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Ministry of Home Affairs announces Model Prisons Act

Relevance: Prelims & Mains Paper II; Governance

Why in news?

- The Ministry of Home Affairs (MHA) announced that it has finalised the preparation of the Model Prisons Act, 2023, to replace the existing 130-year-old colonial law in an attempt to shift the focus of incarceration from "retributive deterrence" to "reform and rehabilitation".

- Intending to provide guidance and address gaps in the existing prison laws, the 2023 Act seeks to bring in the use of technology in prison management, make provisions for the grant of parole, furlough, and remission, and introduce special provisions for women and transgender inmates.

Why was it needed?

- The Model Prisons Act, 2023, is being introduced following the spate of killings and gang violence within prisons.

- One such incident was the killing of 33-year-old Tillu Tajpuriya, who was allegedly stabbed to death by members of a rival gang inside Tihar jail.

- Besides this, last Nov., the National Investigation Agency (NIA) asked the Union Home Ministry to shift several dreaded gangsters lodged in north India's prisons to those in the southern states. The NIA's request to move nearly 25 gangsters was driven by the presence of a "criminal nexus operating from inside prisons in Delhi, Punjab, Haryana, and Rajasthan."

- Moreover, Union Home Minister Amit Shah had announced that a change in the prison law was in the works while calling for a rehabilitative view of prisoners and jails.

- Speaking at the inauguration of the 6th All India Prison Duty Meet 2022 in Ahmedabad, Shah had said that India's incarceration system is prone to abuse since it was set up by the British to suppress political prisoners.

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- Similarly, an MHA's statement read that the pre-Independence Prisons Act, 1894, focused on keeping criminals in custody and enforcing discipline and order in prisons, leaving "no provision for reform and rehabilitation of prisoners".

- The Ministry reasoned that prisons should be seen as "reformative and correctional institutions" where prisoners transform and rehabilitate back into society as law-abiding citizens.

- Thus, the MHA assigned the task of revising the Prisons Act, 1894, to the Bureau of Police Research and Development. The latter prepared the draft, which culminated in the 2023 Act.

Proposed new provisions

- In an attempt to overhaul the colonial 1894 Act, the Model Prisons Act seeks to create provisions for the grant of parole, furlough, and remission to prisoners to encourage good conduct. Additionally, it aims to provide separate accommodation for women and transgender inmates, ensure the physical and mental well-being of prisoners, and focus on the reformation and rehabilitation of inmates.

- The new Act also intends to bring about "attitudinal change towards prisoners" and initiate vocational training and skill development for prisoners for their reintegration into society.

- The 2023 Act also seeks to bring about "transparency in prison management" and includes provisions for security assessment and segregation of prisoners; individual sentence planning; grievance-redressal; prison development board; use of technology in prison administration; and protecting society from criminal activities of hardened criminals and habitual offenders. Provisions for establishing high-security jails and open, semi-open jails have also been inserted.

- Apart from this, new measures for prisoners to video conference with courts have also been introduced. However, if a prisoner is using prohibited items like mobile phones in jail, they will be punished for it.

- Along with the Prisons Act, 1894, the Prisoners Act, 1900, and the Transfer of Prisoners Act, 1950' have also been reviewed by the MHA, and their relevant provisions have been assimilated into the Model Prisons Act, 2023.

- The first legislation that governed the management and administration of prisons in India was the Prisons Act, of 1894.

- It defined a "prison" as "any jail or place used permanently or temporarily under the general or special orders of a State Government for the detention of prisoners", excluding police custody and subsidiary jails.

- The 1894 Act dealt with provisions for accommodation, food, clothing, bedding segregation, and the discipline of prisoners, including solitary confinement. It also laid down provisions for the prisoners' employment, health, and visits.

- However, the act had no provisions for reformation or rehabilitation and permitted "whipping, provided that the number of stripes shall not exceed thirty," albeit for only male prisoners.

- Thus, the Prisoners Act 1900 was introduced with the objective of consolidating the "several acts relating to prisoners" and replacing the "separate enactments by a single act, expressed more simply and intelligibly." The Act dealt with the prisoners within presidency towns and those outside; it also included provisions on how to deal with lunatic prisoners and allowed prisoners to be removed from prisons on conditions like receiving death sentences and maintaining good behaviour within prisons.

- Besides these, there were other legislations, like the Transfer of Prisoners Act, 1950, which also provided for the removal of prisoners from one state prison to another.

- However, presently, the jail manuals of each state also deal with the administration and management of its prisons.

Is the new act binding on states?

- As per the provisions of the Constitution, 'prisons' and 'persons detained therein' fall under the State List. This means that the responsibility of prison management and administration solely vests with the state govt, which alone is competent to make appropriate legislative provisions in this regard.

- However, the MHA stated that owing to the critical role played by "efficient prison management" in the criminal justice system, the Centre finds it crucial to support the States and UTs in this regard.

Law Commission recommends no change in the law on Adverse possession

Relevance: Prelims & Mains Paper II; Governance

Why in news?

- In its recent report, the 22nd Law Commission has said that "There is no justification for introducing any change in the law relating to adverse possession".

- The Law Commission said in its 280th report that there is no reason for increasing the period of limitation.

- However, two of its ex officio members of the commission filed a dissent note stating that the law does not stand judicial scrutiny and "promotes false claims under the colour of adverse possession".

What is adverse possession?

- The concept of adverse possession stems from the idea that land must not be left vacant but instead, be put to judicious use. Essentially, adverse possession refers to the hostile possession of property, which must be "continuous, uninterrupted, and peaceful."

- According to the Law Commission's report, the rationale behind this comes from considerations that the "title to land should not long be in doubt", "society will benefit from someone making use of land the owner leaves idle," and "persons who come to regard the occupant as owner may be protected."

- The saying that the "law does not help those who sleep over their rights" is invoked in support of adverse possession. Simply put, "the original title holder who neglected to enforce his rights over the land cannot be permitted to re-enter the land after a long passage of time".

- While the concept originally dates back to 2000 BC, finding its roots in the Hammurabi Code, the historical basis of "title by adverse possession" is the development of the statutes of limitation on actions for recovery of land in England.

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- The first such statute was the Statute of Westminster, 1275. However, it was the Property Limitation Act, 1874, that set the period of limitation at twelve years from when the cause of action first arose, which laid the groundwork for the limitations model inherited by colonial India.

- The first attempt to bring the law of limitation to domestic shores was the "Act XIV of 1859", which regulated the limitation of civil suits in British India. After the passage of the Limitation Act in 1963, the law on adverse possession underwent significant changes.

Provisions under the Limitation Act, 1963

- The 1963 Act fortified the position of the true owner of the land, as he now had to merely prove his title, while the burden of proof of adverse possession shifted to the person claiming it.

- Under the Limitation Act, 1963, any person in possession of private land for over 12 years or govt land for over 30 years can become the owner of that property, as laid down in Articles 64, 65, 111, or 112 of the 1963 Act, relating to suits for possession of immovable property.

- According to Article 65 of Schedule I of this Act, a person in adverse possession of immovable property acquires title to that property. However, the possession must be open, continuous, and "in defiance of the title of the real owner for twelve years." Similarly, Article 64 governs suits for possession based on previous possession and not on title.

- Meanwhile, Article 112, which applies to govt property, mandates a requirement of 30 years for granting a title by adverse position. Further, Article 111 says that the limitation period for the State will be 30 years from the date of dispossession for land belonging to a private person where any public street or road or any part of it has been dispossessed and no suit has been moved for its possession "by or on behalf of any local authority".

Main ingredients of adverse possession

- In the 2004 Apex Court ruling in Karnataka Board of Wakf v Govt of India, the court dealt with the ingredients of adverse possession.

- According to these observations, "A person who claims adverse possession should show: (a) on what date he came into possession, (b) what was the nature of his possession, (c) whether the factum of possession was known to the other party, (d) how long his possession has continued, and (e) his possession was open and undisturbed."

- For the adverse possession to be "open," or without any attempt at concealment, it doesn't need to be brought to the specific knowledge of the owner. However, such a requirement may be insisted on where an ouster of title is pleaded.

- Further, the mandate for such possession to be "undisturbed" requires a "consistent course of conduct, which means that it cannot be shown by a "stray or sporadic act of possession." In a 1981 ruling, the top court delineated the requirements of openness and continuity.

- However, in a series of decisions, the SC recommended that the govt seriously consider the issue of "adverse possession" and make suitable changes.

SC's suggested changes

- In a 2008 ruling, a two-judge SC bench, while dealing with Article 65 of the Schedule of the Limitation Act, 1963, observed that the law of adverse possession "ousts an owner on the basis of inaction within limitation" and is "irrational, illogical, and wholly disproportionate".

What did the dissent note say?

- Asserting that courts have rarely ruled in favour of adverse possession owing to its contradictory requirement that the nature of possession is "peaceful as well as hostile", the dissenting opinion said that the law should be struck off.

- Citing troubles that true owners have been subjected to, such as "avoidable and expensive litigation" by unscrupulous persons" who are acquainted with fraud, the note said that the already overburdened machinery of the courts is further saddled with avoidable work, much to the misery of the litigants. "If the law of adverse possession is struck off from the Limitation Act it will not hinder anybody's right nor will it cause any neglect of land resources," the note reads.

- It added that the fact that land prices are skyrocketing in both rural and urban areas defeated the Commission's argument that land is not put to proper use, the note said. "In an over-populous country like India where land is scarce, the law of adverse possession only promotes false claims under the colour of adverse possession which ultimately does not stand judicial scrutiny".

Karnataka High Court asks Centre to amend laws to punish necrophilia offenders

Relevance: Prelims & Mains Paper II; Governance

Why in news?

- The Karnataka High Court recently held that having sexual intercourse with a woman's dead body will not attract the offence of rape, punishable under Section 376 of the Indian Penal Code, as there is no provision in the IPC for it.

- Partially allowing the convict's appeal in a rape and murder case, a bench recommended that the Centre should amend the IPC to protect the dignity of the dead. "It is high time for the Central government to amend the provisions of Section 377 of IPC" to include dead bodies of men, women, and animals, the court said.

The case in question

- On June 25, 2015, a 21-year-old woman was returning home after her computer class, when the accused Rangaraju held her, shut her mouth, and dragged her to a nearby bush. Following this, he slit the woman's throat and murdered her, an offence punishable under Section 302 IPC, and after that "raped" her.

- A sessions judge who framed charges against the accused for offences of murder and rape under Sections 302 and 376 IPC found that the prosecution had proved beyond reasonable doubt that the accused committed murder and subsequently "raped" the victim's body.

- The accused was sentenced to rigorous life imprisonment and asked to pay a fine of Rs. 50,000 for murder. For raping the victim's dead body, he was sentenced to another 10 years of rigorous imprisonment and a fine of Rs. 25,000. Consequently, an appeal was filed before the Karnataka High Court.

What did the court say?

- While the trial court's decision to convict and sentence him to life imprisonment for murder under Section 302 of the IPC was upheld, the high court acquitted him under Section 376 for "raping" the victim's dead body, reasoning that there is no provision in the IPC to punish him for the same.

- As per the court, "A careful reading of the provisions of Sections 375 (rape) and 377 (unnatural offences) of the Indian Penal Code makes it clear that the dead body cannot be called as human or person. Thereby, the provisions of Section 375 or 377 of the Indian Penal Code would not attract," the court said.

- Adding that no offence punishable under Section 376 (punishment for rape) had taken place, the court clarified that "sexual intercourse on a dead body is nothing but necrophilia"

- Under Section 46 of the IPC, the court said that "death" denotes the "death of a human being". Therefore, the court opined that rape must be "accomplished with a person, not a dead body". "A dead body cannot consent to or protest a rape, nor can it be in fear of immediate and unlawful bodily injury," the court said while adding that it also doesn't have any feelings of outrage.

- Additionally, the court relied on a 1989 SC ruling which said that the dignity of a dead body must be maintained and respected while establishing a corresponding duty on the state to ensure decent cremation is served to the person. The "right to dignity and fair treatment under Article 21 of the Constitution of India is not only available to a living man but also to his body after his death," the ruling said.

- Besides this, the court invoked the 2021 National Human Rights Commission's advisory which states that there cannot be any physical exploitation or discrimination in the treatment of the body and also mentions the right to a decent and timely burial.

What is necrophilia?	**Is it an offence in India?**

- The Karnataka High Court has observed that "necrophilia" is a morbid fascination with death and the dead and more particularly, an erotic attraction to corpses.

- A psychosexual disorder, classified under the DSM-IV, among a group of disorders, called "paraphilias," including paedophilia, exhibitionism, and sexual masochism, necrophilia "could be the result of rage, experimentation, or lust rather than sexual necessity or habit," the court noted.

- As of date, the IPC does not list "necrophilia" as a specific offence under sexual offences mentioned in the code. However, the court mentioned that it could be brought under Section 297 as causing "indignity to any human corpse" if someone trespasses into a place for performing funeral rites or a depository for the remains of the dead.

- However, Section 297 requires the act of causing indignity to be accompanied by an intention to wound the feelings or insult the religion of any person. Moreover, the knowledge that any person's feelings are likely to be wounded or their religion is likely to be insulted by such an act will make it an offence under Section 297.

- Since India doesn't have any specific law that punishes necrophilia, the Karnataka High Court made some recommendations to the Central govt for including it under Section 377 of the IPC or as a new provision.

- The court has also offered an alternative that the Centre brings in a separate penal provision to criminalise necrophilia with life imprisonment up to 10 years with a fine.

The worldwide scenario

- While India does not have any specific provision punishing necrophilia, the United Kingdom's Sexual Offences Act, 2003, includes necrophilia as an offence under Section 70, which makes "sexual penetration of a corpse" an offence punishable with six months to two years imprisonment.

- Besides this, Canada, New Zealand, and South Africa, too, prohibit necrophilia under different laws.

Kerala launches KFON scheme to provide internet connectivity for all households

Relevance: Prelims & Mains Paper II; Governance

Why in news?

- The Kerala govt has officially launched the Kerala Fibre Optical Network (KFON), one of its flagship projects.

- Through KFON, Kerala, which was the first state to declare the right to internet as a basic right, aims to reduce the digital divide by ensuring high speed broadband internet access to all houses and govt offices.

- It is also intended to give a stimulus to e-governance and accelerate Kerala's journey towards being a knowledge-based economy.

What is KFON?

- Basically, KFON will act as an infrastructure provider. It is an optical fibre cable network of 30,000 kms, with 375 Points-of-Presence across Kerala.

- The KFON infrastructure will be shared with all service providers, including cable operators. While KFON will do the cable work for govt offices, individual beneficiaries will have to depend on private, local internet service providers.

- In many districts, Kerala Vision Broadband, an initiative of cable TV operators, is providing the internet service. The KFON infrastructure will also benefit private service providers as they can use its cable network. Internet connectivity to the households would be provided by local ISP/TSP/cable TV providers.

Its spread	Why was it needed?
- In the first stage of KFON, the govt wants to provide connectivity to 30,000 govt offices and 14,000 BPL families in the state. As on June 5, connectivity has been provided to 17,412 govt offices and 2,105 houses, and cable network has been laid down to give connection to 9,000 houses. - KFON promises an internet speed from 10 mbps to 10 Gbps. The quality of mobile phone calls is also expected to improve. Once KFON is connected to mobile towers in Kerala, it will speed up transition to 4G and 5G.	- The CPI(M) govt in Kerala is showcasing KFON as part of the Left's alternative model of development. - In the telecom sector dominated by private players, KFON is being displayed as the CPI(M)'s commitment to the public sector. - The govt is of the view that existing TELCOS have only limited infrastructure in the rural areas and their wireless connectivity infrastructure is providing only limited bandwidth. Due to the low business potential in rural areas, private TELCOs are not keen to enhance connectivity infrastructure. - Besides, the Kerala State Wide Area Network (KSWAN), the existing state Information Infrastructure connecting govt offices, is limited to 3,800 premises. Hence, the Govt in 2017 decided to establish KFON, for efficient service delivery, assured Quality of Service, reliability, interoperability, and security.

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Services to be provided

- The aim of the KFON is to create a core network infrastructure (information highway) with non-discriminatory access to all service providers, and to ensure a reliable, secure and scalable intranet connecting all govt offices and educational institutions.

- A major highlight of the KFON is that the govt wants to ensure internet connection for 20 lakh families below poverty line.

- In the first phase, as many as 14,000 BPL families would get connections to high-speed internet, free of cost. With time, 100 BPL families in each of the state's 140 Assembly constituencies will be selected for this scheme.

Law Commission seeks views on Uniform Civil Code

Relevance: Prelims & Mains Paper II; Governance

Why in news?

- The 22nd Law Commission of India has sought the views of religious organisations and the public on the issue of a Uniform Civil Code (UCC).

- This comes eight months after the Centre told the Supreme Court that the Constitution obligated the State to have a UCC for its citizens, saying that people of different religions and denominations following different property and matrimonial laws was an "affront (offence) to the nation's unity".

- It had also submitted that the matter would be placed before the 22nd Law Commission.

Huge opposition

- The Congress has led the charge against this move, saying the 21st Law Commission had said that it is "neither necessary nor desirable at this stage" to have a Uniform Civil Code.

- The Congress told the 22nd Law Commission that it should remember that the interests of the nation are distinct from the political ambitions of the BJP.

- The JD(U), RJD, the Left and the Trinamool Congress have also slammed the govt over the move. However, the Sena (UBT) and the AAP parties who have previously voiced support for a UCC, have remained silent.

21st Law Commission's say on this matter

- Underlining that the Uniform Civil Code is "neither necessary nor desirable at this stage", the 21st Law Commission of India, in 2018, argued for reform of family laws of every religion through amendments and codification of certain aspects so as to make them gender-just.

- The Law Commission took a stand in favour of "equality 'within communities' between men and women" (personal law reform), "rather than 'equality between' communities" (UCC).

- The current Law Commission's directive on the issue, while not making any recommendations, again raises the matter.

What is Uniform Civil Code?

- A UCC would provide for one law for the entire country, applicable to all religious communities, in their personal matters such as marriage, divorce, inheritance, adoption etc.

