-care support to COVID-19 patients who are asymptomatic or have mild symptoms. <ul style="list-style-type: none"> ○ It is a part of Aspirational Districts Collaborative in which local leaders, civil societies and volunteers work with district administrations to address emerging problems across key focus areas of the Aspirational Districts Programme.
<p>‘Child Labour: Global estimates 2020, trends and the road forward’</p>	<p>Recently, a new report titled ‘Child Labour: Global estimates 2020, trends and the road forward’ has been released by International Labour Organisation (ILO) and the United Nations Children’s Fund (UNICEF) on occasion of World Day against Child Labour (observed every year on 12th June).</p> <p>Key findings of the report</p> <ul style="list-style-type: none"> • 160 million children were in child labour globally, accounting for almost 1 in 10 of all children worldwide. • The prevalence of child labour in rural areas is close to three times higher than in urban areas. • Global progress against child labour has stagnated since 2016. (refer infographic) • 72% of all child labour occurs within families, primarily on family farms or in family microenterprises. • Globally, 9 million additional children are at risk of being pushed into child labour by the end of 2022 because of COVID 19 pandemic. • The agriculture sector accounts for more child labourers, followed by services and industry. • Sub-Saharan Africa has the highest prevalence and largest number of children in child labour.
<p>Quacquarelli Symonds (QS) World University Rankings (WUR)</p>	<ul style="list-style-type: none"> • IIT-Bombay, IIT-Delhi and Indian Institute of Science, Bengaluru, were the only Indian institutions that made it to the top 200 of the global rankings. <ul style="list-style-type: none"> ○ Globally, Massachusetts Institute of Technology was ranked number-one, followed by the University of Oxford while Stanford University and the University of Cambridge shared the third spot. <p>QS uses six indicators to compile the ranking: Academic reputation, employer reputation, citations per faculty, faculty/student ratio, international faculty ratio and international student ratio.</p>

<p>Guidelines for the Development of E-Content for Children with Disabilities (CWDS)</p>	<ul style="list-style-type: none"> • Union education minister released guidelines for the development of e-content for children with disabilities (CWDS) • It is based on the PM e-VIDYA, 2020 initiative with the aim to unify all efforts related to digital/online/on-air education. • Salient features <ul style="list-style-type: none"> ○ e-Content development for CwDs should be based on the four principles: perceivable, operable, understandable and robust. ○ e-Content should comply with accessibility standards (national standards-GIGW 2.0 and international-WCAG 2.1, E-Pub, DAISY, etc). ○ Various platforms (like DIKSHA for distribution and e-pathshala) must comply with technical standards. ○ Textbooks may be adapted into Accessible Digital Textbooks (ADTs) in multiple formats (text, audio, video, sign language, etc.).
<p>Seniorcare Ageing Growth Engine (Sage) Initiative and Sage Portal</p>	<ul style="list-style-type: none"> • SAGE Initiative aims to identify, evaluate, verify, aggregate, and deliver products, solutions and services directly to the stakeholders. <ul style="list-style-type: none"> ○ It promotes the idea of “silver economy” by developing residential and infrastructure facilities of different grades for seniors through public-private partnership for a dignified and safe aging experience. • The SAGE portal will be a “one-stop access” of elderly care products and services by credible start-ups. <ul style="list-style-type: none"> ○ The start-ups will be selected on the basis of innovative products and services, which they should be able to provide across sectors such as health, housing, care centres, apart from technological access. ○ The Ministry of Social Justice & Empowerment will act as a facilitator.

 <p>SMART QUIZ</p>	<p>You can scan this QR code to practice the Smart Quiz of Social Issues & Social Schemes at our open test online platform for testing your understanding and recalling of the concepts.</p>	
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6. SCIENCE AND TECHNOLOGY

6.1. BIOTECHNOLOGY

6.1.1. GENOME EDITING

Why in News?

Recently, Department of Biotechnology supported First Chimeric Antigen Receptor T-cell (CAR-T) therapy was conducted.

About CAR-T therapy

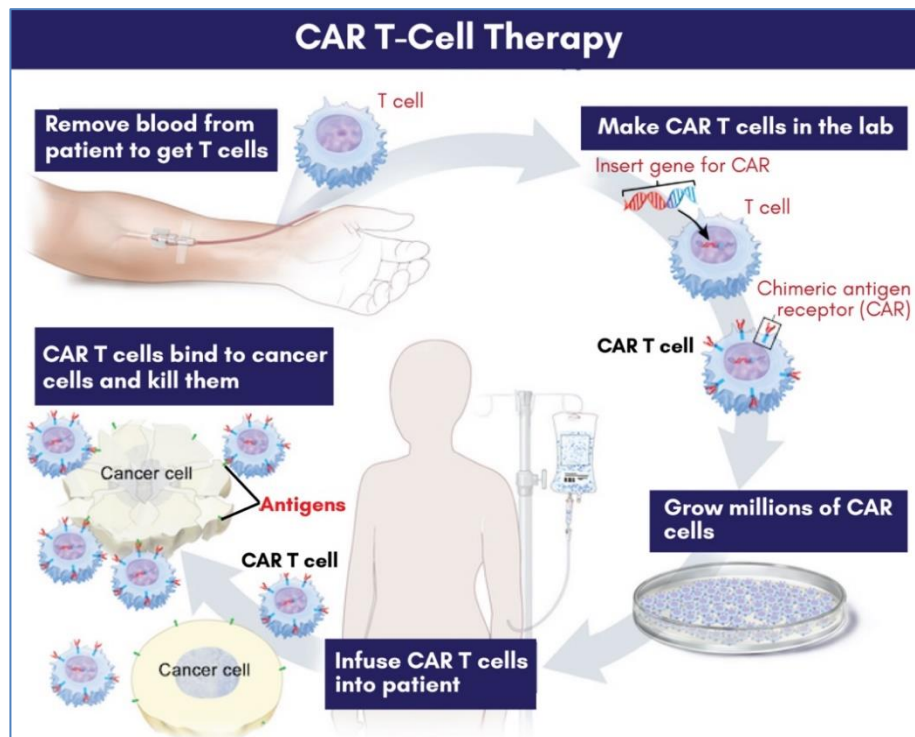
- It is a way to get immune cells called T cells (a type of white blood cell) to fight cancer by editing them in the lab so they can find and destroy cancer cells.
 - T cells are taken from the patient's blood and are changed in the lab by adding a gene for a man-made receptor (called CAR).
 - This helps them better identify specific cancer cell antigens. The CAR T cells are then given back to the patient.
- It is also sometimes talked about as a type of cell-based gene editing, because it involves altering the genes inside T cells to help them attack the cancer.
- In order to promote and support development of CAR-T cell technology, BIRAC and DBT have taken initiatives in the last 2 years.

What is gene editing?

- Genome (or gene) editing is a way of making specific changes to the DNA of a cell or organism. This allows genetic material to be added, removed, or altered at particular locations in the genome.
- It is a three-stage complex mechanism of unwinding, cleaving and rewinding of DNA to bring desirable changes in the genome of any living beings.
 - Cleaving of the DNA includes editing of genes (cut paste of the DNA).
- By editing the genome the characteristics of a cell or an organism can be changed.

How does it work?

- Genome editing uses a type of enzyme called an 'engineered nuclease' which cuts the genome in a specific place.
 - Engineered nucleases are made up of two parts: A nuclease part that cuts the DNA and A DNA-targeting part that is designed to guide the nuclease to a specific sequence of DNA.
- After cutting the DNA in a specific place, the cell will naturally repair the cut.
- This repair process can be manipulated to make changes (or 'edits') to the DNA in that location in the genome.



Situation in India

- Several rules, guidelines, and policies backed by the "Rules for the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells, 1989" notified under the Environment Protection Act, 1986, regulate genetically modified organisms.
- National Ethical Guidelines for Biomedical and Health Research involving human participants, 2017, by the Indian Council of Medical Research (ICMR), and the Biomedical and Health Research Regulation Bill implies regulation of the gene-editing process.

- **Types of Genome editing includes:** Small DNA Changes, Removal of a section of DNA, insertion of section of DNA.

Techniques used for Genome editing

- They mainly **differ in how they recognise the DNA to cut.**
 - **Protein based:** contain a protein that recognises and binds to the target DNA to be cut.
 - **RNA based:** contain a short sequence of RNA that binds to the target DNA to be cut.
- **Based on this there are several techniques:**
 - **CRISPR-Cas9:** the most common, cheap and efficient system used for genome editing.
 - ✓ CRISPR is the DNA-targeting part of the system which consists of an RNA molecule, or 'guide', designed to bind to specific DNA bases through complementary base-pairing.
 - ✓ Cas9 stands for CRISPR-associated protein 9, and is the nuclease part that cuts the DNA.
 - ✓ Emmanuelle Charpentier and Jennifer A. Doudna were awarded Nobel Prize in Chemistry (2020) **for discovering the CRISPR-Cas9 genetic scissors.**
 - **ZFNs (zinc-finger nucleases)**
 - ✓ DNA-binding part of ZFNs is made of zinc-finger proteins, which each bind to about three DNA bases.
 - ✓ The nuclease part of ZFNs is normally a FokI nuclease, which cuts the DNA.
 - **TALENs (Transcription activator-like effector nucleases)**
 - ✓ DNA-binding domain of TALENs is made of transcription activator-like effector (TALE) domains.
 - ✓ Like ZFNs, the nuclease part of TALENs is normally a FokI nuclease.

