

CURRENT AFFAIRS

WEEKLY

WEEK: 3

MAY
2022

MAINS

GS-II

- PLACES OF WORSHIP ACT
- SEDITION LAW IN INDIA
- CUSTODIAL TORTURE CASES IN INDIA

GS-III

- RBI ALLOWS PRIORITY SECTOR TAG TO LOANS FROM BANKS TO NBFCs
- INDIA'S WHEAT EXPORT BAN, UNDERSTANDING INDIA'S AGRICULTURAL EXPORTS & CHALLENGES
- HUMAN CELL ATLAS
- MISSILES SYSTEM AND TECHNOLOGIES
- REPLENISHMENT STUDY OF RIVERBED SAND MUST FOR SAND MINING IN UTTAR PRADESH: NGT
- DESERTIFICATION: 'DROUGHTS REDUCED INDIA'S GDP BY UP TO 5% IN 20 YEARS'
- WHY ARE FOREST FIRES IN THE HILLS INTENSIFYING THIS SUMMER?

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- SHALLOW AND DEEP ECOLOGISM
- EFFECT OF THE INTERNET ON VALUES AND MORALS OF CHILDREN
- ETHICS OF RIGHT TO FREEDOM OF RELIGION
- ETHICS OF PUBLIC INTEREST LITIGATION

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- ART & CULTURE
- Legendary santoor maestro Pandit Shivkumar Sharma passes away

- POLITY & GOVERNANCE
- Ujjwala LPG scheme: 90 lakh beneficiaries don't take refills
 - Country's first Amrit Sarovar inaugurated in UP

- INTERNATIONAL RELATIONS
- Finland and Sweden are set to apply for NATO membership.

- ENVIRONMENT
- Pakkamalai- Gangavaram hills region
 - Vaquita Porpoise

- SCIENCE & TECHNOLOGY
- Lupus affects one in 1,000 Indians
 - National Technology Day
 - Tomato flu and it affects.
 - What is a 'marsquake', and what causes it?
 - The black hole at the centre of Milky Way, photographed for the first time
 - Protected Mobility Vehicles
 - ISRO successfully tests solid rocket booster for Gaganyaan programme
 - Scientist grow plant in moon soil

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The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

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SECTION: A
(MAINS)

CURRENT AFFAIRS

PLACES OF WORSHIP ACT

CONTEXT

The Supreme Court will hear an appeal challenging the order of a civil court in Varanasi, which allowed inspection, survey and videography at the Gyanvapi Mosque complex.

◎ BACKGROUND

- The Committee of Management of **Anjuman Intezamia Masjid**, has filed the appeal.
- The principal contention is that the order of the Varanasi court, which was upheld by Allahabad High Court in April is "clearly interdicted" by The Places of Worship (Special Provisions) Act, 1991.

- ▶ Any place of worship which is an ancient and historical monument or an archaeological site covered by the Ancient Monuments and Archaeological Sites and Remains Act, 1958.

Why this law was required?

- The Act was introduced in the year 1991
- The Act was passed in the backdrop when **Janmabhoomi movement** had gained massive support.
- The main primary motive of the act to prevent rising incidents of communal unrest inside the territorial boundary.

Judicial Opinion on the Act

- While delivering the Ayodhya verdict, SC bench said that,
 - ▶ Legislative guarantee to preserve religious institutions, provides a confidence to every religious community, ensuring fraternity and peace in the society.
 - ▶ The Places of Worship imposes a non-derogable obligation towards protecting the secular feature of the constitution, one of the Basic Structure Doctrine.

◎ ANALYSIS:

What is the law is all about?

- The Places of Worship (Special Provisions) Act, 1991 is described as "An Act to prohibit conversion of any place of worship and to provide for the maintenance of the religious character of any place of worship as it existed on the 15th day of August, 1947, and for matters connected therewith or incidental thereto."
 - ▶ **Section 3** bars the conversion, in full or part, of a place of worship of any religious denomination into a place of worship of a different religious denomination — or even a different segment of the same religious denomination.
 - ▶ **Section 4(1)** declares that the religious character of a place of worship "shall continue to be the same as it existed" on August 15, 1947.
 - ▶ **Section 4(2)** says any suit or legal proceeding with respect to the conversion of the religious character of any place of worship existing on August 15, 1947, pending before any court, shall abate — and no fresh suit or legal proceedings shall be instituted.

Certain Exemptions under the Act:

- **Section 5** stipulates that the Act shall not apply to the **Ramjanmabhoomi-Babri Masjid case**, and to any suit, appeal or proceeding relating to it.
- Besides the **Ayodhya dispute**, the Act also exempted:

◎ CONCLUSION:

Secularism is one of the Basic Structure Doctrine of our Indian Constitution. In order to protect the religious rights of the citizens, Parliament had enacted the Place of Worship (Special Provisions) Act in the 1991. During Ayodhya Verdict Supreme Court described the law as a legislative act to prohibit conversion of any place of worship and to provide for the maintenance of the religious character of any place of worship as it existed on the 15th day of August, 1947.

PRACTICE QUESTION

Q1: What are the provisions of The Places of Worship (Special Provisions) Act, 1991? Discuss its significance in the present day scenario.

Q2: Discuss the relevance of pluralism and secularism in multi-ethnic Indian society.

SEDITION LAW IN INDIA

CONTEXT

The Supreme Court recently directed the Centre and states to keep in abeyance all pending trials, appeals, and proceedings with respect to the charge framed under Section 124A of the Indian Penal Code (IPC), till the central government completes the promised exercise to reconsider and re-examine the provision.

◎ BACKGROUND

- The sedition law is enshrined in **Section 124A of the Indian Penal Code (IPC)**.
- **Thomas Macaulay**, who drafted the Indian Penal Code, had included the law on sedition.
- The first application of the law was the trial of newspaper editor **Jogendra Chandra Bose in 1891**.
- Other prominent examples of the application of the law include the trials of **Tilak (1897) and Gandhi (1922)**.
- **Jawaharlal Nehru, Vinayak Damodar Savarkar, and Abul Kalam Azad** were also charged with sedition.

What is sedition?

- **Sedition** is overt conduct, such as speech and organization that tends toward rebellion against the established order.
- Sedition often includes **subversion of a constitution** and incitement of discontent toward, or insurrection against, established authority.
- Sedition may include any commotion, though not aimed at direct and open violence against the laws.
- A **seditionist** is one who engages in or promotes the interest of sedition.

Present scenario

- Sedition was made a **cognizable offence** for the first time in history in India during the tenure of Prime Minister **Indira Gandhi in 1973**, that is, arrest without a warrant was now permissible.
- In 1962 the Supreme Court of India interpreted the section to apply only if there is, say, "incitement to violence" or "overthrowing a democratically elected government through violent means."
- As of **11th May 2022** this law has been put on temporary hold by **Supreme Court** of India **citing re-examination**.

Section 124A of IPC

- According to the section 124A, the charges could be put on whomever, by words, either spoken or written, or by signs, or by visible representation, or otherwise, brings or attempts to bring into hatred or contempt, or excites or attempts to excite disaffection towards, the Government established by law in India.
- He/she shall be punished with imprisonment for life, to which a fine may be added; or, with imprisonment which may extend to three years, to which a fine may be added; or, with fine."
- **The provision also contains three explanations:**
 - ▶ The expression "**disaffection**" includes disloyalty and all feelings of enmity;
 - ▶ Comments expressing disapprobation of the measures of the Government with a view to obtain their alteration by **lawful means, without exciting or attempting to excite hatred, contempt or disaffection**, do not constitute an offence under this section;
 - ▶ Comments expressing disapprobation of the administrative or other action of the Government without exciting or attempting to **excite hatred, contempt or disaffection, do not constitute an offence under this section**.

Legal challenges to the existing provision for sedition

- As early as **1950**, the Supreme Court in **Romesh Thapar v State of Madras** held that "**criticism of the government exciting disaffection or bad feelings towards it**, is not to be regarded as a justifying ground for restricting the freedom of expression and of the press.
- Subsequently, **two high courts** — the Punjab and Haryana High Court in **Tara Singh Gopi Chand v. The State (1951)**, and the Allahabad High Court in **Ram Nandan v. State of Uttar Pradesh (1959)** — **declared that Section 124A** of the IPC was primarily a tool for colonial masters to quell discontent in the country and declared **the provision unconstitutional**.

- However, in 1962, the issue **came up before the Supreme Court in Kedarnath Singh v State of Bihar.**

Kedar Nath Singh versus State of Bihar (1962):

- In Kedar Nath Singh versus State of Bihar (1962), the Supreme Court had made it clear that **'strong words used to express disapprobation of the measures of the Government with a view to their improvement or alteration by lawful means' did not amount to sedition.**

- This ruling puts the onus on law enforcers to come up with indisputable evidence of incitement to violence or disturbance of public peace.
- The court also issued seven "guidelines", underlining when critical speech cannot be qualified as sedition.

Steps taken forward

- The Supreme Court has agreed to hear fresh challenges against the provision after a batch of petitions were filed.
- This would involve a seven-judge bench considering whether the Kedar Nath ruling was correctly decided.
- Although the government initially defended the provision arguing that "isolated incidents of misuse" do not necessitate removal of the provision itself, it has now told the court that it is mulling a fresh review of the colonial law.
- The court's intervention is crucial because in case it strikes down the provision, it will have to overrule the **KedarNath** ruling and uphold the earlier rulings that were liberal on free speech.
- However, if the government decides to review the law, either by diluting the language or repealing it, it could still bring back the provision in a different form.

Other interpretations

- In August 2018, the **Law Commission of India** published a consultation paper recommending that it is time to re-think or repeal the Section 124A of the Indian Penal Code that deals with sedition.
- In its **39th Report (1968), the Law Commission** had rejected the idea of repealing the section.

- In its **42nd Report (1971)**, the panel wanted the scope of the section to be expanded to cover the Constitution, the legislature and the judiciary, in addition to the government to be established by law, as institutions against which 'disaffection' should not be tolerated.
- In the recent **consultation paper on the sedition**, the Law Commission has suggested invoking 124A to only criminalize acts committed with the intention to disrupt public order or to overthrow the Government with violence and illegal means.

◎ WAY FORWARD

- Numerous critics, students, former government employees including Indian Police Service and Indian Administrative Service officers, legal thinkers and judges, scholar, human rights and civil liberty advocates, journalists, and so on have commented against the sedition law, calling for it to be scrapped or undergo amendments.
- It should be amended as, Section 124A should be retained subject to **three conditions**:
 - ▶ The first, that, the offender **must be in a position of authority**,
 - ▶ Second, that, the **offending words must be understood in context**,
 - ▶ And, third, they should have a **tendency to actually cause violence or disorder**.
- The following laws in India address the same aspects covered by the sedition law are;
 - ▶ Unlawful Activities Act
 - ▶ Public Safety Acts (such as the JK PSA)
 - ▶ National Security Act

These laws can be used according to the offences.

◎ CONCLUSION

Developed Countries like **UK, US and Australia** had successfully repealed the law which was unconstitutional and affects fundamental rights of their citizens. Their way of handling such laws can become an example for India to look into the provisions of the existing law in India, which can only be done by the judiciary effectively.

CUSTODIAL TORTURE CASES IN INDIA

CONTEXT

Haryana human rights panel recommends Rs 25,000 compensation in custodial torture case to the victim.

- The police are empowered by the state to enforce laws and maintain public order. They do not have the right to take the law in their hands.

◎ BACKGROUND

- According to a report by the **National crime bureau**, between 2001 and 2018, there have been 1727 reported custodial deaths and out of these custodial deaths, only mere 26 police personals have been convicted.
- The **National Human Rights Commission** has recorded 2000 human rights violations against police out of which only 34 have reached the level of conviction.
- India has a **mere 5% conviction rate in cases of custodial torture and death**. Police brutality and atrocities are mainly towards underprivileged and poor people.

◎ ANALYSIS

What is custodial torture?

- **Custodial torture** a form of torture that generally happens when a person alleged of any crime is under the custody of law enforcement officials.
- Law commission in 2017 has proposed **anti-torture law** still the government has not taken any action in this regard.
- The Supreme Court has held that Custodial torture is a naked violation of human dignity and degradation which destroys, to a very large extent human personality.

Custodial torture

- Custodial torture is a **punishable offense** under the existing laws but due to various reasons, the accused do not get convicted.
- India is a signatory of **United Nations convention against torture and other cruel activities** since 1997 but it has not ratified it as India does not have any comprehensive law on torture.

Different forms of custodial torture

- There are different methods to bring or commit custodial violence which are applied to bring the desired results by the government agencies.

• Physiological Violence:

- ▶ To break the confidence and morale of the victim following methods are used:
- ▶ By communication technique in which the victim is given wrong information and is tortured mentally.
- ▶ By compulsion or coercion where the victim is compelled or coerced to perform activities or to witness actions that torture him mentally. Forcing the victim to violate social taboos or forcing to witness torture of other victims etc.
- ▶ By depriving the victim the basic needs like water, food, sleep and toilet facilities which results into disorientation and confusion.
- ▶ Pharmacological techniques like use of various drugs to facilitate torture of the victim to mask the effect of torture and also as a means of torture.
- ▶ Threats and humiliations which are directed towards persons in custody or their family members or friends.

• Physical Violence:

- ▶ Causing disfiguration and exhaustion.
- ▶ Causing torture to such an extent that the victim feels fear of immediate death.
- ▶ Forcing the victims to sleep on damp floor.
- ▶ Making the children stay naked in extreme cold weather or under the sun in temperature for more than 30 degrees.
- ▶ Scratches and cuts are made on different parts of the body with sharp objects.

• Sexual Violence:

- ▶ Sexual violence has great social and psychological impact in the minds of its victims.
- ▶ It may start with verbal sexual abuse and humiliation targeting victims' dignity. It results into rape or sodomy.
- ▶ The violators or the perpetrators of this crime keep devising new means and methods according to their own mental aptitude and

imagination to break the resistance of the subject quickly as well as to satiate his/her own urges.

Constitutional provisions

- Indian constitution has granted rights to every person and under fundamental rights enshrined **under Article 21**: Right to life, it includes the person who has been detained or convicted or arrested.
- Basic human rights cannot be taken away plus under **Article 22**, rights are laid down for people who are being arrested and detained.
- The prohibitions imposed by Article 20 of the constitution are directly relevant to the criminal process.
 - ▶ **Article 20(1)** prohibits retrospective operation of penal legislations.
 - ▶ **Article 20(2)** guards against double jeopardy for the same offence.

Steps to curb the custodial violence in India

- Strict implementation of existing laws and guidelines
- Reforms in Police administration
- Investigation and Punishment in cases of Custodial torture
- Enhancing the role of media

Supreme Court's stand

- In the landmark case of **D.K. Basu v. State of West Bengal**, the Supreme Court of India observed in this widely publicized death in police custody that using torture to impermissible and offensive to Article 21.
 - ▶ The court noted the ubiquity of torture and third-degree methods in police investigations and lamented the 'growing incidence of torture and deaths in police custody' and held:
 - ▶ "Such a crime-suspect must be interrogated – indeed subjected to sustained and scientific interrogation determined in accordance with the provisions of law. He can't however be tortured or subjected to third-degree methods or eliminated with a view to elicit information, extract confession or derive knowledge about his accomplices, weapons etc."
- It referred to its duty to enforce Fundamental Rights under **Articles 14, 21 and 32** of the Indian constitution and the need to make the guaranteed remedies effective and to provide complete justice.

Role of Human Rights commission

- The **National Human Rights Commission (NHRC) of India** is a statutory public body constituted on 12 October 1993 under the Protection of Human Rights Ordinance of 28 September 1993.
 - ▶ It was given a statutory basis by the **Protection of Human Rights Act, 1993 (PHRA)**.
- The NHRC is responsible for the protection and promotion of human rights, defined by the act as "**Rights Relating to Life, liberty, equality and dignity** of the individual guaranteed by the constitution or embodied in the international covenants and enforceable by courts in India".

Laws for Protection of custodial torture victims in India

- **Protection under the Code of Criminal Procedure, 1973**: The code of criminal procedure, 1973 contains provisions intended to operate as a safeguard against custodial torture.
 - ▶ **Section 163 provides that**, No police officer or other person in authority shall offer or make, or cause to be offered, or make, any such inducement, threat or promise as is mentioned in section 24 of the **Indian Evidence Act, 1872**
 - ▶ But no police officer or person shall prevent, by any caution or otherwise, any person from making in the course of any investigation under this chapter any statement which he may be disposed to make of his own free will.
- **Protection Under The Indian Penal Code, 1860**:
 - ▶ Whoever, being a **public servant**, knowingly disobeys any direction of the law as to the way in which he is to conduct himself as such public servant, intending to cause, or knowing it to be likely that he will, by such disobedience, cause injury to any person, shall be
 - ▶ Punished with simple imprisonment for a term which may extend to one year, or with fine, or with both".
 - ▶ It may be reiterated that the expression injury covers harm illegally caused to **body, mind, reputation or property**.

© CONCLUSION

Police is the machinery which controls crime. If crime takes place in police custody, then we must lean

towards some other machinery to curb it. Despite, we have many provisions in our Indian laws, custodial violence continues to exist. It is the duty of the prison administration to provide proper facilities of medical,

sanitation, food, security to the prisoners and a monitoring body to only review it but also keep an eye on the other activities inside the prison.

RBI ALLOWS PRIORITY SECTOR TAG TO LOANS FROM BANKS TO NBFCs

CONTEXT

The Reserve Bank of India has allowed for the continuance of lending by scheduled commercial banks (SCBs) to non-banking finance companies (NBFCs) for the purpose of 'on-lending' to priority sector loan (PSL) segments on an on-going basis.

- Loans to microfinance institutions (MFIs) by small finance banks (SFB) will also continue to be tagged as PSL loans on an on-going basis.