- Currently, Indian personal law is fairly complex, with each religion adhering to its own specific laws. Separate laws govern Hindus including Sikhs, Jains and Buddhist, Muslims, Christians, and followers of other religions.

- Moreover, there is diversity even within communities. All Hindus of the country are not governed by one law, nor are all Muslims or all Christians.

- For e.g, in the Northeast, there are more than 200 tribes with their own varied customary laws. The Constitution itself protects local customs in Nagaland. Similar protections are enjoyed by Meghalaya and Mizoram. Even reformed Hindu law, in spite of codification, protects customary practices.

- The exception to this rule is Goa, where all religions have a common law regarding marriages, divorces, and adoption.

Constitution's say on UCC

- Article 44 of the Constitution lays down that the state shall endeavour to secure a UCC for citizens throughout the territory of India.

- Article 44 is among the Directive Principles of State Policy. Directive Principles are not enforceable by court, but are supposed to inform and guide governance.

- "However, in some senses, Article 44 is unique in this manner. While Article 44 uses the words "state shall endeavour", other Articles in the 'Directive Principles' chapter use words such as "in particular strive"; "shall in particular direct its policy"; "shall be obligation of the state" etc.

- Furthermore, the phrase "by suitable legislation" is absent in Article 44. All this implies that the duty of the state is greater in other directive principles than in Article 44.

Why there's no uniform code for personal law?

- Article 25 lays down an individual's fundamental right to religion; Article 26(b) upholds the right of each religious denomination or any section thereof to "manage its own affairs in matters of religion"; Article 29 defines the right to conserve distinctive culture.

- An individual's freedom of religion under Article 25 is subject to "public order, health, morality" and other provisions relating to fundamental rights, but a group's freedom under Article 26 has not been subjected to other fundamental rights.

What's next?

- Over the next 30 days, the Law Commission will receive views of the public and stakeholders.

- After reviewing the submissions, the Law Commission will again make observations/recommendations regarding a UCC, which may or may not differ from the previous Commission's observations.

- On the political front, the UCC issue has been at the core of the BJP's agenda for decades. It has frequently cited Article 44 to support its case.

- With the upcoming 2024 General Elections, BJP is likely to vocally raise the issue once again.

Gita Press, Gorakhpur, awarded Gandhi Peace Prize for 2021

Relevance: Prelims & Mains Paper II; Governance

Why in news?

- The Gandhi Peace Prize for 2021 will be conferred on Gita Press, Gorakhpur, one of the largest publishers of religious texts such as the Bhagavad Gita, the Ramayana and the Upanishads.

- The decision to confer the award on Gita Press was taken by a jury headed by Prime Minister Narendra Modi after due deliberations in recognition of the publishing house's "outstanding contribution towards social, economic and political transformation through non-violent and other Gandhian methods".

- The annual Gandhi Peace Prize was instituted in 1995 on the occasion of the 125th birth anniversary of Mahatma Gandhi. The award carries an amount of ₹1 crore, a citation, a plaque and an exquisite handicraft or handloom item.

- The previous awardees include organisations such as the Indian Space Research Organisation; Ramakrishna Mission; Grameen Bank of Bangladesh; Vivekananda Kendra, Kanyakumari and Sulabh International, New Delhi.

- It has also been awarded to former President of South Africa Nelson Mandela, social worker Baba Amte, Archbishop Desmond Tutu of South Africa, environmentalist Chandi Prasad Bhatt and Bangabandhu Sheikh Mujibur Rahman of Bangladesh.

Centenary year

- Gita Press is one of the world's largest publishers, having published 41.7 crore books in 14 languages, including 16.21 crore Bhagavad Gita. It completes 100 years of its establishment in 2023.

- Notably, this institution has never relied on advertisement in its publications, for revenue generation.

- As per Gita Press, it's main objective is to "promote and spread the principles of Sanatana Dharma, the Hindu religion among the general public by publishing Gita, Ramayana, Upanishads, Puranas, Discourses of eminent Saints and other character-building books and magazines and marketing them at highly subsidised prices".

Centre brings ordinance to gain control of services in Delhi

Relevance: Prelims & Mains Paper II; Governance

Why in news?

- The Centre has brought an Ordinance extending powers to the Delhi lieutenant governor over services in the administration of the national capital – basically, the power to transfer and appoint bureaucrats posted to Delhi.

- The Ordinance, aimed at nullifying the effect of the Supreme Court's decision that gave the Delhi govt powers over administrative services in the national capital, raises several key questions– questions, which are likely to soon be posed before the Supreme Court.

Can a decision of the Supreme Court be undone?

- The Parliament has powers to undo the effect of a judgement of the Court by a legislative act. However, the law cannot simply be contradictory to the Supreme Court judgement, it must address the underlying reasoning of the Court, the defect due to which the Court has given judgement.

- Such a law can be both retrospective or prospective.

Ordinance vs. Supreme Court's judgement

- Two constitution benches of the Supreme Court, in 2018 and on May 5, 2023 have dealt with the issue of the powers of the Delhi government. Both these judgements involve the interpretation of Article 239AA of the Constitution that deals with the governance structure of the national capital. In 1991, when Article 239 AA was inserted, the Parliament also passed the Government of National Capital Territory of Delhi Act, 1991 to provide a framework for the functioning of the legislative assembly and the government of Delhi.

- The ruling on May 5 places, three constitutional principles – representative democracy, federalism and accountability – to an elected government within the interpretation of Article 239AA.

- The judgement also recognises "principles of democracy and federalism" to be part of the basic structure of the Constitution.

- Since the basis for the Court's decision is found in interpretation of constitutional provisions, it can be debated whether a law amending the GNCTD Act, 1991 will suffice to nullify the effect of the judgements.

- Delhi govt can argue that a legislation that nullifies the effect of the ruling must be an amendment to the Constitution and not just an amendment to the statutory law.

- The Court also clearly held that Part XIV of the Constitution that contains provisions for regulating the employment of persons to the public services under the union and States is applicable to union territories which includes Delhi.

- The current ordinance takes away this power from the Delhi govt and places it with a statutory body that comprises Delhi's CM and the Chief Secretary and principal Home Secretary of the Delhi govt.

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Cont'd	**Ordinance's impact on the basic structure of the Constitution**

- This arrangement means that the chief minister can effectively be vetoed by two senior bureaucrats on the issue of appointments and transfers of bureaucrats.

- This dilution of power of the Delhi govt will have to be justified within the Court's interpretation of Article 239 AA.

- While the Ordinance does not address the issue, it will be litigated in Court whether the new statutory authority will impact the court's finding on Delhi's powers.

- The Parliament cannot bring in a law, or even a Constitution amendment, that violates the basic structure of the Constitution.

- In the majority ruling in the 2018, the Constitution bench held that while Delhi could not be accorded the status of a state, the concept of federalism would still be applicable to it.

- On 5 May, the unanimous ruling penned by Chief Justice of India DY Chandrachud also held that with the introduction of Article 239AA the Constitution created a federal model with the Union of India at the Centre, and the NCTD at the regional level.

Ranking system of colleges comes under scrutiny

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Relevance: Prelims & Mains Paper II; Governance

Why in news?

- In a country as diverse as India, ranking universities and institutions is not an easy task. The Ministry of Education established the National Institutional Ranking Framework (NIRF) in 2016 to determine the critical indicators in which institutions' performance could be measured.

- Since then, institutions nationwide, including universities and colleges, eagerly await their standings in this nationally recognised system every year.

How does the NIRF rank institutes?

- Currently, the NIRF releases rankings across various categories: 'Overall', 'Research Institutions', 'Universities', and 'Colleges', and specific disciplines like engineering, management, pharmacy, law, etc. The rankings are an important resource for prospective students to choose among higher education institutions in India.

- NIRF ranks institutes by their total score and it uses five indicators to determine this score — 'Teaching, Learning & Resources' (30% weightage); 'Research and Professional Practice' (30%); 'Graduation Outcomes' (20%); 'Outreach and Inclusivity' (10%); and 'Perception' (10%).

- Academic communities have had concerns about the construction of these indicators, the transparency of the methods used, and the overall framework. An important part of it is focused on the research and professional practices part of the evaluation because they pay a lot of attention to bibliometric measures.

What are bibliometrics?

- Bibliometrics refers to the measurable aspects of research, such as the number of papers published, the number of times they are cited, and the impact factors of journals.

- The appeal of bibliometrics as a tool for assessing research output lies in its efficiency and convenience compared to qualitative assessments performed by subject experts, which are more resource-intensive and require time.

- However, science policy experts have cautioned authorities against relying too much on bibliometrics as a complete assessment. They argued that bibliometric indicators don't fully capture the intricacies of scientific performance, and that we need a more comprehensive evaluation methodology.

- The journal Science recently reported that a dental college in Chennai was using "nasty self-citation practices on an industrial scale" to inflate its rankings. They reported the use of bibliometric parameters to understand the research impact of institutions as well as the risk of a metric becoming the target.

Issues related to bibliometrics

- This criticism has been levelled against the NIRF regarding the efficiency and fairness of its approach to ranking universities. For example, the NIRF uses commercial databases, such as 'Scopus' and 'Web of Science', to get bibliometric data.

- But these entities aren't resistant to inaccuracies or misuse. Recently, 'Web of Science' had to delist around 50 journals, including a flagship journal of the publisher MDPI.

- The NIRF's publication-metrics indicator solely considers research articles, sidelining other forms of intellectual contributions, such as books, book chapters, monographs, non-traditional outputs like popular articles, workshop reports, and other forms of grey literature.

- As a result, the NIRF passively encourages researchers to focus on work that is likelier to be published in journals, especially international journals, at the cost of work that the NIRF isn't likely to pay attention to. This in turn disprivileges work that focuses on national and local issues, as international journals prefer work on topics of global significance.

Is the NIRF transparent?

- University rankings are controversial. NIRF, the Times Higher Education World University Rankings, and the QS World University Rankings all have flaws.

- Experts have emphasised that they ought to be transparent about the data they collect, the sources and how they collect it, and how that data becomes the basis for the total score. The NIRF is partly transparent as it publicly shares its methodology, but it doesn't provide a detailed view.

- The framework for assessment and scoring are based on bibliometric data. However, there is a potential discrepancy in how they label research quantity and quality. The labels in question are imprecise and potentially misleading.

The overall effect on the NIRF

- The case of the dental college is an example of the dangers of over-relying on one type of assessment criterion, and it opens a door to manipulation and obscure the true performance of an institution.

- No matter how rigorous the methods, university rankings invariably involve some level of ambiguity. The NIRF's emphasis on rankings can lead to unhealthy competition between universities, fostering a culture that puts metrics in front of the thing they are trying to measure: excellence in education and research.

EU countries sign migration deal to tackle asylum-seekers and migrants

Why in news?

- The European Union ministers have agreed on how to handle irregular arrivals of asylum-seekers and migrants.

- This deal is being hailed as a breakthrough after almost a decade of bitter feuds on this sensitive matter.

- As the deal took shape, a stabbing in France by a Syrian man who was granted asylum in Sweden 10 years ago drew fresh attention to Europe's migration policies, highlighting political as well as practical challenges lying ahead of any EU migration scheme.

Significance of this deal

- EU states have been trading blame over providing for the new arrivals since more than a million people – mostly fleeing the war in Syria – caught the bloc by surprise by reaching it across the Mediterranean in 2015.

- The bloc has since tightened external borders and its asylum laws, and struck deals in the Middle East and North Africa to have more people stay there. U.N. data shows fewer than 160,000 sea migrants made to it Europe last year.

- The bloc hopes lower irregular immigration would allow EU countries to restart cooperation to spread more evenly the task of taking care of arriving refugees and migrants.

How will it work?

- Each EU country would be assigned a share of the 30,000 people overall the bloc is expected to accommodate in its joint migration system at any given time.

- That will be calculated based on the size of the country's GDP and population, the number of irregular border crossings including via sea rescue operations, and more.

- Countries unwilling to take in people would instead be able to help their hosting peers through cash – at least 20,000 euros per person a year – equipment or personnel.

Other measures

- The agreement would introduce a new expedited border procedure for those deemed unlikely to win asylum to prevent them from lingering inside the bloc for years.

- Instead, they should be sent away within six months if their asylum applications fails, one of several shortened deadlines in the deal.

- That mechanism would apply to all those deemed dangerous, uncooperative or coming from countries with low asylum recognition rates in the EU like India or Serbia.

- EU countries could also apply the speedy procedure to people picked up in the sea, caught while trying to get in illegally or filing for asylum at the border rather than in advance.

prep mate

Will it work in practice?

- Before eventually endorsing it, Italy and Greece voiced concerns about whether the new system would prove workable given some states' refusal to host people.

- The southern countries of arrival worry about being overwhelmed, while those further away from the bloc's external borders tend to drag their feet on admitting arrivals and complex solidarity schemes take time to kick in.

- Another challenge is keeping close tabs on the movements of people once they get inside Europe's zone of free travel.

Criticisms

- Rights groups said the scheme risked reviving tragic scenes witnessed on the Greek islands several years ago by creating more overcrowded migration camps on the edges of the EU.

- They said the new plan could lead to protracted detention of minors and criticised it as focusing on keeping people away rather than helping those in need.

- Criticism also came from Poland and Hungary, the EU's loudest voices against immigration from the Middle East and Africa.

- Notably, Poland has refused to host any of the mainly-Muslim arrivals, though it has given shelter to millions of Ukrainians fleeing Russia's war.

Should go through!

- Despite the aforesaid criticism and opposition, this deal is expected to eventually win enough backing.

- There are hopes for a final agreement before a bloc-wide election in 2024.

U.S. threatens visa restrictions on Bangladeshis for undermining election process at home

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- The U.S. Secretary of State Antony Blinken recently announced a "new visa policy" which threatens to restrict visas to Bangladeshis who undermine the democratic election process at home.

- The notification said the restriction would apply to current and former Bangladeshi officials, members of pro-govt and opposition political parties, and members of law enforcement, the judiciary and security services.

- There were allegations of rigging in elections held in 2014 and 2018, which the govt of Prime Minister Sheikh Hasina had denied.

- Bangladesh responded immediately to the U.S. threat, with the govt saying it would take steps to prevent any interference in elections. The U.S. is the largest foreign direct investor in Bangladesh followed by Japan and China.

What does the notification specify?

- The new visa policy specifies that actions that undermine the democratic election process include "rigging, voter intimidation, the use of violence to prevent people from exercising their right to freedoms of association and peaceful assembly, and the use of measures designed to prevent political parties, voters, civil society, or the media from disseminating their views."

Status of U.S-Bangladesh relations

- Bangladesh and the U.S. share a strong economic bond despite somewhat icy political relations because of legacy reasons.

- Former U.S. President Nixon was not in favour of East Pakistan seeking liberation from West Pakistan, followed by the birth of Bangladesh post-December 16, 1971.

- This particular issue got highlighted as the govt of Sheikh Hasina has modelled itself as the defender of the spirit of 1971, and equates its opponents with those who opposed the creation of Bangladesh.

- The Hasina govt has maintained a distinction between economic and political relations between the two sides. The U.S. is the third largest trading partner of Bangladesh and is the largest recipient of the garments produced in Bangladesh.

- With China taking a keen interest in Bangladesh, the U.S. feels the need to look beyond trade ties. The importance of the Indo-Pacific strategy also makes Bangladesh politically indispensable for the U.S.

Other hurdles!

- PM Hasina has followed a policy of zero tolerance against terrorism and extremism since being sworn to power in 2009. She has uprooted insurgents of northeast India who had maintained a base in Bangladesh for decades. Islamist radicals have also been consistently targeted by security agencies especially the RAB (Rapid Action Battalion).

- Her actions, however, have drawn criticism from various quarters including the U.S., which has accused Bangladesh of violating human rights and for enforcing the disappearance of around 600 individuals. In Dec. 2021, serving and former top officials of the RAB were sanctioned by the U.S. Treasury Dept.

- Additionally, Bangladesh maintains a neutral policy on the Ukraine crisis, with Ms. Hasina repeatedly arguing against interference in the affairs of sovereign countries.

- Bangladesh is increasing its cooperation with Russia which is building Bangladesh's first nuclear power project in Rooppur.

prep**mate**

India and Nepal sign pacts on energy and transport

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- The Nepalese Prime Minister Pushpa Kamal Dahal 'Prachanda' is on a four-day visit to India. He met with his Indian counterpart PM Narendra Modi.

- The two countries have signed a series of agreements on energy and transport.

Details

- A long-term Power Trade Agreement has been signed between India and Nepal. Under this agreement, India will import 10,000 MW of electricity from Nepal in the coming years.

- A new pipeline will be constructed from Siliguri to Jhapa in eastern Nepal.

- Also, Nepal will export hydropower to Bangladesh through Indian territory. Transmission of up to 50 megawatts of power will commence soon via this route.

- Among the other agreements, Nepal and India have signed are - an MoU between India's NHPC (National Hydro Electric Power Corporation) and VUCL (Vidyut Utpadan Company Ltd.) of Nepal. This is for the development of Phukot Karnali Hydroelectric Project.

- There is also a Project Development Agreement for Lower Arun Hydroelectric Project. This has been signed by SJVN (India) and Investment Board of Nepal.

- PM Modi and PM Dahal participated through a video link in the ground breaking ceremony of the Gorakhpur-Bhutwal Transmission Line — on the Indian side.

(more ahead)

- The two countries have also signed the revised Treaty of Transit under which Nepal will get to access to India's inland waterways. It is being labelled as a "once in a generation" pact.

- The two Prime Ministers jointly inaugurated a cargo train from Bathnaha in India to Nepal Customs Yard. The rail link was built with an Indian grant.

- They also inaugurated integrated checkposts (ICPs) at Nepalgunj in Nepal and Rupaidiha on the Indian side.

- The two PMs also participated in the ground breaking ceremony of ICPs at Bhairahawa and Sonauli as well as Phase-II facilities as part of the Motihari-Amlekhgunj Petroleum Pipeline.

- PM Modi and PM Dahal have also agreed to achieve substantial and time-bound progress on the Pancheshwar multipurpose project. This bi-national hydropower project is to be developed on the Mahakali River bordering Nepal and India.

- As per PM Modi, the two countries should also fast-track projects related to the Ramayana circuit.