6.1.2. RIBONUCLEIC ACID INTERFERENCE

Why in News?

Recently, **RNA interference (RNAi) technology** has been suggested for manufacturing pesticides.

Procedure for use of RNAi in pesticides

- Scientists first **identified proteins necessary for survival of pests** at cellular level.
- Using **RNAi technology**, they created a **specific RNA to prevent those proteins from being formed in the pest.**
- This can help in **targeting only specific pests** and **avoid damage to friendly insects** such as bees, earthworms etc.
- RNA molecules can be externally delivered to plants, through applications like **spray, stem injection, root drenching, or seed treatment.**
- Thus, by "vaccinating" plants, i.e., delivering the specific RNA molecule to pests from plants, they are protected from infestation.

About RNA interference (RNAi)

- Cell produces molecules it needs by **reading the genetic code written in the DNA.** This is known as **gene expression.**
- **RNA interference regulates gene expression** by a highly precise mechanism called **sequence-directed gene silencing** by **degrading specific messenger RNAs (mRNAs)** or by blocking its translation into protein.
 - mRNA is a **single-stranded molecule that carries genetic code from DNA in a cell's nucleus to ribosomes**, the cell's protein-making machinery.
- Under RNAi, special enzymes known as '**Dicer**' are used to **cleave (split) 'double stranded RNA' (dsRNA)** into small fragments known as '**small interfering RNA' (siRNA).**
- The siRNA is deployed to '**interfere**' in **gene expression** and manipulate function of genes.
- RNAi **occurs naturally in almost all eukaryotes** (organisms whose cells contain a nucleus and other membrane-bound organelles) such as **animals, insects, fungi** etc.

6.2. IT & COMPUTER

Global Cybersecurity index (GCI)	<ul style="list-style-type: none">• India is ranked 10th (among 194 countries) in the GCI 2020 ahead of China and Pakistan.• GCI is released by the International Telecommunication Union (ITU), the United Nations agency for information and communication technologies (ICT).
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	<ul style="list-style-type: none"> ○ The ranking is based on five pillars: legal measures, technical measures, capacity building measures, organizational measures and cooperation. ○ In the Asia-Pacific region India secured the 4th spot. ○ US is ranked first, followed by UK.
Content delivery network (CDN)	<ul style="list-style-type: none"> ● A glitch at U.S. based CDN provider Fastly was thought to be the reason behind global outage that hit social media, government, and news websites across the globe. ● CDN refers to a geographically distributed group of servers which work together to provide fast delivery of Internet content. <ul style="list-style-type: none"> ○ Majority of web traffic across the world today is routed through CDNs. ○ Also, companies rely on these CDNs to protect their sites against traffic spikes, distributed denial of service attacks, etc.
El Salvador approves bitcoin as legal tender	<ul style="list-style-type: none"> ● El Salvador has become the first country in the world to grant legal tender status to bitcoin. ● Bitcoin is a digital or virtual currency created in 2009, allegedly by a Japanese entrepreneur named Satoshi Nakamoto. ● It uses peer-to-peer technology, with no central authority, to facilitate instant payments. ● Bitcoins are created through a complex process known as "mining", and then monitored by a network of computers across the world. ● Bitcoin is the first implementation of cryptocurrency concept.

6.3. SPACE TECHNOLOGY

6.3.1. NUCLEAR TECHNOLOGY IN SPACE MISSIONS

Why in News?

Recently, the UR Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) invited proposals for the three-phase development of a 100-Watt **Radioisotope Thermoelectric Generator (RTG)**.

More on the News

- The centre envisions using **Radioisotope Thermoelectric Generator (RTG)** for power generation and thermal management of ISRO's deep space missions.
- RTG is a type of Nuclear-based power system that is generally used for power generation and thermal management of space missions.

Types of Nuclear Power Systems (NPS) with application in Space missions

- **Radioisotope power systems (RPSs)**: They are a type of nuclear energy technology that uses heat (produced by the natural radioactive decay of plutonium-238) to produce electric power for operating spacecraft systems and science instruments. **There are two types of RPSs**:
 - **Radioisotope Heater Units (RHU)**: Small devices that provide heat to keep a spacecraft's electronic instruments and mechanical systems operational in the cold temperatures of our solar system. This heat is transferred to spacecraft structures, systems, and instruments directly, without moving parts or intervening electronic components.
 - **Radioisotope Thermoelectric Generator (RTG)**: Flight-proven systems that provide power and heat to a spacecraft (see infographic). RTGs were first used in space during the Cold War in 1961 for the US's Transit-4A Mission.

Radioisotope Thermoelectric Generator (RTG)

How it works

- **Converts thermal energy into electrical energy** through devices known as thermocouples.
- The **natural decay of plutonium-238 produces heat** that is then transferred to one side of the thermocouple.
- The thermocouple **produces electricity through the transfer of heat** from the RPS to the cold environment of space or the planetary atmosphere.
- Excess heat energy is used as a steady source to **maintain proper operating temperature** for the spacecraft and its instruments in cold environments.

Current model
Multi-Mission Radioisotope Thermoelectric Generator (MMRTG) is designed to be used in either the vacuum of space or within the atmosphere of planet.

Mars Science Laboratory
Curiosity Rover
Launched - 2011

Mars 2020
Perseverance Rover
Launched - 2020

Dragonfly
Rotocraft
Launch - 2027

Stack of eight General Purpose Heat Source modules

Thermoelectric module (Thermocouples)

Radiator fins

Updated Classroom Study Material

73

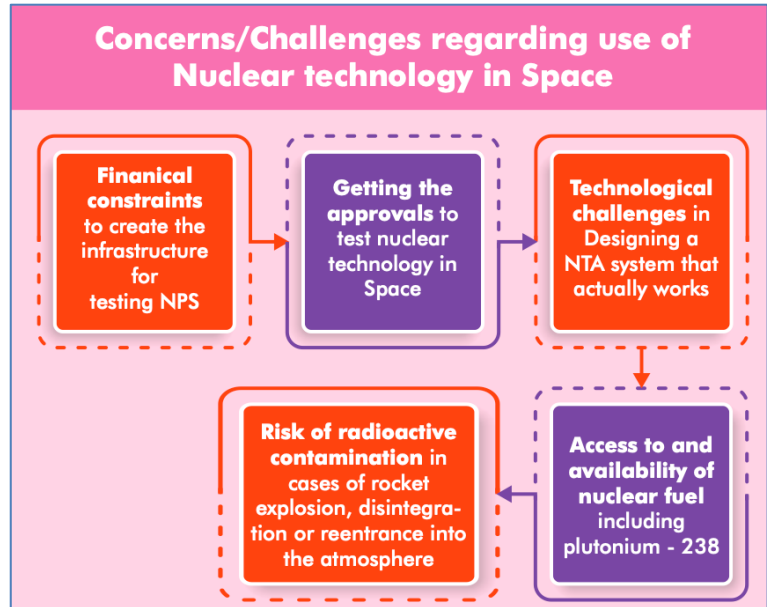
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- **Nuclear Propulsion Systems:** Nuclear power can be used for a rocket propulsion system. NASA is currently working on development of nuclear thermal propulsion (NTP) systems, which are powered by Nuclear Fission.
 - NTP systems work by pumping a liquid propellant, most likely hydrogen, through a reactor core. Uranium atoms split apart inside the core and release heat through fission.
 - This physical process heats up the propellant and converts it to a gas, which is expanded through a nozzle to produce thrust.
 - NTP systems are not designed to produce the amount of thrust needed to leave the Earth's surface. Instead, they will be launched into space by chemical rockets before they are turned on.

Associated Benefits with use of Nuclear Technology in Space

- **RTGs are highly reliable and maintenance-free:** The absence of moving parts in thermocouples reduces the chances of failure and wear out.
- **Enable deep space and interplanetary travel:** Nuclear-propelled rockets are more fuel efficient and lighter than chemical rockets. Hence, they would travel further, are faster, and would shorten the trip time.
- **RTGs as an alternative to solar power:** Solar power is not an option for space objects meant to operate on the dark sides of celestial objects where sunlight is obscured or those sent to far off missions away from the sun.
- **Flexible launch windows** as RTGs are independent of solar proximity and planetary alignment.
- **RPS function largely independent of changes in sunlight, temperature,** charged particle radiation, or surface conditions like thick clouds or dust.



6.3.2. ARTEMIS ACCORD

Why in news

Recently, New Zealand became the 11th Country to sign the Artemis accords.

About the Artemis Accords

- It was **announced by NASA** in 2020.
- It is a **set of guidelines surrounding the Artemis Program** for crewed exploration of the Moon. This **agreement is for lunar exploration and beyond**, with participation of both international partners and commercial players.
- The accords describe a shared vision for principles, **grounded in the Outer Space Treaty of 1967** to create a safe and transparent environment.
- **Signatories:** US, New Zealand, Australia, Canada, Italy, Japan, Luxembourg, the Republic of Korea, the United Kingdom, the United Arab Emirates, and Ukraine.
- Major space players like **India, Russia, China, France and Germany are not a signatory** of the accord. The European Space Agency (ESA) as an organisation has not signed on to the accords either, but a number of ESA member states have.