BACKGROUND

- The facility of lending by commercial banks to NBFCs and lending by Small Finance Banks (SFBs) to NBFC-MFIs, for the purpose of on-lending to certain priority sectors, was available till March 31, 2022.
- Now, the Reserve Bank of India (RBI) permitted banks, including small finance banks, to continue providing credit facility to NBFCs for the purpose of on-lending to certain priority sectors.
- Bank credit to NBFCs, including HFCs, for on-lending will be allowed up to an overall limit of 5 per cent of an individual bank's total priority sector lending in the case of commercial banks.
- In the case of SFBs, credit to **NBFC-MFIs (Non-Banking Financial Company - Micro Finance Institutions)** and other **MFIs (Societies, Trusts, etc)** which are members of RBI recognised 'Self-Regulatory Organisation' of the sector, will be allowed up to an overall limit of 10 per cent of an individual bank's total priority sector lending.
- These limits will be computed by averaging across four quarters of the financial year, to determine adherence to the prescribed cap.
- According to the circular, SFBs are allowed to lend to registered NBFC-MFIs and other MFIs which have a **Gross Loan Portfolio (GLP)** of up to Rs 500 crore as on March 31 of the previous financial year, for the purpose of on-lending to priority sectors.

ANALYSIS

What is Priority Sector Lending?

- PSL refers to mandatory lending by banks to economically weaker sections.
- The idea behind this is to ensure that adequate institutional credit reaches some of the rather vulnerable sectors of the economy, which otherwise may not be attractive for banks from the profitability point of view.

Priority Sectors: PS includes eight identified sectors.

- Agriculture
- Micro, Small and Medium Enterprises
- Export Credit
- Education
- Housing
- Social Infrastructure
- Renewable Energy
- Others

Background (Origin of PSL)

- The origins of priority sector (PS) lending can be traced back to 1966 when **Morarji Desai** saw a need for increasing credit to agriculture and small industries.
- However, the definition for PS was only formalised based on a Reserve Bank of India (RBI) report in the National Credit Council in 1972.
- After bank nationalisation, the PS formulation also allowed Indira Gandhi to assuage important political lobbies, in a poor country with full adult franchise, through such directed lending.

The existing guidelines for PSL

- Commercial Banks:** Commercial banks have to lend at least 40 percent of their loan to PSL category.
- Small Finance Banks:** SFBs are required to extend 75 percent of its Adjusted Net Bank Credit (ANBC) to the sectors eligible for classification as PSL by the Reserve Bank.
- Under existing guidelines, bank loans up to a limit of Rs 150 million for purposes like solar power generators, biomass power generators, wind mills, micro-hydel plants and for non-conventional energy based public utilities like street lighting

systems and remote village electrification are currently eligible to be classified under priority sector loans under the '**Renewable Energy**'.

- For individual households, the loan limit is Rs. 1 million per borrower.

What is 'on lending'?

- In literal terms, on-lending refers to giving loans to somebody by the use of borrowed money.
- In India, the RBI has promoted on-lending by banks to the NBFCs for providing loans to certain sectors. Here, the banks give funds to the NBFCs and the latter deliver the loans to the ultimate weaker section beneficiary.

- Effectively, under the programme, NBFCs can make on-lending to the priority sector beneficiaries by using bank's funds under the **Priority Sector Lending programme**.

◎ CONCLUSION

The decision of RBI to continue the scheme is a welcome step as it will improve the flow of credit to the unserved and underserved sector of the economy and make available funds to the ultimate beneficiary at an affordable cost, considering the lower cost of funds from banks and greater reach of the NBFCs.

INDIA'S WHEAT EXPORT BAN, UNDERSTANDING INDIA'S AGRICULTURAL EXPORTS & CHALLENGES

CONTEXT:

India has banned exports of wheat recently, citing a risk to food security, partly due to the war in Ukraine and as a scorching heatwave curtailed output and domestic prices hit a record high.

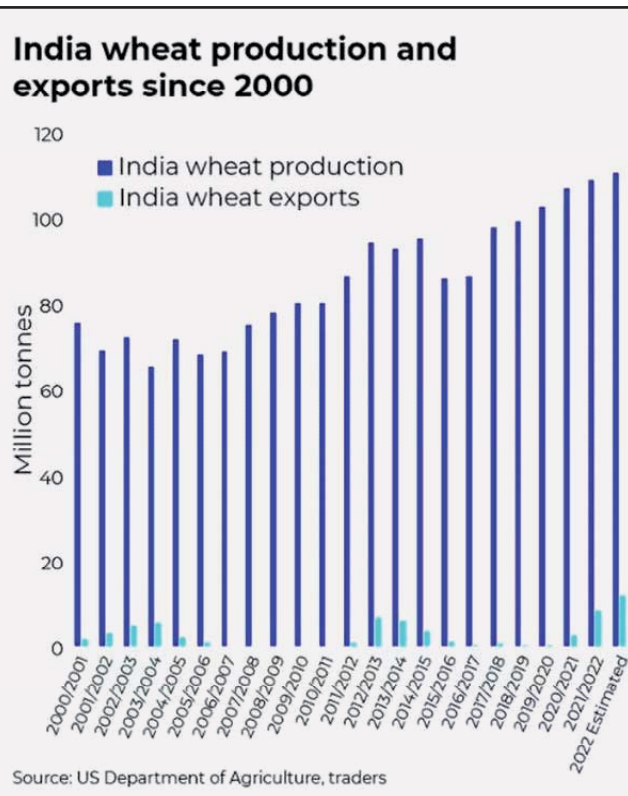
ANALYSIS

India's agricultural export

- India is one of the largest agricultural products exporters in the world. During 2021-22, the country crossed US\$ 50 billion in agriculture exports with a 19.92% increase from US\$ 41.87 billion in 2020-21.
- It exports **rice, meat, grains, wheat, nuts, onions, fruits, pulses, dairy products, alcoholic beverages, cereals, cashews, vegetables, etc.**
- Rice is the largest exported agricultural product from India and contributed to more than 17% of the total agriculture export during the year 2021-22.
- Buffalo meat, wheat and maize are among the largest exported products with the contribution of 6%, 4% and 2% to 2021-22 agriculture exports respectively.
- The largest importers of India's agricultural products are the US, China, Bangladesh, UAE, Vietnam, Saudi Arabia, Indonesia, Iran, Nepal and Malaysia.
 - The other importing countries are Korea, Japan, Italy and the UK.

Recent Agricultural export statistics:

- Wheat:** India is world's second biggest producer of wheat after China. Though India is not a major exporter of wheat, but India's share now stands at 5% as against 0.3% in 2019-20.
- Rice:** India's share in global exports of rice has increased from about 22% in 2018-19 to 40% in 2021-22.
- Sugar:** India's share in sugar exports, which has increased to over 11% as against 3.4% in 2017-18.



Global Agricultural trade:

- World Bank** predicted that food prices are expected to soar by 22.9% this year, driven by a **40% rise in wheat prices**.
 - Primarily because Ukraine and Russia together account for about 14% of global wheat production, and about 29% of all wheat exports.
- India is a crucial supplier of wheat to its neighbours.** Apart from Afghanistan which recently received large consignments of wheat from India on humanitarian grounds, Bangladesh is another big importer of Indian wheat.
 - India produced around 7 million tonnes of wheat during 2021-'22 and out of that nearly 50% was imported by Bangladesh.
- Food protectionism:**
 - Indonesia** began restricting exports of palm oil, a common ingredient found in many of the

world's food, cosmetics and household items. It's the world's top producer of the product.

- ▶ **Egypt** had banned exports of key staples such as wheat, flour, lentils and beans amid growing concerns over food reserves in the Arab world's most populous state.

India and WTO:

- India's agricultural exports are under intense scrutiny in the World Trade Organization (WTO).
 - ▶ In 2019, Australia, Brazil, and Guatemala complained to WTO's dispute settlement body that the Indian government was implementing several subsidy schemes for promoting sugar exports.
 - ▶ The complainants argued that by implementing these subsidy schemes, the government had violated the rules of WTO's Agreement on Agriculture (AoA), which prohibit the use of export subsidies.
 - ▶ In December 2021, the dispute settlement panel adjudicating the dispute gave its ruling against India.
- Several countries, including Japan, Russia and the US, have sought clarifications from India as to whether its exports of food grains are in any way linked to the Open Market Sales Scheme of the Food Corporation of India.

WTO's Agreement on Agriculture:

- It is aimed to remove trade barriers and to promote transparent market access and integration of global markets.
- The WTO's Agriculture Committee oversees implementation of the Agreement and provides a forum for members to address related concerns.

Important Government Intervention

- **Financial Assistance Scheme:** FAS is the export promotion scheme by the Agriculture and Processed Food Products Export Development Authority (APEDA). It aims to assist businesses in export infrastructure development, quality development and market development.

APEDA

- APEDA was formed in 1986 for the development of the exports of the agriculture industry in India.
- APEDA is entrusted with the responsibility of export and promotion of 14 agriculture and processed food product groups.

- **Agriculture Export Policy:** The **Agriculture Export Policy** was announced in 2018 with a focus on agriculture export-oriented production, export promotion, better farmer realisation and synchronisation with the policies and programmes of the Government of India.
- **Agri-clusters:** **Agri-clusters** have been activated by forming cluster-level committees, forming FPOs, connecting exporters to the FPOs, and sorting out the issues of transportation/ logistics/ pack houses, etc.
- **Farmer Connect Portal:** A **Farmer Connect Portal** has been set up through APEDA for providing a platform for FPOs/FPCs, cooperatives to interact with exporters.
- **Digital platforms:** A number of digital platforms, using technologies like **blockchain**, for traceability have been developed for enabling smooth flow of business and ensuring transparency in the system, such as **HortiNet** for mango, vegetables and citrus fruits, **Basmati.net**, **TraceNet** for organics, **Peanut.net**, farm registration app, **Meat.net** and **Grapenet**.
- **TMA Scheme: 'Transport and Marketing Assistance (TMA) for Specified Agriculture Products'** is a scheme for providing assistance for the international component of freight to mitigate the freight disadvantage for the export of agriculture products and assistance for the marketing of agricultural produce.

Required measures

The country needs to address the following elements of the agri-food supply chain to emerge as a top global exporter:

- Agri-production practices
- Supply chain and logistics
- Streamlining regulatory compliance practices
- Delivering transparency and traceability using technology
- Developing products suited to the global palate.

◎ CONCLUSION:

India's ban on wheat exports has delivered a fresh blow to world markets already reeling from tight supplies due to output issues in traditional export powerhouses Canada, Europe and Australia and snarled supply lines in the war-torn Black Sea area. However, India is a crucial supplier of wheat to its neighbours and the Indian government is committed to ensuring food security of neighbours and vulnerable countries.

HUMAN CELL ATLAS

CONTEXT

Scientists have mapped out more than a million cells across 33 organs in the human body. The map can help to provide unparalleled insights into health and diseases

◎ BACKGROUND

- The Human Cell Atlas is a project to describe all cell types in the human body.
- The initiative was announced by a consortium after its inaugural meeting in London in October 2016.
- In October 2017, the Chan Zuckerberg's Initiative announced funding for 38 projects related to the Human Cell Atlas.
- By April 2018, the project included more than 480 researchers conducting 185 projects.
- In April 2018, the first data set from the project was released, representing 530,000 immune system cells collected from bone marrow and cord blood.
- Many single-cell sequencing approaches exist and so the HCA has the opportunity to perform systematic comparisons as well as to develop novel methods.
- Single-cell sequencing data present unique computations challenges and rich areas for innovation.

The scRNA-seq technique

- Single cell RNA - Sequencing (scRNA - Seq) enables simple and robust access to the transcriptomes of thousands of single cells.
- **Features:** ScRNA-seq can be used to define the molecular identities of a large number of cells at affordable costs and is a sufficiently mature and distributed technology to be available to a diverse range of laboratories worldwide.

◎ ANALYSIS

What is a Human Cell Atlas?

- The Human Cell Atlas will be catalogue of a cell based on several criteria,
 - ▶ The cell type
 - ▶ Its state
 - ▶ its location in the body
 - ▶ The transitions it undergoes
 - ▶ The lineage of the cell
- It will gather data from **existing research, and integrate** it with data collected in future research projects.
- Its scope is to categorize the **37 trillion cells** of the human body to determine which genes in each cell expresses the sampling cells from all parts of the body.
- All aspects of the project will be made "**available to the public for free**", including **software and results**.

Key features

- The HCA aims to **identify and describe** every cell type in the human body.
- Two main approaches to achieve this will be **scRNAseq and spatially resolved methods**.
- Sources of human tissue samples and appropriate handling techniques will be key to this project.

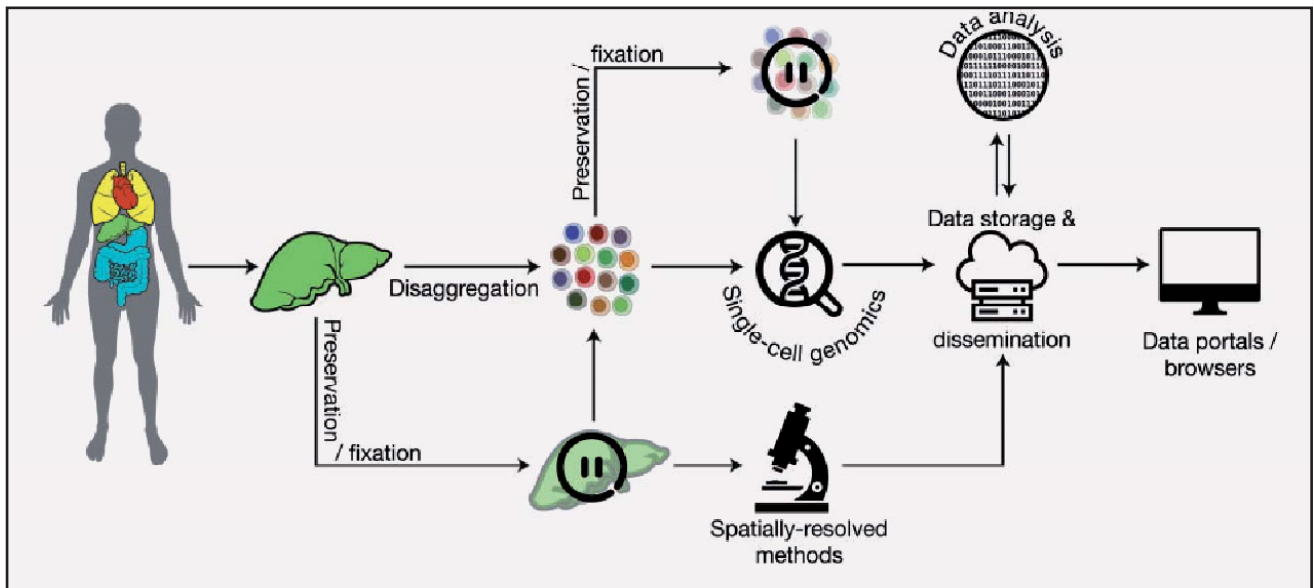
What does it aim?

- The initiative can transform our understanding of the trillions of cells in the human body.
- Without maps of different cell types, their molecular features and location in the body, we cannot describe all their functions or understand the networks that direct their activities.
- The map can also help us understand how a disease emerged in a body and identify the precise place or cell where it arises.
- It will allow us to develop more precise diagnostics for patients and new treatments.

How does it collect data?

• Steps involved:

- ▶ The exact approach that will be taken to build the HCA remains under discussion.
- ▶ The current state-of-the-art of technical approaches that could be used to generate the Atlas are in three areas;
 - ▶ **Sample acquisition, data-generating technologies and computational analyses.**
- **Sample acquisition:** obtaining samples from all the tissues that are present in a human is the initial challenge for human cell atlas.
 - ▶ The single-cell resolution that will be a defining feature of the HCA were able to fix, freeze or



analyse tissues immediately after collection and then ship the samples to central facilities for gene expression assays.

- **Data-generating technologies:** Once tissue samples have been acquired, they must be analysed to determine the cell populations contained within.
 - ▶ The choice of platforms and protocols used within the HCA will depend on balancing requirements of throughput, data quality and cost.
 - ▶ A key driver of the rapid growth in single-cell research has been the commercial availability of instruments that partition and process cells for scRNAseq analysis.
 - ▶ The first of its kind was **Fluidigm's C1 platform**, which captures cells at low to medium throughput using a microfluidic circuit, where the cells are lysed and reverse transcribed, and cDNA is amplified.
- **Computational analyses:** The computational process can be split into **four broad areas:**
 - ▶ Estimation of expression levels,
 - ▶ Definition of cell identity,
 - ▶ Identification of gene signatures and
 - ▶ Analysis of spatially resolved data.

Global Initiatives

- **India's Project 'MANAV'**
 - ▶ The project named '**Manav**' has been launched by the Department of Biotechnology and Persistent Systems, a biotechnology company.
 - ▶ This mega project will collate and integrate molecular information on human tissues and organs that currently lies hidden in research

articles in an unstructured and disorganized form.

- **Human Genome project:** The Human Genome Project originally aimed to map the nucleotides contained in a human haploid reference genome (more than three billion).
 - ▶ The "genome" of any given individual is unique; mapping the "human genome" involved sequencing a small number of individuals and then assembling to get a complete sequence for each chromosome.
 - ▶ Therefore, the finished human genome is a mosaic, not representing any one individual. The utility of the project comes from the fact that the vast majority of the human genome is the same in all humans.
- The **Human Protein Atlas (HPA):** is a Swedish-based program started in 2003 with the aim to map all the human proteins in cells, tissues and organs using integration of various omics technologies, including antibody-based imaging, mass spectrometry-based proteomics, transcriptomics and systems biology.
 - ▶ All the data in the knowledge resource is open access to allow scientists both in academia and industry to freely access the data for exploration of the human proteome.

Benefits

- **Biological scope:** The full atlas, will ultimately describe at least 10 billion cells, covering all tissues, organs, and systems. Specimens will come from both healthy research participants and small cohorts of patients with relevant diseases.