Ukraine and Russia blame each other for the breach of Kakhovka Dam

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- A huge Soviet-era dam on the Dnipro River that separates Russian and Ukrainian forces in southern Ukraine was recently breached. This unleashed floodwaters across the war zone.

- Ukraine said Russia had destroyed it, while Russian officials gave conflicting accounts, some saying it was destroyed by Ukrainian shelling and others saying it collapsed due to earlier damage.

Details about Kakhovka dam

- Kakhovka dam which is 30m (98 feet) tall and 3.2 km (2 miles) long, was built in 1956 as part of the Kakhovka hydroelectric power plant.

- This reservoir whose total water volume is 18 km3 also supplies water to the Crimean peninsula, which Russia claims to have annexed in 2014, and to the Zaporizhzhia nuclear plant, which is also under Russian control.

Accusations all around!

- As per a Ukrainian army commander, the Kakhovka reservoir was blown up by the Russian occupying forces.

- On the other hand, some Russian-installed officials blamed Ukraine for this incident. As per them, Ukrainian shelling damaged the hydraulic valves of the dam.

- Meanwhile, other Russian-installed officials said no attack took place. As per one of them, the dam collapsed due to earlier damage and the pressure of the water.

Impact

- With water levels surging higher, many thousands of people have been affected. Evacuations of civilians began on both sides of the front line.

- 22,000 people living across 14 settlements in Ukraine's southern Kherson region are at risk of flooding.

- As per the Russian-backed governor of Crimea, there is a risk that water levels in the North Crimea Canal, which carries fresh water to the peninsula from the Dnipro river, could fall after breach of the dam.

- The Crimean peninsula is dependent for fresh water on the canal. Ukraine previously blocked water supplies to Crimea after Russia annexed the peninsula in 2014, causing water shortages in the region.

- The Zaporizhzhia Nuclear Power Plant, Europe's largest, gets its cooling water from the reservoir. It is located on the southern side, now under Russian control.

- The U.N. nuclear watchdog, the International Atomic Energy Agency, said it was closely monitoring the situation but that there was "no immediate nuclear safety risk at (the) plant".

- Russia's state nuclear energy company Rosatom has also said there was no threat to the Moscow-controlled nuclear plant.

Military-backed parties suffer a major setback in Thai elections

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- Thailand's progressive Move Forward Party (MFP) and the populist Pheu Thai Party claimed victory in an election that gave a thumbs-down to the military-backed parties which ruled on and off for a decade.

- The alliance has signed an ambitious deal aiming to draft a new constitution, end mandatory military conscription and monopolies, and allow same-sex marriage, among other things.

- However, a govt has not been formed yet and the possibility of any legislative reform will boil down to who gets to form Thailand's govt — a power which in Thailand, is not automatically given to the majority election winners owing to a constitutional tweak by the military govt in 2017.

The election outcome

- The MFP emerged as the single-largest party in the May 14 polls, winning 151 seats in the 500-seat House of Representatives.

- Its 42-year-old leader Pita Limjaroenrat capitalised on his popularity among disillusioned young voters awaiting change after eight years of a military-backed govt.

- MFP is the only party promising to reform the strict lèse-majesté laws. Mr. Limjaroenrat is seen as the Prime Ministerial candidate if the coalition led by his party forms the govt.

- MFP's main ally Pheu Thai, the populist party led by the billionaire family of the self-exiled former Premier Thaksin Shinawatra, emerged as the second biggest winner with 141 seats. Pheu Thai drew its support from the rural and urban working class, mainly in the north and northeast regions of Thailand.

- Other smaller parties in the pro-democracy alliance also managed to secure a significant share of votes.

(more ahead)

Cont'd

- This election dealt a historic blow to Thailand's military-backed parties. The United Thai Nation Party, a recently formed party of the 69-year-old former military chief and incumbent Prime Minister Prayuth Chan-o-cha only managed 36 seats.

- Mr. Prayuth's previous party, the Palang Pracharat, the biggest in the incumbent ruling coalition, also bagged just 40 seats under current leader and Mr. Prayuth's deputy and military mentor Prawit Wongsuwan.

- Another party, the Bhumjaithai (proud to be Thai), which had consistently won enough seats to be kingmaker, secured 71 seats.

Thailand's political history

- The Siamese revolution marked the end of absolute monarchy in 1932. Since then, Thailand's military has staged 13 coups. The confrontation between military generals and civilian politicians and activists has been at the root of continuing instability in the country.

- In 2001, Thailand got its first elected govt which completed a four-year term, under policeman-turned-telecom giant Mr. Thaksin, who rode a populist wave to victory with his Thai Rak Thai (Thais Love Thais) party. However, the ensuing two decades were one of the most turbulent times in Thai politics. Mr. Thaksin's controversial 'war on drugs' killed more than 2,500 people.

- Additionally, scores of lives were lost through security force crackdowns in the Muslim-dominated south region of the country, igniting a new round of insurgency. While Mr. Thaksin did sweep the 2005 polls, his premiership was soon engulfed by a financial scandal and with subsequent protests, he was forced to call for fresh elections.

- However, the leader was removed from power out months later in a bloodless coup.

(more ahead)

- The period post 2006 is often described as Thailand's "lost decade". Bangkok descended into a cycle of rallies and riots in 2008. With Mr. Thaksin in self-exile and his successors deposed by the courts, the govt of leader Abhisit Vejjajiva struggled for legitimacy after being installed without a public mandate.

- In 2010, Thailand saw its most brutal crackdown on protestors, with more than 90 people— supporters of Mr. Thaksin, called the Red Shirts — killed by army firing in Bangkok.

- Notably, the crackdown was led by the current incumbent Premier and the then-general Prayut Chan-O-Cha. The protest years brought to the fore the deep social divide between the rural poor and the wealthier middle and upper classes mostly in Bangkok.

- In 2011, Mr. Thaksin's younger sister Yingluck became the country's first female Prime Minister but her administration too faced protests as she sought amnesty for her brother, still in self-exile.

- This led to the army carrying out a coup and declaring martial law in 2014 under the pretext of bringing stability to a country in paralysis. The coup brought Mr. Prayuth to power.

- In 2017, the military introduced a new Constitution, allowing it to appoint a 250-member Senate which would play a role in selecting the Prime Minister. The military delayed a Parliamentary election, which was then held in 2019 and initially seen as an exercise to transfer power from the military junta to an elected govt. However, Mr. Prayuth retained power after the election, resulting in renewed resentment.

Role of the monarchy

- Even after the end of absolute monarchy, the Thai King retained god-like status in society and enormous influence in the govt. Criticising or even talking about the state of the monarchy has long been a taboo in Thailand.

- The institution has historically been shielded from public criticism by strict lèse-majesté laws. It has wielded strong political influence, putting its seal of approval on every military coup since the 1990s.

- The current monarch, Maha Vajiralongkorn, assumed the throne in 2016 after the death of his father, the revered King Bhumibol Adulyadej, who was the world's longest-reigning monarch at the time of his death.

- The junta gave the new King full control of the Crown Property Bureau, which manages the palace's roughly $30 billion worth of assets (Thailand is the richest existing monarchy). Last year, the King assumed direct control of two Army units.

- In 2020, in an unprecedented expression of discontent with the monarchy, widespread protests, led mainly by students spread through the country, asked for a separation of the King's assets and the Crown Property Bureau.

- They also wanted to cut the Palace's share in the national budget and ban the King from expressing his political views. The protestors also rejected the military's outsized influence in Mr. Prayuth's govt.

- These protests were a long-simmering reaction against Thailand's economic and political system, seen for decades as serving mainly three privileged groups — the one per cent of the population owning two-thirds of all Thai assets, the financially-privileged military which is intertwined with state enterprises, and the world's richest monarchy.

Significance of these elections	Uncertainty over govt formation
- The current election is the first election since the major pro-democracy protests of 2020 and the second since the 2014 coup. - The fact that Thai people came out in record numbers (a 75% voter turnout) to vote for a young party promising historic reforms, rejecting influential military-backed parties is being considered as a tectonic shift in the country's politics. - The overwhelming support for the MFP, the only party pledging to change lèse-majesté laws, also showed how the anti-monarchy sentiment of 2020 translated into an electoral mandate. - The support for the populist Pheu Thai party also indicated conservative working-class fatigue, and a population seeking an end to corruption and army influence.	- The winner of the May 14 vote is not assured the right to form the new govt. A joint session of the 500-seat House of Representatives and the 250-member Senate will be held in July to select the new prime minister. - This process is widely seen as undemocratic because the senators, appointed by the military rather than elected, vote along with election winning lawmakers. - While Mr. Limjaroenrat now claims that his alliance led by the MFP comprises 313 seats, he will need the backing of 376 legislators in the House to be voted in. - Besides, the alliance will need to win over some of the 250 members of the conservative-leaning Senate, which is usually inclined to support military-backed parties. - However, such an alliance, even if it forms a govt, might face the threat of military intervention due to MFP's radical pledge to change the monarchy laws. - There is also another alliance scenario, interestingly, without the largest vote-getting party. While the populist Pheu Thai party is making strong calls for a govt led by MFP, analysts say it could also tie up with Bhumjaithai as well as the current ruling party, Palang Pracharat. (more ahead)

Cont'd

- In yet another potentially contentious scenario, the military-backed parties could form a minority govt with the Senate's support, going against the will of the electorate.

- Meanwhile, if no compromise is reached, Thailand could also witness months of deadlock without a working govt, since there is no constitutional deadline to form one.

US wants to rejoin UNESCO after years of disputes over Israel and Palestine

Why in news?

- The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has announced that the United States will rejoin it in July.

- This will come four years after it left the agency (along with Israel), alleging that UNESCO was biased against Israel. The move to rejoin will face a vote by UNESCO's member states and is expected to pass easily.

- UNESCO is a UN agency tasked with furthering international cooperation and peace through the promotion of educational, scientific and cultural causes. For instance, it designates locations globally as World Heritage Sites, which means international recognition and possible funding. The United States was a founding member of UNESCO in 1945.

Why did US leave UNESCO?

- The issue goes back to 2011, when UNESCO inducted Palestine as a member. This led to the US halting the agency's funding, worth millions of dollars, under then President Barack Obama.

- Notably, Palestine is not recognised as a sovereign state by the United Nations. It was included as a non-member observer State over Israel's objections in 2012, meaning it could participate in General Assembly proceedings but lacked voting rights.

- The Palestinians claim the West Bank, east Jerusalem and Gaza Strip — territories captured by Israel in the 1967 war — for an independent state. Israel says the Palestinians' efforts to win recognition at the UN are aimed at evading a negotiated settlement and meant to pressure Israel into concessions.

(more ahead)

Cont'd

- Israel and the U.S. termed the inclusion of Palestine, UNESCO's previous criticism of Israel's occupation of East Jerusalem and naming what it said were ancient Jewish sites as Palestinian heritage sites as examples of anti–Israel bias.

- US laws, owing to the country's historical ties with Israel, prohibit funding to any UN agency that implies recognition of the Palestinians' demands for their own state. But this was negotiated recently through an agreement in 2022 that allowed for giving UNESCO funds again.

- Officials estimated that the US accrued $600 million in unpaid dues in these years and this amount was one of the reasons behind then US President Donald Trump's decision to withdraw in 2017, a year after he was elected President. The decision came into effect in 2019. Israel owes an estimated $10 million and it also cut funding to the agency in the years leading up to its exit.

What is U.S. returning?

- As per US officials, the decision to return was due to China filling the gap left by the US in UNESCO policy making, such as in setting standards for artificial intelligence and technology education around the world.

Hiroshima AI Process (HAP) aims to regulate AI governance

Relevance: Prelims & Mains Paper II; International Organizations

Why in news?

- The annual Group of Seven (G-7) Summit, hosted by Japan, took place in Hiroshima in May. Among other matters, the G-7 Hiroshima Leaders' Communiqué initiated the Hiroshima AI Process (HAP) — an effort by this bloc to determine a way forward to regulate Artificial Intelligence (AI).

- The ministers of these countries discussed "responsible AI" and global AI governance. They called for promoting human-centric and trustworthy AI based on the OECD (Organisation for Economics Co-operation and Development) AI Principles and to foster collaboration to maximise the benefits for all brought by AI technologies.

- Notably, G-7 countries are acting on their own instead of waiting for the outcomes from the HAP. So while there is an accord to regulate AI, the discord — as evident in countries preferring to go their own paths — will also continue.

What is the Hiroshima AI process?

- The aforesaid communiqué accorded more importance to AI than the technology has ever received in such a forum.

- In this respect, G7 has tasked relevant ministers to establish the Hiroshima AI process, through a G7 working group, in an inclusive manner and in cooperation with the OECD and GPAI, for discussions on generative AI by the end of this year.

- These discussions could include topics such as governance, safeguard of intellectual property rights including copyrights, promotion of transparency, response to foreign information manipulation, including disinformation, and responsible utilisation of these technologies.

- The HAP is likely to conclude by Dec. 2023.

Significance

- While the communiqué doesn't indicate the expected outcomes from the HAP, there is enough in there to indicate what values and norms will guide it and from where it will derive its guiding principles, based on which it will govern AI.

- The communiqué as well as the ministerial declaration also say more than once that AI development and implementation must be aligned with values such as freedom, democracy, and human rights.

How will HAP work?

- An emphasis on aforesaid values indicates that the HAP isn't expected to address AI regulation from a state-centric perspective.

- Instead, it exists to account for the importance of involving multiple stakeholders in various processes and to ensure the latter are fair and transparent.

- The task before the HAP is really challenging considering the divergence among G-7 countries in, among other things, regulating risks arising out of applying AI.

- It can help these countries develop a common understanding on some key regulatory issues while ensuring that any disagreement doesn't result in complete discord.

India, U.S. initiative on greater cooperation in future tech

Why in news?

- Earlier this week, India and the United States unveiled a roadmap for enhanced collaboration in high-technology areas, with a focus on addressing regulatory barriers and aligning export controls for smoother trade and "deeper cooperation" in critical areas.

- This was part of the Initiative on Critical and Emerging Technology (iCET) announced by President Joe Biden and Prime Minister Narendra Modi last year.

What is iCET?

- The Initiative on Critical and Emerging Technologies is a framework agreed upon by India and the U.S. for cooperation on critical and emerging technologies in areas including artificial intelligence, quantum computing, semiconductors and wireless telecommunication.

- It was launched in January this year to strengthen their strategic partnership and drive technology and defence cooperation. Mr. Modi and Mr. Biden first announced the framework on the sidelines of the Quad meeting in Tokyo in May 2022.

Focus areas of the initiative

- Primarily, the iCET seeks to position India and the U.S. as "trusted technology partners" to build supply chains and support the co-production and co-development of items.

- A White House fact sheet released after the inaugural dialogue gives a broad outline of areas the two countries intend to explore to expand the depth of tech partnership and cooperation between their governments, businesses, and academic institutions.

- Key takeaways include:
  - setting up a research agency partnership to drive collaboration in areas like AI;
  - developing a new defence industrial cooperation roadmap to accelerate technological cooperation for joint development and production;
  - developing common standards in AI; developing a roadmap to accelerate defence technological cooperation and 'innovation bridge' to connect defence startups;
  - supporting the development of a semiconductor ecosystem;
  - strengthening cooperation on human spaceflight;
  - advancing cooperation on development in 5G and 6G; and
  - adopting OpenRAN network technology in India.

The progress so far

- India and the U.S. have made "significant progress" in several key areas identified for collaboration since the launch of iCET.

- The two countries have already put in place the Quantum Coordination Mechanism, launched a public-private dialogue (PDD) on telecommunication to drive collaboration in OpenRAN, 5G and 6G, and held "important exchanges" on AI and space.

- In March, India and the U.S. signed an MoU on establishing a semiconductor supply chain that paved the way for creating a semiconductor sub-committee to review recommendations from an industry-led task force launched in connection with the iCET.

(more ahead)

- On the defence front, the two countries are close to concluding a mega jet engine deal, with a final announcement expected during Mr. Modi's visit.

- In addition, a new initiative to advance cutting-edge technology cooperation, known as the India-U.S. Defence Acceleration Ecosystem (INDUS-X), is set to be launched during the visit.

- India and the U.S. have also concluded a roadmap for 'Defence Industrial Cooperation' to guide the policy direction for the next few years.

- The two countries have also established a Strategic Trade Dialogue to remove regulatory "barriers" and review existing export control norms to take forward strategic technology and trade collaborations envisaged under iCET.

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- As PM Narendra Modi heads to the United States for an official state visit on the invitation of President Joe Biden, the bipartisan consensus in the U.S. on strengthening the bilateral relationship is evident by the invitation extended to the PM by the leaders of the two chambers of the US Congress.

- Modi is scheduled to address a joint meeting of Congress for a second time — an honour that has been accorded earlier only to a few leaders including Winston Churchill, Nelson Mandela, and Israel's Prime Ministers Binyamin Netanyahu and Yitzhak Rabin.

- PM Modi first addressed a joint meeting of Congress on June 8, 2016.

EXPRESS explained.
ECONOMICS

Economic engagement

- At the heart of the Indo-US strategic partnership is deepening economic engagement and a resolve on both sides to elevate the bilateral relationship to a "global strategic partnership".

- While the relationship is founded in shared democratic values and an increasing convergence of interests on regional and global issues, an indication of how far the needle has moved is in the fact that only 25 years ago, India was under US sanctions.

- Modi's visit comes at a time when the value of trade between the two countries has touched a record $191 billion, making the US India's largest trading partner.

- For India, the favourable balance of trade position with the US is comforting, given that it has an adverse balance of trade equation with the majority of its other major trading partners. For the US, India is the ninth largest trading partner.

- American companies have invested around $60 billion in India in sectors ranging from manufacturing to telecommunications and consumer goods to aerospace.

- Meanwhile, Indian companies have put in more than $40 billion in sectors such as IT, pharmaceuticals, and green energy, thus supporting "425,000 jobs from California to Georgia".

- In February, Air India announced the purchase of more than 200 Boeing aircraft — a historic deal that President Biden said would "support over one million American jobs across 44 states", and which will likely figure as a key pitch of his re-election campaign.