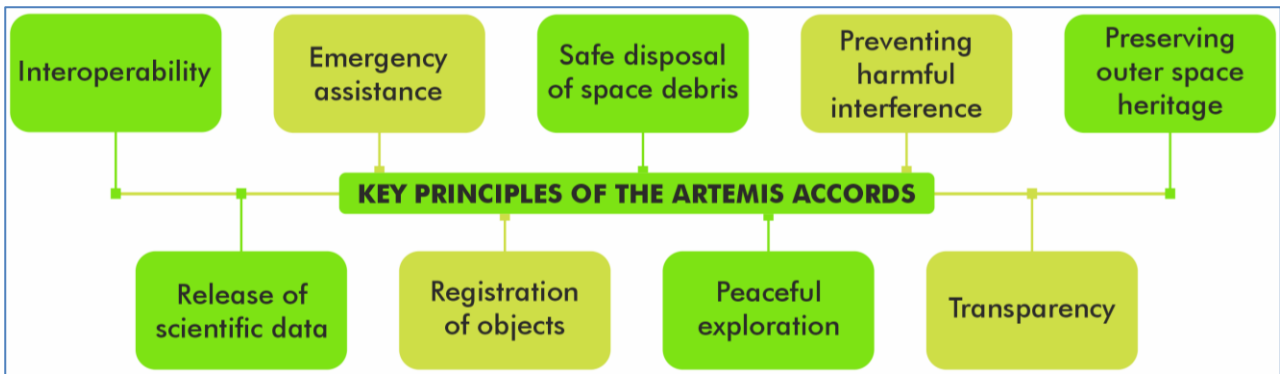
Related Information

The Artemis Programme

- It is the latest endeavor in boosting human space exploration by NASA.
- The mission will see the **arrival of the first woman and next man to the surface of the Moon in 2024.**

International principles governing the exploration of the Moon

- **The Outer Space Treaty 1967** laid down the foundational principles for human space exploration which facilitates exploration, science, and commercial activities for all of humanity to enjoy. India ratified the treaty in 1982.
- **The Moon Agreement of 1979** attempted to prevent commercial exploitation of outer-space resources. Only 18 countries signed the agreement, **including India** and France.
 - **US, Russia and China** have not signed the agreement.



6.3.3. GRAVITATIONAL WAVES

Why in News?

- Recently, scientists at LIGO detected new source of **gravitational waves (GW)** from **Neutron Star- Black Hole (NS-BH) collision**.

More about News

- Scientists have **earlier detected signals of colliding black holes, and colliding neutron stars**, but had not confirmed a merging of NS-BH until now.
 - Neutron stars are **formed when a massive star runs out of fuel and collapses**.
 - The scientists report observing not just one, but **two such rare events**, each of which gave off GW.
 - These were detected by the Laser Interferometer Gravitational-Wave Observatory (**LIGO**) in the **United States, and by Virgo in Italy**.
 - Technique used to detect the signal is called **matched filtering**.
- Gravitational waves**
 - GWs are '**ripples**' in **space-time** travelling at speed of light caused by some of most violent and energetic processes in Universe.
 - They carry with them **information about their cataclysmic origins, as well as invaluable clues to nature of gravity itself**.
 - They are **created when**
 - ✓ objects move at very high speeds,
 - ✓ when a star explodes asymmetrically (called a supernova),
 - ✓ when two big stars orbit each other ,
 - ✓ when two black holes orbit each other and merge
 - Albert Einstein predicted existence** of gravitational waves in his general theory of relativity.
 - GWs were first detected in 2015** by LIGO, located in US.
 - ✓ LIGO is world's largest gravitational wave observatory comprising of two enormous laser interferometers.
 - ✓ **There are 3 LIGO's sisters' facilities:** Virgo in Italy, GEO600 in Germany and KAGRA in Japan.
 - ✓ Also there is **LIGO-India- a planned Joint India-US detector** at Hingoli District in Maharashtra.

6.3.4. OTHER IMPORTANT NEWS

Black Hole	<ul style="list-style-type: none"> A new study has confirmed that Black holes do not shrink over time. The black hole area theorem, by Stephen Hawking, states that it is impossible for the surface area of a black hole to decrease over time has been proven right. <ul style="list-style-type: none"> Black hole area theorem was derived in 1971 from Einstein's theory of general relativity that defines gravitational waves and black hole. <ul style="list-style-type: none"> ✓ Einstein's 1915 general theory of relativity holds that the force of gravity arises from the curvature of space and time. ✓ The theory, expanded the theory of special relativity which argued that space and time are inextricably connected, but that theory didn't acknowledge the existence of gravity.
SUN HALO	<ul style="list-style-type: none"> Recently a sun halo was witnessed in different parts of Karnataka. Sun halo is an optical phenomenon that occurs due to refraction of sunlight by hexagonal ice crystals suspended in the atmosphere.

	<ul style="list-style-type: none"> It is also called '22-degree halo' because the light is refracted by 22 degrees from its original direction. Circular halos specifically are produced by cirrus clouds, which are formed at a height of over 20000 feet. Sun halos are also indicative of rainfall as cirrus clouds are usually precursor to development of cyclonic warm front. 	
<p>Heliosphere</p>	<ul style="list-style-type: none"> Recently, scientists have mapped the boundary of the heliosphere for the first time. Scientists used data from NASA's Earth-orbiting Interstellar Boundary Explorer (IBEX) satellite, which detects particles that come from the Heliosheath - the boundary layer between the solar system and interstellar space. The developed map shows that the minimum distance from the Sun to the heliopause is about 120 Astronomical Units (AU) in the direction facing the interstellar wind, and in the opposite direction, it extends at least 350 AU. (1 AU = Distance between Earth and Sun). About Heliosphere <ul style="list-style-type: none"> The sun sends out a constant flow of charged particles (protons, electrons, alpha particles etc.) called the solar wind, which ultimately travels past all the planets to some three times the distance to Pluto before being impeded by the interstellar medium. This forms a giant bubble around the Sun and its planets called the heliosphere. 	
<p>Positron Excess</p>	<ul style="list-style-type: none"> Over the years, astronomers have observed an excess of positrons having energy of more than 10 giga-electronvolts, or 10 GeV. Positrons with energy more than 300 GeV, however, are lower in comparison to what astronomers expect. <ul style="list-style-type: none"> This behaviour of positrons between 10 and 300 GeV is what astronomers call the 'positron excess'. Their study proposed that cosmic rays while propagating through the Milky Way galaxy interact with matter producing other cosmic rays, primarily electrons and positrons. <ul style="list-style-type: none"> ✓ Cosmic rays are high energy particles that move through space at nearly the speed of light. They provide one of our few direct samples of matter from outside the solar system. These new cosmic rays are the origin of the 'positron excess' phenomenon. About Positron <ul style="list-style-type: none"> Positron is the anti-particle of the electron. Also known as anti-electron, it has the same properties as the electron with the exception of electric charge. Electron has a negative charge while the positron has a positive charge. 	
<p>Shifting of Earth Axis</p>	<p>A recent study published in the Geophysical Research Letters Journal, suggests that human-caused climate change has accelerated the rate at which Earth's rotational axis changes.</p> <ul style="list-style-type: none"> Key Finding: From 1995 to 2020, the average speed of movement in earth's axis of rotation was 17 times faster as compared to the speed from 1981 to 1995. Potential Cause: The increased melting of glaciers because of global temperature rise. <ul style="list-style-type: none"> The other possible reasons include the change in non-glacial regions due to climate change, unsustainable consumption of groundwater for irrigation and other anthropogenic activities. Likely Impact: Although it is not large enough to affect daily life, it can change the length of the day by a few milliseconds. 	

6.3.5. SPACE MISSION/INTIATIVES IN NEWS

<p>EnVision</p>	<ul style="list-style-type: none"> It is an European Space Agency led mission to planet Venus, with contributions from NASA. It is likely to be launched sometime in the 2030s.
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	<ul style="list-style-type: none"> It will study the planet's atmosphere and surface, monitor trace gases in the atmosphere and analyse its surface composition. Venus is the hottest planet in the solar system because of the heat that is trapped by its thick cloud cover. Venus spins on its axis from east to west. Venus also does not have a moon and no rings. It is called the Earth's twin because of their similar sizes.
New Missions to Venus	<ul style="list-style-type: none"> NASA has announced two missions to Venus, Earth's closest planetary neighbour, as part of its 'Discovery Program' that aims to explore and study the solar system. About new missions: <ul style="list-style-type: none"> DAVINCI+ (Deep Atmosphere Venus Investigation of Noble gases, Chemistry, and Imaging) mission VERITAS (Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy) The last US probe to visit the planet was the Magellan orbiter in 1990.
Volatiles Investigating Polar Exploration Rover (VIPER)	<ul style="list-style-type: none"> It is NASA's first mobile robot to be sent to the Moon in late 2023 in search of ice and other resources on and below the lunar surface. It is part of NASA's Artemis programme. VIPER runs on solar power. It will collect data that would help NASA map resources at the lunar South Pole that could one day be harvested for long-term human exploration at the Moon. VIPER runs on solar power. This is yet another example of how robotic science missions and human exploration go hand in hand.
Polar-Areas Stellar-Imaging in Polarisation High-Accuracy Experiment (PASIPHAE)	<ul style="list-style-type: none"> It is an international collaborative sky surveying project. <ul style="list-style-type: none"> Aim to study the polarisation in the light coming from millions of stars. It can help to determine a star's location. A novel instrument, Wide Area Linear Optical Polarimeter (WALOP) will be used to detect polarised light signals emerging from the stars along high galactic latitudes.
Long March 5B	<ul style="list-style-type: none"> Parts of Long March 5B re-entered the atmosphere and landed in the Indian Ocean, with the bulk of its components destroyed upon re-entry into the Earth's atmosphere. Long March 5B was carrying components for the construction of China's space station, which will be completed by the end of next year. Last year, debris from another Chinese Long March rocket fell on Ivory Coast, damaging several buildings.