- **Model organisms: The Human Genome Project and the broader scientific community benefitted** from insights learned from genome projects conducted in parallel in model organisms. These projects empowered functional studies in model organisms, ushered a new era of comparative genomics, and provided important technical lessons.
- **Open data availability:** The Human Genome Project made clear the power of open data that can be used by all and freely combined with other datasets. A Human Cell Atlas should similarly be an open endeavor, to the full extent permitted by participants' wishes and legal regulation.
- **Helps scientific community:** it will provide the core scientific knowledge and discoveries that will result from having a reference map;
 - ▶ the empowerment of scientists working across any tissue or cell type to pursue their research more precisely and effectively;
 - ▶ the development, hardening and dissemination of experimental techniques and computational methods in the context of big-data settings,
 - ▶ all of which will be openly shared; the inclusive and maximally open Human Cell Atlas community,
 - ▶ inviting participation by all individual labs and research centers; and
 - ▶ The coordination of efforts that would otherwise be unconnected, less extensive, and more expensive.

Concerns

- **Lack of global equity:** Geographical atlases of the Earth were largely developed to serve global

power centers. The Human Cell Atlas should be designed to serve all people. It should span genders, ethnicities, environments, and the global burden of diseases –all of which are likely to affect the molecular profiles of cells and must be characterized to maximize the atlas's benefits.

- **Problem to scientists:** They may face premature restriction to specific technologies or approaches, which might limit innovation in a fast-moving field, implicit restriction of participation, based on available resources; and diversion of funding from other research directions.
- **Lack of non-governmental cooperation:** The general public is a key stakeholder community for the Human Cell Atlas. Proper public engagement should involve many communities, including interested members of the public, citizen-scientists, schoolchildren, teachers and, where appropriate, research participants. Engagement will take diverse forms, including traditional media, social media, video and, importantly, direct sharing of the project's data.

◎ CONCLUSION

The past quarter-century has many times showed the value of the scientific community joining together in collaborative efforts to generate and make freely available systematic information resources to accelerate scientific and medical progress in tens of thousands of laboratories around the world. The Human Cell Atlas builds on this rich tradition, extending it to the fundamental unit of biological organization: the cell. Many challenges will arise along the way, but we are confident that they can be met through scientific creativity and collaboration.

MISSILES SYSTEM AND TECHNOLOGIES

CONTEXT

The Indian Air Force successfully fires extended range version of Brahmos missile from Su-30 MKI aircraft. It is the first launch of extended range version of BrahMos missile.

◎ BACKGROUND

- The first missiles to be used operationally were a series of missiles developed by Nazi Germany in World War II.
- The Integrated Guided Missile Development Program (IGMDP) was launched in 1983 by India.
- This program was launched with an agenda to develop five missile systems in the country – Trishul, Akash, Nag, Prithvi, and Agni.
- Tessy Thomas who is an Indian scientist and Director General of Aeronautical Systems and the former Project Director for Agni-IV missile in Defence Research and Development Organisation (DRDO) is known as the 'Missile Woman of India'.
- Prithvi was the first Indian single staged liquid-fuelled surface-to-surface Missile.

◎ ABOUT

What is a missile?

- A **missile** is a guided airborne ranged weapon capable of **self-propelled flight** usually by a jet engine or rocket motor.
- The word **missile** referred to **any projectile** that is thrown, shot or propelled towards a target; this usage is still recognized today.
- Missiles are thus also called **guided missiles** or **guided rockets** (when in rocket form).

What are their types?

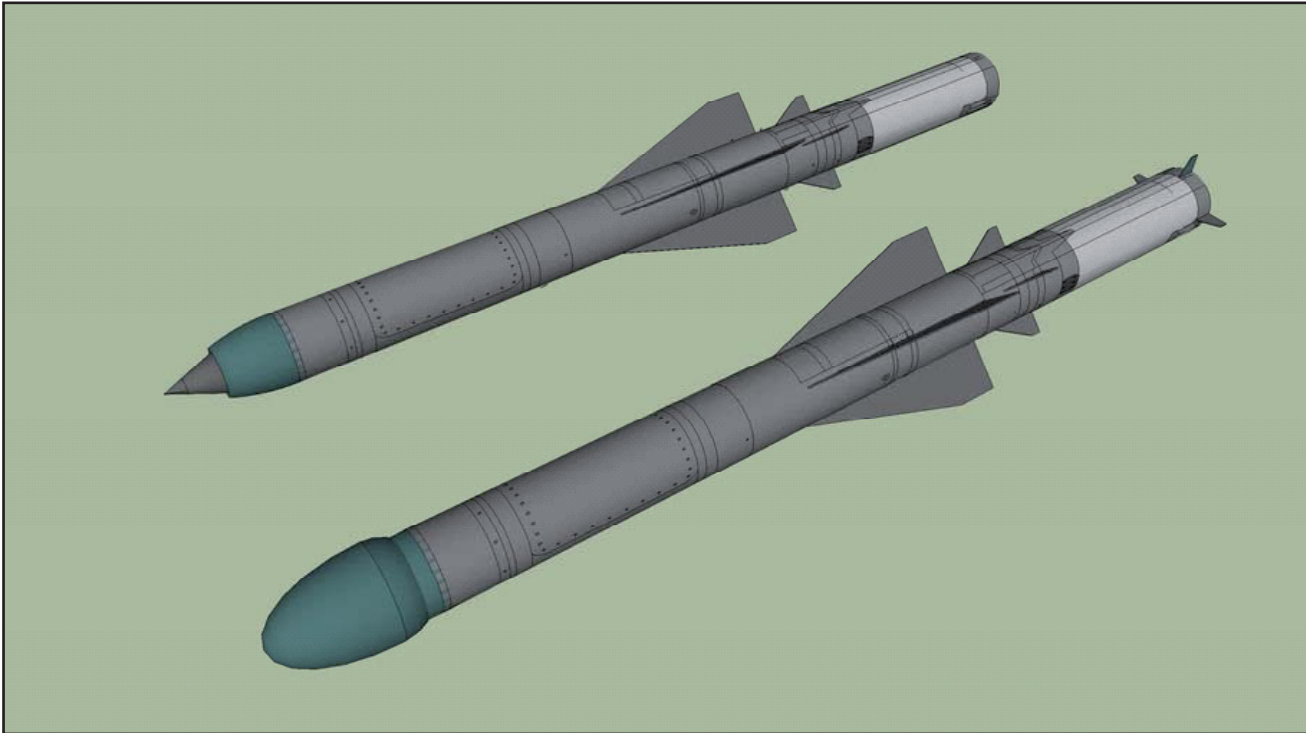
- Missiles are generally classified on the basis of their **Type, Launch Mode, Range, Propulsion and Warhead**.
 - ▶ **Based on launch mode:**
 - Surface -to -Surface Missile
 - Surface-to-Air Missile
 - Surface (Coast)-to-Sea Missile
 - Air-to-Air Missile
 - Air-to-Surface Missile
 - Sea-to-Sea Missile
 - Sea-to-Surface (Coast) Missile
 - Anti-Tank Missile

- **Depending upon the speed such missiles are classified as:**

- ▶ Subsonic cruise missile
- ▶ Supersonic cruise missile
- ▶ Hypersonic cruise missile
- Subsonic cruise missile flies at a speed lesser than that of sound. It travels at a speed of around 0.8 Mach.
- The well-known subsonic missile is the **American Tomahawk cruise missile**. Some other examples are **Harpoon of USA and Exocet of France**.
- Supersonic cruise missile travels at a speed of around 2-3 Mach i.e.; it travels a kilometre approximately in a second.
- The modular design of the missile and its capability of being launched at different orientations enable it to be integrated with a wide spectrum of platforms like warships, submarines, different types of aircraft, mobile autonomous launchers and silos.
- The combination of supersonic speed and warhead mass provides high kinetic energy ensuring tremendous lethal effect.
- **BRAHMOS is the only known versatile supersonic cruise missile system which is in service.**
- Hypersonic cruise missile travels at a speed of more than 5 Mach.
- Many countries are working to develop hypersonic cruise missiles.
- BrahMos Aerospace is also in the process of developing a hypersonic cruise missile, BRAHMOS-II, which would fly at a speed greater than 5 Mach.

BrahMos missile system

- The BrahMos is a **ramjet supersonic cruise missile** of a short-range developed by **Defence Research and Development Organisation (DRDO) and the Russian Federation's NPO Mashinostroyeniya**.
- BrahMos was named after two major rivers of India and Russia: **Brahmaputra and Moskva**.



- The technology used in this joint venture is based on the Russian P-800 Oniks cruise missile and similar sea-skimming cruise missiles from Russia.

- **Features:**

- ▶ Stealth Technology
- ▶ Advanced guidance system
- ▶ **High Target Accuracy** (irrespective of weather conditions)
- ▶ Constant supersonic speed
- ▶ Operates on '**Fire and Forget**' Principle
- ▶ BrahMos can be launched from **land, aircraft, ships, and even submarines.**
- ▶ One of the heaviest missiles, weighing up to 2.5 tonnes.

- **Based on Technology used**

- ▶ **Guidance system:** The most common method of guidance is to use some form of radiation, such as infrared, lasers, or radio waves, to guide the missile onto its target. This radiation may emanate from the target or it may be provided by the missile itself (such as radar), or it may be provided by a friendly third party. This also includes two procedures;
- ▶ **Fire and forget:** they need no further support or control from the launch vehicle/platform in order to function.

- ▶ **TV guidance:** with visible light or infrared pictures produced in order to see the target. The pictures may be used either by a human operator who steers the missile onto its target or by a computer doing much the same job.

- **Targeting system: Another method is to target the missile by knowing the location of the target and using a guidance system such as INS, TERCOM or satellite guidance.**

- ▶ This guidance system guides the missile by knowing the missile's current position and the position of the target, and then calculating a course between them.

- **Flight system:** The flight system uses the data from the targeting or guidance system to maneuver the missile in flight, allowing it to counter inaccuracies in the missile or to follow a moving target.

- ▶ There are two main systems: **vectored thrust** (for missiles that are powered throughout the guidance phase of their flight) and **aerodynamic maneuvering.**

- **Engine:** Missiles are powered by an engine, generally either a type of rocket engine or jet engine. Rockets are generally of the solid-propellant type for ease of maintenance and fast deployment, although some larger ballistic missiles use liquid-propellant rockets. Jet engines are generally used in cruise missiles, most commonly of the turbojet type, due to its relative simplicity and low frontal area.

- ▶ **Turbofans** and **ramjets** are the only other common forms of jet engine propulsion, although any type of engine could theoretically be used.
 - ▶ Long-range missiles may have multiple engine stages, particularly in those launched from the surface.
 - **Warhead:** The warheads of a missile provide its primary destructive power. Warheads are most commonly of **the high explosive type**, often employing shaped charges to exploit the accuracy of a guided weapon to destroy hardened targets.
 - ▶ Based on intended target, they are classified as;
 - **Ballistic missiles:**
 - ▶ After the boost stage, ballistic missiles follow a trajectory mainly determined by ballistics. The guidance is for relatively small deviations from that.
 - **Ballistic missiles are largely used for land attack missions.** Although normally associated with nuclear weapons, some conventionally armed ballistic missiles are in service, such as MGM-140 ATACMS.
 - **Cruise missile:**
 - ▶ Cruise missiles are generally associated with **land-attack operations**, but also have an important role **as anti-shipping weapons**.
 - ▶ They are primarily launched from **air, sea or submarine platforms in both roles**, although land-based launchers also exist.
 - **Anti-ship and Anti-submarine:**
 - ▶ These missile are generally use the missile in order to deliver another weapon system such as a torpedo or depth charge to the location of the submarine, at which point the other weapon will conduct the underwater phase of the mission.
 - **Anti-tank:** it is man-portable missile proved and may be launched from aircraft, vehicles or by ground troops in the case of smaller weapons.
- **Classification based on launching base**
 - ▶ **Surface-to-Surface Missile:** A surface-to-surface missile is a guided projectile launched from a hand-held, vehicle mounted, trailer mounted or fixed installation. It is often powered by a rocket motor or sometimes fired by an explosive charge since the launch platform is stationary.
 - ▶ **Surface-to-Air Missile:** A surface-to-air missile is designed for launch from the ground to destroy aerial targets like aircrafts, helicopters and even ballistic missile. These missiles are generally called air defence systems as they defend any aerial attacks by the enemy.
 - ▶ **Surface (Coast)-to-Sea Missile:** A Surface (Coast)-to-Sea Missile is designed to be launched from land to ship in the sea as targets.
 - ▶ **Air-to-Air Missile:** An Air-to-Air Missile is launched from an aircraft to destroy the enemy aircraft. The missile flies at a speed of 4 Mach.
 - ▶ **Air-to-Surface Missile:** An Air-to-Surface Missile is designed for launch from military aircraft and strikes ground targets on land, at sea or both. The missiles are basically guided via laser guidance infrared guidance and optical guidance or via GPS signals. The type of guidance depends on the type of target.
 - ▶ **Sea-to-Sea Missile:** Sea-to-Sea Missile is designed for launch from one ship to another ship.
 - ▶ **Sea-to-Surface (Coast) Missile:** A Sea-to-Surface (Coast) Missile is designed for launch from ship to land based targets.
 - ▶ **Anti-Tank Missile:** An Anti-Tank Missile is a guided missile primarily designed to hit and destroy heavily-armoured tanks and other armoured fighting vehicles. Anti-tank missiles could be launched from aircraft, helicopters, tanks and also from shoulder mounted launcher.

REPLENISHMENT STUDY OF RIVERBED SAND MUST FOR SAND MINING IN UTTAR PRADESH: NGT

CONTEXT

National Green Tribunal (NGT) has directed Uttar Pradesh government not to permit any sand mining before completion of replenishment studies for riverbed sand.

- Such studies must be done by credible institutions, following due procedure, in accordance with Enforcement and Monitoring Guidelines for Sand Mining, 2020.

BACKGROUND

- A United Nations study calculates that humankind's total consumption of sand—more than 40 billion tons a year—is now double the number of sediments being replenished naturally on the Earth by the sum of the world's rivers.
- UNEP in its report '**Sand and Sustainability**' highlighted that the demand for sand has increased three-fold over the last decades, driven by
 - shifting consumption patterns
 - growing populations
 - increasing urbanisation
 - rapid infrastructure development

ANALYSIS

Understanding Geology and usage of sand

- Sand is a granular material composed of finely divided rock and mineral
- Composition of sand is highly variable, depending on the local rock sources and conditions, but the most common constituent of sand in inland continental settings and non-tropical coastal settings is silica (silicon dioxide, or SiO₂), usually in the form of quartz.
- Sand is classified as a "minor mineral", as per **The Mines and Minerals (Development and Regulations) Act, 1957 (MMDR Act)**.
- Sand mining is the extraction of sand, mainly through an open pit (or sand pit) but sometimes mined from beaches and inland dunes or dredged from ocean and river beds.
- The extracted sand can be used for various types of manufacturing, such as concrete used in the construction of buildings and other structures.
- The use of sand for cement-making in industrial projects has generated significant demand in India.
- The sand can also be used as an abrasive or can be mixed with salt and applied to icy roads to reduce the melting point of ice.

Minor Minerals

- The central government has the power to notify "minor minerals" under the MMDR Act, 1957.
- Under the MMDR Act, the legal and administrative control over minor minerals vests with the State Governments, who have the powers to make rules to govern minor minerals.

Major Minerals

- Major minerals are those specified in the first schedule appended in the MMDR Act 1957 and the common major minerals are Lignite, Coal, Uranium, iron ore, gold etc. It may be noted that there is no official definition for "major minerals" in the MMDR Act. Hence, whatever is not declared as a "minor mineral" may be treated as the major mineral.
- The policy and legislation relating to the major minerals are dealt by the Ministry of Mines under the Union /Central Government.

Provisions for Sand Mining in India

- As sand is a **Minor Mineral**, different State Governments have made different rules for awarding, regulating and administering the sand concessions.
- To curb Illegal mining, there have been various judicial interventions by the **Supreme Court (SC) and National Green Tribunal (NGT)**.
- The National Green Tribunal in August 2013 passed an order banning sand mining without proper environment clearance.
- The **Ministry of Environment, Forest and Climate Change (MoEFCC)** has released "Sustainable Sand Mining Management Guidelines 2016" to promote scientific mining of sand and encourage environmental friendly management practices.
- Indian government's Ministry of Mines has also developed a Mining Surveillance System (MSS) to

use space technology for facilitating State governments in curbing illegal mining activities in the country.

- Under Sections 120B read with Section 34 of Indian Penal Code, 1860, extraction of sand without a legal permit is a punishable offence.

What is the impact of riverbed sand mining?

• Environmental Impact

- ▶ **Alteration of Rivers:** Excessive sand mining can alter the river bed, force the river to change course, erode banks and lead to flooding. It leads to deepening of rivers and estuaries, and the enlargement of river mouths and coastal inlets. It may also lead to saline-water intrusion from the nearby sea.
- ▶ **Damage River Biodiversity:** In stream mining can have other costly effects beyond the immediate mine sites. Degraded stream habitats result in loss of fisheries productivity, biodiversity, and recreational potential.
 - Sand Mining in Chambal has impacted the population of Gharials (National Chambal Sanctuary has been established for their conservation), a critically endangered species. The mining hurts wildlife by removing basking and egg-laying habitat.
- ▶ **Alter Sediment Budget:** As the amount of sand reaching Oceans changes, rivers are not able to replenish the sand on beaches and in deltas.

- **Lead to poor water quality:** Increased riverbed and bank erosion increases suspended solids in the water at the excavation site and downstream. Suspended solids may adversely affect water users and aquatic ecosystems.

• Socio-Economic Impacts

- ▶ Worsen water scarcity
- ▶ Threat to Coastal Communities
- ▶ Damage Public and Private Property

What measures are needed for sustainable sand mining?