INDIA-US BILATERAL TRADE

in US$ billion	2018	2019	2020	2021
INDIA'S EXPORTS TO THE US				
Merchandise	54.28	57.69	51.19	73.37
Services	28.87	29.74	25.84	28.98
Total	83.16	87.43	77.03	102.35
US EXPORTS TO INDIA				
Merchandise	33.19	34.29	27.39	39.94
Services	25.20	24.33	17.42	16.72
Total	58.39	58.62	44.82	56.66
TOTAL BILATERAL				
Merchandise & Services	141.55	146.05	121.85	159.01

Source: US Dept of Commerce, US Bureau of Census, Indian Embassy in Washington

Bonding over strategic interests

- Much of the U.S-India relationship is strategic with both partners increasing their engagement with an eye on China.

- Central to this cooperation is also the consensus on diversifying and deepening supply chains with trusted countries, while reducing strategic dependencies. The two govts are pursuing more than 50 bilateral dialogue mechanisms at various levels.

➢ The flagbearer of the strategic engagement is the Quadrilateral Security Dialogue. The Quad which has Australia and Japan alongside India and the US, was repurposed in 2017, primarily as a counter to China's growing influence in the Indian Ocean rim, and as a forum for redoubling focus on the Indo-Pacific region.

➢ The I2U2, a grouping of India, Israel, the US and the United Arab Emirates, is focused on joint investments and new initiatives in water, energy, transportation, space, health, and food security.

➢ This January, a new US-India initiative on Critical and Emerging Technologies was launched. The two countries established a partnership to make the semiconductor supply chain more resilient through private sector cooperation.

➢ The defence sector is likely to see multiple pacts. Cooperation in areas such as armoured vehicles, ammunition, and air combat could include a deal for India, the world's largest arms importer, to manufacture under licence GE's F414 turbofan jet engine to power the indigenous Tejas Mk2 light combat aircraft that is under development.

- A few issues between India and the U.S. need to be resolved. The US still has significant export controls on India (instituted after the 1998 nuclear test), which prevents the free transfer of technology. And the GE deal, if it goes through, will require clearance by Congress.

➤ Among the outstanding trade issues that require resolution are visa delays and the revoking of India's trade benefits under the Generalised System of Preferences (GSP) programme in 2019. The US has complained about India's trade policy being overly protectionist, especially with regard to entry barriers for foreign investment and unsteady legal rules. India has been raising tariffs over the last few years, reversing an earlier policy of lowering tariffs that endured for decades.

➤ India's rising procurement of discounted crude oil from Russia (which is now almost half of India's total crude imports) also needs to be resolved. The US has looked the other way so far — even as G-7 countries slapped price caps on Russian oil products to restrict Russia's access to funds for its war on Ukraine.

➤ India will likely be asked to join the trade pillar of the US-led Indo-Pacific Economic Framework (IPEF). From the U.S. perspective, there is no political appetite for a full-scale free trade agreement (FTA) with India in Congress at this moment!

- India has signed up for three pillars of the IPEF — committed to building more resilient supply chains, tapping clean energy opportunities, and combating corruption — but has opted out of the fourth pillar (trade) citing reservations about the commitments required on environment, labour, digital trade, and public procurement.

➤ India has so far not find an entry into the Minerals Security Partnership (MSP), a US-led partnership to secure supply chains of critical minerals that is aimed at reducing dependency on China.

Key takeaways from the Joint Statement on PM Modi's official U.S. State Visit

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- The Joint Statement issued by India and the United States affirmed a vision of the two countries as "among the closest partners in the world — a partnership of democracies looking into the 21st century with hope, ambition, and confidence".

- Following are the key points from the 58-paragraph Joint Statement, and a 'Fact Sheet' issued by the White House.

Technology partnership

- This has eight key elements:

➢ Strengthening semiconductor supply chains: Micron Technology will invest more than $800 million toward a new $2.75 billion semiconductor assembly and test facility in India. Applied Materials will build a Semiconductor Centre for Commercialization and Innovation in India. Also, Lam Research will train 60,000 Indian engineers.

➢ Critical Minerals Partnership: India has become the newest partner of the US-led Minerals Security Partnership (MSP) that has been established to accelerate the development of diverse and sustainable critical energy minerals supply chains globally. The MSP has 12 other partner countries, plus the European Union. India's Epsilon Carbon Limited will invest $650 million in a greenfield electric vehicle battery component factory, which will be the largest ever Indian investment in the US electric vehicle battery industry.

➢ Advanced Telecommunications: India and the US have launched public-private Joint Task Forces on the development and deployment of Open RAN systems and on advanced telecoms research and development. India's Bharat 6G and the US Next G Alliance will co-lead this public-private research.

(more ahead)

➢ **NASA-ISRO collaboration in space:** India has signed the Artemis Accords, thus joining 26 other countries. This agreement will enable exploration of the Moon, Mars, and beyond. NASA will provide advanced training to Indian Space Research Organization (ISRO) astronauts with the goal of launching a joint effort to the International Space Station in 2024. NASA and ISRO are also developing a strategic framework for human spaceflight cooperation by the end of 2023.

➢ **Quantum, Advanced Computing, and Artificial Intelligence:** The two countries have established a Joint Indo-US Quantum Coordination Mechanism to facilitate joint research between the public and private sectors across the two countries. They have also signed an implanting arrangement to support joint research on quantum, Artificial Intelligence (AI), and advanced wireless technologies.

➢ **Cutting-edge Research:** The US National Science Foundation has announced 35 joint research collaborations with India's Department of Science and Technology, and signed a new cooperative arrangement with India's Ministry of Electronics and Information Technology on emerging technologies.

➢ **Innovation Handshake:** To support the US-India Initiative on Critical and Emerging Technology (iCET), the US-India Commercial Dialogue will launch a new "Innovation Handshake" to connect the startup ecosystems of the two countries.

➢ **Fiber Optics Investments:** India's Sterlite Technologies Ltd has invested $100 million in the construction of an optical fibre cable manufacturing unit near Columbia, South Carolina, which will facilitate $150 million in annual exports of optical fibre from India.

- GE F414 Engine Co-Production: General Electric (GE) and Hindustan Aeronautics Limited (HAL) have signed a MoU. This first-of-its-kind initiative to manufacture F414 engines in India will enable greater transfer of US jet engine technology than ever before.

- General Atomics MQ-9Bs: India intends to procure armed MQ-9B SeaGuardian UAVs. The drones will increase India's intelligence, surveillance, and reconnaissance capabilities.

- Service and repair of US Navy ships: The US Navy has concluded a Master Ship Repair Agreement (MSRA) with Larsen and Toubro Shipyard in Kattupalli (Chennai) and is finalizing agreements with Mazagon Dock Limited (Mumbai) and Goa Shipyard (Goa). These agreements will allow mid-voyage US Navy ships to undergo service and repair at Indian shipyards.

- More robust defence cooperation: The two countries have resolved to strengthen undersea domain awareness cooperation, and agreed to place three Indian liaison officers in US commands for the first time. The US and India have also begun negotiations for a Security of Supply Arrangement and Reciprocal Defence Procurement Arrangement that will enable the supply of defence goods in the event of unanticipated supply chain disruptions.

- Defence "Innovation Bridge": The recently inaugurated India-US Defence Acceleration Ecosystem (INDUS-X) will facilitate joint innovation on defence technologies and accelerate the integration of India's private sector defence industry with the US defence sector.

People-centric efforts

- The Joint Statement mentions the historic aviation deal between Air India and Boeing to acquire more than 200 American-made aircraft, and the efforts to resolve trade issues between the two countries.

- Domestic visa renewals: The U.S. State Dept will launch a pilot this year to adjudicate domestic renewals of certain petition-based temporary work visas, including for Indian nationals, who will no longer be required to leave the country for renewal in eligible categories. This will be implemented for an expanded pool of H1B and L visa holders in 2024, with the aim of broadening the programme to include other eligible categories.

- New consulates: The US intends to open new consulates in Bengaluru and Ahmedabad, and India looks forward to opening its consulate in Seattle later this year, and announcing two new consulates in the US.

- Student exchanges and scholarships: The US last year issued a record 125,000 visas to Indian students, and Indians are on track to become the largest foreign student community in the US, with a 20% increase last year alone. India and the US have launched a new Joint Task Force of the Association of American Universities and leading Indian educational institutions, for research.

- Agreement on cultural property: The US and India are continuing negotiations for a Cultural Property Agreement which would help to prevent illegal trafficking of cultural property from India and enhance cooperation on the protection and lawful exchange of cultural property.

Cooperation in the Indo-Pacific

- Indo-Pacific and Indian Ocean: The US will join the Indo-Pacific Oceans Initiative, a regional initiative inaugurated by PM Modi in 2015 to promote a safe, secure, and stable maritime domain and promote its conservation and sustainable use.

- India will continue to participate as an observer in the Partners in the Blue Pacific. The US and India will hold an Indian Ocean Dialogue with experts and stakeholders from across the Indian Ocean region to promote greater regional coordination.

Sustainable development

- Energy collaboration: India and the US will continue to work together to achieve their national climate and energy goals. The US welcomes India's decision to co-lead the multilateral Hydrogen Breakthrough Agenda to make affordable renewable and low carbon hydrogen globally available by 2030.

- Green technology: The two countries will work to create innovative investment platforms that will lower the cost of capital and attract international private finance at scale for renewable energy, battery storage, and emerging green technology projects in India. They have also taken initiatives to decarbonise the transportation sector. There is also the Global Biofuels Alliance, which has been established by India with the US as a founding member.

Initiatives on health

- Fighting cancer and diabetes: The US and Indian scientists will develop an Artificial Intelligence (AI)-enabled digital pathology platform, which will be utilized for cancer diagnosis as well as AI-based automated radiotherapy treatment for several types of cancers.

- The US National Institute of Diabetes and Digestive and Kidney Diseases and the Indian Council of Medical Research will do basic, clinical, and translational research on diabetes.

Fighting terror and drugs

- President Biden and PM Modi reiterated the call for concerted action against all UN-listed terrorist groups including al-Qa'ida, ISIS/Daesh, Lashkar e-Tayyeba (LeT), Jaish-e-Mohammad (JeM), and Hizb-ul-Mujhahideen.

- They strongly condemned cross-border terrorism, the use of terrorist proxies and called on Pakistan to take immediate action to ensure that no territory under its control is used for launching terrorist attacks. They called for the perpetrators of the 26/11 Mumbai and Pathankot attacks to be brought to justice.

- The US and India are developing a broader and deeper bilateral counternarcotics framework to disrupt the illicit production and international trafficking of illicit drugs, including synthetic drugs, fentanyl, and precursors.

PM Modi-led yoga session creates a Guinness World Record

Relevance: Prelims & Mains Paper II; International Events

Why in news?

- Prime Minister Narendra Modi-led yoga session at United Nations headquarters, on the occasion of 9th International Yoga Day, created a Guinness World Record for participation of people of most nationalities in a yoga event.

- Guinness World Records, since its inception in 1955, has become the primary international source for cataloguing and verification of a huge number of world records. It has sold over 150 million books globally in 40 languages.

What are the Guinness World Records?

- Guinness World Records – originally known as the Guinness Book of Records – documents record-breaking achievements of all kinds, listing world records both of human achievements and the extremes of the natural world.

- The first edition topped the bestseller list in the U.K. by Christmas 1955. Today, it contains 62,252 active records. From the "world's tallest building" (Burj Khalifa, Dubai) to "longest fingernails ever" (Lee Redmond), GWR documents it all.

- While originally a yearbook, today, GWR has television shows across the world, as well as a robust online presence, with a huge social media following.

Origin

- Interestingly, GWR started out as an idea for a book of facts to solve arguments in pubs – arguments which often got messy and violent.

- In the 1950s, Sir Hugh Beaver, Managing Director of the Guinness Brewery, attended a hunting party in County Wexford. There, he and his hosts argued about the fastest game bird in Europe and failed to find an answer in any reference book.

- Sir Hugh then got the idea for a Guinness promotion based on the idea of settling pub arguments. It was to come up with a book which provides definitive answers for contentious facts.

- He employed two researchers for this book. They ended up creating a product which would become much more than just a promotion for Guinness.

- After the book became a surprise hit, it rapidly expanded and took the form of yearly editions where all records would be updated and new records would be set.

How a GWR is made?

- While some records are obvious (for example, "world's tallest man"), others might be less so. As GWR has expanded, so has the number of records and categories it documents.

- GWR has over 75 adjudicators across the world, who determine whether a record has been broken or not. There is even an application process – one can apply to invite an adjudicator to witness a record being broken.

- A GWR record must satisfy all of the following criteria to count:

➤ It should be objectively measurable.

➤ It should be breakable – it cannot be something so unique that only one person can do it.

➤ Similarly, it should also be standardisable with a possibility to create a set of parameters and conditions that all challengers can follow.

➤ It should be verifiable.

➤ It should be based on only one variable.

➤ It should be the best in the world. For any new record, GWR sets a minimum standard that has to be met for the record to be broken.

Criticism too!

- Since 2008, GWR has orientated its business model toward inventing new world records as publicity stunts for companies and individuals, attracting a lot of criticism.

- In 2019, GWR got criticized for taking money from authoritarian govts for pointless vanity projects. It has also come under fire for encouraging people to participate in risky activities.

- This has led to GWR revisiting some of its policies. According to its latest policy, there are a number of records that are disqualified from the GWR. These include those which cause harm to animals, which endanger the person or spectators, which cause food waste, etc.

The importance of U.S.-India fighter jet deal

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- Coinciding with PM Modi's first state visit, India and the U.S. announced several deals in defence cooperation, space technology, AI and other areas.

- The U.S.-India joint statement mentions the "landmark" signing of a Memorandum of Understanding between General Electric (GE) and Hindustan Aeronautics Limited (HAL) for the manufacture of GE F414 jet engines in India, for the Light Combat Aircraft (LCA) Mk2.

The status of the deal

- The aforesaid deal is "almost done" with some commercial terms pending finalisation, in addition to the U.S. Congressional approval.

- There would be an 80% transfer of production technology which will see some critical technologies transferred to India.

- It will take three years for the first engine to roll out once the contract is signed. Except for a small component, the F414-INS6 engine will be entirely manufactured in India.

- Notably, the U.S. has strict export controls and licensing systems for sharing sensitive and niche technologies.

Significance

- If the deal goes through, it will mean transfer of almost the entire engine technology compared to a 2012 deal between GE and HAL for the F414 engine. It involved 58% transfer of technology.

- The latest deal marks a major high-technology cooperation between the oldest and largest democracies, which the U.S. has shared with only its closest allies.

- While the most critical technologies of the engine will be off limits, Indian industry, both public and private, will get a chance to upgrade their capacities and skills as significant sourcing as well as manufacturing will be done in the country, with the technologies that GE has agreed to transfer.

The status of indigenous tech development

- Jet engine technology is the proprietary right of very few countries and is a closely guarded secret due to its extreme criticality in modern warfare.

- India made unsuccessful attempts in the past to develop an engine locally under the now-shelved 'Kaveri' project.

- This project which was sanctioned in 1989 lasted over the course of 30 years before it was shut down. Its cost was ₹2035.56 crore.

Where will the GE engines be fitted?

- The F414 engines are meant to power the indigenous LCA-Mk2, a larger and more capable variant of the LCA currently in service, and also the initial version of the fifth generation Advanced Medium Combat Aircraft (AMCA) that is under development.

- The F414 is from the family of the F404 engine that powers the current LCA-Mk1 and also the upcoming LCA-Mk1A. An F414 engine produces 98kN thrust compared to 84kN by the F404 engine.

The timeline for production and delivery

- GE has delivered 75 F404 engines for the LCA Mk1A and eight engines for LCA Mk2.

- The LCA-Mk2 is a major boost for the IAF to arrest the dwindling fighter squadron as several frontline fighters like Mirage-2000, Jaguars and MiG-29s will be phased out by the end of the decade.

- The three existing Mig-21 squadrons will also be phased out by end-2025. The strength of India's fighter squadron is 31 now from a sanctioned strength of 42.

- The number of Mk2 jets is expected to be between 120 and 130 fighters.

India signs a landmark jet engine deal with the U.S.

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- A landmark agreement to facilitate the transfer of at least 11 critical jet engine technologies has been announced during Prime Minister Narendra Modi's official State Visit to the United States.

- This deal has been signed between the American multinational corporation - General Electric (GE) and Hindustan Aeronautics Limited (HAL) for the manufacture under licence in India of GE's F414 engine for the indigenous Light Combat Aircraft (LCA) Tejas Mk2.

- This agreement for transfer of technology was a key component of the US-India Initiative on Critical and Emerging Technologies (iCET).

The GE-414 engine

- The turbofan engine, part of GE's suite of military aircraft engines, has been in use by the US Navy for more than 30 years. More than 1,600 F414 engines have been delivered, adding up to more than 5 million engine flight hours on a wide variety of missions.

- The engines are in the thrust class of 22,000 lb or 98 kN, and feature advanced technology such as Full Authority Digital Electronic Control (FADEC) — the latest aircraft ignition and engine control system that controls engine performance digitally.

- The use of advanced materials and cooling techniques improve performance and extend component life.