6.4. HEALTH

6.4.1. NEGLECTED TROPICAL DISEASES

Why in News?

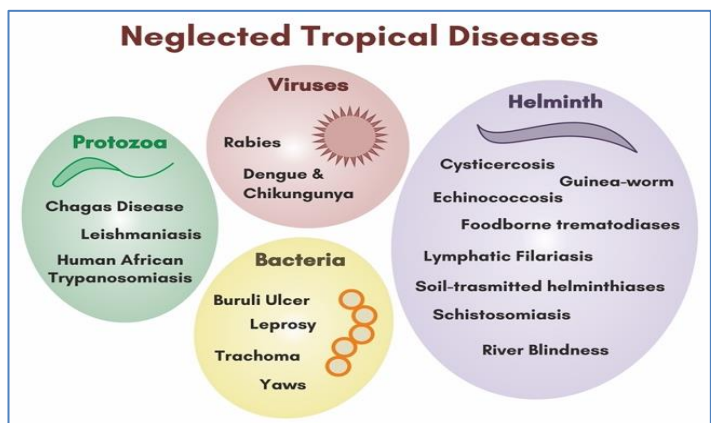
Accepting the proposal of the United Arab Emirates (UAE), 74th World Health Assembly declared January 30 as 'World Neglected Tropical Diseases (NTD) Day'

About Neglected Tropical Diseases (NTD)

NTD are communicable diseases that prevail in tropical and subtropical countries and

Did you Know?

- On 30 January, Leprosy Day is observed in India, which marks the Martyrdom Day of Mahatma Gandhi.
- The world celebrates leprosy day on the last Sunday of January.



affect more than one billion people.

- Populations living in **poverty, without adequate sanitation** and in close contact with infectious vectors and domestic animals and livestock are those worst affected.
 - Worldwide, 149 countries and territories are affected by at least one neglected tropical disease.
- India experiences the **world's largest absolute burden of at least 11 major NTD** (2018), though India has already **eliminated several NTDs, including guinea worm, trachoma, and yaws**.

Initiatives taken to eradicate NTDs

- **The WHO recognizes 17 NTDs:** They include dengue, rabies, blinding trachoma, Buruli ulcer, endemic treponematoses (yaws), leprosy (Hansen disease), Chagas disease, human African trypanosomiasis (sleeping sickness), leishmaniasis, cysticercosis, dracunculiasis (guinea-worm disease), echinococcosis, foodborne trematode infections, lymphatic filariasis, onchocerciasis (river blindness), schistosomiasis (bilharziasis), soil-transmitted helminthiasis (intestinal worms).
- **WHO's new road map for 2021–2030 calls for three strategic shifts to end NTDs:**
 - From measuring process to measuring impact.
 - From disease-specific planning and programming to collaborative work across sectors.
 - From externally driven agendas reliant to programmes that are country-owned and country-financed.
- WHO's first **road map for the prevention and control of NTDs** was published in 2012.
- WHO recommends **five public-health interventions** to accelerate the prevention, control, elimination and eradication of NTDs:
 - Preventive chemotherapy;
 - Innovative and intensified disease management;
 - Vector control and pesticide management;
 - Safe drinking-water, basic sanitation and hygiene services, and education;
 - Zoonotic disease management.
- **END7, an international public awareness campaign** with a mission to see the end of seven neglected tropical diseases (NTDs) by 2020.
 - Seven NTDs are lymphatic filariasis (elephantiasis), river blindness (onchocerciasis), snail fever (schistosomiasis), trachoma, hookworm, whipworm (trichuriasis) and roundworm (ascarasis) which account for 90% of the global NTD burden.
- **Bangladesh, India, and Nepal launched an initiative to eliminate kala-azar** as a public health problem in 2005.

6.4.2. MUCORMYCOSIS

Why in News?

As cases of Mucormycosis or Black Fungus cases have started rising **some states declared it as epidemic under Epidemic Diseases Act 1897.**

About Mucormycosis

- Mucormycosis, as defined by the Indian Council of Medical Research (ICMR), is a **fungal infection that mainly affects people who are on medication for other health problems** that reduces their ability to fight pathogens.
- It has been **commonly called as black fungus** because it causes the tissue affected to necrose and **turn into black.**
- Previously called zygomycosis, it is a **serious but rare fungal infection** caused by a group of molds called **mucormycetes.**
 - These molds live throughout the environment, particularly in **soil and in decaying organic matter, such as leaves, compost piles, or rotten wood.**
- **Examples of fungi** that most commonly cause mucormycosis are: Rhizopus species, Mucor species, Rhizomucor species, Syncephalastrum species etc.
- **Most people come in contact with microscopic fungal spores every day** but it mainly affects people with weakened immune system. Person can get infected through **inhalation, inoculation or ingestion** of fungal spores.
- Mucormycosis **isn't contagious**, so one can't get it from an infected person. It can't spread **between people and animals.**
- **Symptoms:** Symptoms to watch out for in patients of COVID-19, diabetes or those who are immunosuppressed (on chemotherapy or after organ transplant) include:
 - Sinusitis, nasal blockade, blackish or bloody nasal discharge and localised pain on the cheek bone.
 - One-sided facial pain, numbness or swelling,
 - blackish discolouration over bridge of nose or palate,
 - Thrombosis and necrosis, blurred vision, toothache, chest pain etc.
- **Prevention:**
 - Maintaining **personal hygiene** (especially oral hygiene and keeping **body parts clean and dry** in case of diabetics).
 - **Aggressive monitoring of blood sugar** is another preventive measure.

- **Treatment:** Mucormycosis needs to be treated with prescription **antifungal medicine**, usually amphotericin B, posaconazole, or isavuconazole. Often, mucormycosis requires surgery to cut away the infected tissue.

Other types of Fungal Infections

Fungal Infection
<ul style="list-style-type: none"> • White Fungus or Candidiasis (caused by fungus called Candida). • When fungus attacks private parts, there is white colour discharge, thus the name white fungus.
<ul style="list-style-type: none"> • Yellow Fungus (caused by moulds (a type of fungi) in the environment). • Because of Yellow colour pus that is formed in the area wounded by the fungus, it has been called Yellow Fungus.
<ul style="list-style-type: none"> • Aspergillosis (caused by a common mould, <i>Aspergillus</i>)

- Fungi**
- Fungi (singular: Fungus) are **eukaryotes** which are responsible for decomposition and nutrient cycling through the environment.
 - **Eukaryote** refers to any of the single-celled or multicellular organisms whose cell contains a **distinct, membrane-bound nucleus**.
 - Fungi are **classified as a separate kingdom**, along with other eukaryotic kingdoms like Plantae, Animalia and Protista (see infographic).

Characteristics of the Five Kingdoms					
Characteristics	Five Kingdoms				
	Monera	Protista	Fungi	Plantae	Animalia
Cell Type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellulosic (Polysaccharide + amino acid)	Present in some	Present with chitin	Present (cellulose)	Absent
Nuclear Membrane	Absent	Present	Present	Present	Present
Body organisation	Cellular	Cellular	Multicellular/ loose tissue	Tissue/ organ	Tissue/organ/ organ system
Mode of nutrition	Autotrophic (chemosynthetic and photosynthetic) and Heterotrophic (saprophytic/ parasitic)	Autotrophic (photosynthetic) Heterotrophic	Heterotrophic (Saprophytic Parasitic)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

- **Common examples** of fungi are: yeasts, rusts, truffles, moulds, mildews and mushrooms.

All About Fungi

Features	<ul style="list-style-type: none"> • Thrive in environments that are moist and slightly acidic; they can grow with or without light. • Some fungi are single-celled, while others are multicellular. Single-celled fungi are called yeast. • Some fungi alternate between single-celled yeast and multicellular forms depending on what stage of the life cycle they are in
Cell Structure	<ul style="list-style-type: none"> • The cell walls are composed of chitin and polysaccharides. • The bodies of multicellular fungi are made of cells that band together in rows. Each individual branched structure is called a hypha (plural: hyphae). • Most often, the individual cells in hyphae sit right next to each other in a continuous line (also known as coenocytic hyphae). Others have septae or cross walls in their hyphae.
Nutrition	<ul style="list-style-type: none"> • Most fungi absorb soluble organic matter from dead substrates and hence are called saprophytes. • If a fungus derives sustenance from a live host without harming it, then it is called a symbiont or a mutualist. E.g. Lichens and Mycorrhiza. • Some fungi are parasitic, infecting either plants or animals.
Reproduction	<ul style="list-style-type: none"> • Fungi can reproduce asexually by fragmentation, budding, or producing spores, or sexually with homothallic or heterothallic mycelia. • When both mating types are present in the same mycelium, it is called homothallic, or self-fertile. Heterothallic mycelia require two different, but compatible, mycelia to reproduce sexually.
Application	<ul style="list-style-type: none"> • Food Industry: Uses yeasts in baking, brewing, and cheese and wine making. • Medication: The antibiotics penicillin and cephalosporin, as well as the drug cyclosporine are produced by fungi. • Pest Control: Some fungi may be used to suppress growth or eliminate harmful plant pathogens, such as insects, mites, weeds

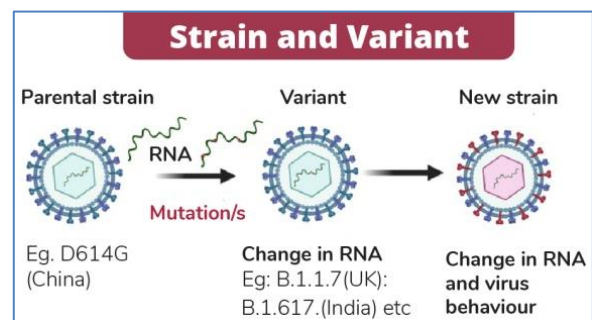
6.4.3. VARIANTS AND STRAINS OF SARS-COV-2

Why in News?