- Strengthen Policy Framework
- Focusing on alternatives to Sand
- Reducing consumption of sand
- Reducing the negative consequences of extraction

◎ CONCLUSION

Sand and gravel represent the highest volume of raw material used on earth after water. Their use greatly exceeds natural renewal rates. Moreover, the amount being mined is increasing exponentially, mainly as a result of rapid economic growth. To sustain the economic growth in future, it becomes important that the resource is used judiciously.

DESERTIFICATION: 'DROUGHTS REDUCED INDIA'S GDP BY UP TO 5% IN 20 YEARS'

CONTEXT

According to the Drought in Numbers, 2022 report released at the 15th Conference of Parties (CoP15) to the United Nations Convention to Combat Desertification (UNCCD), the frequency and duration of drought is increasing at an alarming rate across the world since the onset of the 21st century.

◎ BACKGROUND

- According to **Desertification and Land Degradation Atlas of India**, released by the **Space Applications Centre of the Indian Space Research Organisation**, some 97.85 million hectares (mha) — nearly 30 per cent of India's total geographical area (TGA) — underwent land degradation during 2018-19.
 - ▶ In 2003-05, 94.53 mha (28.76% of the TGA) underwent land degradation. This number increased to 96.40 mha (29.32% of the TGA) in 2011-13.
 - ▶ Some 83.69 mha underwent desertification in 2018-19.
 - ▶ The level of desertification increased in 28 of 31 states and Union territories between 2011-13 and 2018-19.
 - ▶ In eight states—Rajasthan, Delhi, Goa, Maharashtra, Jharkhand, Nagaland, Tripura, and Himachal Pradesh—around 40 to 70 per cent of land has undergone desertification.
 - ▶ Around 23.79% of the area undergoing desertification/land degradation in the country was contributed by **Rajasthan, Maharashtra, Gujarat, Karnataka, Ladakh, Jharkhand, Odisha, Madhya Pradesh and Telangana**.

What are the concerns for India?

- The assessment has featured India as one of the severely drought-impacted countries. Nearly two-thirds of the country suffered drought during 2020-2022.
- Geographically, India's drought vulnerability compares with that of sub-Saharan Africa.
- The effect of severe droughts was estimated to have reduced India's gross domestic product by 2-5 per cent over the 20 years from 1998 to 2017.
- India's drought-prone area has increased by 57 per cent since 1997.
- One-third of India's districts have faced more than four droughts over the past decade and 50 million people are affected by drought every year.
- Some 97.85 million hectares — nearly 30 per cent of

the country's land — underwent land degradation during 2018-19.

- Drought impacts India's dominantly rainfed agriculture which accounts for 60 per cent of the sown area on average.

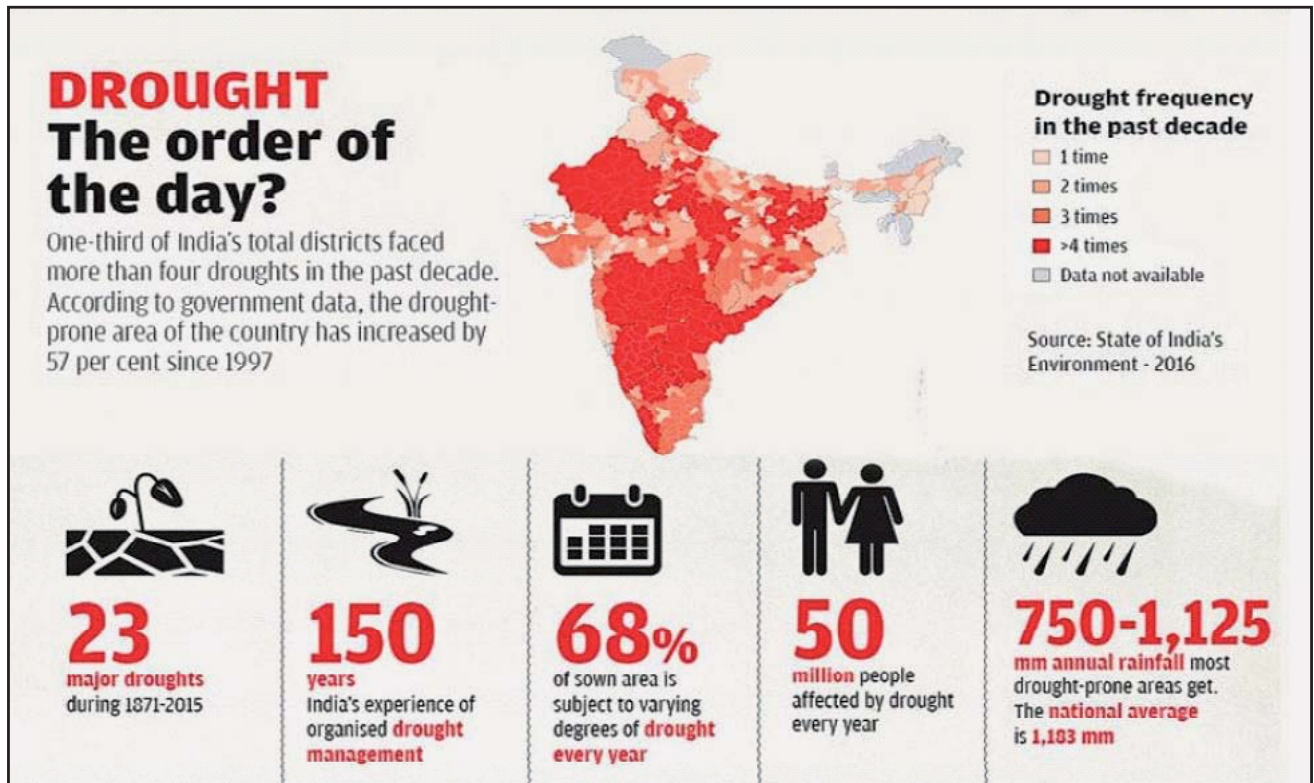
What is Land degradation/Desertification?

- UNCCD defines desertification as "land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities".
- Drylands affected by desertification not only lose their ability to support plant life but also their ability to offer ecosystem services, such as management of water systems and storage of carbon use in global warming.
- With changing climate, prolonged droughts, and increasing incidences of floods, landslides, and frost heaving are in any case reducing the amount of productive land.
- At the same time, the growing demand for food, fodder, fuel and raw materials is increasing the pressure on land and the competition for natural resources.

United Nations Convention to Combat Desertification (UNCCD)

- Established in 1994, UNCCD is the sole legally binding international agreement linking environment and development to sustainable land management.
- The Convention addresses specifically the arid, semi-arid, and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found.
- The UNCCD is particularly committed to a bottom-up approach, encouraging the participation of local people in combating desertification and land degradation.

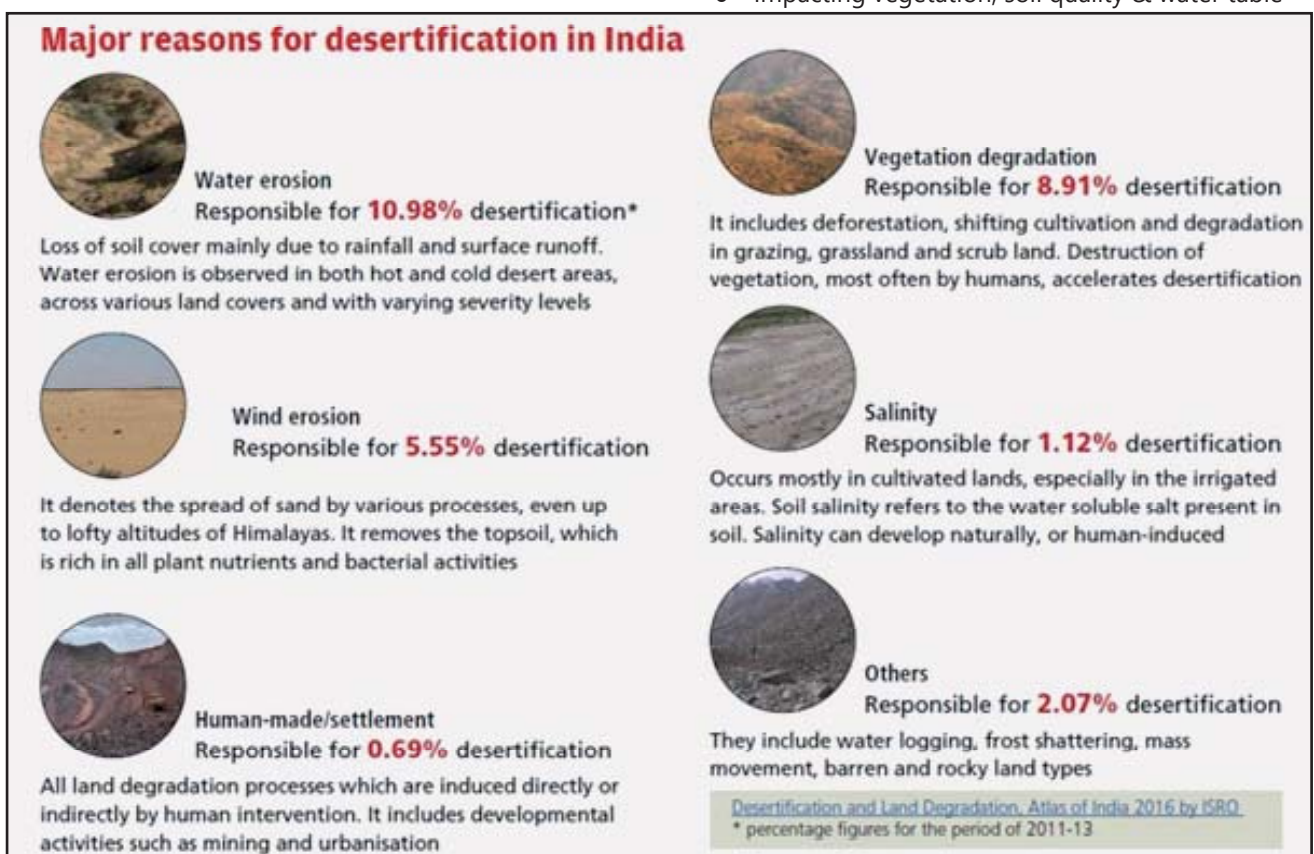
What are the causes of Land degradation/Desertification?



- Factors like deforestation, wetland drainage, overgrazing, unsustainable land-use practices, and the expansion of agricultural, industrial, and urban areas are the other significant causes of land degradation.

What are the impacts of land degradation?

- Loss of soil fertility
- Erosion
- Impacting vegetation, soil quality & water table



- Destructing the ecosystems
- Economic loss
- Leading to climate crisis
- Impact on human health

How to combat desertification?

- Terracing on hill slopes
- Drip Irrigation
- Contour binding
- Dune stabilization
- Cover crops
- Climate-smart agriculture
- Windbreaks

Steps Taken by Government of India to combat desertification

- **Integrated Watershed Management Programme:** It aims to restore ecological balance by harnessing, conserving, and developing degraded natural resources with the creation of Rural Employment. It is subsumed under **Pradhan Mantri Krishi Sinchai Yojana**.
- **UNCCD:** India became a signatory to the United Nations Convention to Combat Desertification (UNCCD) in 1994 and ratified in 1996.

- **National Afforestation Programme:** Implemented since 2000 for the afforestation of degraded forest lands.
- **National Action Programme to Combat Desertification:** It was prepared in 2001 to address issues of increasing desertification and to take appropriate actions.
- **Fodder and Feed Development Scheme:** Launched in 2010 to improve degraded grassland and also the vegetation cover of problematic soils like saline, acidic and heavy soil.
- **National Mission on Green India:** It is a part of the National Action Plan on Climate Change (NAPCC). It was approved in 2014 to protect, restore and enhance India's diminishing forest cover with a deadline of 10 years.

◎ CONCLUSION

Desertification or land degradation is not new to the world. In an age governed by steep population growth, industrialisation and the global rise in temperatures, one of nature's precious bounties, land, is threatened severely. The need of the hour is to stop ongoing desertification and increase green cover of the country. It will help not only tackling climate change but also conserve wildlife and ensure human wellbeing.

WHY ARE FOREST FIRES IN THE HILLS INTENSIFYING THIS SUMMER?

CONTEXT

- Forest fires continue to scorch several hectares of green cover in the Uttarakhand and Himachal Pradesh.
- Himachal reported close to 750 forest fires, while Uttarakhand recorded over 1,500 such incidents.

◎ BACKGROUND

- The forest fire season in India lasts between **November and June**.
- The **large forest fires** are the most challenging to control due to their intensity, geographical cover and duration that can go up to **5 days**.
- Some of the leading natural causes of **wildfires include, dry climate, lightning, climate variability and volcanic eruption**.
- Uttarakhand** had witnessed 51 large fire incidents, the maximum by any Indian state.
- Vulnerability of India's Forests to Fires:**
 - As of 2019, about 21.67% (7,12,249 sq km) of the country's geographical area is identified as forest, according to the India State of Forest Report 2019 (ISFR) released by the Forest Survey of India (FSI), Dehradun.
 - Tree cover makes up another 2.89% (95, 027 sq km).
 - Based on previous fire incidents and records, forests of the Northeast and central India regions are the most vulnerable areas to forest fires.
 - Forests in Assam, Mizoram and Tripura have been identified as '**extremely prone**' to forest fire.
 - States with large forest areas under the 'very highly prone' category include Andhra Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Maharashtra, Bihar and Uttar Pradesh.
 - As per the 2020-2021 annual report of the MoEFCC, Western Maharashtra, Southern Chhattisgarh and areas of Telangana and Andhra Pradesh, along with central Odisha, are turning into '**extremely prone**' forest fire hotspots.
 - Areas under the '**highly prone**' and '**moderately prone**' categories make up about 26.2% of the total forest cover.

◎ ANALYSIS

What does a forest fire mean?

- A **wildfire, forest fire, bushfire, wildland fire or rural fire** is an unplanned, uncontrolled fire in

an area of combustible vegetation starting in rural and urban areas.

- Some forest ecosystems in their natural state depend on wildfire.
- Depending on the type of vegetation present, a wildfire can also be classified more specifically as a forest fire, brush fire, bushfire (in Australia), desert fire, grass fire, hill fire, peat fire, prairie fire, vegetation fire, or veld fire.

What are the causes of forest fires?

- Several factors like temperatures, precipitation, vegetation, and moisture contribute to the scale and frequency of these fires.
- According to the Forest Survey of India, nearly 36 per cent of India's forests are prone to frequent fires.
- Higher fire incidents are reported in March, April and May due to ample availability of dry biomass (fuel load) following the end of winter and the on-going summer season.
- Most forest fires, according to experts, are man-made due to changes in agriculture and unchecked land-use patterns.

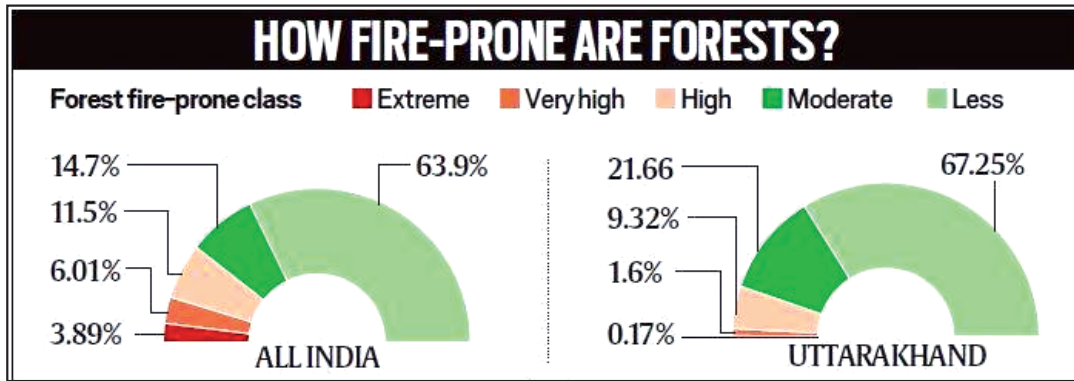
How are forest fires classified?

Forest fires are broadly categorised into three categories:

- Ground:** Fires that burn organic material in the soil are called ground fires, and they burn slowly, under vegetation.
- Surface:** Surface fires are caused largely by burning of dry leaves, branches and other materials on the ground. Such fires spread swiftly, as in the case of fires in Himachal.
- Crown fire:** Crown fires burn quickly, from one tree top to another and have huge flames with intense heat. Such fires are rare in India.

Has there been an increase in forest fire incidents this year?

- The **Forest Survey of India** data on forest fire points between March 1 and April 30 this year shows a clear spike in incidents coinciding with rising heat wave conditions.
- The number of forest fire points rose from 8,735 to 42,486 during the four weeks in March.



- However, the week-wise progress in the number of forest fire points in April peaked in the first week fell to 13,719 in the second week and picked up to touch 20,285 in the last week.
- In the last three months, Uttarakhand has recorded at least 1,791 forest fires that have scorched over 2,891 hectares of forest land, including 2,079 hectares of reserve forest areas. These fires have caused estimated damage to property worth over Rs 74 lakh and death of at least one person.
- While the numbers are lesser in last year's comparison, the issue of forest fires intensifying mainly in mid-February and continuing usually till mid-June is a major problem for the hill state which has forests in almost **71 per cent of its geographical area**.
- The chief conservator of forests admitted that the number of forest fires this year increased significantly in the month of April mainly due to unexpected rise in **temperature and less rain**.
- The **strong wind velocity also contributed majorly** to spreading the fires fast across the jungles.

How vulnerable are forests in Uttarakhand and Himachal?

- Out of the total forest land in Uttarakhand, 26 per cent consists of pine trees. Dry pine leaves are highly inflammable and significantly increase the fuel load. Officials admit that the situation is alarming because the peak time for forest fire – the third week of May when the temperatures are the highest – is yet to come.
- In Himachal, of the 196 forest ranges in Himachal Pradesh, 80 are vulnerable to fires. The chir pine forests which make up 15 percent of Himachal's forests are most prone to fires. The chir forests

are spread over an area of 1258.85 sq km, which is about 3.4 per cent of the total forest area of the state.