INSIDE THE F414 MILITARY AIRCRAFT ENGINE

FAN
- New high-flow design
- Stage 2/3 blisk

COMBUSTOR
- New annular combustor with multi-hole cooling design

HIGH PRESSURE TURBINE (HPT)
- Single crystal HPT blades
- Boltless retainers
- Thermally matched rotor/stator

LOW PRESSURE TURBINE (LPT)
- Single crystal HPT blades
- Boltless retainers
- Thermally matched rotor/stator

AFTERBURNER & NOZZLE
- Air-cooled flame holder system
- Ceramic Matrix Composite (CMC) seals

ENGINE SPECIFICATIONS

Maximum diameter **35 In**

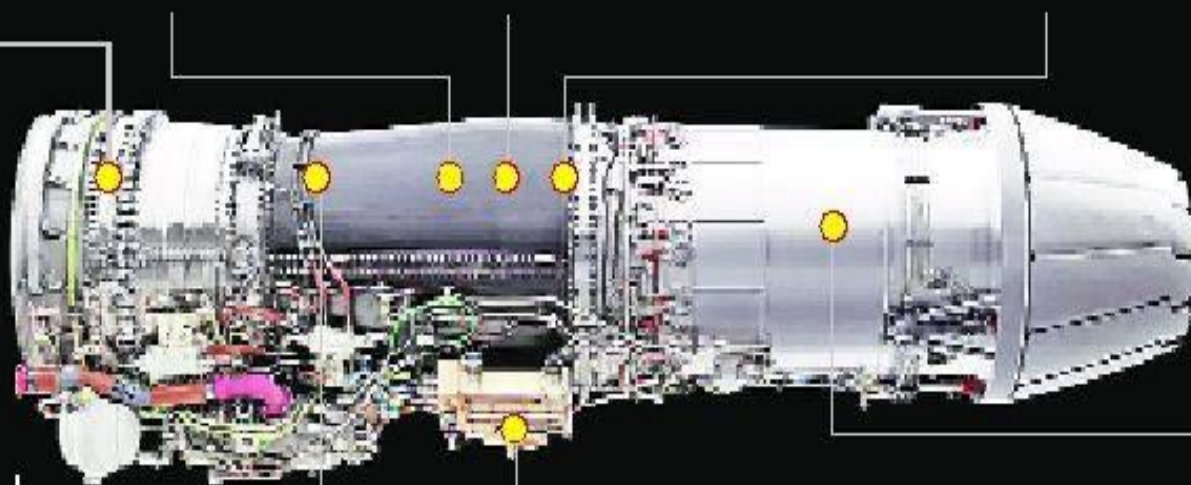|	
Length	154 in
Thrust Class	22,000 lb
Airflow	170 lb/sec
Pressure Ratio	30:1

HIGH PRESSURE COMPRESSOR (HPC)
- Stage 1/2 blisk
- Stage 3 blisk

ADVANCED CONTROLS
- Dual channel. Full Authority Digital Engine Control (FADEC)
- Advanced engine analytics capability

F414-powered jets

- Eight nations have F414-powered aircraft in operation or on order. F414-GE-400 engines power the US Navy's Boeing F/A-18E/F Super Hornet and EA18G Growler electronic attack aircraft.

- Saab's Gripen E/F fighters use the F414G, the single-engine variant of the F414-GE-400. F414 engines could also power emerging platforms such as the Korean KF-X.

For Indian aircraft

- The India-specific version of the engine, F414-INS6, was selected by the Aeronautical Development Agency (ADA) of the Defence Research Development Organisation (DRDO) for the LCA Tejas Mk2.

- The LCA Tejas is powered by a single GE-404-IN20 engine. The GE-404 engine, the basic design of which has been replicated in the F414, was developed in the 1970s.

- F414 engines may also power the prototypes and the initial batch of the Advanced Medium Combat Aircraft (AMCA), India's futuristic fifth generation fighter aircraft for its Air Force. The AMCA is a possible recipient of the engine, even though it will likely face competition from other jet engine makers such as Safran SA of France and Rolls-Royce of the United Kingdom.

- Safran and HAL have co-developed the Shakti engine for the indigenous Advanced Light Helicopter (ALH) Dhruv and Light Combat Helicopter (LCH) Prachand.

Significance of this deal

- Only a handful of countries — such as the US, Russia, the UK, and France — have mastered the technology and metallurgy needed to manufacture an engine that can power combat aircraft.

- India is not in this list, its push for self-reliance in manufacturing several critical technologies, including cryogenic rocket engines, notwithstanding.

- The DRDO's Gas Turbine Research Establishment (GTRE) first worked on developing the GTX-37 engine for the LCA. Subsequently, the ambitious Kaveri engine project was sanctioned in 1989.

- Though engines have been developed, and their testing and other trials have been completed — they have not been found suitable for fighter aircraft. There was a major shortfall in the wet thrust of the engine, which generated only 70.4 kN as against the targeted 81 kN.

- In 2011, the Comptroller and Auditor General (CAG) pulled up the GTRE for its inability to produce the engine for the LCA despite heavy cost overruns.

- While the LCA Tejas was integrated with the GE-404 engine, the govt told Parliament in 2021 that technological capabilities built through the Kaveri engine project would be utilised, including as derivatives in drones.

- The countries that have the technology to manufacture advanced engines for fighter aircraft have been traditionally unwilling to share them. That is why this deal to manufacture GE's F414s in India is pathbreaking. The pact will bring an end to India's long-drawn pursuit of advanced combat jet engine technology.

PM Modi's visit to Egypt revives ties between both countries

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- After wrapping up his first State visit to the U.S, PM Narendra Modi landed in Egypt for a two-day visit. Modi became the first Indian PM to visit the country since 1997.

- During his stay, Modi met prominent personalities, visit the 11-century Al-Hakim Mosque and held bilateral talks with Egyptian President Abdel Fattah el-Sisi, who visited India earlier this year as the chief guest for Republic Day celebrations.

- The two leaders interaction highlights the growing cooperation between the two countries, especially in recent years.

A modern-day timeline of India-Egypt relations

- India established a bilateral relationship with Egypt in 1947. Their partnership, however, began to blossom when India's first PM Jawaharlal Nehru and Egypt's 2nd President Gamal Abdel Nasser became close. The friendship was first tested during the 1956 Suez Canal crisis when Nasser nationalised the canal leading Israel, and later France and Britain, to attack Egypt. Nehru condemned this "aggression" against Egypt.

- In the following years these two leaders played a pivotal role in founding the Non-Aligned Movement (NAM) along with Yugoslavia's President Josip Broz Tito, Indonesia's President Sukarno and Ghana's President Kwame Nkrumah.

- India also stood firmly next to Egypt and the Arab world when they came to blows with Israel over Palestine — India didn't establish full diplomatic relations with Israel until 1992.

- Both nations also seek to strengthen their defence and economic ties. They cooperated in developing a fighter aircraft in the 1960s.

- However, India put its partnership with Egypt on the back burner in later years, particularly during the 1970s. India's deepening anti-Western rhetoric and empathy for radical Arab States in the 1970s, was not sympathetic to the concerns and interests of Egypt as it began to rethink its regional policies.

- Those years saw India completely ignoring not just Egypt but also the whole West Asia region. By the end of the Cold War, the area had completely dropped off India's agenda — India had only maintained relations on "a mercantilist basis" with oil-producing nations and those countries where Indian labourers migrated for work.

What has brought India and Egypt closer again?

- Since 2014, India has sought to engage with West Asian countries. India wants to draw huge amounts of capital from Gulf nations, curtail religious extremism by supporting moderate countries in the region while encouraging social reforms, and participate in the security politics of the area.

- India has realised that Egypt is a key player. The country has remained fairly moderate over the years, shares strong ties with the UAE and Saudi Arabia and is located at a crucial geo-strategic location — 12% of global trade passes through the Suez Canal.

- Meanwhile, Egypt wants India's help to tackle its battered economy. The COVID-19 pandemic along with the implications of the Russia and Ukraine war has worsened its financial woes. Inflation in Egypt is at a five-year high of over 30% and it has approached the International Monetary Fund (IMF) for the fourth time in six years for a bailout.

- Egypt has sought India's investments in infrastructure. Notably, more than 50 Indian companies have invested more than $3.15 billion in Egypt.

- When el-Sisi arrived in India earlier this year, the two countries announced that they had decided to elevate their bilateral relationship to a "strategic partnership". During Modi's visit to Egypt, it's expected the two leaders will work further towards deepening the ties between the two countries.

Modi conferred with the Order of the Nile, Egypt's highest civilian award

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- Recently, in a special ceremony at the Presidency in Cairo Egyptian President Abdel Fattah El-Sisi, conferred Prime Minister Narendra Modi with the 'Order of the Nile', the highest civilian award of Egypt.

- The Order of the Nile (Kiladat El Nil) was established in 1915 and was one of the Kingdom of Egypt's principal orders until the monarchy was abolished in 1953.

- This honour is conferred upon heads of states, crown princes, and vice-presidents who offer Egypt or humanity invaluable services.

- It is a pure gold collar consisting of three square gold units comprising Pharaonic symbols.

ANI

PM Modi visits Egypt's Heliopolis Memorial, pays homage to India's WW 1 soldiers

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- PM Narendra Modi paid his respects at the Heliopolis (Port Tewfik) Memorial in the Heliopolis War Cemetery in Cairo, Egypt.

- Here the names of nearly 4,000 Indian soldiers who fought in World War 1 in Egypt and Palestine are commemorated.

- The Heliopolis Commonwealth War Graves Cemetery also commemorates 1,700 Commonwealth soldiers who died in World War 2.

Significance

- The Heliopolis (Port Tewfik) Memorial is part of the larger Heliopolis Commonwealth War Graves Cemetery. This memorial commemorates the memory of 3,727 Indian soldiers who died fighting in various campaigns in Egypt and Palestine in the First World War.

- The original Port Tewfik memorial was destroyed in the Israeli-Egyptian War of 1967 by retreating Egyptian soldiers.

- A new memorial bearing the names of the Indian soldiers who died in the aforesaid war campaigns was erected in Heliopolis Commonwealth War Grave Cemetery in 1980.

Indian Army's role in West Asia in WW 1

- Indian troops of the expeditionary forces sent from India played a major role in West Asia in the First World War.

- They played a key role in securing the Suez Canal in Egypt and in Palestine, where Indian cavalry participated in the Battle of Haifa, commemorated in New Delhi in a war memorial. Indian soldiers also played a key role in Mesopotamia in the First World War.

Indian regiments and soldiers commemorated at this war memorial

- A large number of Indian Regiments belonging to the Indian Army, as well as to the State Forces of the princely states, are represented in this memorial.

- The princely states played a vital part in the war effort in the First World War and the troops of State Forces saw widespread action in almost all theatres of the war.

- Risaldar Badlu Singh, who was awarded the highest British war time gallantry award, Victoria Cross, posthumously, is commemorated at this war memorial.

- The names of some of the personnel who died in this theatre of operations and who are commemorated are Sepoy Nazara Singh, Sepoy Nikka Singh, Havildar Narayan Singh, Sepoy Gurcharan, Sowar Aidan Singh, Sapper Bhaguji and Major Mohammad Yusuf Ali Khan.

Pakistan and Iran inaugurate border market

Relevance: Prelims & Mains Paper II; International Relations

prep mate

Why in news?

- In a bid to boost cross-border trade, Pakistan's Prime Minister Shehbaz Sharif and Iran's President Ebrahim Raisi recently inaugurated the first border market at the Mand-Pashin crossing point of the Pakistan-Iran border.

- The top leaders also launched an electricity transmission line, which will provide some of Pakistan's remote regions with Iranian-generated electricity.

Details

- This newly inaugurated border market - the Mand-Pishin Border Sustenance Marketplace, is one of the six border markets to be constructed along the 959 km-long border Pakistan-Iran border. Three Border Markets are now being established at Gabd, Mund & Chedgi in Balochistan.

- These facilities would enhance cross-border trade, foster economic growth and open up new avenues of opportunity for local businesses.

- The latest border market, which is located at Mand town in Pakistan's Balochistan province and adjacent to Pishin city in Iran's Sistan-Baluchestan province, has been set up on 10 acres of land. It is the third border crossing point to be opened along the between both countries.

- Trade through the Mand-Pishin border has a long history with Mand being a hub for small-scale border business owners from across Balochistan, especially those connected with the food and beverage businesses in Kech and Gwadar districts.

- Mand has several large storage houses, where goods such as food and beverage commodities are imported, stored and then distributed across Balochistan and other provinces of Pakistan.

Strategic significance

- The relationship between Shia-majority Iran and Sunni-dominated Pakistan is far from being steady. The two nations have been at odds with each other, especially since the 1979 Islamic Revolution in Iran that brought Ayatollah Khomeini to power.

- In recent years, the ties between them further deteriorated due to cross-border attacks by Pakistani militants along their shared border.

- Small separatist groups have been behind a long-running insurgency calling for Baluchistan's independence from the central govt in Islamabad. Pakistani anti-Iran militants have also targeted the Iranian border in recent years, increasing the friction between the two countries.

- Despite these differences, the two countries haven't ever completely severed their ties. They now seem to be improving their relationship to deal with common issues such as their respective economic crises — While Iran's finances are diminishing due to tough sanctions imposed by the U.S., Pakistan has failed to deal with inflation.

- Another reason for their new-found closeness could be the normalisation of ties between Saudi Arabia and Iran. For decades, Saudi Arabia had been opposed to strong ties between Pakistan and Iran. However, now that Iran and Saudi Arabia have finally re-established their diplomatic relations, Pakistan can fully cooperate with its neighbour and benefit from it.

- The entry of China as a diplomatic player in West Asia can also be a factor. Both Iran and Pakistan share a strong relationship with China and, therefore, it becomes obligatory for them to remain cordial with each other.

China-Pak nuclear-deal raises eyebrows for flouting global rules

Relevance: Prelims & Mains Paper II; International Relations

Why in news?

- China and Pakistan recently signed an agreement for a 1,200 MW nuclear power plant in the Chashma nuclear complex in Pakistan.

- The deal, reported to be worth $4.8 billion, comes amid Pakistan facing a dual energy and economic crisis.

- This deal has implications not only for the crisis-hit country but also for the global governance of nuclear commerce, with China proceeding with the recent deal without seeking necessary waivers from the Nuclear Suppliers Group (NSG).

Details

- This is the fifth reactor at the Chashma nuclear complex (C-5). China had given "special concessions" for financing the construction amid Pakistan's continuing financial crisis and on-going negotiations for a bailout from the International Monetary Fund (IMF).

- C-5 will be the biggest reactor at Chashma, where China has already constructed four phases of the complex, with four reactors of around 325 MW each.

Other nuclear plants built by China for Pakistan

- Pakistan is currently operating six China-built nuclear plants.

- Pakistan's oldest reactor, the Canada-built KANUPP-1, is now decommissioned, while KANUPP-2 and KANUPP-3 both use 1,100 MW Chinese reactors.

- An agreement for KANUPP-3 was signed in 2013, the year Chinese President Xi Jinping launched his Belt and Road Initiative (BRI), and became a flagship energy project as part of the China Pakistan Economic Corridor (CPEC) of the BRI.

- The Pakistani govt wants to urgently increase the share of renewables and nuclear energy.

The broader implications

- China's civilian nuclear projects with Pakistan have come under scrutiny of the Nuclear Suppliers Group (NSG),

- NSG which describes itself as a group of nuclear supplier countries "that seeks to contribute to the non-proliferation of nuclear weapons through the implementation of two sets of Guidelines for nuclear exports and nuclear-related exports", explicitly prohibits the transfer of nuclear technology by its members to countries that have not signed the nuclear Non-Proliferation Treaty (NPT).

- China joined the 48-member grouping in 2004, and argued subsequently that the Chashma 3 and Chashma 4 reactors were "grandfathered" under its earlier Chashma deals with Pakistan that pre-dated its joining of the NSG.

- Chinese analysts have now justified the continuing nuclear commerce, despite Beijing's NSG commitments, by pointing to the India-U.S. nuclear deal. There are, however, significant differences.

(more ahead)

Cont'd

- For one, India and the U.S. had to seek a waiver from the NSG for their civilian nuclear deal, which was granted in 2008, paving the way for India to enter the tent of global nuclear commerce.

- That was, however, only granted after India undertook a number of commitments such as placing facilities under International Atomic Energy Agency (IAEA) safeguards, separating civilian and military nuclear programmes and a continued moratorium on testing.

- Neither has China sought any such waiver from the NSG nor has Pakistan undertaken similar commitments. China has suggested that the reactors being under IAEA safeguards would be sufficient.

- Meanwhile, long-running negotiations to include India as a full-fledged NSG member have run into Chinese opposition when it started to link India's aspirations for NSG membership with that of Pakistan's.

- Experts fear the latest deals have only further eroded the global rules governing nuclear commerce, and also raised questions about both the continuing relevance and future of the NSG and governance of global nuclear commerce.

ECONOMICS

RBI plans a lightweight payments system as an alternative to UPI, NEFT, RTGS

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- The Reserve Bank of India (RBI) has conceptualised a lightweight payment and settlements system, which it is calling a "bunker" equivalent of digital payments.

- It can be operated from anywhere by a bare minimum staff in exigencies such as natural calamities or war.

- The infrastructure for this system will be independent of the technologies that underlie the existing systems of payments such as UPI, NEFT, and RTGS.

- RBI has not offered a timeline for the launch of this payments system yet.

Why is it needed?

- In its Annual Report for 2022-23, RBI says that the lightweight and portable payment system is expected to operate on minimalistic hardware and software, and would be made active only on a "need basis".

- It said, "Such a lightweight and portable payment system could ensure near-zero downtime of the payment and settlement system in the country and keep the liquidity pipeline of the economy alive and intact by facilitating uninterrupted functioning of essential payment services like bulk payments, interbank payments and provision of cash to participant institutions".

- The system is expected to process transactions that are critical to ensure the stability of the economy, including govt and market-related transactions.

Differences from UPI

- According to the RBI, existing conventional payments systems such as RTGS, NEFT, and UPI are designed to handle large volumes of transactions while ensuring sustained availability. As a result, they are dependent on complex wired networks backed by advanced IT infrastructure.

- "However, catastrophic events like natural calamities and war have the potential to render these payment systems temporarily unavailable by disrupting the underlying information and communication infrastructure," the RBI said. "Therefore, it is prudent to be prepared to face such extreme and volatile situations."

Insurance regulator framing all-in-one policy plan to spread insurance in India

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- If India's insurance regulator - the Insurance Regulatory and Development Authority (IRDA)'s plans get realized, households across the country could soon be able to get an affordable single policy that covers health, life, property and accident, get their claims settled within hours, and even secure value-added services such as gym or yoga memberships at the time of buying a policy.

- In an ambitious bid to expand the poor insurance penetration in the country, the IRDA is devising a new affordable bundled product to give citizens protection against multiple risks, and seeking to expedite claim settlements by linking death registries onto a common industry platform.

- These initiatives are part of a broader overhaul, including legislative amendments to attract more investments through differentiated licences for niche players similar to the banking sector, with an eye on making insurance "available, affordable and accessible" to citizens with a 'Gram Sabha- to district- to State-level' approach.