According to WHO, COVID-19 Delta variant will rapidly out-compete other strains and become the dominant circulating lineage over the coming months.

About Variants

- Any change in the genetic sequence of the virus during replication is known as a mutation and **viruses with new mutations are called variants**. Variants can differ by one or multiple mutations.
- When a **new variant shows functional properties different from the original virus** and becomes established in a population, it is referred to as a **new strain** of the virus. A strain **behaves differently from its parent virus**.
 - **All strains are variants but not all variants are strains.**



Variant Classification of SAR-CoV-2 to prioritise global monitoring and research:

Variant Classification	Characteristics
Variant of Interest (VoI)	<ul style="list-style-type: none"> • Predicted increase in transmissibility and disease severity. • Reduced neutralization by antibodies generated against previous infection or vaccination • Reduced efficacy of treatments or potential diagnostic impact
Variant of Concern (VoC)	<ul style="list-style-type: none"> • Evidence of increase in transmissibility and severity of illness • Significant reduction in neutralization by antibodies generated during previous infection or vaccination • Reduced effectiveness of treatments or vaccines or diagnostic detection failures
Variant of High Consequence (VoHC)	<ul style="list-style-type: none"> • Clear evidence that prevention measures or medical countermeasures (MCMs) have significantly reduced effectiveness relative to previously circulating variants.

WHO announced labels of SARS-CoV-2 variants:

- WHO has assigned simple, easy to remember and non-stigmatising labels for key variants of SARS-CoV-2 **using letters of the Greek alphabet**

SARS-CoV-2 Variants	WHO label	Earliest documented samples
B.1.1.7	Alpha	United Kingdom
B.1.351	Beta	South Africa
P.1	Gamma	Brazil
B.1.617.2	Delta	India

6.4.4. GLOBAL SODIUM BENCHMARKS FOR DIFFERENT FOOD CATEGORIES

Why in News?

Recently, WHO has established global benchmarks for sodium levels in foods across different food categories.

About Sodium

- WHO **recommended daily intake** of salt or sodium is **5 gm**, but most people around the world **consume more than double this amount**.
- **Sodium is necessary to maintain normal cell metabolism**, healthy plasma, and improves the health of the nervous system.
- It is **found naturally in a range of foods** like meat and dairy.
- However, it is **present in very high amounts** in processed foods, like snacks, bread, or condiments.
- Excess dietary sodium intake increases **blood pressure** and consequently increases the risk of **cardiovascular diseases**.
 - It is estimated that 2.5 million deaths could be prevented globally if salt consumption is cut down to recommended levels.

6.4.5. A COMPARISON OF ALL COVID-19 VACCINES THAT COULD BE AVAILABLE

Vaccine	Type of vaccine	Dosage and time gap between doses	Storage and expiry	Efficacy
AstraZeneca (Covishield from Serum Institute of India i.e. SII - Pune)	Adenovirus vector platform	2 injections, 12-week gap	2 to 8 °C, 6 months	82.4% when the dosing interval is stretched to 12 weeks or more
CoVaxin (Bharat Biotech, Hyderabad)	inactivated whole virion platform	2 injections, 4-8 week gap	2 to 8 °C	81% at a four-week interval between two doses
Sputnik V (Gamaleya - Russia & Dr. Reddy's)	Adenovirus vector platform	2 injections, 21 days to 3 months	-18.55 °C (liquid form) and 2 to 8 °C (dry form)	91.6% efficacy

Vaccine	Type of vaccine	Safety	Efficacy	Doses and cold chain
Johnson & Johnson	Adenovirus vector platform	Safe vaccine with mild-to-moderate side effects	66% protective against moderate to severe Covid infections overall	Single dose and storage temperature of 2-8 °C (household refrigerator temperature)

			from 28 days after injection	
Pfizer-BioNTech	Genetic material or mRNA	Safe vaccine with mostly mild-to-moderate side effects	95% after the second dose	2 full doses with a gap of 21 days and storage temperature of -70 °C
Moderna	Genetic material or mRNA	Safe vaccine with mostly mild-to-moderate side effects	94% after the second dose	2 full doses after a gap of 28 days and storage temperature of -20 °C
Sinopharm and Sinovac	Inactivated vector	Safe with mostly mild-to-moderate side effects	Sinopharm - 79% Sinovac - 50%	2 full doses and storage temperature of 2-8 °C

6.4.6. GLOBAL HUB FOR PANDEMIC AND EPIDEMIC INTELLIGENCE

Why in News?

The **World Health Organization (WHO) and Germany** will establish a new global hub for pandemic and epidemic intelligence as part of WHO's Health Emergencies Programme.

About WHO's Global Emergencies Programme

- The programme was **established in 2016 by WHO to deal with emergency health needs related to disease outbreaks, disasters and conflicts** by coordinating assistance, delivering medicines supplies and vaccines etc.

Significance of the move

- The hub will create a shared network access to vital multi-sectoral data that will **drive innovations in data analytics to predict, prevent, detect, prepare and respond to worldwide health threats.**
 - It will strengthen the global early warning surveillance system to identify pandemic and epidemic risks.
- It will help in **developing tools and models** for risk analysis and monitor disease control measures and infodemics.
 - Infodemics is made from two words i.e. 'information' and 'epidemic' that typically refers to a rapid spread of both accurate and inaccurate information about a disease.
- The **Berlin-based hub will be a global platform** bringing together governmental, academic and private sector institutions.

6.4.7. OTHER IMPORTANT NEWS

One Health Approach	<ul style="list-style-type: none"> World Health Organization (WHO) formed a high-level expert panel 'One Health' to investigate rise in zoonotic diseases. Interconnectedness of animals, humans, and the environment, an approach referred to as "One Health" (refer to infographics). <ul style="list-style-type: none"> This concept recognises that health of human beings is connected to health of animals and environment and is relevant for Food safety, controlling zoonosis and antibiotic resistance. It was associated with the emergence of severe acute respiratory disease (SARS) in early 2003 and subsequently avian influenza H5N1. 	
H10N3 bird flu	<ul style="list-style-type: none"> China reported first human case of H10N3 bird flu. H10N3 is low pathogenic, which means it causes relatively less severe disease in poultry and is unlikely to cause a large-scale outbreak. <ul style="list-style-type: none"> It is said to be a case of occasional poultry-to-human cross-species transmission and, there is no indication of human-to-human transmission. 	
'Sick-building syndrome' (SBS)	<ul style="list-style-type: none"> SBS is a situation in which building occupants experience acute health and comfort effects that appear to be linked to time spent in a building, but no specific illness or cause can be identified. India's new buildings don't get adequate ventilation due to poor architecture planning. <ul style="list-style-type: none"> Aerosols could be carried in the air for up to 10 metres and improving the ventilation of indoor spaces would reduce transmission, a government advisory on stopping the spread of COVID-19 said recently 	
Covid dashboard portal launched	<ul style="list-style-type: none"> Centre has launched this portal to track COVID management in rural areas. It allows anyone to track the formation of village health and sanitation committees, enrolment of frontline workers and volunteers, or the creation of isolation centres in schools or panchayat buildings. 	

	<ul style="list-style-type: none"> Portal will help policymakers and administrators to find out just how prepared rural India is in terms of manpower and infrastructure to meet the challenge posed by the pandemic.
High-Resolution Computed Tomography (HRCT)	<ul style="list-style-type: none"> HRCT is a widely used technique to image various lung pathology. Compared to helical CT, HRCT uses a narrow beam collimation to take thin slice images of the lung parenchyma. This protocol produces extremely high definition images of lung alveoli, airways, interstitium, and pulmonary vasculature. Expiration images may assist in identifying air-trapping in patients with lung disease.
SPOT (Scalable and Portable Testing)	<ul style="list-style-type: none"> The US scientists have developed a new SPOT system to detect COVID-19 easily from saliva samples. It uses Reverse Transcriptase-Loop Mediated Isothermal Amplification (RT- LAMP), a one-step nucleic acid amplification method. <ul style="list-style-type: none"> It does not need complex machinery or expertise. It can be completed more quickly and is more accurate than most antigen tests. The only difference between RT-PCR and RT-LAMP is that RT-LAMP uses four LAMP Primers. Primers are short fragments of nucleic acids.
2-deoxy-D-glucose (2-DG)	<ul style="list-style-type: none"> Drugs Controller General of India (DCGI) has approved anti-COVID oral drug 2-DG developed by the Institute of Nuclear Medicine and Allied Sciences (INMAS), a leading laboratory of DRDO, in collaboration with Dr. Reddy's Laboratories (DRL) in Hyderabad. <ul style="list-style-type: none"> It accumulates in the virus-infected cells and prevents virus growth by stopping viral synthesis and energy production. Its selective accumulation in virally infected cells makes this drug unique. It helps in faster recovery of hospitalised patients and reduces supplemental oxygen dependence.
SUTRA model	<ul style="list-style-type: none"> Concerns are raised on whether a government-backed model, called SUTRA, to accurately forecast the rise and ebb of the COVID-19 pandemic. About SUTRA model: SUTRA (Susceptible, Undetected, Tested (positive), and Removed Approach) model uses three main parameters: <ul style="list-style-type: none"> Beta, or contact rate, which measures how many people an infected person infects per day. Reach, which is a measure of exposure level of the population to the pandemic, and Epsilon which is the ratio of detected and undetected cases.