How have other places prone to forest fires fared so far?

- Apart from Himachal and Uttarakhand, Assam, Madhya Pradesh, Maharashtra, Tripura, Mizoram and Odisha report frequent forest fires annually.
- Incidentally, Madhya Pradesh, Uttarakhand, Odisha — along with Chhattisgarh and Maharashtra — have been the top five states reporting high number of large forest fires ranging between 143 to 441 between November 2021 and April 2022.

Impacts of forest fires

- Human risk and exposure
- Airborne hazards
- Water pollution
- Post-fire risks
- **Health effects:** Wildfire smoke contains particulate matter that may have adverse effects upon the human respiratory system.

Efforts to Mitigate Forest Fires

- Since 2004, the **FSI (Forest Survey of India)** developed the **Forest Fire Alert System** to monitor forest fires in real time.
- In its advanced version launched in January 2019, the system now uses satellite information gathered from **NASA** and **ISRO**.
- National Action Plan on Forest Fires (NAPFF) 2018 and Forest Fire Prevention and Management Scheme.

MARITAL RAPE

CONTEXT

On May 10, 2022, a two-judge bench of the Delhi High Court gave a split ruling on marital rape, thus ensuring a future hearing in the Supreme Court. The legal battles will, of course, continue but this may nevertheless be a good moment to examine the issues that lie behind it.

◎ BACKGROUND

- The definition of Marital Rape is provided under the Indian Penal Code (IPC), framed by the colonial rulers.
- **Section 375** of Indian Penal Code (IPC) defines the term rape as, any form of sexual assault involving non-consensual intercourse with a woman.
- However, as per the law, a wife is presumed to deliver perpetual consent to have intercourse with her husband after entering into a marital relation.
- **Exception 2 to Section 375**, provides a non-criminal status to sexual intercourse without the consent of the wife and immunizes such actions of the husband.
- The concept of marital rape is the epitome of **'implied consent'**, marital relation between a man and a woman implies to have consented sexual intercourse from both the sides.

◎ ANALYSIS

Marital Rape: Against legal provisions

- **Doctrine of coverture:** Non-criminalising status of marital rape emanates from British rule, which was influenced by and derived from the doctrine of merging identity of women with her husband.
 - ▶ In 1860s, when IPSC was drafted by the British government, married women were not considered as independent identity.
- **Violation of Right to Equality:** Article 14 of the constitution provides Right to equality, but the exception 2 to the section 375 of the IPC creates two different classes of women on the basis of marital status of the women.
 - ▶ Exemption creates the scope of victimization of married women and provides legal protection to the unmarried woman for the same act.
- **Violation of Article 21:** According to judicial interpretation, Protection of life and personal liberty includes right to life with dignity, right to health, right to privacy and right to safe environment etc.

Judicial interpretation on Marital Rape:

- **State of Kerala v/s Krishnappa:** Under this

verdict Supreme Court held that sexual violence apart from being a dehumanizing act is a unlawful intrusion of the right to privacy and sanctity of a female.

- ▶ Also, non-consensual intercourse amounts to physical and sexual violence.

- **Suchita Srivastava v/s Chandigarh Administration: SC under this verdict equated right to make choices related to sexual activity with the right to privacy, liberty, dignity and bodily integrity under Article 21.**
- **Justice Puttuswami v/s Union of India: SC recognized right to privacy as the fundamental right to all the citizen**
 - ▶ Right to Privacy includes decisional privacy of intimate relations.

Supreme court in all these judgment recognized right to abstain from sexual relation as a fundamental right under Article 21 of the Constitution for all women irrespective of their marital status, ensuring right to equality under Article 14.

Who are the major stakeholders involved?

- Husband
- Wife
- Society
- State

'Non-consensual Intercourse after marriage', Is it a rape?

- The ethical dilemma to consider the non-consensual intercourse after marriage arises from the roots of conflicts of values;
- **Right to privacy, liberty, dignity and bodily integrity of the wife v/s Family Institution and right of husband to have safe and private conjugal relation with wife.**

Interest of the wife:

- Article 21 of the constitution provides Right to life with dignity which includes privacy, liberty and bodily integrity. Right to life the epitome of

the human existence which should be available to all the citizen irrespective of gender and marital status. Right to privacy includes decisional privacy of intimate relations. Merging the identity of married women with that of her husbands and not recognizing wife's independent identity is a direct attempt to the liberty of the women. Any non-consensual attempt to have sexual and physical relation irrespective of marital status of the women should be considered as attempt to sexual violence and rape.

Interest of the husband:

Marital relations between two individual provides a perpetual consent to have sexual intercourse from both the sides. Right to have sexual relation with wife also becomes essential agenda to protect the family institution of the society. Apart from family institutions it is also important to protect the right of husbands to get immunity from false complaints of sexual assault.

◎ WHO ARE PRONE TO MAJOR LOSSES?

- **Wife:** 'Marital Rape', non-consensual sexual intercourse with wife, violates the right to privacy and bodily integrity of the married woman.
- **Husband:** Instances of false and fake cases of marital rape complaints violates the right of the husband to live with dignity and right to have sexual relation to protect the family institution.
- **Society:** Conflict of values and ethical dilemma between of having conjugal rights negatively impact the social structure of the society and hinders the family institution

◎ CONCLUSION:

The decision in the interest of the major stakeholders should be taken by considering the above points

SHALLOW AND DEEP ECOLOGISM

◎ INTRODUCTION: -

As the world continues to grapple with the unrelenting climatic changes, it becomes necessary to understand two kinds of environmental philosophy that reinvent the relationship between Nature and human beings; these philosophies are shallow and deep ecologism.

To address environmental degradation, we seek to look beyond the popular pollution and conventional environmental degradation regimes. In this context, a Norwegian philosopher Arne Næss, in the 1970s, while placing humans at the heart of the environmental crisis, emphasized for the deep ecologism for imbibing the role of the individual in Nature.

What is Shallow and Deep Ecologism-?

Shallow Ecologism: -

- Shallow Ecology is a regime, which promotes powerful and fashionable conservation strategies against pollution and the haphazard depletion of resources.
- Shallow ecologism, while keeping conservation at its heart, takes an anthropocentric approach to conservation. Nature should be conserved for the sake of human welfare.
- The proponents of the shallow ecologism of this philosophy believe that we should conserve the environment because it will benefit humans to maintain their lifestyles.
- The approach advocates for the continuation of the exploitation of Nature but with specific short-term solutions using research & development (R & D) to find ways to manipulate and exploit Nature; for instance, using vehicles with blended petrol/diesel; or electric vehicles, administering the non-conventional energy sources, or using air conditioners that do not release chlorofluorocarbons (CFCs), etc.
- This approach relies on the calculation of what will benefit the society utmost; hence, it follows the utilitarian principle of maximizing the benefits to the majority, as propounded by Jeremy Bentham.
- Ultimately, this branch of ecologism leads to inequitable distribution of resources, and undue benefits dwelling in the developed countries at the cost of environmental degradation.

Deep Ecologism: -

- Deep ecologism is a movement while keeping humans at its heart, regards human lives as just one of the equal components of the global

ecosystem.

- In this biocentric approach or the 'life-centered' approach, it is believed that the environment carries with itself a certain intrinsic worth that obligates human beings to take care of it. As a result, all individuals and elements from the natural environment form a unified ecological community.
- The deep ecology regime promotes "ecological wisdom", which is based on the principle of ecological harmony or equilibrium and emphasizes the policy acknowledging the inherent values of life.
- This philosophy stresses that humans have no right to reduce the richness, and diversity except to satisfy the vital human needs.
- Indian culture propagates the idea of deep ecologism in her practices; Naess, while citing Mahatma Gandhi in his studies, states, "*self-realization is the key to biospherical egalitarianism*".
- Moreover, we have several personalities, such as Amrita Devi Bishnoi who sacrificed her life, in the year 1730 to save 300 trees of her village from being cut by the Maharaja of Jodhpur, exemplifies the intrinsic relationship between humans and Nature. Other such environmentalists are Medha Patkar, Rajendra Singh, MC Mehta, etc.

Challenges: -

- Taking the example of acid rain- the shallow reaction of acid rain is to demand more species of trees that will tolerate increased levels of acidity; while the deep ecology approach is to fight against the economic conditions, and technological responsibilities producing acid rains at the first place.
- The evolution of carbon credit works on the same shallow approach, as it promotes and motivates the higher emissions countries, such as the USA, and China to exploit the environment at the cost of the least developing countries.
- Moreover, as Næss stated that shallow approach is more influential than that of the deep ecologism as it focuses on human health, and affluence rather than deep-seated respect and even veneration for ways and forms of life. We, humans, are more prone to the practice, which is less hectic and more influential.

◎ WAY FORWARD: -

Socialism is the Key: - Næss argues that a narrow focus on pollution and conservation projects, though,

prone to solving pollution, generates evils of a different kind. Such projects monotonic projects may lead to an increase in the cost of living, and promote class differences. Hence, an ethically responsible ecologism is one that operates in the interest of all economic classes.

Inclusive, and Decentralized Decision-making:

- As Mahatama Gandhi stressed the promotion of local governance, and cooperation, the solution to the environment can be found in decentralizing the decision-making process and strengthening local participation. Indian Constitution also promotes the idea of local self-government through Municipalities, Panchayati Raj Institutions (PRI), etc. The participation of the local communities will pave the way for more inclusive decision-making, social auditing and social impact assessment should promote the idea of deep environmental ethics.

◎ **CONCLUSION:**

- With the evolution of anthropocentrism, humans have cut themselves off from nature and started viewing Nature as an entity to serve humanity. This mentality disrupts the mutual, and integrated relationship between humans and Nature; hence, needs to be changed. Conclusively, it can be said that human control of the environment is a problem; not a solution.
- Aldo Leopold has said, "*a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community*". We need to link *Atman* as being part of the ultimate, which he ties to the environment and makes us a part of creation.

EFFECT OF THE INTERNET ON VALUES AND MORALS OF CHILDREN

◎ INTRODUCTION: -

In this digital era, and specifically, after the COVID-19 pandemic, technology-the internet in particular-the internet becomes a reality, which cannot be denied. The Internet exposes us to varied ideas and provides us with the means to express our creativity by allowing our potential to engage in a range of experiences, which are otherwise impossible to do in the real world. The benefits of internet use for children and adolescents can also be seen in the domain of healthcare, education, etc.

However, every such revolution comes with its own consequences. And, when it comes to the consequences of the internet, the children are the first, to come to our mind because the children and teenagers are the largest individual internet users, and the internet has a positive or negative impact or influence. The positive impact is that we can get information easily. However, the internet can affect the moral development of children, because of its negative impact of the internet itself. A sense of motivation and self-discipline is well needed to work on the internet, which is the major challenge that children face.

The Effect of the Internet on Children's Morals and Values: -

Positive Effect of the Internet on the Children's Morals and Values: -

- At first, the main goal of the internet is to enlighten insight, and improve skills, as a medium of learning, and obtaining information.
- It enhances the area of knowledge of the children, and incentive them to innovate, invent, and create. Moreover, the internet is full of inspirational information, which paves the way for a child to become a civilized, and ethical person.
- The circulation, accessing of positive information, and interactions with the positive personalities on the internet imbibe the qualities of empathy, compassion, and moral aptitude.
- Interactions with peers, which are very important in developing skills like setting boundaries, learning cooperation, and empathy has become possible during the pandemic situation through the internet.

Negative Effect of the Internet on the Children's Morals, and Values: -

- The internet also began to be abused, which exposes children to unauthorized, and fraudulent sites. The increasing of such unethical websites and content that are accessed through the internet by children makes them vulnerable to cyber-bullying, abuses, and security risks, which results in the degradation of moral and value-centric development.
- Face-to-face interaction provides the children with a neutral environment for social interactions that aids in building social relationships. However, such face-to-face instances are not possible on the internet.
- Sometimes, the readymade information on the internet restricts the scope of critical learning among children, which affects their cognitive development.
- The internet detaches the children from the societal reality, which may create societal apathy, indifference, etc. among them, which ultimately results in the diminishing of our moral, and cultural values. Moreover, the societal detachments negatively impact their decision-making, and leadership skills.
- It is also seen that the overdose of the internet can cause a delay in the emotional skills, and generate several other emotional problems.

What Needs to be Done-?

- **Balanced Approach:** - The positive points of the internet are hard to dismiss; however, it is important to take the necessary Internet safety measures to be able to benefit from the positive effects of technology without facing the negative impacts of technology. The restrictions on internet usage by children should be balanced with their need to access the internet to keep abreast with the latest developments in various fields.
- **Role of the Adults:** - Any recommendation to guide parents, educators, and health professionals should take into account the needs and rights of children in the context of internet usage.
- **Communication is the key:** - The communication gap between the children, and the parents, teachers, etc. enhances the gravity of the issue. Raising

awareness through communication, and explanation about all the good, and evil characteristics of the internet will reduce the negative emotional impact of technology on children.

- **Utilitarian Approach:** - It is important to use robust evidence rather than popular beliefs to achieve the maximum benefits of the internet. Accessibility of the internet to the children should be provided as per their cognitive requirements, which is more feasible than that banning the access for them.

◎ **CONCLUSION:**

It is clear that the internet and the online environment is a moral terrain that requires sustainable navigation. By understanding how effectively such moral disengagement can be avoided, we can help to create a safer and more even path for young people to negotiate.

ETHICS OF RIGHT TO FREEDOM OF RELIGION

◎ INTRODUCTION: -

Article 25 of the Constitution of India provides the citizens the right to practice, propagate, and profess the religion in a way that does not disrupt public order, public health, and morality adversely. This provision, though not prohibits conversion, calls out proselytism, which is meant by involuntary forced conversion through bribery, coercion, or violence.

In the light of the same, the debate about the anti-conversion laws arises. The question here is not about how constitutional such laws are the question here is how ethical it is to force someone to convert; or how ethical to put legal restrictions on one's right to conversion.

What is Anti-Conversion Law?

- India's Freedom of Religion Acts or "anti-conversion" laws are state-level statutes that have been enacted to regulate religious conversions. The laws are in force in the states, such as Arunachal Pradesh, Madhya Pradesh, Gujarat, Himachal Pradesh, Uttarakhand, Uttar Pradesh, etc.
- All of the laws seek to prevent any person from converting or attempting to convert, either directly or otherwise, another person through forcible or fraudulent means, or by allurements or inducement. However, the anti-conversion laws in Rajasthan and Arunachal Pradesh appear to exclude reconversions to native or original faiths from their prohibitions.
- Moreover, such a law passed by the Karnataka government held a marriage void, which has happened with the sole purpose of conversion or vice-versa i.e. conversion for the sole purpose of marriage.

Ethical Issue Arises through such laws: -

- When the government held a marriage void under the pretext of certain conditions, there is an underlying presumption of the presence of force, threatening, coercion, and undue influence in every inter-faith marriage, which questions the autonomy, and in mandating publication of an intention to convert, it invades on the right to privacy the person as enshrined under Article 21 of the Constitution, and upheld by the Supreme Court in the case of *Justice K.S. Puttuswamy vs. Union of India*.
- The right to marry of one's choice is one's Human Right as well. Moreover, the lengthier procedure to avail the approval of the administration, and the constant surveillance by the government diminishes the value of religious diversity.
- The provisions prohibiting conversion for the

purpose of marriage, and reconversion to original religion strike at the heart of Indian secularism. These provisions treat liberties governing ethical choice not as fundamental rights but as grants that are subject to the whims and fancies of a bureaucratic, theological state.

- So, the government needs to question whether it is ethical to curb one's fundamental rights under the garb of such harsh laws. Though the fact cannot be denied that forceful conversions are a menace to our society, there could be a more inclusive, and progressive interpretation of the law, or some alternative solutions can also be resorted to curb this menace.

◎ WAY FORWARD: -

- **Sustainable Amendment:** - The laws are required to be amended to preserve the autonomy, and liberty of the individuals. There is a need to establish a balanced approach between the Fundamental Rights of the individuals, and the state's duty to promote religious harmony. For, the same, the government needs to gather suggestions from all the stakeholders while framing such laws.
- **Harmonious Interpretation & Application of Law:** The fact cannot be denied that the anti-conversion laws are well-required in our society but the underlying ideologies, majoritarianism, and objective with which such laws are enacted create the chaos, which needs to be set aside through the liberal interpretation by the lawmakers, and the judiciary.
- **Administrative Efficiency:** - In such laws, the district administrators have been empowered to inspect, and provide approval for such inter-faith marriages; hence, the administrative efficiency should be strengthened to imbibe empathy, open-mindedness, and compassion among the public officers.
- **Promotion of Ethics, and Harmony:** - The most important factor that is required to be done is to promote ethical values, and harmony among the common masses for the promotion of diversity, and constitutional ethos.

◎ CONCLUSION: -

Anti-conversion laws should be inclusively discussed. We need to make sure that no religious community comes at a disadvantage due to the regressive interpretations of the law. The stringent and majoritarian approach of the law can defeat the societal diversities, values, and ethos.

ETHICS OF PUBLIC INTEREST LITIGATION

◎ INTRODUCTION: -

- In the Indian context, the Public Interest Litigation (PIL) is interpreted as a mechanism to fulfil the Constitutional objectives extending beyond the interests of individual litigants in a case. As the name indicates, it is the litigation to represent the unrepresented/under-represented, while extending the *locus standi* regime, in the public interest.
- The Supreme Court of India, the pioneer of the PIL, has given the remarkable judgments in the matters of bonded labour (*Bandhua Mukti Morcha vs. Union of India*); neglected children (*Bachpan Bachao Andolan vs. Union of India*); exploitation of casual labourers, and non-payment of wages to them (*People's Union for Democratic Rights (PUDR) vs. Union of India*); prisoners' reforms (*Sunil Batra vs. Delhi Administration*); illegal detention (*Hussainara Khatoon vs. State of Bihar*); matters relating to environmental pollution, disturbance of ecological balance (*MC Mehta Cases*); etc.