- IRDA believes these changes could double the number of jobs in the sector to 1.2 crore.

Policies lack necessary protection!

- IRDA has pointed out at "huge protection gaps" that exist even today in almost all the lines of the insurance, be it life, health, motor, property or crops.

- It aims to create an "UPI-like moment" in insurance through a plan, termed "Bima Trinity".

- A new Bima Sugam platform will integrate insurers and distributors on to one platform to make it a one-stop shop for customers, who at a later stage can pursue service requests and settlement of claims through the same portal.

- IRDA is simultaneously developing "Bima Vistar" that will be a bundled risk cover for life, health, property and casualties or accidents, with defined benefits for each risk that can be paid out faster than usual without need for surveyors.

Cont'd

- As per IRDA, they are trying to design it in a manner so that there are parametric triggers which don't need a surveyor to assess the loss.

- If there is a loss, the defined benefit immediately goes to the bank account of the policyholder. IRDA is looking to price it in an affordable manner.

- Also, banks can possibly be given an auto-debit authority for the premium payments.

- The third part of the trinity envisaged by the IRDA entails a women-centric workforce of Bima Vaahaks (carriers) in each Gram Sabha that will meet the women heads of each household to convince them that a composite insurance product like Bima Vistar can "come in handy if there is any distress".

- With many States digitising their birth and death registries, the IRDA platform, if integrated with those registries, could help settle claims as fast as six to eight hours or a day at the most.

'The game changer'

- According to IRDA, all a policy holder needs to do is go to the platform, use his consent to pull their policy from insurers' repository and the death certificate. The engine at the back-end will process the claim from the insurance company and put the money in the bank account within 6-8 hours or maximum, the next day, the claim settlement can be in one's account.

- To meet the target of providing insurance cover for all by 2047, the IRDA is also looking to form State-level insurance committees similar to the ones prevalent in the banking sector, and involve State govts to formulate district-level plans.

- Separately, the IRDA has proposed amendments to the insurance laws that the govt may take up soon, which will allow differentiated capital requirements for niche insurers so as to attract more investments and permit players to add value-added services to the policies they sell.

(more ahead)

- The amendments will also enable the entry of new players in the form of micro, regional, small, captive players, specialised players, and even composite licences. By doing this kind of differentiation, insurance companies will be able to cater to different geographies and the different strata of the population.

- To support the idea, IRDA has cited the developments on the banking front, where the central bank oversees several types of banks addressing the needs of different geographies and segments of the population, such as payment banks, small finance banks, co-operative banks, et al.

Cover drive for the uninsured

The Insurance Regulatory and Development Authority is driving multi-pronged changes to expand citizens' safety nets

- A new bundled insurance product Bima Vistar to provide life, health, accident and property cover through a single, simple policy

- A Bima Sugam platform as a one-stop shop for customers, integrating insurers and distributors

- Linking digital death registries to platform so claims can be settled within hours or a day

- Permitting insurers to sell value-added services with policies; for example, a yoga class bundled with a health scheme

- Women to lead campaign to spur insurance penetration in each Gram Sabha

- Roping in States to form insurance committees and expand coverage across districts

- Move will also allow smaller, micro and regional insurers to reach different strata of society

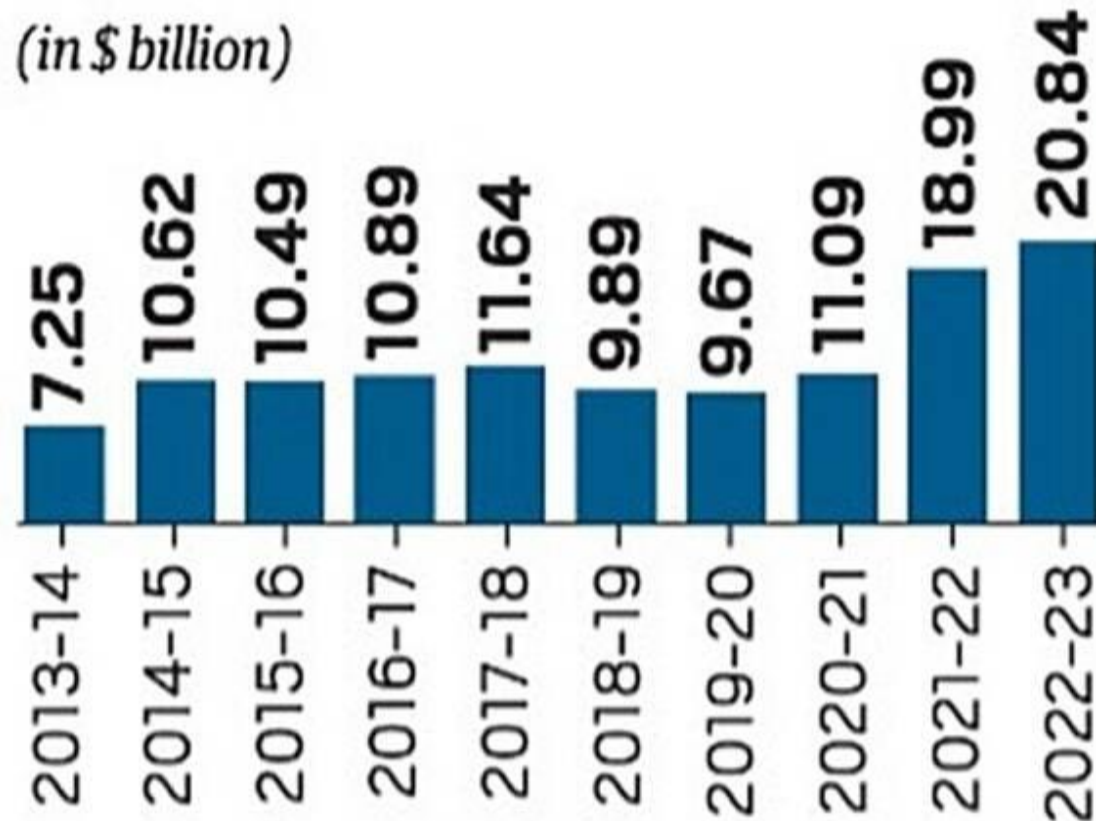# India becomes relatively self-sufficient in pulses compared to edible oil

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- There are two agricultural commodities in which India is significantly import-dependent: Edible oil and pulses.

- Between 2013-14 and 2022-23 (April-March), the value of India's vegetable oil imports has soared from $7,249.85 million (Rs 44,038.04 crore) to $20,837.70 million (Rs 167,269.99 crore).

- Out of the 24-25 million tonnes (mt) cooking oil that the country consumes annually, only 9-10 mt is from domestically produced grain. The balance 14-15 mt is imported.
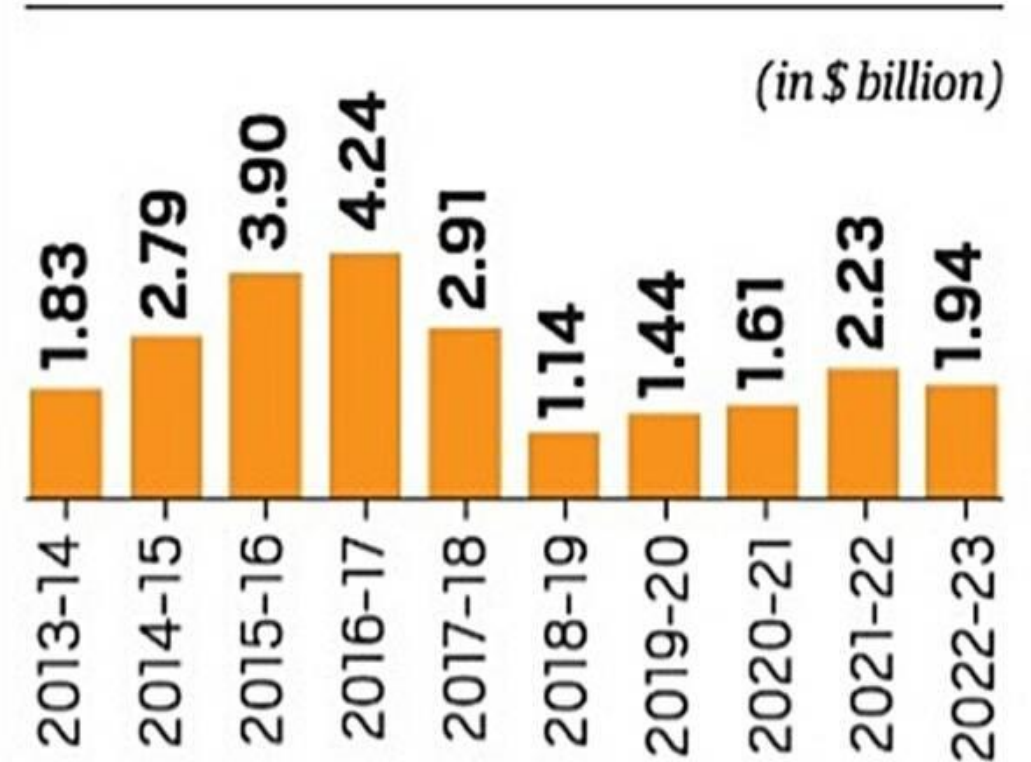
IMPORTS OF VEGETABLE OILS

(in $ billion)

Year	Value
2013-14	7.25
2014-15	10.62
2015-16	10.49
2016-17	10.89
2017-18	11.64
2018-19	9.89
2019-20	9.67
2020-21	11.09
2021-22	18.99
2022-23	20.84

Relatively self-sufficiency in pulses

- Compared to edible oil, it's been quite a reverse case with pulses.

- The value of imports has posted only a marginal rise during the nine years of the Narendra Modi-led govt: From $1,828.16 million (Rs 11,036.75 crore) to $1,943.89 million (Rs 15,780.56 crore). Imports went up initially to reach a high of $4,244.13 million (Rs 28,523.18 crore) in 2016-17, only to fall substantially thereafter.

- In quantity terms, India's imports of pulses more than doubled from 3.18 mt in 2013-14 to 6.61 mt in 2016-17. From those peaks, they have come down to 2.70 mt in 2021-22 and 2.52 mt in 2022-23. Thus, the nine years of the Modi govt has actually seen a decline, unlike in vegetable oils, where the quantum of imports too has surged from 7.94 mt to 15.67 mt between 2013-14 and 2022-23.

- The reduction in pulses imports has come essentially on the back of higher domestic production. India's pulses output has increased from 19.26 mt in 2013-14 to 27.50 mt in 2022-23. Private trade estimates of production are lower at 23-24 mt. Even taking 23 mt production and 2.5 mt imports translates into an atmanirbharta or self-sufficiency ratio of over 90% in pulses, as against hardly 40% for edible oils.

IMPORTS OF PULSES

(in $ billion)

2013-14: 1.83
2014-15: 2.79
2015-16: 3.90
2016-17: 4.24
2017-18: 2.91
2018-19: 1.14
2019-20: 1.44
2020-21: 1.61
2021-22: 2.23
2022-23: 1.94

A huge turnaround in Chana output

- The imports of two items - Yellow/white peas (matar) and chickpea (chana) have recorded dramatic drops. At their height, yearly imports of the former topped 3 mt and the latter 1 mt. Those have since plunged to negligible levels.

- The reason is that Yellow/white peas are basically a substitute for chana. When chickpea prices saw a huge rise, as India's production dipped from 9.53 mt in 2013-14 to 7.33 mt and 7.06 mt in the following two years, split yellow peas replaced chana dal in many curry recipes. In fact, besan (chana flour) makers resorted to adulteration by adding cheaper yellow/white matar. Imports of chickpea also increased dramatically during that period.

- The situation changed after 2016-17, with domestic output of chana registering a jump to 11.38 mt in 2017-18 and further to 13.54 mt each in 2021-22 and 2022-23. While the trade's estimate is only 11-12 mt, it is still a considerable improvement over the production in the initial years of the Modi govt.

- The boost to chana production came from two key government measures, incentivizing Indian farmers to expand area under the pulses crop grown during the rabi (winter-spring) season.

- The first is the levy of a 60% import duty on chana since March 2018. In yellow/white peas, there is a 50% duty plus a minimum price of Rs 200/kg below which imports are not permitted, the latter imposed in Dec. 2019. These have resulted in a near-complete stoppage of imports.

- The second intervention has been govt procurement at minimum support prices (MSP). Such purchases amounted to 2.14 mt in 2020 (the rabi marketing season from March-June), 0.63 mt in 2021, 2.56 mt in 2022 and 2.23 mt this year till May-end. The MSP of chana itself has been raised from Rs 3,100 to Rs 5,335 per quintal between 2013-14 and 2022-23.

Arhar remains a concern!

IMPORTS OF MAJOR PULSES (in thousand tonnes)

	Peas (Matar)	Chickpea (Chana)	Lentil (Masoor)	Pigeonpea (Tur/Arhar)	Urad & Moong
2014-15	1951.97	418.88	816.47	575.22	622.89
2015-16	2245.39	1031.49	1260.19	462.71	581.6
2016-17	3172.76	1080.63	829.44	703.54	574.52
2017-18	2877.03	981.32	796.62	412.95	346.97
2018-19	851.41	185.95	248.97	530.67	574.24
2019-20	666.7	370.67	854.46	449.78	381.52
2020-21	46.33	294.53	1116.17	442.62	416.63
2021-22	0.85	202.1	667.43	840.46	807.17
2022-23	0.86	62.92	858.44	894.42	556.71

Source: Department of Commerce

- Chana's success has, however, not been replicated for other pulses, particularly arhar/tur or pigeonpea. Its production has shown an erratic trend, rising from 3.17 mt in 2013-14 to 4.87 mt in 2016-17, before falling to 4.22 mt in 2021-22 and 3.43 mt in 2022-23. The trade, again, reckons this year's crop at just 2.5 mt.

- The same goes for urad (black gram), a predominantly kharif (post-monsoon sown) crop like arhar. Its output in the last four years has averaged 2.42 mt, down from the 3.49 mt and 3.06 mt highs of 2017-18 and 2018-19.

- Moong (green gram) has fared better. Its estimated production of 3.74 mt in 2022-23, for the first time, overtook arhar's at 3.43 mt. In the last four years, moong has moved up from No. 4 (behind urad, arhar and chana) to No. 2 (next only to chana). While moong is largely cultivated during kharif, much of the recent output gain has been from the spring-sown and summer-harvested crop.

Implications for imports and inflation

- The inconsistent production of most non-chana pulses has meant no decrease in their imports. Arhar imports – from Mozambique, Myanmar, Tanzania, Malawi and Sudan – hit a record 0.9 mt in 2022-23.

- Meanwhile, the imports of masoor (red lentil) from Canada and Australia have crossed 1.1-1.2 mt in some years. That has partly to do with it becoming a substitute for arhar. Red masoor dal being used in place of yellow arhar – including for making sambar – is happening mainly in hotels, restaurants and canteens. It makes economic sense, when masoor dal is retailing at an average of Rs 90/kg, compared to Rs 120-plus for arhar.

- Looking ahead, a subnormal monsoon can potentially lead to inflation in pulses. But there are at least two buffers against this.

- The first is the ample govt stocks of chana, which includes the newly procured 2.23 mt and the 1.47 mt carryover from last year's crop. The second is imports: At $680-690 or Rs 56,000-57,000 per tonne, the landed price of raw masoor in India is below its MSP of Rs 60,000 and wholesale mandi rates of Rs 98,000-100,000/tonne for arhar. There is currently no duty on imports of masoor, arhar or urad.

- Lastly there are stock limits on the trade. The Modi govt, last week, imposed these on arhar and urad, while applicable to wholesalers and retailers as well as dal millers. In an election year, one can expect more such measures being deployed to prevent hoarding and unscrupulous speculation.

RBI permits loan default guarantee in digital lending

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- The Reserve Bank of India (RBI) has allowed default loss guarantee (DLG), a safety-net arrangement among banks, non-banking finance companies, and lending service providers (LSPs, popularly known as fintech players) in the digital lending space.

- DLG is also known as First Loss Default Guarantee (FLDG). The RBI nod for compensating banks in case of default is expected to boost fintech activity in the financial sector.

What is an FLDG arrangement?

- FLDG is an arrangement whereby a third party such as a financial technology (fintech) player (LSP) compensates lenders if the borrower defaults. The LSP provides certain credit enhancement features such as first loss guarantee up to a pre-decided percentage of loans generated by it.

- From the perspective of the fintechs, offering FLDG acts as a demonstration of its underwriting skills. From the perspective of the lender, it ensures the platform has a significant stake in the business.

- For all practical purposes, credit risk is borne by the LSP without having to maintain any regulatory capital. The loan portfolio backed by FLDG is similar to the off-balance sheet portfolio of the LSP wherein the nominal loans sit in the books of the lender without being a part of any lending process.

RBI's initial reservations

- RBI had expressed reservations on the FLDG arrangement because it felt that the model could pose a systemic risk.

- A working group committee of the bank in its report released in 2021 observed that in some cases, fintechs were undertaking balance-sheet lending in partnership with a bank/ NBFC or on a standalone basis, while not satisfying the principal business criteria to remain outside regulation.

- This was happening outside the RBI regulations. There were higher operational risks arising due to the increasing reliance of lenders on third-party service providers, it had said.

- The RBI issued guidelines on digital lending in Sept. 2022, but it did not provide clarity on the FLDG structure. In the absence of clear directions, regulated entities like banks had stopped entering into such arrangements with fintech players, posing a threat to their business. The fintech industry was demanding that the RBI should allow FLDG arrangements.

LSP's functions

- Lending service providers are new-age players who use technology platforms in the lending space.

- They are agents of a bank or NBFC who carry out one or more of a lender's functions (in part or full) in customer acquisition, underwriting support, pricing support, disbursement, servicing, monitoring, recovery of specific loan or loan portfolio as per the outsourcing guidelines of the RBI.

RBI's stance on FDLG

- The RBI, after examining FLDG, permitted the arrangements between banks and fintechs or between two regulated entities (REs). The central bank said an RE can enter into DLG arrangements only with an LSP or other REs with which it has entered into an outsourcing (LSP) arrangement.