6.5. DEFENCE

Project P-75 (I)	<ul style="list-style-type: none"> Recently, the Defence Acquisition Council, chaired by the Defence Minister, approved request for proposal for construction of six Conventional Submarines under Project P 75 (I). <ul style="list-style-type: none"> As part of 30-year Submarine construction programme to acquire national competence in submarine construction, these submarines will be made under Strategic Partnership Model The submarines will include indigenous technologies like Air Independent Propulsion as well as the new technologies and manufacturing capabilities to be brought by foreign partners, helping India to achieve self-reliance.
Agni Prime	<ul style="list-style-type: none"> DRDO tested the new missile Agni Prime, advanced version of the 'Agni-1' missile. 'Agni Prime' is a short-range (surface to a surface) ballistic missile that will have a range of 1000 km to 1500 km and will have advanced features in agility and road mobility. <ul style="list-style-type: none"> It can carry a payload of around 1,000 Kg or a nuclear warhead. The double stage missile will be lighter and much sleeker than its predecessor 'Agni-1'. <ul style="list-style-type: none"> Agni-1 is a short-range (surface to a surface) nuclear capable ballistic missile. It has a strike range of 700 km, 1,200 km.
Project Seabird	<ul style="list-style-type: none"> Defence Minister reviewed the progress of ongoing infrastructure development under 'Project Seabird'. The largest naval infrastructure project for India, Project Seabird involves creation of a naval base at Karwar (Karnataka) on the west coast of India. Upon completion, this will provide the Indian Navy with its largest naval base on the west coast and also the largest naval base east of the Suez Canal.
Hypersonic Missiles	<ul style="list-style-type: none"> China, Russia and U.S. are all pursuing hypersonic weapons technologies, setting stage for an arms race. A hypersonic missile travels at speeds of Mach 5 and higher-five times faster than speed of sound (3836 mph). They are highly manoeuvrable and do not follow a predictable arc as they travel.

	<ul style="list-style-type: none"> There are two primary categories of hypersonic weapons: <ul style="list-style-type: none"> Hypersonic glide vehicles (HGV) are launched from a rocket before gliding to a target. Hypersonic cruise missiles are powered by high-speed, air-breathing engines, or “scramjets,” after acquiring their target.
DRDO develops critical near isothermal forging technology for Aeroengines	<ul style="list-style-type: none"> Isothermal forging is a hot working process to work on super alloys that have low forge ability. Here the workpiece is maintained at its maximum elevated temperature throughout the entire operation. <ul style="list-style-type: none"> This technological breakthrough involves developing complex titanium and nickel based alloys that can withstand temperatures exceeding 1000 degrees Celsius. It would help in India in developing jet engines with thrust to power a combat fighter.
Iron Dome aerial defence system (ADS)	<ul style="list-style-type: none"> This ADS of Israel intercepted a Hamas Unmanned Aerial Vehicle (UAV) that crossed from Gaza. It is a multi-mission system capable of intercepting rockets, artillery, mortars and Precision Guided Munitions like very short range air defence (V-SHORAD), aircraft, helicopters and UAV over short ranges of up to 70 km. It is an all-weather system and can engage multiple targets simultaneously. It can be deployed over land and sea.
Innovations for Defence Excellence (iDEX)	<ul style="list-style-type: none"> Ministry of Defence has approved ₹498.8 crore to iDEX under the Defence Innovation Organisation (DIO) for the next five years. <ul style="list-style-type: none"> DIO is a “not for profit” company to administer the iDEX framework. Department of Defence Production (DDP) will release funds to DIO for setting up and managing the iDEX network. iDEX aims to achieve self - reliance and foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups, individual innovators, R&D institutes and academia.

6.6. MISCELLANEOUS

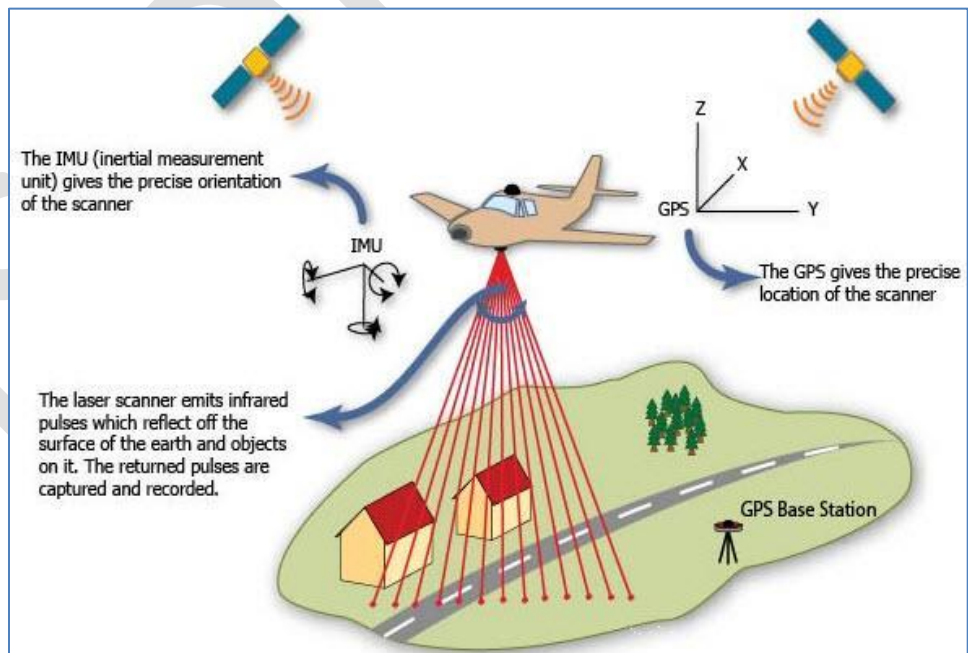
6.6.1. LIDAR

Why in News?

Recently, Ministry of Environment, Forest and Climate Change released LiDAR (light detection and ranging) based reports mapping out the water requirement within forest areas in 10 states.

More on News

- Project, which was awarded to WAPCOS**, a public sector unit under the Ministry of Jal Shakti ministry, is a first of its kind and a unique experiment using LiDAR technology.
 - LiDAR technology was used to create 3-D images** of the project areas to recommend soil and water conservation structures.
- Surveys were carried out at forest areas in **Assam, Bihar, Chhatisgarh, Goa, Jharkhand, Madhya Pradesh, Maharashtra, Manipur, Nagaland, and Tripura**.
- WAPCOS followed the **Ridge to Valley approach** (seeks to detain, divert, store and use available rainwater) of watershed management for this survey.