Ethical Analysis of the PIL: -

- **Transformative Constitutionalism:** - The PIL system, since its inception in the 1980s, has given us the motivation to promote transformative constitutionalism, which was recently interpreted in the case of *Navej Johar vs. Union of India*. The Apex Court stated that this principle requires that individuals and groups pursue their own conceptions of the good.
- Though, the Constitution does not set up a maximalist system that dictates to people exactly what is valuable in their lives or how they should go about achieving those values; the very objective of the PIL is to imbibe those transformations in their lives.
- But the question arises of how far the PIL system has been successful in bringing transformational changes in the society. The entitlements to the resources and capabilities are also needed to be free from threats to survival and to form and enact these transformations.
- **Litigation alone is not sufficient:** - There is no doubt in saying that the rights are not self-implementable; hence, the litigation is not a panacea for all the cures. For instance, the Supreme Court in the case of *Justice K.S. Puttaswamy vs. Union of India* held the right to privacy as a Fundamental Right under Article 21 of the Constitution; or in the case of *Hussainara Khatoon vs. State of Bihar*, Hon'ble Apex Court has given the directions in the cases of detention of a person by the authorities.

The question here is how far the vigilant state is considering these judgments.

- **Judicial Overreach vs. Judicial Constraint:** - It is uncontentious fact that the Constitution; not Parliament is supreme in India, and that Constitutional Courts are the arbiters of whether law and conduct withstand constitutional scrutiny. The PIL system promotes the philosophy of judicial activism, wherein in decision-making, judges allow their personal views regarding a public policy instead of constitutionalism.
- However, while doing so, the Court sometimes blurs the *Lakshman Rekha* between the judiciary and the legislature. For instance, in the case of *Subhash Kashinath Mahajan vs. State of Maharashtra* (2018), the Court amended the Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989, by annulling Section 18 of the Act, which stated that no anticipatory bail will be granted to persons accused under the Act.
- Hence, it is the ethical dilemma for the Indian judiciary whether to entertain a case or where to restrain to prevent judicial overreach.
- **Clogging of the Cases:** - There are more than 3 crore cases pending in the different courts in India. Many of these cases are pending for more than 10 years. In such a situation, the PIL has led to new problems such as an unanticipated increase in the workload of the superior courts, lack of judicial infrastructure to determine the factual matter, gap between the promise and reality, abuse of power, friction, and confrontation with fellow organs of the government, and dangers inherent in judicial populism. Moreover, the lack of a mechanism to segregate the frivolous complaints also makes the task of the Court more difficult.

◎ WAY FORWARD: -

- **Judicial Restraints:** - The judiciary should evolve a method to segregate the PILs of genuine concerns; at the same time, the judiciary should self-restrains herself from entertaining each and every case considered to be of public interest. The separation of power doctrine, which is also a part of the basic structure of the Constitution needs to be exercised judiciously.
- **Rejuvenating Judicial Infrastructure:** - As proposed by Chief Justice N V Ramana, the National Judicial Infrastructure Authority will lighten the burden of the judiciary through technological evolution; moreover, the appropriate infrastructure

will also pave the way for the segregation of the PILs.

- **State's Intervention:** - Majorly, the PILs are filed against the state or state entities; the state and the administration should understand their duties and act in an appropriate manner to protect, and preserve the public interest. The state should also promote the idea of transformative constitutionalism by bringing it into practice.
- **Ethical Duties of the Citizens:** - Lastly, it is the duty of the common public to judiciously avail the route of the PIL. They should restrict themselves from filing false, frivolous, and trivial matters in the PIL. A drastic behaviour change among the masses is required to justify the ethical aspects of the PIL.

◎ **CONCLUSION:**

- Despite all the criticism, the PIL proved to be an effective tool for the Judicial Review and has proven its importance in several instances. It completely democratizes access to Justice for all. Hence, despite being subjected to many criticisms, the PIL has established itself as a great positive tool for Judicial Activism.
- However, certain loopholes should be filled to continue faith in the PILs. The accountability of PIL activists should be increased more so that the abuse of PIL can be prevented and will further lower the burden of the overburdened Judiciary.
- Lastly, we need to understand that the PIL is not a pill to the injustices; transformative constitutionalism is needed to be imbibed in the system.

SECTION: B

(PRELIMS)

CURRENT AFFAIRS

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LEGENDARY SANTOOR MAESTRO PANDIT SHIVKUMAR SHARMA PASSES AWAY

© **CONTEXT:** Veteran santoor player and music composer Pandit Shiv Kumar Sharma passes away at the age of 84, following a heart attack.

Pandit Shiv Kumar Sharma:

- Shiv Kumar Sharma was born in Jammu in 1938.
- He is believed to be the first musician to have played Indian classical music on the santoor.
- Pandit Shiv Kumar Sharma was awarded:
 - **Sangeet Natak Akademi Award** in 1986
 - **Padma Shri** in 1991
 - **Padma Vibhushan** in 2001



- Born in Jammu, Pandit Shivkumar Sharma began learning santoor at the age of thirteen.
- His first public performance was in Mumbai in 1955.
- Sharma is believed to be the first musician to have played Indian classical music on the santoor, a folk instrument from Jammu and Kashmir.
- He gave santoor a classical status and exalted it along with other, more traditional and famous instruments such as sitar and sarod.

Important facts about Santoor

- **Type:** TAT VADYA
- Santoor is a stringed instrument made of wood, steel, and bamboo.
- This is a traditional instrument, found in Jammu and Kashmir.
- Majorly used in the traditional music of Kashmir called **Sufiana Qalam**.
- It has now acquired an important place as a classical music instrument.
- A trapezoid wooden box, 120 steel strings, stretched on 30 wooden bridges in sets of four on each bridge.
 - Bridges are arranged in a set of fifteen on each side.
 - Struck by bamboo mallets.
 - It is placed on a triangular wooden stand while playing.



UJJWALA LPG SCHEME: 90 LAKH BENEFICIARIES DON'T TAKE REFILLS

◎ CONTEXT:

Recently, in reply to an Right to Information (RTI) application, it was revealed that in the financial year 2021-22, 90 lakh beneficiaries of the Pradhan Mantri Ujjwala Scheme did not refill their cylinders. Also, over 1 crore beneficiaries refilled their cylinders only once.

Pradhan Mantri Ujjwala Yojana (PMUY)

- **PMUY** is a programme launched in **2016**.
- **Implementing agency:** The implementation of the scheme is under the **Ministry of Petroleum and Natural Gas through its Oil Marketing Companies**.
- **Objective:** to distribute LPG (liquefied petroleum gas) connections to the women of low households in India.
- The programme was initially launched with a **budget of Rs. 80 billion**.
- **Initially, five crores BPL (below poverty line) households** were targeted through PMUY; the target was achieved by March 31, 2019.
- An additional allocation of Rs 4,800 crore was done, and the **target was expanded to benefit 80 million low-income families through the scheme**.
- Under this scheme, towards an initiative for the loss by Covid-19 outbreak, the Finance Minister of India, announced to provide cylinders free of cost to the BPL families from March 26, 2020, for three months.

Achievements of Pradhan Mantri Ujjwala Yojana

- The Programme helped in increasing the LPG coverage from 62% on 1st May 2016 to 99.8% on 1st April 2021.
- Approx 1 lakh people got employment opportunities through the LPG distribution network.
- As part of the Pradhan Mantri Garib Kalyan Package, more than 14 crores of free LPG cylinder refills were provided to the PMUY beneficiaries during COVID-19.

Low usage | The chart lists the States where LPG coverage was at least 98% but the share of households that used clean fuel (LPG/natural gas, biogas) for cooking was less than 80%

State	Clean fuel usage (%)	State	Clean fuel usage (%)
West Bengal	40.2	Manipur	70.4
Rajasthan	41.4	Kerala	72.1
Assam	42.1	Punjab	76.7
U.P.	49.5	Sikkim	78.4
Himachal	51.7	Karnataka	79.7
Uttarakhand	59.2	Maharashtra	79.7
Haryana	59.5		

SOURCE: NFHS 5 (2019-20)

Liquified petroleum gas (LPG):

- Liquified petroleum gas (LPG) is a fuel used in many household appliances for cooking, heating, and hot water.
- It is called liquefied gas because it is easily transformed into a liquid.
- LPG composition is primarily propane, butane, isobutane, butylenes, propylene and mixtures of these gases.
- It is composed of liquid or gas (vapor), depending on pressure and LPG gas temperature.
- LPG needs only low pressure or refrigeration to change it into liquid from its gaseous state.

COUNTRY'S FIRST AMRIT SAROVAR INAUGURATED IN UP

◎ **CONTEXT:**

The country's first "Amrit Sarovar" has been inaugurated at Patwai in Rampur in Uttar Pradesh.

About India's first 'Amrit Sarovar':

- Amrit Sarovar in Rampur is basically one of 789 ponds which the Uttar Pradesh government will develop.
- **Cost:** Nearly INR 60 lakh were spent in the creation of this water body.
- Amrit Sarovars have the potential to play an important role in increasing the availability of water, both on surface and under-ground.

Water crisis

- In rural India, 80 to 90% of drinking water needs are fulfilled by groundwater resources.
- The groundwater levels declined by over 60% between 2007 and 2017, and of the extracted water, almost 90% is used in agriculture.
- According to a report by the **Central Pollution Control Board**, cities are home to 36% of India's population but account for 70% of water pollution.

Mission Amrit Sarovar

- The Government launched the Mission Amrit Sarovar in April 2022 to conserve water for the future.
- **Objective:** Objective of Mission Amrit Sarovar is "construction/development of at least 75 Amrit Sarovar (ponds) in every district of the country".
 - Each Amrit Sarovar will have pondage area of minimum of 1 acre (0.4 hectare) with water holding capacity of about 10,000 cubic meter.
- **Participating agencies:** Following Ministries and Organizations have agreed to participate:
 - Ministry of Rural Development (Dept. of Rural Development/ Dept. of Land Resources)
 - Ministry of Jal Shakti (Dept. of Water Resources/ Dept. of Drinking Water & Sanitation)
 - Ministry of Culture
 - Ministry of Panchayati Raj
 - Ministry of Environment, Forest & Climate Change
 - Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N)
- The Mission Amrit Sarovar is to be completed by 15th August 2023.

FINLAND AND SWEDEN ARE SET TO APPLY FOR NATO MEMBERSHIP.

◎ CONTEXT:

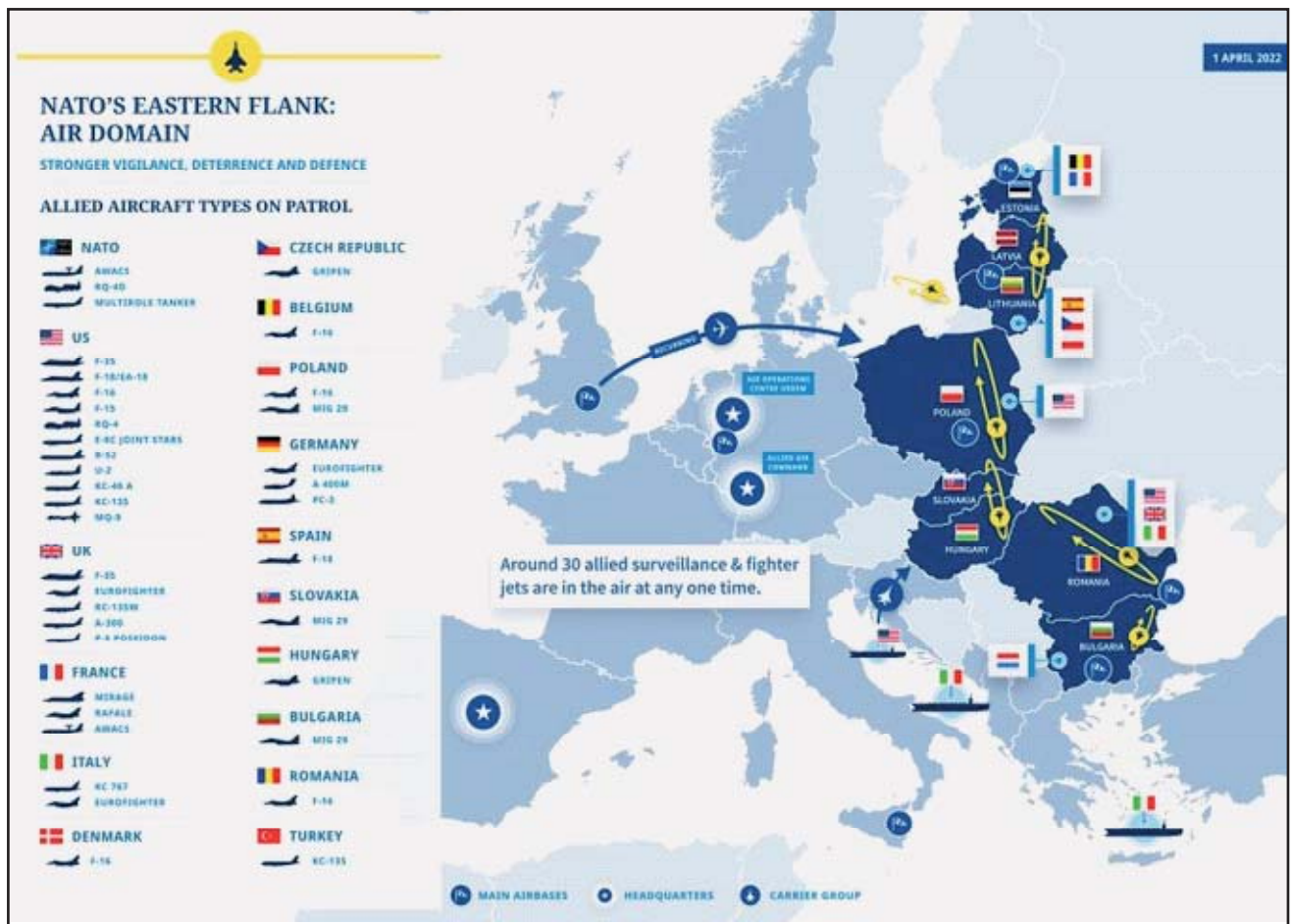
Finland and Sweden could apply for membership of the 30-nation NATO alliance within days, ending decades of military non-alignment in a historic shift triggered by Russia's invasion of Ukraine.

North Atlantic Treaty Organization (NATO):

- NATO is an **intergovernmental military alliance** 30 different countries from Europe, North American and Asia.
- It was established by the North Atlantic Treaty (also called the **Washington Treaty**) of April 4, **1949**, which sought to create a counterweight to Soviet armies stationed in Central and Eastern Europe after World War II.
- **Original member:** Its **original members** were **Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, and the United States.**
- The heart of NATO is expressed in **Article 5 of the North Atlantic Treaty**, in which the

signatory members agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and collective action must be taken to assist party or parties so attacked.

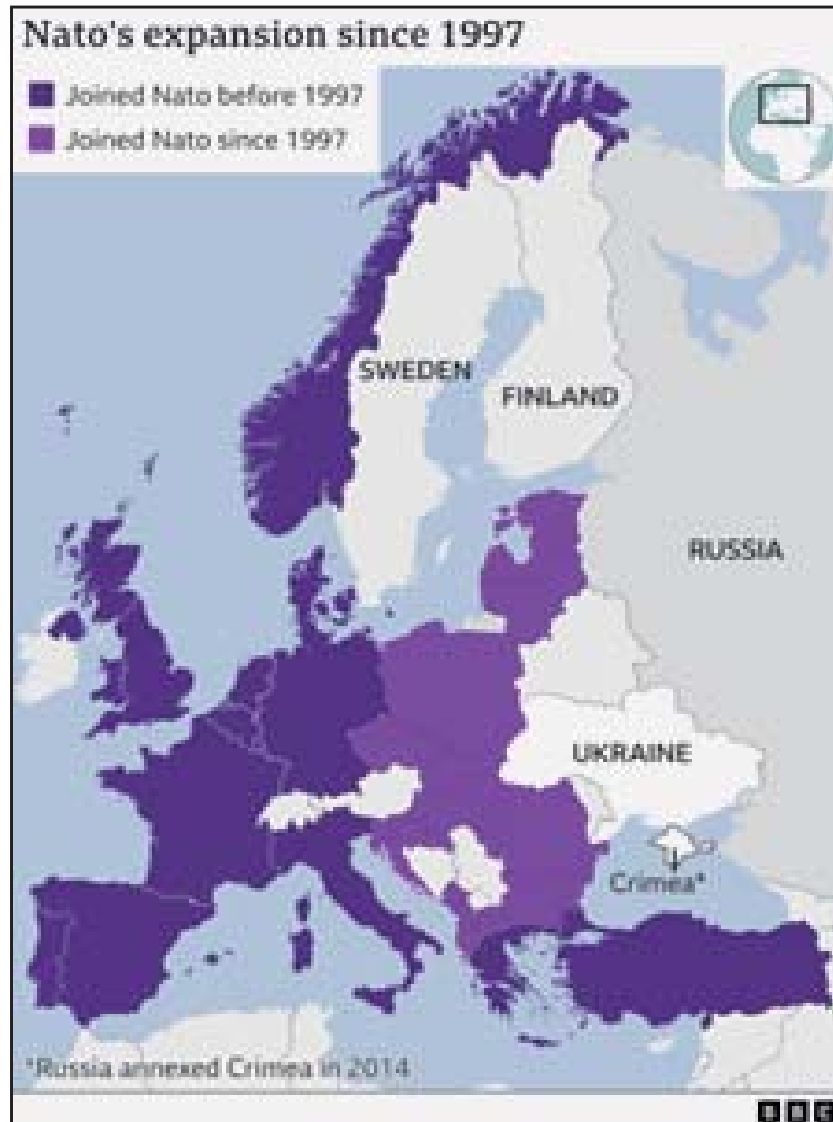
- **Headquarter:** The NATO headquarters are located in Brussels, Belgium, while the headquarters of Allied Command Operations is near Mons, Belgium.
- **Member countries:** Albania, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Turkey, UK and USA.
- **North Macedonia is the latest entry in the organization.**



Why are Finland and Sweden not already members?