- The LSP-providing DLG must be incorporated as a company under the Companies Act, 2013.

- The RBI has allowed banks to accept DLG in digital lending only if the guarantee is in the form of a cash deposit, or fixed deposits in a bank with a lien in favour of the RE, or a bank guarantee in favour of the RE.

- Banks and NBFCs should ensure that the total amount of DLG cover on any outstanding portfolio does not exceed 5% of the amount of that loan portfolio.

Reaction of the Fintech industry

- The fintech industry has welcomed the RBI move to permit FLDG arrangements. As per it, the new circular clearly specifies details on scope, eligibility, structure, form, cap, disclosure requirements, and exceptions, which leaves limited room for doubts and uncertainty.

- As per it, this will facilitate entry of small and medium fintechs into the digital lending space in partnerships with banks or NBFCs.

Committee suggests RBI to extend deposit insurance cover to PPI holders

Why in news?

- Prepaid Payment Instrument (PPI) holders may soon get protection for their money against any fraud or unauthorised payment transactions.

- A committee set up to review the Customer Service Standards in RBI Regulated Entities has recommended that the central bank should examine the extension of Deposit Insurance and Credit Guarantee Corporation (DICGC) cover to PPIs, which, at present, is available only to bank deposits.

- If the committee's recommendation is accepted, it will come as a big relief for PPI holders.

What are PPIs?

- PPIs are instruments that facilitate the purchase of goods and services, conduct of financial services and enable remittance facilities, among others, against the money stored in them.

- PPIs can be issued as cards or wallets. There are two types of PPIs – small PPIs and full-KYC (know your customer) PPIs. Further, small PPIs are categorized as – PPIs up to Rs 10,000 (with cash loading facility) and PPIs up to Rs 10,000 (with no cash loading facility).

- PPIs can be loaded/reloaded by cash, debit to a bank account, or credit and debit cards. The cash loading of PPIs is limited to Rs 50,000 per month subject to the overall limit of the PPI.

Who can issue PPI instruments?

- PPIs can be issued by banks and non-banks after obtaining approval from the RBI. As on Nov 9, 2022, over 58 banks including Airtel Payments Bank, Axis Bank, Bank of Baroda, Jio Payments Bank, Kotak Mahindra Bank, Standard Chartered Bank, UCO Bank and Union Bank have been permitted to issue and operate prepaid payment instruments.

- There are 33 non-bank PPI issuers as on May 30, 2023. Some of the non-bank PPI issuers are Amazon Pay (India), Bajaj Finance, Delhi Metro Rail Corporation Ltd, Manappuram Finance Ltd, Ola Financial Services, Razorpay Technologies and Sodexo SVC India Pvt.

- The money kept in wallets is in the nature of deposits.

What is DICGC?

- DICGC is a wholly-owned subsidiary of the RBI and provides deposit insurance.

- The deposit insurance system plays an important role in maintaining the stability of the financial system, particularly by assuring the small depositors of the protection of their deposits in the event of a bank failure.

- The deposit insurance extended by DICGC covers all commercial banks including local area banks (LABs), payments banks (PBs), small finance banks (SFBs), regional rural banks (RRBs) and co-operative banks, that are licensed by the RBI.

- The number of registered insured banks as on March 31, 2023, stood at 2,027, comprising 140 commercial banks and 1,887 co-operative banks.

Provisions for heavy penalties!

- DICGC insures all deposits such as savings, fixed, current and recurring including accrued interest. Each depositor in a bank is insured up to a maximum of Rs 5 lakh for both principal and interest amount held by them as on the date of liquidation or failure of a bank.

- The earlier insurance cover provided by DICGC was Rs one lakh. However, the limit of insurance cover for depositors in insured banks was raised to Rs 5 lakh in 2020.

Total number of PPIs in the system

- As per the recent RBI data, the total number of PPIs stood at 16,185.26 lakh as on March 31, 2023. Of this, the number of wallets was nearly 1,3384.68 lakh and the number of cards was 2800.58 lakh. In FY2023, the total volume transacted through PPIs was 74,667.44 lakh.

Initiatives to strengthen Urban Co-operative Banks (UCBs) in India

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- Four important initiatives have been taken to strengthen 1,514 Urban Co-operative Banks (UCBs) in the country.

- These measures which have been notified by the RBI are in line with Modi govt's vision of 'Sahakar se Samridhi'. They will help UCBs in being treated at par with other forms of economic entities, both as beneficiaries and participants.

New Branches

- In order to expand their business, Urban Cooperative Banks (UCBs) can now open new branches.

- This figure would be up to 10% (maximum 5 branches) of the number of branches in the previous financial year without prior approval of RBI in their approved area of operation.

- In order to avail this facility, UCBs have to get the policy approved by their board and comply with the Financially Sound and Well Managed (FSWM) Norms.

One Time Settlement

- UCBs can also do One Time Settlement at par with Commercial Banks. RBI has notified a framework governing this aspect for all regulated entities including Urban Co-operative Banks.

- Now co-operative banks through board-approved policies may provide process for technical write-off as well as settlement with borrowers. This has now brought cooperative banks at par with other commercial banks.

Revised timelines for PSL targets

- The RBI has decided to extend the timeline for UCBs to achieve Priority Sector Lending (PSL) targets by two years i.e. up to March 31,2026.

- Deadline of March 31, 2023 to achieve PSL target of 60% has now also been extended to March 31,2024. The excess deposits, if any, after clearing the shortfall of PSL during FY 2022-23 will also be refunded to UCB.

- Since UCB work in urban areas unlike commercial banks who have branches in rural areas as well, they were facing hardships on this score.

Designation of a Nodal Officer in RBI

- In order to meet the long pending demand of the cooperative sector for closer coordination and focused interaction, RBI has recently notified a nodal officer as well.

Term Loan B in news

Relevance: Prelims & Mains Paper III; Economics

prep*mate*

Why in news?

- Ed-tech giant Byju's has sued some of its lenders in the New York Supreme Court.

- Notably, Byju failed to pay interest of $40 million on its term loan B of $1.2 billion, and the next day, it initiated legal action against the lenders, calling their tactics "high-handed" and "predatory".

- This is perhaps the first instance of an Indian start-up suing its own lenders after failing to pay the interest amount.

- Byju's, the world's most valuable ed-tech firm, has also decided to halt payment to the lenders. In particular, it accused US-based hedge fund Redwood of buying the company's distressed debt "with the intent of making windfall gains".

- In May, Byju's lenders had filed a suit against the firm in a Delaware court, accusing it of defaulting on payments.

- Byju's, however, has said that the defaults were "non-monetary and technical" and that the lenders used it as an excuse to take control of its US entity, Byju's Alpha, and appoint their management.

What brought this?

- To know about this, we'll first have to understand what is a term loan B?

- A term loan B, or TLB, is a debt instrument through which start-ups raise money that allows for a flexible repayment of their dues to creditors.

- Generally, borrowers are not required to pay the principal amount upfront, and unlike a regular loan, can pay a large amount at the end of the loan period. This allows borrowers the flexibility to spend money and invest in growing their business.

Byju's loan details

- In Nov. 2021, Byju's raised $1.2 billion through a term loan from the overseas market. It raised the amount to fund general corporate purposes offshore, including supporting business growth in the North American market, which is key to the firm's global aspirations.

- This was before the company had filed its financial reports for FY'21 with the govt – which it finally did after a delay of eighteen months.

- The numbers were dismal, signalling a cash crunch at the company, later compounded by a weak market owing to geopolitical tensions and rate increases.

- As per its FY'21 results, Byju's lost more than Rs 12 crore everyday. It posted a revenue of Rs 2,428 crore as its losses in the fiscal rose 17-fold to over Rs 4,500 crore, the highest ever posted by an Indian start-up.

Reasons behind Byju's legal action

- In a statement, Byju's said that on March 3, the lenders "unlawfully" accelerated the TLB on account of certain alleged non-monetary and technical defaults.

- Byju's claimed that the lenders continued to conduct themselves in a "high-handed manner". It said that they issued a notice demanding immediate payment of the entire amount under the TLB, "despite knowing that this purported acceleration was under challenge before the court".

Farmers term Centre's hike in MSP on Kharif crops as insufficient

Relevance: Prelims & Mains Paper III; Economics

Why in news?
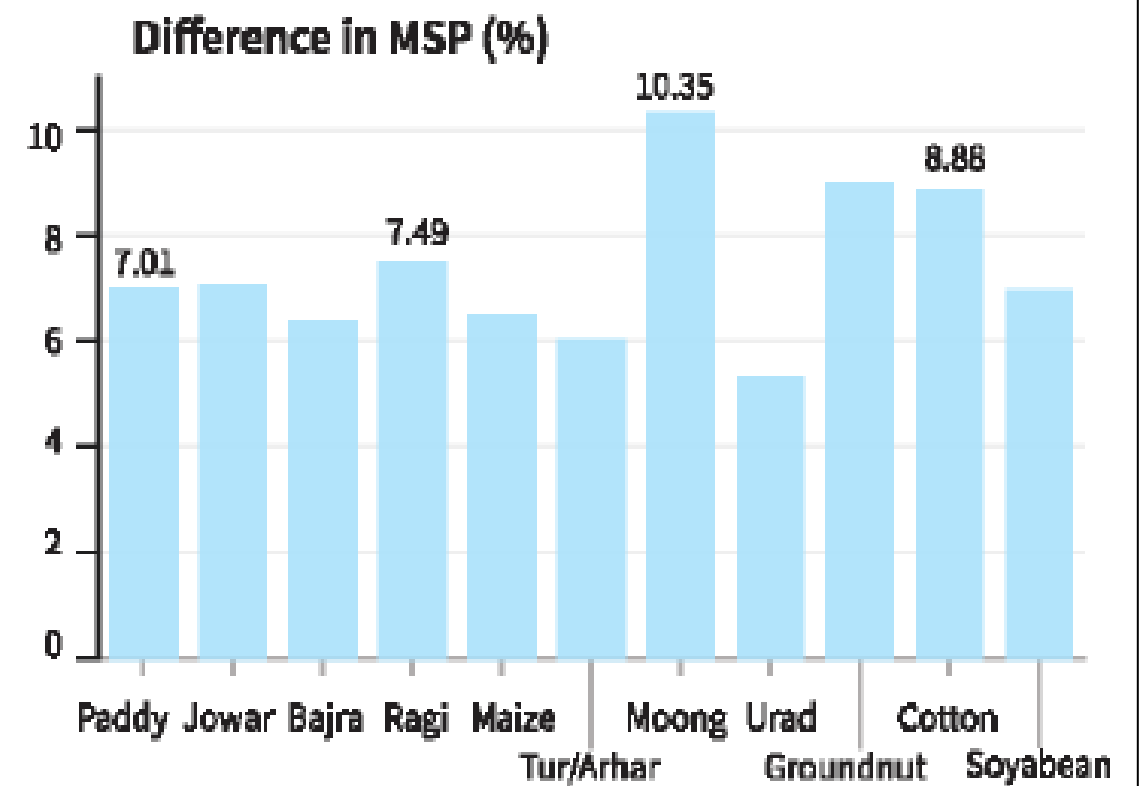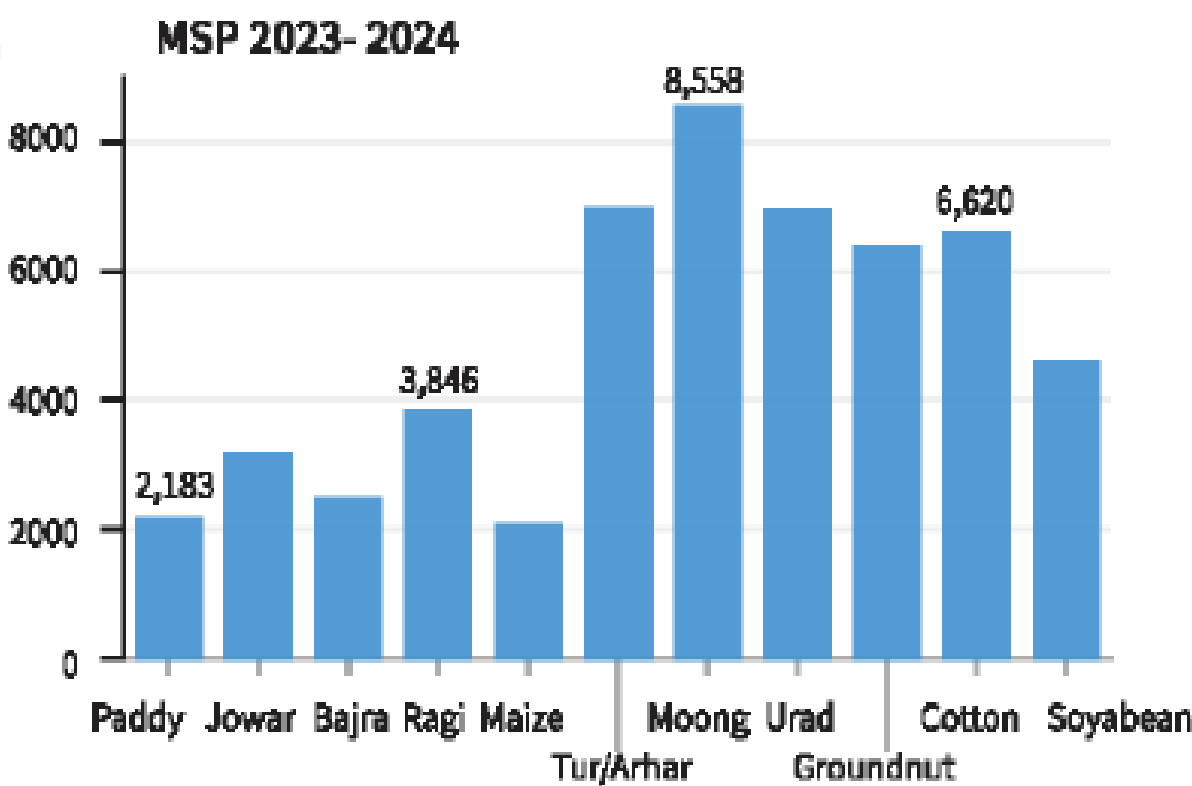
- Last week, the Centre announced the Minimum Support Price (MSP) for this year's summer (kharif) season crops.

- It hiked prices between 5-10% from last season, "to ensure remunerative prices to growers for their produce and to encourage crop diversification."

How does the MSP work?

- The MSP, which is a part of the govt's agricultural price policy, is the price at which the govt offers to procure farmers' produce during the season.

- It works as a tool to stabilise production and to control consumer prices, yet farmers across the country have been facing problems of selling their produce at the MSP.

- Delays in establishing procurement centres, exploitation at the hands of commission agents, who most of the time buy the produce from farmers below the MSP, and a lack of awareness about the MSP among a large section of farmers, are some of the challenges growers have been facing for years now.

- Against this background, farmers have been demanding a 'legal status' to the MSP. The govt, including the Centre and States, ought to come up with a system to set up an 'assured market mechanism,' point out farmers. The MSP has little meaning unless farmers' produce is procured/purchased at the assured price.

Benchmark rises

In the latest minimum support price (MSP) announced by the Centre, there has been a 5-10% hike in prices for kharif crops from the last season. A look at the (MSP) for select kharif crops for marketing season 2023-24 and their difference from the last season

MSP 2023- 2024

- Paddy: 2,183
- Ragi: 3,846
- Moong: 8,558
- Cotton: 6,620

Difference in MSP (%)

- Paddy: 7.01
- Ragi: 7.49
- Moong: 10.35
- Cotton: 8.88

Compiled by J. Hudson Joshiya

Announcements made by the govt

- On June 7, the govt announced the MSP for 17 'kharif' crops, like paddy, pulses (moong, arhar, urad), oilseeds (groundnut and soyabean) and cotton, for the marketing season of 2023-24.

- As per the govt, the increase in MSP is in line with the Union Budget 2018-19 announcement of fixing the MSP at a level of at least 1.5 times the all-India weighted average cost of production, which aims at a reasonably fair remuneration for the farmers.

- As per Food Minister Piyush Goyal, the increase in MSP of kharif crops for this year is the highest compared to previous years.

Farmers not impressed!

- Several farmers' outfits have expressed their discontentment over the latest MSP for the summer crops, terming it as insufficient.

- As per them, rising input costs coupled with unfair MSP will push large sections of farmers, especially the small, marginal, and middle-level farmers, as well as tenants into indebtedness.

- They add that the longstanding promise of providing MSP according to the Swaminathan Commission recommendation of C2+50% (C2 or comprehensive cost of production) remains an unfulfilled election promise.

- As per the Bharatiya Kisan Union (Ekta-Ugrahan), the govt's notion of ensuring 1.5 times the cost of production on crops does not help in addressing the farmers' plight as it does not provide remunerative price.

View of agricultural experts	Current foodgrain levels

- As per an eminent economist, the past track record shows that only three to four crops (mainly wheat, paddy and cotton and at times some pulses), were being procured at MSP while the remaining crops were being procured at much below the MSP.

- "This is mainly because the farmers are left at the mercy of market forces and the private players. Non-implementation of MSP and below-MSP-procurement of a large number of crops has been one of the major hurdles in 'crop diversification' which is so vital for Indian agriculture and in saving the environment".

- He adds "Ineffective implementation of MSP and 'non-procurement' of all the crops at the MSP is also one of the main concerns of farmers. Such a scenario builds a strong rationale for giving 'legal status' to MSP as it is the floor or reference price."

- As per third advance estimates for 2022-23, total foodgrain production in the country is estimated at a record 330.5 million tonnes which is higher by 14.9 million tonnes compared to 2021-22.

- This is the highest increase in the last five years, according to govt data. The total stocks of rice and wheat held by Food Corporation of India (FCI) and State agencies as on May 1, 2023, was 555.34 lakh tonnes comprising 265.06 lakh tonnes of rice and 290.28 lakh tonnes of wheat.

- As per an agricultural expert, the delay in monsoon would impact cropping in non-irrigated regions of the country. "Around 51% area in the country is rain-fed, so if rains are delayed some impact is bound to be seen. But the country's foodgrains stocks are at a comfortable level, there's nothing to worry as of now".