About LiDAR technology

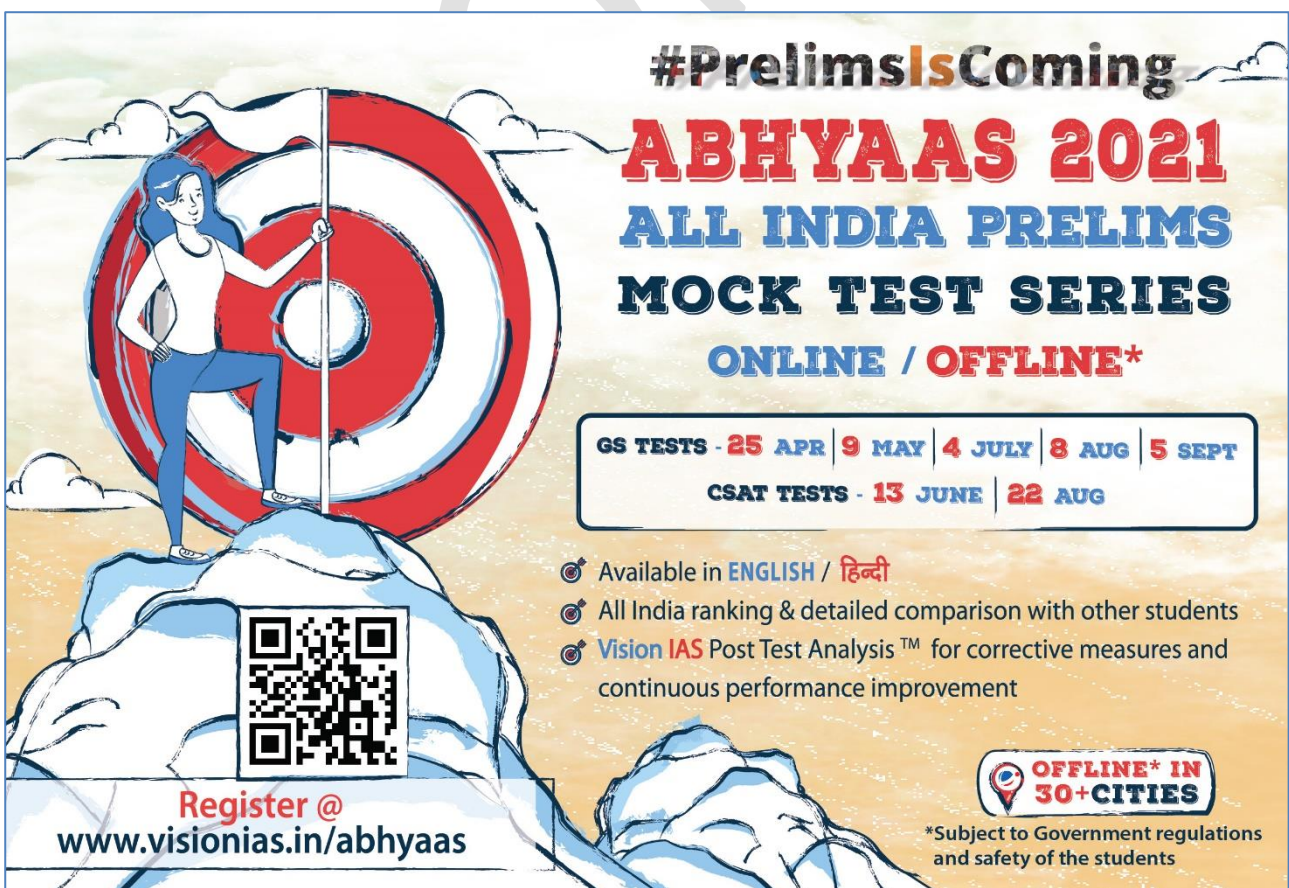
- LiDAR is a **remote sensing technology** that uses light in the form of a pulsed laser to measure ranges (distances) to a target.
 - These light pulses—combined with other data recorded by the airborne system— **generate precise, three-dimensional information about the shape of the Earth** and its surface characteristics.
 - It is similar to **radar and sonar** (that use radio and sound waves, respectively).
- A lidar instrument principally consists of a **laser, a scanner, and a specialized GPS receiver**.
 - Airplanes and helicopters are the most commonly used platforms for acquiring lidar data over broad areas.
- **Two types of lidar are topographic and bathymetric**.
 - Topographic lidar typically uses a **near-infrared laser to map the land**.
 - Bathymetric lidar **uses water-penetrating green light to also measure seafloor and riverbed elevations**.
- Lidar systems allow **scientists and mapping professionals to examine both natural and manmade environments** with accuracy, precision, and flexibility.
 - **Applications:** Land management and planning efforts, including hazard assessment, forestry, agriculture, geologic mapping, and watershed and river surveys etc.

6.6.2. OTHER IMPORTANT NEWS

<p>UNESCO SCIENCE REPORT 2021</p>	<p>Report titled “The race against time for smarter development “was released recently.</p> <ul style="list-style-type: none"> • Report monitors trends in science governance worldwide and explores how countries are using science to realize a digitally and ecologically smart future. • India specific Findings <ul style="list-style-type: none"> ○ Average gross domestic expenditure on research and development (GERD) over past two decades is 0.75% of GDP, lowest among BRICS (Brazil, Russian Federation, India, China and South Africa). ○ Number of start-ups is almost doubling each year since 2016 (17,390 start-ups in 2019), however most are in the services sector. ○ Employability increased from 34% in 2014 to almost 47% in 2019, meaning that one out of two graduates is still not employable. ○ As a share of total installed capacity for electricity generation, green energy sources (wind, solar, biofuels and small hydro-electricity generators) rose from 13% in 2015 to 22% in 2018.
<p>Sophisticated Analytical & Technical Help Institutes (SATHI) scheme by DST</p>	<ul style="list-style-type: none"> • The Department of Science & Technology (DST) has launched a scheme called SATHI. • DST is planned to set up five SATHI Centers every year for the next four years. 3 centers are already present at IIT Kharagpur, IIT Delhi and BHU Varanasi. <ul style="list-style-type: none"> ○ They will provide common services of high-end analytical testing, thus avoiding duplication and reduced dependency on foreign sources. ○ The aim is to provide professionally managed services with efficiency, accessibility and transparency of highest order.
<p>Zeolites</p>	<ul style="list-style-type: none"> • Air India has begun the first of its “zeolite cargo flights” with the government of India having commenced the process of importing zeolite from across the world for use in medical oxygen plants. • About Zeolites: <ul style="list-style-type: none"> ○ Zeolites are crystalline alumina silicates with periodic arrangement of cages and channels. ○ Many different zeolite structures have been described, leading to a wide versatility in terms of their pore dimensions, channel systems' dimensionality, or composition. ○ Zeolites are being widely employed as sorbents, as ion exchangers in detergents, or as catalysts in industrial processes, and as diverse as oil refining or petrochemistry and chemicals and fine chemicals.
<p>Dried Blood Spot (DBS) testing technique</p>	<p>Recently, World Anti-Doping Agency (WADA) has approved dried blood spot (DBS) testing technique for the Tokyo Olympics.</p> <p>About Dried Blood Spot (DBS) testing technique</p> <ul style="list-style-type: none"> • DBS is an innovative method of screening for banned substances in which few drops of blood is taken and put on a kind of blotting paper (dry matrix). • The sample is analysed using an appropriate solvent which extracts the biological material that is required for the test.

	<ul style="list-style-type: none">• It is less invasive methods than current urine and blood collection and therefore, a better athlete experience. <p>World Anti-Doping Agency (WADA)</p> <ul style="list-style-type: none">• WADA was established as an international independent agency composed and funded equally by the sport movement and governments of the world.• Its key activities include<ul style="list-style-type: none">○ Scientific research,○ Education,○ Development of anti-doping capacities, and○ Monitoring of the World Anti-Doping Code– the document harmonizing anti-doping policies in all sports and all countries.• It was established in 1999 under Lausanne Declaration in Switzerland.
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7. CULTURE

7.1. RECLINING BUDDHA

Why in news?

India's largest statue of the Reclining Buddha is being installed at the Buddha International Welfare Mission temple in Bodh Gaya.

About reclining Buddha

- A reclining Buddha statue **represents The Buddha during his last illness**, about to enter **Parinirvana** - the stage of great salvation after death that can only be attained by enlightened souls.
- Statues of Reclining Buddha show him **lying on his right side, his head resting on a cushion or on his right elbow**. It is meant to show that **all beings have the potential to be awakened and be released from the cycle of death and rebirth**.
- The Reclining Buddha was **first depicted in Gandhara art** - which began in between 50 BC and 75 AD, and **peaked during the Kushana period** from the 1st – 5th centuries AD.



Reclining Buddha in India

- **Cave No. 26 of Ajanta** contains a 24-foot-long and nine-foot-tall sculpture of the Reclining Buddha, believed to have been carved in the 5th century AD.
- **Kushinagar** (present day Uttar Pradesh – where Buddha attained parinirvana) has a 6-metre-long red sandstone monolith statue of the Reclining Buddha inside the Parinirvana Stupa.

Reclining Buddha outside India

- In Sri Lanka and India, the Buddha is mostly shown in sitting postures, while the **reclining postures are more prevalent in Thailand** and other parts of **South East Asia**.
- The **largest Reclining Buddha** in the world is the **600-foot Winsein Tawya Buddha** built in 1992 in **Mawlamyine, Myanmar**.
- The **Bhamala Buddha Parinirvana** in **Pakistan's Khyber Pakhtunkhwa province** is considered the **oldest statue of its kind in the world**. It is over 1800 years old.
- In the **late 15th century**, a **70-metre statue** of the Reclining Buddha was built at the **Hindu temple site of Baphuon in Cambodia's Angkor**.

Related News






Vesak Buddha Poornima	<ul style="list-style-type: none"> • Vesak Buddha Poornima is considered the Triple Blessed Day as Tathagata Gautam Buddha's birth, enlightenment and MahaParinirvana (death). • Lord Buddha was born as Prince Siddhartha Gautama on the Purnima Tithi (full moon day) in 563 BC in Lumbini (modern day Nepal). <ul style="list-style-type: none"> ○ He attained enlightenment under a bodhi tree at Bodhgaya. He gave his first sermon at Sarnath and later his teachings and principles became Buddhism. • In Hinduism, Buddha is considered as the ninth avatar of Lord Vishnu.
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7.2. OTHER IMPORTANT NEWS


Central Vista Project





- The Central Vista is a **heritage area**, declared in the **1962 Master Plan of Delhi** as an 'important site to meet the aspirations of a rich culture',
 - It envisages **constructing a new triangular Parliament building**, a common secretariat for central government offices, along with the Prime Minister's office and residence, Special Protection Group building and Vice-President Enclave.
 - **Central Public Works Department** is executing the project.