- Both considered that joining the alliance would represent an unnecessary provocation of Moscow, and so have long pursued policies of neutrality, and then non-alignment, to avoid antagonising a major regional power.
- **Finland's concerns have been largely practical:**
 - It shares an 810-mile (1,300km) border with Russia, declared independence in 1917 after more than a century of rule by Moscow, and
 - Its army twice fought off Soviet forces during the Second World War before ceding about 10% of its territory.

- **Sweden's opposition to NATO membership has been more ideological.**
 - Its post-war foreign policy has focused on multilateral dialogue and nuclear disarmament and it has long seen itself as a mediator on the international stage, running down its military after the end of the cold war.



Would NATO welcome them?

- Both countries switched from formal neutrality to military non-alignment in 1995 when they joined the EU.
- They are already NATO partners, taking part in exercises and exchanging intelligence with the alliance.
- Finland already meets NATO's defence spending target of 2% of GDP, while Sweden is on course to do so.
- From the military perspective, the addition of Finland's and Sweden's armed forces would represent a major boost to NATO's assets in northern Europe, filling a hole in the alliance's defences by doubling the length of its border with Russia and improving security and stability in the **Baltic region**.

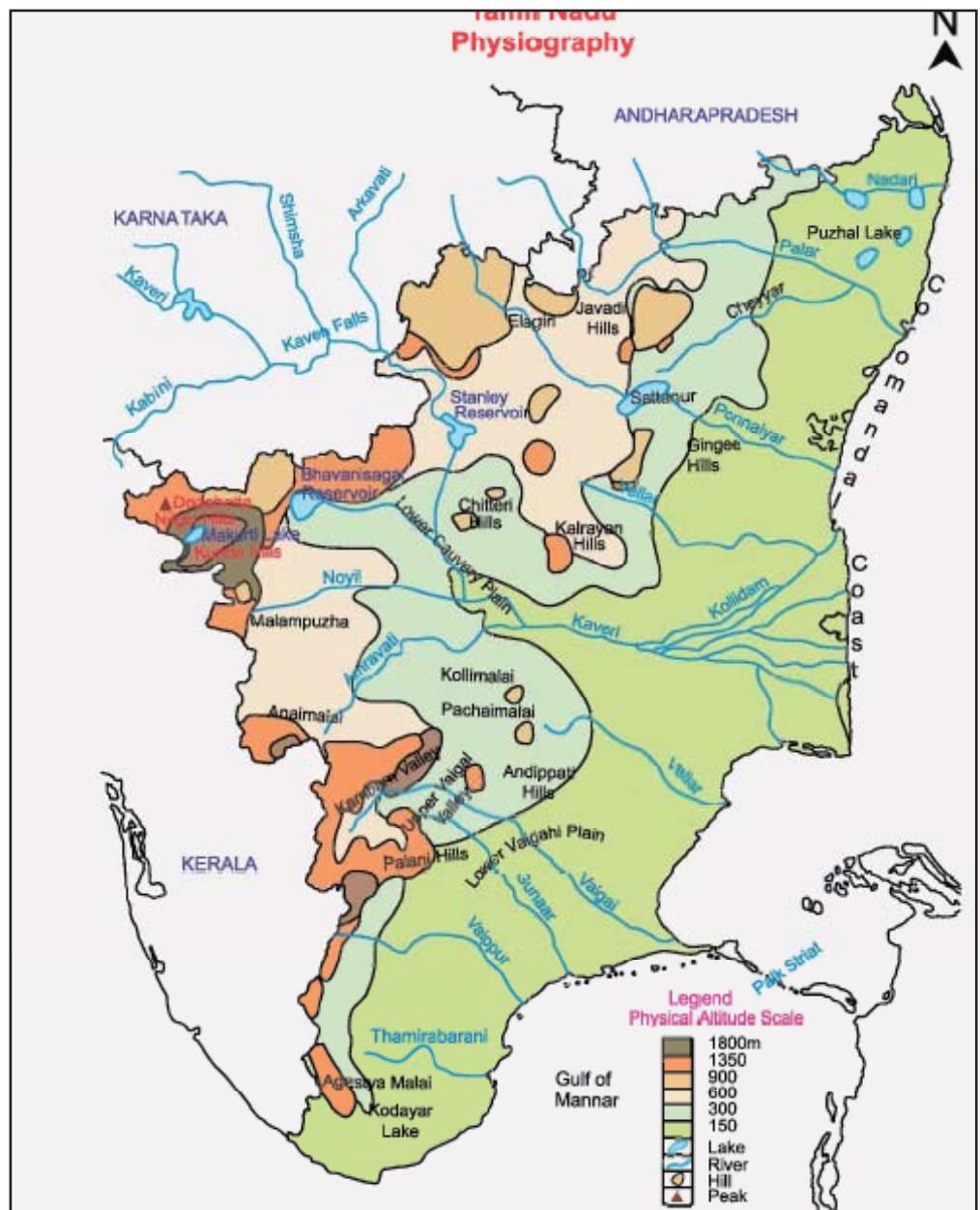
PAKKAMALAI- GANGAVARAM HILLS REGION

◎ **CONTEXT:**

Conservationists have sought better protection for the Pakkamalai and Gangavaram hills, and demand to declare the area encompassing over 7,000 hectares into a wildlife sanctuary.

Pakkamalai and Gangavaram hills

- Pakkamalai and Gangavaram hills is a biodiversity-rich area near **Gingee** in Villupuram district, Tamil Nadu.
- It is an ecologically important area in the **eastern-ghats**.
- The demand for notifying **Gingee hills** a wildlife sanctuary was first mooted in 2019.
- The area was first notified as a **Reserve Forest** in 1897 and since then it has given protection to the flora and fauna found here.



Flora and Fauna of the region:

- The forests in Pakkamalai were **unique with rocky terrain** and houses several **rare varieties** of flora from **tropical dry evergreen forests and dry deciduous forests**.
- Pakkamalai and Gangavaram have a **rich wealth of biodiversity** and are a geographically important area in the Eastern Ghats.
- The forests have a good **population of grizzled giant squirrel, grey langur, Pangolin**, and the critically endangered **golden gecko** listed under **Schedule I** of the **Wildlife Protection Act, 1972**.
- The grizzled giant squirrel was first discovered from Pakkamalai in 2019.
- There have also been recorded findings of **Bamboo pit viper and Gunthers toad**, one of the most poorly known endemic toad.
- There are rare sightings of large carnivores like **leopards and sloth bears** and different species of cave bats.
- About **21 endemic plant species** like the *Adhatodasengiana* and *Drypetes porteri* have also been recorded in the hills.

Benefit of declaring it a wildlife sanctuary:

- Declaring it as a wildlife sanctuary will certainly help protect the endangered flora and fauna in the long run apart from initiating conservation activities.
- The declaration of the hills as a wildlife sanctuary would ensure the protection of both native and endemic species besides maintaining a healthy biodiversity reserve.
- It would also ensure the protection of the living gene bank of endemic and endangered taxa.

VAQUITA PORPOISE

◎ CONTEXT:

Vaquita Porpoise is believed to be on the brink of extinction, with 10 or fewer still living in Mexico's Gulf of California, their sole habitat.

About Vaquita Porpoise:

- **Category:** Mammal
- **Length:** 4-5 feet
- **Habitat:** Gulf of California
- **Threat:** The biggest threat to the species is not habitat loss or genetic factors but illegal **"gillnet" fishing**.
 - The porpoises often become entangled and die in the large mesh gillnets used by poachers hunting the totoaba, an endangered fish highly valued in some countries for its perceived medicinal properties.
- **Status:** Critically Endangered

MEASUREMENT AT BIRTH

70-78^{CM} LENGTH

7.5^{KG} WEIGHT

MAXIMUM MEASUREMENTS

1.45^{CM} MALE 1.5^{CM} FEMALE

45-50^{KG} MALE

BREEDING PERIOD


2 YEARS

VAQUITA LIFESPAN

21 YEARS

VAQUITA MARINA

PHOCOENIDAE FAMILY



THE SMALLEST AND MOST
ENDANGERED CETACEAN IN THE WORLD

UPUS AFFECTS ONE IN 1,000 INDIANS

◎ **CONTEXT:**

May 10 is observed as World Lupus Day. The day is observed every year to raise awareness about Lupus which is an autoimmune disease that can cause damage to any part of the body.

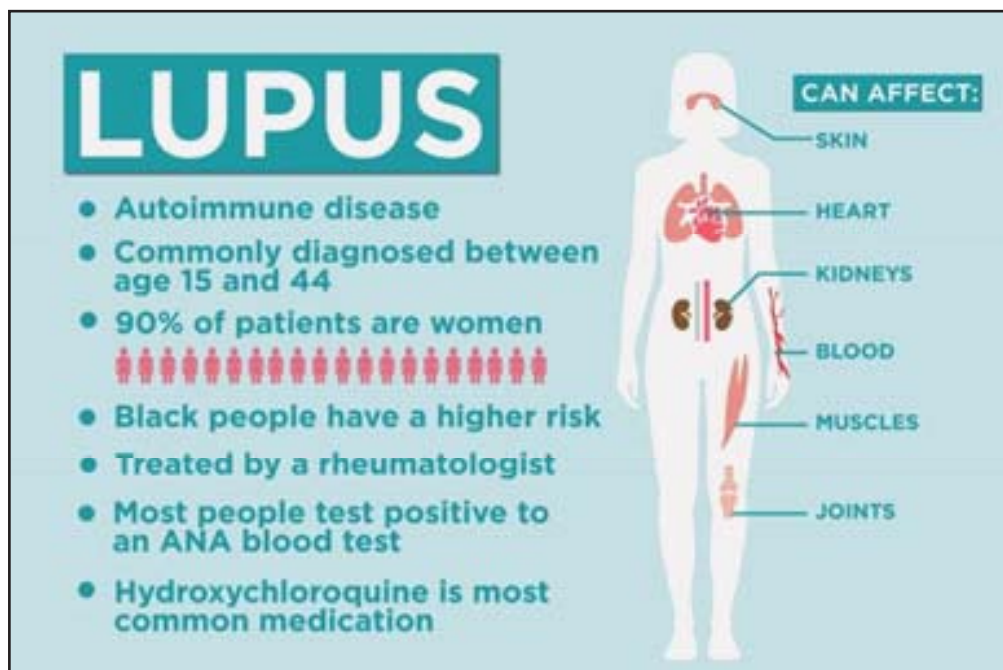
About

■ What is Lupus?

- Lupus is an **autoimmune disease** that can cause damage to any part of the body.
 - ▶ An autoimmune disease is one in which the immune system is unable to recognize the difference between healthy cells in the human body and the foreign cells it fights to remove.
- This results in multiple organs like skin, joints, blood, kidney, liver, lung, and heart getting affected.
- The disease onset may be in the age group of 12-45 years affecting women or young girls more than men.

What are the symptoms?

- **General symptoms:** lymphadenopathy, fever and repeated infections
- **Specific symptoms:** arthritis, butterfly rash and ulcers
- A person with Lupus typically has at least four of these 11 symptoms: serositis, oral ulcers, arthritis, photosensitivity, blood disorder, renal (kidney) disorder, anti-nuclear antibodies (ANA), immunological dysfunction, neurological, malar rash, and discoid rash.



NATIONAL TECHNOLOGY DAY

◎ **CONTEXT:** May 11th is celebrated as National Technology Day to remind Indians of the country's technological advancements.

National Technology Day 2022:

- The day is celebrated every year on May 11 across the country as National Technology Day.
- The first time the National Technology Day was celebrated was on **May 11, 1999**.
- The day celebrates the **achievements in the Science and Technology sector**.

■ Technology Development Board (TDB):

- A statutory body within the Department of Science and Technology at the Centre has been celebrating the day by honouring technological innovations that have added to the national growth.
- Each year the Board organises an event where the President of India confers awards to scientists for their contributions.
- It also provides financial assistance for concerns of Indian industries and other agencies for commercialization of indigenized technologies or adoption of imported technologies for wider domestic applications.
- **Theme:** Each year a different theme is given for celebrating this important day.
 - This is decided by the Technology Development Board (TDB).
 - The theme of Year 2022 is: **"Integrated Approach in Science and Technology for a Sustainable Future"**.

Significance of the day:

- On the same day in 1998, India carried out three successful nuclear tests under the

name Operation Shakti, at the Indian Army's Pokhran Test Range which is located in Rajasthan, which had following features:

- It was the code name given to the nuclear tests.
- The tests were led by the late President Dr APJ Abdul Kalam.
- These nuclear tests gave India entry into the elite group of nations with nuclear weapons.
- India became the sixth nation to join the 'nuclear-club'.
- The Indian Army in collaboration with Bhabha Atomic Research Centre (BARC), Atomic Minerals Directorate for Exploration and Research (AMDER) and scientists from the Defence Research and Development Organisation (DRDO) conducted the tests.

TOMATO FLU AND IT AFFECTS.

◎ **CONTEXT:**

Tamil Nadu has ramped up surveillance at its borders in the wake of "tomato flu" cases being detected in Kerala.

About Tomato Flu:

- Tomato flu is a viral disease, which causes red rashes, skin irritation, and dehydration.
- The fever is affecting children below the age of five in Kerala.
- The flu that gets its name because of the red blister it causes.
- Around 80 children have so far been infected with the Tomato flu.
- There is no confirmation yet on whether the Tomato Fever is a viral fever or is an after-effect of chikungunya or dengue fever.

■ **Symptoms of Tomato flu:**

- The main symptoms include high fever, rashes, and skin irritation. Hand and leg skin colour can change with rising blisters.
- Children might also experience abdominal cramps, body aches, fatigue, nausea, vomiting, or diarrhoea.

■ **Treatment of Tomato flu:**

- If a child shows symptoms, they should be taken directly to a doctor.
- Children are advised to be kept hydrated.
- If infected, the child must avoid scratching the blisters and maintain cleanliness and hygiene.

Preventive measures:

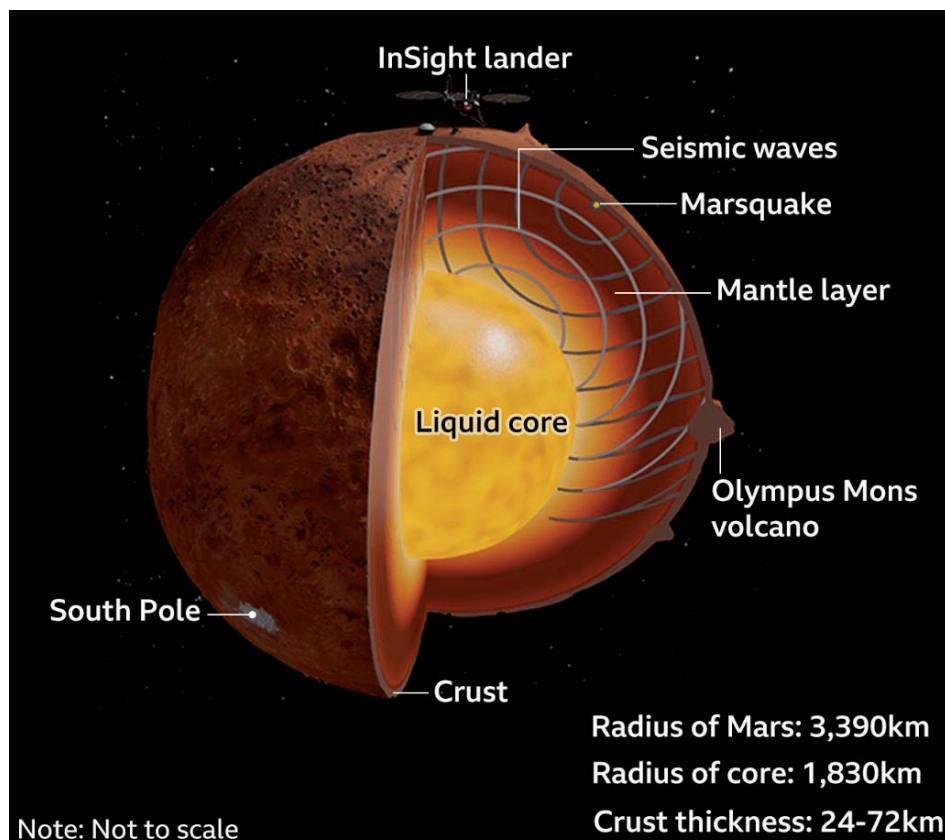
- Contact doctor immediately
- Do not scratch the blisters
- Stay hydrated by drinking boiled water.
- Maintain proper hygiene.
- Avoid close contact with the infected person.
- Use warm water for bathing
- Take proper rest to avoid its long-lasting effect

WHAT IS A 'MARSQUAKE', AND WHAT CAUSES IT?

◎ **CONTEXT:** NASA's InSight lander has recently detected a quake on Mars, the largest ever observed on another planet.

About Marsquake:

- The **InSight rover** first landed on Mars in November 2018, and has since heard 1,313 quakes.
- A magnitude 5 quake shook the surface of Mars, the strongest temblor ever detected not only on Mars but on any planet besides Earth.
 - The marsquake surpassed the previous record-holder, a 4.2-magnitude quake that took place in August 2021.
- On Earth, **quakes are caused by shifts in tectonic plates**. Mars, however, **does not have tectonic plates, and its crust is a giant plate**.
 - Therefore, NASA notes, 'marsquakes' are **caused due to stresses that cause rock fractures or faults in its crust**.



About InSight rover:

- InSight (**I**nterior **E**xploration using **S**eismic **I**vestigations, **G**eodesy and **H**eat **T**ransport), is a Mars lander which is the **first robotic explorer to study the crust, mantle and core of Mars**.
- The InSight rover has **two primary science objectives**:
 - to understand the formation and evolution of the terrestrial planet by investigating the interior structure and processes of Mars and

- to determine the present level of tectonic activity and meteorite impact rate on the planet
- Apart from helping learn how Mars was formed, understanding its patterns will also help prepare for human exploration of the planet.
- It uses its instruments to dig deep beneath the surface of the red planet and seek the 'fingerprints' of the process that formed the planet.
- To do this, it measures the planet's "vital signs": seismology, heat flow and precision tracking.