	<ul style="list-style-type: none"> • Need <ul style="list-style-type: none"> ○ Current Parliament was built in 1927. It was not intended to house a bicameral legislature. Rather it was built to house Legislative Council. <ul style="list-style-type: none"> ✓ New Parliament building has the capacity to seat between 900 and 1,200 MPs. ○ The existing building does not abide by safety norms and is not earthquake proof. • Lutyens' Delhi, named after British architect Edwin Lutyens (1869–1944), who was responsible for much of the architectural design and building during 1920s and 1930s. <ul style="list-style-type: none"> ○ Along with Edwin Lutyens, Herbert Baker also designed the buildings.
<p>Trirashmi or PandavLeni caves</p> 	<ul style="list-style-type: none"> • The Archaeological Survey of India (ASI) has found three more caves in the Trirashmi Buddhist cave complex, also known as PandavLeni, near Nashik, Maharashtra. • About Trirashmi caves: <ul style="list-style-type: none"> ○ Trirashmi caves are a group of 24 caves dated between 1st BC and the 6th-7th AD. The caves are on a vertical face of the hill and are a tourist attraction. ○ A preliminary examination has led archeologists to believe that new caves could be older than the Trirashmi caves.
<p>Haloclasty</p> 	<ul style="list-style-type: none"> • Recently, Researchers have reported that Pleistocene-era rock paintings dating back to 45,000-20,000 on the Indonesian island of Sulawesi years (considered to be world's oldest cave art) are weathering at an alarming rate. • The Researchers found flakes of rock detaching from these cave surfaces. The artwork made with pigments is decaying due to a process known as Haloclasty, which is triggered by the growth of salt crystals due to repeated changes in temperature and humidity caused by alternating wet and dry weather in the region.
<p>Raja Parba</p> 	<ul style="list-style-type: none"> • Raja Parba or Mithuna Sankranti is a 3-day festival celebrating womanhood in Odisha <ul style="list-style-type: none"> ○ It is believed that during this period Mother Earth menstruates & prepare herself for future agricultural activities with the arrival of monsoon. ○ People worship Goddess Bhudevi, who is the wife of Lord Jagannath. ○ Women are given a break from household work and people abstain from walking barefoot on the earth.
<p>PutolaNach</p> 	<ul style="list-style-type: none"> • Recently, in collaboration with UNICEF an Assam based Trust has produced three short videos using PutolaNach for creating mass awareness on COVID appropriate behaviour. • PutolaNachis the string puppetry of Assam. It is performed in three areas with distinct characteristics. <ul style="list-style-type: none"> ○ Lower Assam:Putala-Bhoariya andPutala-Bhaona. ○ Upper Assam (Majuli island): In the style of the Ankia Nat form developed by Sankaradev. ○ North Assam: borrow largely from the mobile theatre of Assam (Bhraymaman) in terms of themes and costumes.
<p>Toycathon 2021</p> 	<ul style="list-style-type: none"> • Toycathon 2021 is being organized by Ministry of Education in coordination with five other Ministries. • Toycathon focuses on conceptualizing new and innovative toys using local materials which are economical, affordable, safe, environment friendly, with exceptional high quality for both Indian and global markets.

7.3. PERSONALITIES IN NEWS



<p>Basava Jayanthi</p> 	<ul style="list-style-type: none"> • It is a festival which is being celebrated by Lingayats in Karnataka, Maharashtra, Telangana, and Andhra Pradesh to mark the birthday of Lord Basavanna (12th-century poet-philosopher and social reformer). <ul style="list-style-type: none"> ○ Several works are attributed to Basavanna like Vachana such as the Shatsthala-vachana (discourses of the six stages of salvation), Kala-jnana-vachana (forecasts of the future), Mantra-gopya, Ghatna Chakra-vachana and Raja-yoga-vachan. ○ He conceptualised AnubhavaMantapa – an academy that acted as the fountainhead of thoughts on common human values and ethics.
<p>Kabir Das</p>	<ul style="list-style-type: none"> • Kabir was a famous poet, saint and social reformer. He was born in 1440.

	<ul style="list-style-type: none"> • He did not acknowledge distinctions based on caste and spoke against idol worship and criticised both Hindus and Muslims for their rites, rituals and customs. • He is a man known for, and by his poems. His poetry is a mixture of Hindi, Khari boli, Punjabi, Bhojpuri, Urdu, Persian and Marwari. • Kabir Das' writings had a great influence on the Bhakti movement and include titles like Kabir Granthawali, Anurag Sagar, Bijak, and Sakhi Granth. <ul style="list-style-type: none"> ○ Major part of his work was collected by the fifth Sikh guru--Guru Arjan Dev.
<p>Guru TeghBahadur</p> 	<ul style="list-style-type: none"> • 400th birth anniversary of Guru TegBahaduris being celebrated. • He was the youngest son of Guru Hargobind Sahib, the sixth Sikh guru. He was 9th of 10 Sikh Gurus. • His 115 hymns are included in Sri Guru Granth Sahib. • In the year 1675, Guru TeghBahadur was executed in Delhi under the orders of the Mughal Emperor Aurangzeb.
<p>Rishi Bankim Chandra Chattopadhyay</p> 	<ul style="list-style-type: none"> • Though a Bengali magistrate who worked for the British, he wrote the first Indian novel in English, Rajmohan's Wife, an economical exploration of the Bengali family . • His novel Anandamath— which was set in the background of the SanyashiBidroho (rebellion of monks in late 18th century) — is considered to be one of key works on Bengal's nationalism. <ul style="list-style-type: none"> ○ Later published in English as The Abbey of Bliss. • Founded a monthly literary magazine, Bangadarshan, in 1872, • Other popular works of fiction - Bishabriksha (The Poison Tree), Debi Choudhurani
<p>Rabindranath Tagore</p> 	<ul style="list-style-type: none"> • His birth anniversary is celebrated in Bengal as PachisheBaishakh. • He was a poet, novelist, essayist, philosopher and musician • He is the composer of National Anthems of two nations - India and Bangladesh. He is also considered to have influenced the Sri Lankan National anthem • He was awarded Nobel Prize for Literature (for collection of poems Geetanjali) in 1913, becoming the first non-European to win it. • His father Debendranath Tagore, was a leader of the Brahmo Samaj. • It was Tagore who conferred the title of 'Mahatma' on Mohandas Karamchand Gandhi in 1915. • Visva-Bharati university was founded by Rabindranath Tagore.
<p>Gopal Krishna Gokhale</p> 	<ul style="list-style-type: none"> • Gokhale became Congress president at its Banaras session in 1905. • Before joining politics, Gokhale worked as a professor. • He founded the Servants of India Society in 1905, which launched campaigns for the promotion of education, health care and sanitation. • Gokhale was a 'moderate' Congress leader, and was a mentor to both Mahatma Gandhi and Mohammed Ali Jinnah. • He was elected to the Council of India of the Governor-General of India in 1903. • He started english weekly newspaper, The Hitavada. • Gandhi wrote a book in Gujarati dedicated to Gokhale titled 'Dharmatma Gokhale'.
<p>VinayakDamodarSavarkar(18 May 1883-26 February 1966)</p> 	<ul style="list-style-type: none"> • Born in Maharashtra's Nashik he is popularly known as Veer Savarkar. He was a great leader, lawyer and writer. • He served as the President of Hindu Mahasabha, formulated Hindu Nationalist philosophy of "Hindutva". • He co-founded the student society called "Abhinav Bharat Society". He was also associated with societies such as 'India House' and the 'Free India Society' while studying law in the UK. • He authored Indian War of Independence 1857, Hindu RashtraDarshan, Inside the enemy camp etc.

<p>Sunderlal Bahuguna (9 January 1927- 21 May 2021)</p> 	<ul style="list-style-type: none"> • He was a great environmentalist known for initiating the Chipko movement, a non-violent agitation, in 1973 in Uttarakhand against the felling of trees by forest contractors. He followed Gandhian philosophy of peaceful resistance. • His appeal resulted in a 15-year ban on chopping of green trees in 1980. • He also spearheaded the anti-Tehri dam movement in the 1980s. In 2009, he was awarded Padma Vibhushan.
<p>Professor C.N.R. Rao</p> 	<ul style="list-style-type: none"> • Bharat Ratna Professor C.N.R. Rao has received the International Eni Award 2020 also called the Energy Frontier award. • The Energy Frontiers award has been conferred for his work on metal oxides, carbon nanotubes (CNTs), and other materials and two-dimensional systems, including graphene, boron-nitrogen-carbon hybrid materials, and molybdenum sulfide (Molybdenite - MoS₂) for energy applications and green hydrogen production.

7.4. TRIBES IN NEWS

Tribes	Details
Van Gujjars Nomadic Tribe	<ul style="list-style-type: none"> • The Uttarakhand High Court passed an order upholding the right of Van Gujjars to migrate to their summer homesteads in the bugyals (Himalayan alpine meadows) located within the Govind Pashu Vihar National Park. • The Van Gujjars are nomadic pastoral community in Uttarakhand Himalayas that pursue transhumance from the Terai-Bhabar and Siwalik region to the higher bugyals in summer and vice versa in winter to enable their livestock to feed on the meadows/pastures.
Hakki Pikki Tribe	<ul style="list-style-type: none"> • Hakki Pikki are a nomadic tribe which migrated from Northern India and now mainly settled in Karnataka region and other South Indian states • They are known as Bird Catcher (Hakki means Bird and Pikki means catcher in Kannada language) • They speak Indo Aryan language named as 'Vaagri' by scholars <ul style="list-style-type: none"> ◦ UNESCO has listed Hakki Pikki is one of the endangered languages. • Today, they are mainly engaged in selling of herbal products like herbal oils.
Buddhist Dard Tribes	<ul style="list-style-type: none"> • It is a Buddhist tribal group in Ladakh. <ul style="list-style-type: none"> ◦ The Dard Aryans inhabit Dha, Hanu, Beema, Darchik and Garkone villages in Leh and Kargil districts. The 5 villages are together called the Aryan valley. ◦ Their culture is the Aryan Culture. ◦ Dard Aryan' is not among the list of notified Schedule Tribes.

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