Do you know?

- InSight is not looking for life on Mars, but is studying what Mars is made of, how its material is layered, and how much heat seeps out of it.
- Some missions studying the possibility of life on Mars include UAE's Hope, China's Tianwen-1, and NASA's Perseverance.

THE BLACK HOLE AT THE CENTRE OF MILKY WAY, PHOTOGRAPHED FOR THE FIRST TIME

◎ CONTEXT:

Astronomers of the Event Horizon Telescope (EHT) recently revealed the first photograph of Sagittarius A*, a supermassive black hole about 26,000 light years from Earth and situated at the centre of the Milky Way.

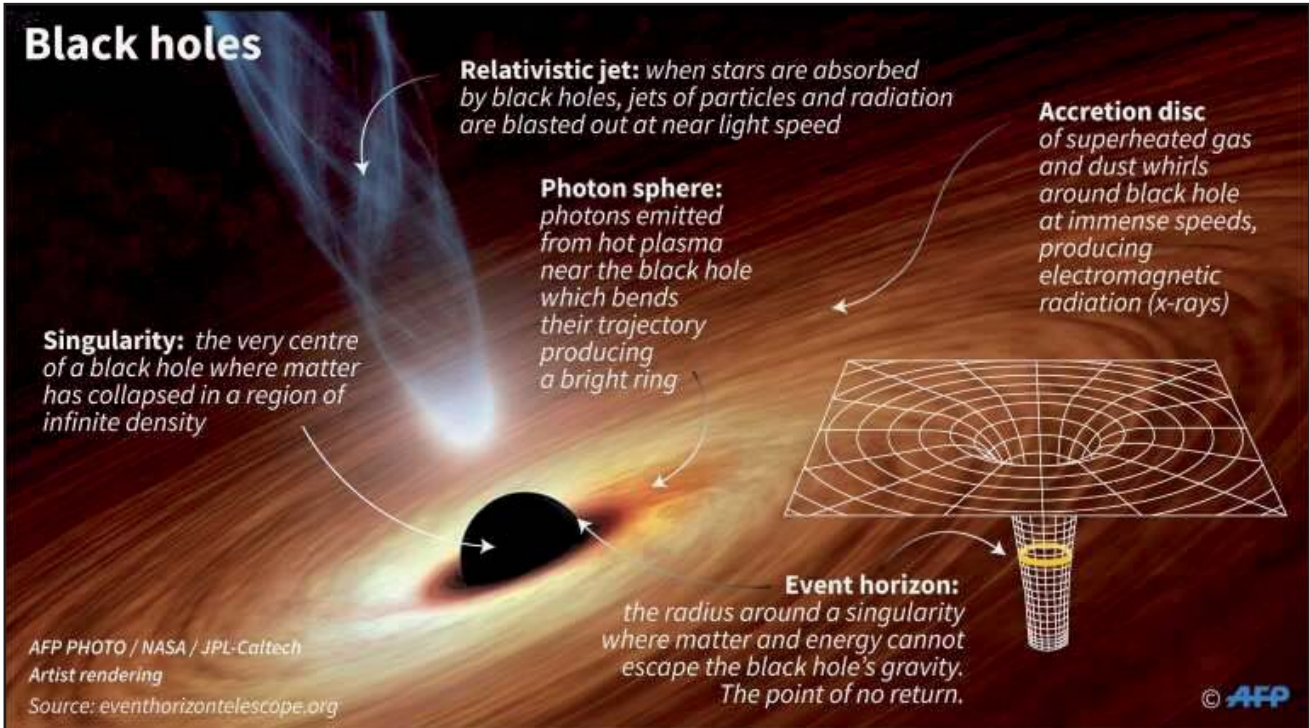
- **In April 2019, astronomers captured the first ever photograph of a black hole M87, which was located in a distant galaxy called Messier 87.**

What are black holes?

- A black hole is formed when stars collapse, leading to a space in the universe with an escape velocity — the speed at which an object must travel to override a planet or an object's gravitational force.
- For instance, for a spacecraft to leave the surface of the Earth, it needs to be travelling at a speed of about 40,000 km per hour which is so great that even light cannot escape it.
- Because light cannot get out, black holes are invisible and can only be tracked with the help of spatial telescopes and special tools.
- The light cannot go out because the gravity inside a black hole is very strong as a result of a lot of matter being squeezed into a small space.
- In 2020, the Royal Swedish Academy of Sciences decided to award one half of the year's Nobel Prize in physics to Roger Penrose and the other half jointly to Reinhard Genzel and Andrea Ghez for furthering the understanding of black holes, the most "enigmatic" objects in the universe.

Why and how was the blackhole photographed?

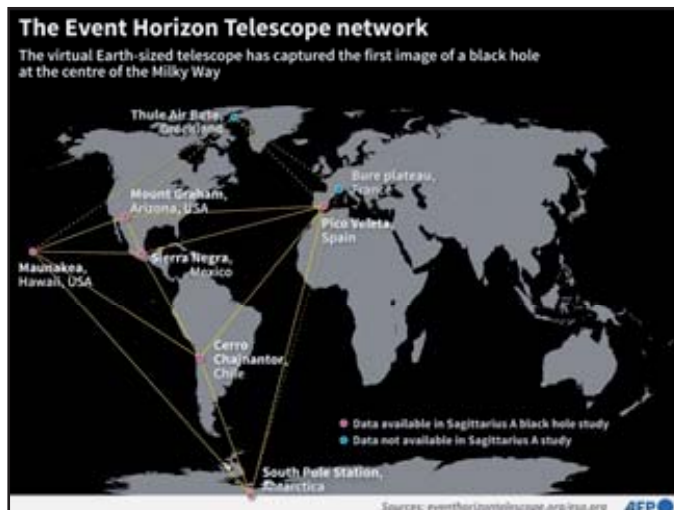
- The photograph provides evidence that the object at the centre of the Milky Way, which has been a subject of speculation for decades, is indeed a black hole.
- To take its photograph, the team created a powerful Event Horizon Telescope after which Sagittarius A was observed on multiple nights and data was collected for hours in a row, an exercise similar to using a long exposure time on a camera.



- A statement released by EHT said that scientists are excited about having images of two black holes that are of very different sizes, "which offers the opportunity to understand how they compare and contrast."

Event Horizon Telescope:

- The EHT is an international collaboration that has formed to continue the steady long-term progress on improving the capability of Very Long Baseline Interferometry (VLBI) at short wavelengths in pursuit of this goal.
- This technique of linking radio dishes across the globe to create an Earth-sized interferometer.
- It has been used to measure the size of the emission regions of the two supermassive black holes with the largest apparent event horizons: SgrA* at the center of the Milky Way and M87 in the center of the Virgo A galaxy.



PROTECTED MOBILITY VEHICLES

© **CONTEXT:** The Army has floated a Request for Information (RFI) to purchase Protected Mobility Vehicles (PMV) for high-altitude areas and for deserts and plains.

Protected Mobility Vehicles (PMV):

- The PMV is essentially a **wheeled armoured personnel carrier**.
- It provides protection to the soldiers travelling inside the vehicle from mine blasts and sudden attack by small arms.
- The troops in these vehicles could be members of any quick reaction team heading to a point of conflict, or members of patrolling parties heading to border areas.
- They could also be members of a reconnaissance squad operating behind enemy lines or in forward positions of own troops.



Request for Information (RFI)

- The Army floated an RFI for information from vendors for PMV to deploy in areas above the height of 4000 metres and for deserts and plains.
- The detailed instructions given by the Army along with the RFI specifies that these vehicles should be wheeled, 4X4 drive mode and should have automatic transmission.
- These vehicles should be able to carry ten personnel excluding the driver and co-driver with each person carrying a combat load of not less than 30 kg.

Technical specifications:

- **Protection type:** The PMVs must have **ballistic protection** and should be able to protect the vehicle from **grenade and mine blasts**.
- **Speed:** It should have a maximum speed of 90 km on road and 40 km per hour on cross country terrain.
- **Temperature:** They should be able to operate in temperature range of 40 degree centigrade to minus 15 degree in high-altitude areas.
- **Weapon mount:** The vehicles are required to have a weapon mount to enable a 7.62 mm Light Machine Gun (LMG) to be fitted and a turret with 360 degree rotation for a LMG.

- **Firing ports:** It is also required to have 11 firing ports with five each on the starboard and port side of the vehicle and one at the rear.
- The PMV should be able to ford in water with depth of 1000 mm without any special preparation.

ISRO SUCCESSFULLY TESTS SOLID ROCKET BOOSTER FOR GAGANYAAN PROGRAMME

◎ **CONTEXT:** The Indian Space Research Organisation (ISRO) has successfully carried out the static test of the HS200 solid rocket booster.

About Gaganyaan mission

- Gaganyaan is an Indian crewed orbital spacecraft intended to be the formative spacecraft of the **Indian Human Spaceflight Programme**.
- The spacecraft is being designed to carry three people, and a planned upgraded version will be equipped with rendezvous and docking capability.
- In its maiden crewed mission, Indian Space Research Organisation (ISRO)'s largely autonomous 5.3 metric tonnes capsule will orbit the Earth at 400 km altitude for up to seven days with a two or three-person crew on board.
- It is the first crewed mission to space by India and was originally planned to be launched on ISRO's GSLV Mk III in December 2021, but this has since been delayed to no earlier than 2023

What is HS200 solid rocket booster?

- HS200 booster is the 'human-rated' version of the S200 rocket boosters used on the Geosynchronous Satellite Launch Vehicle Mk-III (GSLV Mk-III), also called the
- The HS200 is a 20-metre-long booster with a diameter of 3.2 metres and is the world's second largest operational booster using solid propellants.
- The system is indigenously designed and developed by ISRO in association with many industries in India.

About GSLV MK-III

- The Geosynchronous Satellite Launch Vehicle Mark III (GSLV Mk III), also referred to as the Launch Vehicle Mark 3 (LVM3), is a three-stage, medium-lift launch vehicle developed by ISRO.
- The three stages of the LVM3:
 - two solid strap-on motors (S200)
 - one liquid core stage
 - a high-thrust cryogenic upper stage make up the LVM3
- The first successful experimental flight of LVM3 was made in December 2014.
- Primarily designed to launch communication satellites into geostationary orbit, it is also identified as the launch vehicle for crewed missions under the Indian Human Spaceflight Programme.
- It was used in dedicated science missions like **Chandrayaan-2**.
- The GSLV Mk III has a higher payload capacity than the similarly named **GSLV Mk II**.
- The GSLV Mk-III will have improvements to increase reliability and safety to meet the requirements of 'human ratings'.

Human ratings

- While the GSLV Mk III is being human rated for **Gaganyaan project**, the rocket was designed with potential human spaceflight applications in consideration.
- The maximum acceleration during ascent phase of flight was limited to 4 g for crew comfort and 5 meter diameter payload fairing was inducted to be able to accommodate large modules like space station segments.

Testing for the mission

- Crew Module Atmospheric Re-entry Experiment
- S200 static fire tests
- L110 static fire tests

SCIENTIST GROW PLANT IN MOON SOIL

◎ CONTEXT:

Scientists have for the first time grown plants in lunar soil brought back by astronauts in the Apollo program.

About the research:

- For their experiment, the researchers used just **12 grams** (a few teaspoons) of lunar soil collected from various spots on the Moon during the Apollo 11, 12, and 17 missions.
- In tiny thimble-sized pots, they placed about a gram of soil (called “**regolith**”) and added water, then the seeds. They also fed the plants a nutrient solution every day.
- The researchers chose to plant **arabidopsis thaliana**, a relative of mustard greens, because it grows easily and, most importantly, has been studied extensively.
 - Its genetic code and responses to hostile environments -- even in space -- are well known.
- As a control group, seeds were also planted in soil from Earth as well as samples imitating lunar and Martian soil.

Key findings:

- Every plant -- whether in a lunar sample or in a control -- looked the same up until about day six.
- But after that, differences started to appear: the plants in the lunar samples grew more slowly and had stunted roots.
- After 20 days, the scientists harvested all the plants, and ran studies on their DNA.
- In the future, scientists want to understand how this environment could be made more hospitable.
- NASA is preparing to return to the Moon as part of the Artemis program, with a long-term goal of establishing a lasting human presence on its surface.

About NASA’s Artemis mission:

- NASA’s Artemis mission is touted as the next generation of lunar exploration, and is named after the twin sister of Apollo from Greek mythology.
- Artemis is also the goddess of the moon.
- NASA’s Artemis program aims to put astronauts on the moon’s South Pole in 2024.

- The program is part of an international effort to build a sustainable human presence on the lunar surface
- **Artemis I** is the first of NASA's deep space exploration systems.
- It is an un-crewed space mission where the spacecraft will launch on SLS, the most powerful rocket in the world.
- It will travel 2,80,000 miles from the earth for over four to six weeks during the course of the mission.
- The Orion spacecraft is going to remain in space without docking to a space station, longer than any ship for astronauts has ever done before.
- The SLS rocket has been designed for space missions beyond the low-earth orbit and can carry crew or cargo to the moon and beyond.
- The learnings from the Artemis programme will be utilised to send the first astronauts to Mars.

ARTEMIS FIRSTS

2021

- First CLPS Mission**
In 2021, the first Commercial Lunar Payload Services deliveries will begin with two companies delivering 16 instruments to the lunar surface that will pave the way for human explorers.
- VIPER**
This golf-cart-sized rover will be the first to investigate lunar polar soil samples to characterize the distribution and concentrations of volatiles, including water, across a large region on the Moon.
- CAPSTONE CubeSat**
This small satellite will be the first spacecraft to enter the lunar Near Rectilinear Halo Orbit—the future home of the Gateway. There it will test new navigation techniques to validate predictive models, reducing uncertainties about the orbit.
- Artemis I**
The uncrewed, maiden flight of the integrated Space Launch System rocket and Orion spacecraft will verify spacecraft performance and test Orion's heat shield during its high-speed Earth reentry at nearly 5,000 degrees Fahrenheit.
- PPE & HALO Launch**
The Power and Propulsion Element (PPE) and the Habitation and Logistics Outpost (HALO) are the first pieces of the Gateway. On-board science investigations from NASA and the European Space Agency will conduct early characterization of the deep space environment.
- Artemis II**
On this 10-day crewed test flight, NASA astronauts will set the record for the farthest human travel from Earth. They will validate deep space communication and navigation systems and ensure that life support systems keep them healthy and safe.
- Artemis III**
With confidence gained through Artemis I and Artemis II, Orion and its crew will once again travel to the Moon, this time boarding the Human Landing System that will bring the first woman and next man to the lunar surface.

2024

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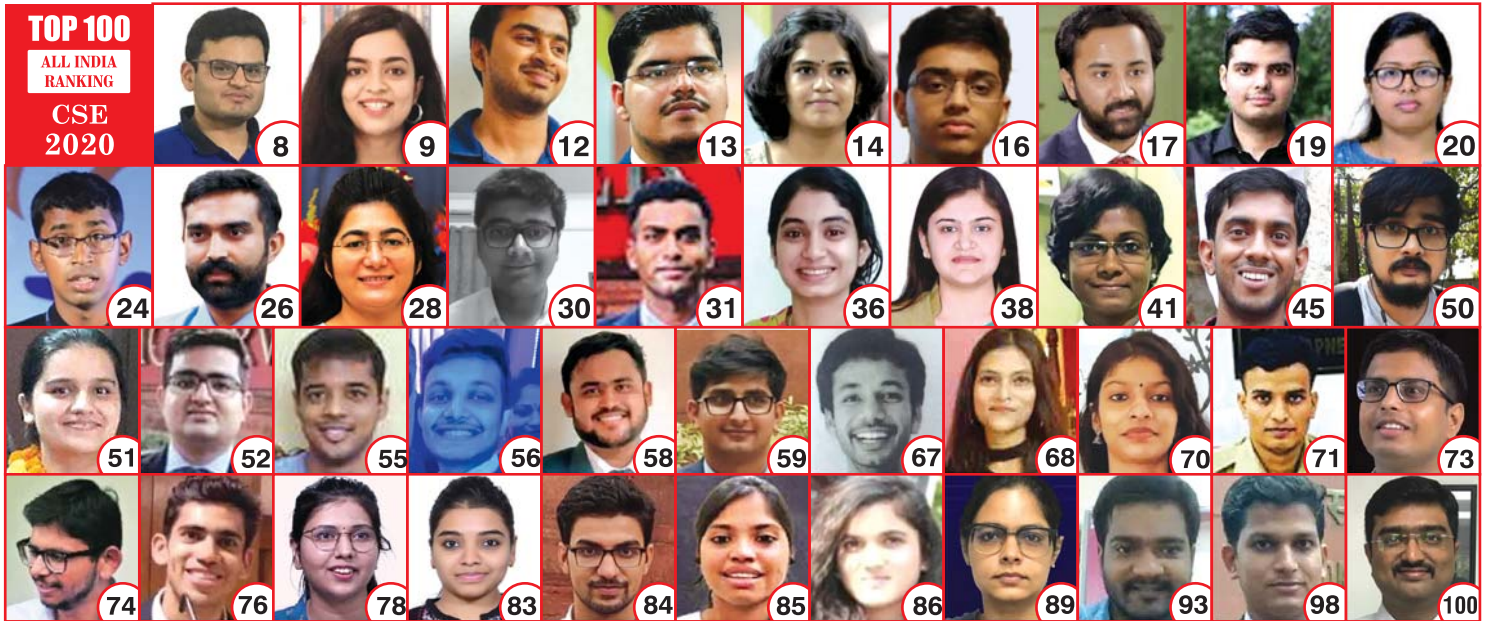
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