SEBI bars ZEE's Subhash Chandra and Punit Goenka from holding directorial positions

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- Securities and Exchange Board of India (SEBI), in an interim order, has barred Essel Group Chairman Subhash Chandra and his son Punit Goenka, Managing Director and CEO of Zee Entertainment Enterprises Ltd (ZEEL), from holding directorial or key management personnel positions in any listed entity.

- This action is a result of an alleged diversion of funds of Essel Group companies by them for their own benefit.

Details

- SEBI started investigating the matter related to the appropriation of certain fixed deposits (FD) of ZEEL by Yes Bank, for squaring off loans of related entities of Essel Group.

- The issue came to light after the resignation of two independent directors – Sunil Kumar and Neharika Vohra – of ZEEL in Nov. 2019.

- The regulator found that Chandra, the then Chairman of ZEEL/ Essel Group, had provided a Letter of Comfort (LoC) in Sept. 2018, towards credit facilities amounting to Rs 200 crore availed by certain group companies from Yes Bank.

- The LoC was issued without the knowledge of the board of ZEEL, which was a violation of SEBI's Listing Obligations and Disclosure Requirements (LODR) norms.

(more ahead)

- LoC is a document issued by a parent company which assures a bank that they are aware of the loan availed by one of their subsidiaries. The letter shows that the parent company supports its subsidiary in the loan process and in case of any issue, it will help in meeting the obligations.

- Sebi said that Yes Bank had adjusted the FD of ZEEL for meeting the obligations of seven associates that were owned or controlled by the family members of Chandra and Goenka (promoter family).

- When asked, ZEEL submitted to SEBI that Rs 200 crore, equivalent to the value of FD which was encashed by Yes Bank for the dues from associate entities owned by the promoter family, had subsequently been received back from those associate entities in Sept./Oct. 2019.

- The regulator found that the funds had originated from ZEEL or other listed companies of Essel Group, which moved through multiple layers of promoter family-owned or controlled entities and were ultimately transferred to ZEEL, in order to show the fulfilment of payment obligations of the associate entities towards ZEEL.

- As per SEBI, at least Rs 143.90 crore had been transferred from ZEEL or other listed companies of Essel Group, to falsely portray repayment of due amounts to ZEEL from associate entities.

- As per SEBI, since Chandra issued the LoC without the knowledge or approval of the board of directors of ZEEL, he had a direct role in the diversion of funds of ZEEL and other listed companies of Essel Group.

- Goenka was involved in falsely portraying that ZEEL had received the dues from associate entities. Both were the direct beneficiaries of the fund diversion, since the associate entities which benefited from the liquidation of FD of ZEEL by Yes Bank, were owned or controlled by the promoter family.

- As per SEBI, "the siphoning of funds appears to be a well-planned scheme since, in some instances, the layering of transactions involved using as many as 13 entities as pass-through entities within a short period of two days only".

(more ahead)

- SEBI noted that during FY 2018-19 to FY 2022-23, the share price of ZEEL has come down from a high of close to Rs 600 per share to the current price of less than Rs 200 per share.

- This erosion of wealth despite the company being so profitable and generating profit after tax consistently would lead to a conclusion that all was not well with the company. During this period, the promoter shareholding also dropped from 41.62% to the current level of 3.99%.

EXPRESS explained.
ECONOMICS

Govt. imposes a ceiling on wheat stocks

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- In order to manage the "overall food security and to prevent hoarding and unscrupulous speculation", the Union Govt has imposed limits on stock of wheat that can be held by traders, wholesalers, retailers, big chain retailers and processors.

- This order stood effective with immediate effect until the end of March next year.

- The objective behind this order is to stabilise the price of this essential commodity by steadying supply. As per the govt., there was enough stock of wheat in the country.

Details

- The permissible stock that traders/ wholesalers can hold is 3,000 metric tonnes. Retailers and big chain retailers can hold up to 10 metric tonnes at each of their outlets, while the latter can hold up to 3,000 metric tonnes at all their depots combined. Processors would be able to stock 75% of the annual installed capacity.

- The mentioned entities are expected to declare their stock positions and update them regularly on the Department of Food and Public Distribution's portal.

- If the stock held by them are higher than the limit, they will have 30 days from the day of issue of notification to bring the same under the prescribed limits.

The additional orders

- The govt has also decided to offload 15 lakh tonnes of wheat from the central pool via the Open Market Sale Scheme (OMSS) to flour mills, private traders, bulk buyers, manufacturers of wheat products through e-auction.

- The idea is to control retail prices of wheat. They would be sold in lot sizes of 10 to 100 metric tonnes. This would be the first batch, and more could be released depending on the prices and demand.

- Notably, the govt would also offload rice under OMSS to moderate its prices. The quantity of the first phase of the e-auction (for rice) would be decided shortly.

Concerns over wheat output!

- The aforesaid move comes in the backdrop of rising concerns about the overall wheat output taking a hit after the unseasonal rains and hailstorms towards the end of March and early April alongside hotter temperatures in February.

- Lower production leads to higher prices of the crop. This could in turn create conditions for local prices exceeding the govt's purchase prices and thus, hampering the latter's plans to stock up supplies.

- The daily average price of wheat at the retail level, on June 14, stood at ₹29/kg compared to ₹27.54/kg a year back. At the wholesale level, it stood at ₹2,593.5 for each quintal against ₹2,557.89/quintal for the previous month and about ₹2,423/quintal a year back.

- The Food Corporation of India is entrusted with the responsibility to ensure food grains are accessible at reasonable prices to the vulnerable sections of society under the Public Distribution System.

- The govt had set a target of procuring 341.5 lakh metric tonnes of wheat for the Central Pool in the ongoing Rabi Marketing Season (RMS) 2023-24. RMS rolls from April to March with the maximum proportion acquired around April and June.

(more ahead)

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- As on June 12, 261.99 lakh metric tonnes of wheat have been procured. As per govt officials and traders, India's wheat procurement in 2023 could fall by a fifth from the initial estimate as govt purchases have slowed down in the last few days after local prices jumped.

- As of June, the govt had 313.9 lakh metric tonnes of wheat in the central stock compared to 311.42 lakh metric tonnes in the year-ago period.

Production figures

- Notwithstanding the warnings from experts about the potential effects of El Nino, the Agricultural Ministry estimates the production of wheat at a record 1,127.43 lakh metric tonnes for the agriculture year 2022-23, higher by 50.01 lakh metric tonnes from previous year's production.

- The optimism is based on the increased area of wheat sowed and better yield.

Competition Act applies to Coal India Ltd. says Supreme Court

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- The Supreme Court recently held that there was "no merit" in Coal India Ltd (CIL), a public sector undertaking, being excluded from the purview of the Competition Act.

- The Court was hearing the PSU's appeal against the Competition Appellate Tribunal's order which alleged the former of abusing its position.

Details

- The chain of events goes back to March 2017 when the Competition Commission of India (CCI) had imposed a penalty of ₹591.01 crore on CIL for "imposing unfair/discriminatory conditions in fuel supply agreements (FSAs) with the power producers for supply of non-coking coal."

- In other words, CIL was found to be supplying lower quality of the essential resource at higher prices and placing opaque conditions in the contract about supply parameters and quality.

- The regulator contended that Coal India and its subsidiaries operated independently of market forces and enjoyed market dominance in the relevant market with respect to production and supply of non-coking coal in India.

Coal India' arguments

- Coal India argued that it operated with the principles of 'common good' and ensuring equitable distribution of the essential natural resource.

- With this objective, it was secured as a 'monopoly' under the Nationalisation Act, 1973 (more specifically, the Coal Mines (Nationalisation) Act, 1973).

- The entity said that it may have to adhere to a differential pricing mechanism to encourage captive coal production (referring to mines that are handed over to companies for specific and exclusive use through lease or any other route).

- Differential pricing, which may be inconsistent with market principles, was to ensure the viability of the larger operating ecosystem as well as for pursuing welfare objectives.

- Furthermore, coal supply also has a bearing on larger national policies, for example, if the govt were to encourage growth in backward areas through increased allocation.

- The PSU stated that it did not operate in the commercial sphere. It specifically pointed to 345 out of its 462 mines having suffered cumulative losses totalling ₹9,878 crore in 2012-13.

CCI's response

- The respondents broadened the scope of the arguments. The Raghavan Committee (2020) report, put up by the respondents, had observed that state monopolies were not conducive to the best interests of the nation.

- They could not be allowed to operate in a state of inefficiency and should instead, operate amid competition.

- Furthermore, coal ceased to be an 'essential commodity' in Feb. 2007 and the Nationalisation Act too was removed from the Ninth Schedule (laws that cannot be challenged in court) in 2017.

- It was also pointed out that Coal India was a fully-govt owned entity until the disinvestment in 2010. The govt's shareholding reduced to 67% with the rest held by private hands.

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- Moreover, it was stated that the CIL directed 80% of its supplies to power companies. The latter would then pass power generated using coal to discoms (distribution companies), who, in turn, would supply power to the final consumer.

- The continual supply of coal, adherence to the contract, reasonableness in the rates and quality of coal also serve a common good, the respondents contended.

- Coal constitutes about 60 to 70% of the costs for power generation companies. Thus, irregular prices and supply will have a significant bearing indirectly on consumers.

SC's observations

- As per the SC, there was "no merit" in the argument that the Competition Act would not apply to CIL because they are governed by the Nationalisation Act, and it cannot be reconciled with the Competition Act.

- Separately, it said that entities cannot act with caprice (impulsively), treat unfairly otherwise or similarly situated entities with discrimination.

- According to a law expert, the judgment reinforced the principle of "competitive neutrality" — meaning that the Competition Act equally applies to public and private sector enterprises.

ONDC on the path to revolutionizing India's digital commerce ecosystem

Relevance: Prelims & Mains Paper III; Economics

Why in news?

- After the revolution brought in the realm of digital payments by the Unified Payments Interface (UPI), the Open Network for Digital Commerce (ONDC) is set to break new ground in the country's digital commerce ecosystem.

- ONDC employs cutting-edge digital infrastructure, seeking to democratise digital commerce in India and make it more accessible and inclusive. More than 29,000 sellers are live on the network, and alpha tests are currently running in 236 cities.

- Its backers expect that over the next five years, ONDC, with its network-centric approach and inclusive governance framework, will transform the digital commerce landscape in India and serve as an important reference point for a forward-looking Digital Public Infrastructure (DPI) governance framework.

What is ONDC?

- ONDC is an interoperable network based on the BeckN protocol that can be used by anyone. It seeks to create a unified vision in digital commerce by enabling both big and small platforms to connect and operate seamlessly on it.

- It comprises different entities called 'Network Participants', including Buyer Applications, Seller Applications, and Gateways that perform the search and discovery function.

- Imagine a scenario where all the large e-commerce platforms, from food delivery to clothing and fashion to conveyance, are accessible in one place, along with your neighbourhood start-ups, shops, and kirana stores.

Significance

- By moving the exchange of goods and services from a platform-centric approach to a network-centric approach, ONDC eliminates the need for buyers and sellers to use the same application, and promotes the discoverability of local digital stores across industries.

- This model shift from "store of value" to "flow of value" brings with it several benefits.

- From the buyer's perspective, ONDC offers greater freedom of choice, reducing the overwhelming reliance on a single platform.

- Sellers also stand to benefit greatly: the network-centric approach of ONDC reduces the skewed bargaining power in favour of the platforms, which often results in higher entry barriers and lower margins for sellers.

- For instance, if a seller wanted to be on multiple platforms, they would have to maintain a separate infrastructure for each, increasing the cost and limiting participation. ONDC's network-centric approach levels the playing field by making goods and services equitably accessible to all and benefiting all participants in the ecosystem.

Inclusive governance approach

- The ONDC entity, a not-for-profit company incorporated under Section 8 of the Companies Act 2013, manages and operates the ONDC Network.

- It is responsible for building and maintaining the underlying infrastructure (common registries and protocols) as well as defining the rules of engagement and code of conduct for the Network Participants through the ONDC Network Policy and the ONDC Network Participant Agreement.

- Moving a step forward from previous Digital Public Infrastructure (DPI) governance models such as those of Aadhaar and UPI, ONDC takes a more representative and multistakeholder approach to the governance that prioritises the evolving needs of its users.

Funding for ONDC	**Govt's involvement in ONDC**

- The ONDC entity was initially promoted by the Quality Council of India and Protean e-Gov Technologies Ltd. in Dec. 2021, and has since raised more than Rs 180 crore from multiple investors including private and public sector banks, depositories, development banks, and other financial institutions.

- While initial funding was obtained through share allotments, the ONDC entity aims to develop a self-sustaining financial model in the future.

- One potential revenue stream could include charging a small fee from platforms to fund ongoing and expansion-related activities independently. This approach draws on lessons learned from the limitations of UPI, which was heavily reliant on govt subsidies as a revenue stream.

- ONDC has been endorsed by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Union Ministry of Commerce and Industry. Though DPIIT is not involved in ONDC's funding, it provides support to this network.

- To ensure a market+community driven approach to decision-making, the board includes representatives from banks, the govt, and independent industry and civil society members.

- It will establish a User Council, comprising representatives from Network Participants and civil society. The User Council will provide regular guidance on various aspects of the network's functioning and governance, serving as a liaison between Network Participants, Consumers, and the network.

US Federal Reserve decides not to hike rates

Relevance: Prelims & Mains Paper III; Economics

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Why in news?

- While the US Federal Reserve went along with the market mood and maintained the status quo at its recent policy meeting, it did signal the possibility of two more rate hikes this year to counter inflation.

- This led to a downturn in major indexes, including Indian markets.

Why did the Fed keep rates unchanged?

- Though the Fed Chairman has admitted that the effects of their cumulative tightening are yet to be seen, he insists on further tightening. It's becoming clear that the Fed is prepared for a growth setback if required to bring inflation down to its target.

- The latest pause came after 10 consecutive policy tightenings, as the central bank bought time to assess the impact of the earlier five percentage points hike on the economy, especially on the inflation and labour market front.

- The Fed has revised its inflation and growth projection upwards and its unemployment rate downwards, which means price pressures are looking to stay for the time being, the widely expected US recession has been pushed aside, and the labour markets are displaying strength.

Will interest rates come down soon?

- The Fed's projection of two more rate hikes later this year reinforces the perception that interest rates will remain higher for an extended period, supported by various factors.

- The RBI had kept the policy instrument – repo rate – unchanged at 6.50% in the June policy review. The repo rate has gone up by 250 basis points (bps) since May 2022 and the hike is still working its way through the system.

- Regarding the Indian markets, while domestic inflation trends — retail inflation eased to 4.25% in May — are indicating a potential cooling off, uncertainties surrounding the monsoon and a comparison of equity valuations with other emerging markets introduce additional risks.

Impact on the Indian markets

- The benchmark Sensex at BSE fell 0.5% following the Fed's indication of more hikes.

- This indication came as a dampener for the Indian equity markets as a continued rise in interest rates in the US may not only stall inflow of funds into Indian equities, but may also lead to some outflow from emerging markets to US treasury bonds.

- Experts, however, feel that the Indian markets would be more driven by domestic strength. Given that inflation has softened, the GDP growth rate is projected at 7.2% for the year ended March 2023, and is set to stay strong going forward, investors should take medium to long-term positions in equities.

Indian corporates come under the scanner for causing 'greedflation'

Relevance: Prelims & Mains Paper III; Economics

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Why in news?

- Lately, some experts have been blaming a phenomenon called 'greedflation' for the rise in the prices of certain essential commodities in India.

- Notably, inflation throughout the Western world has been rising over the past few years. This is because of the supply chain issues in the food and energy sectors caused by Covid-19 as well as the war in Ukraine.

- This has led some to question how companies are able to increase their profits despite such issues!

What is inflation — and disinflation, deflation and reflation?

- Inflation is the rate at which the general price level rises. When it is reported that the inflation rate was 5% in June it implies that the general price level of the economy (as measured by a representative basket of goods and services) was 5% more than what it was in June 2022.

- There are two other key terms: disinflation and deflation.

- Disinflation refers to the trend when the inflation rate decelerates. Suppose it was 10% in April, 7% in May and 5% in June. This is disinflation. In other words, disinflation refers to a period when even though prices are rising (or inflation is happening), it is happening at a slower rate each passing month.

- Deflation is the exact opposite of inflation. Imagine if the general prices level in June was 5% lower than what it was in June last year. That's deflation.

- Reflation typically follows deflation as policymakers try to pump up economic activity either by govt spending more and/or interest rates being reduced.

What causes inflation?

- For the most part, there are two main ways in which inflation happens. Either prices get pushed up because input costs have risen — this is called cost-push inflation — or they are pulled up because there is excess demand — this is called demand-pull inflation.

- If crude oil prices went up by 10% overnight — say, because of a supply disruption — then the general price level will be pushed up because energy costs have gone up.

- Similarly, if demand goes up suddenly and far in excess of supply, then prices can be pulled up. Suppose RBI cuts interest rates sharply and buying a house becomes quite affordable, since EMIs have fallen, then the sudden surge in demand for new houses will pull up home prices because new houses cannot be made immediately.

How is inflation solved?

- If inflation is because of excess demand, the central banks raise interest rates to bring overall demand in line with overall supply.

- However, oddly enough, if inflation is due to cost pressures, even then the central banks raise interest rates. Though raising interest rates does nothing to boost supply, still central banks do what they can: contain demand because that is all they can do.

What is Greedflation?

- Greedflation simply means corporate greed is fuelling inflation. In other words, instead of the wage-price spiral, it is the profit-price spiral that is in play.

- In essence, greedflation implies that companies exploited the inflation that people were experiencing by putting up their prices way beyond just covering their increased costs and then used that to maximise their profit margins. That, in turn, further fuelled inflation.

- In the developed countries — in Europe and the US — there is a growing consensus that greedflation is the real culprit.

ENVIRONMENT & BIODIVERSITY

Climate change and human activities shrunk over half of the world's largest lakes

Why in news?

- More than 50% of the world's largest lakes and reservoirs have shrunk over the past three decades primarily due to climate change and human activities, according to a new study.

- From these water bodies, approximately 600 cubic km of water was lost between 1992 and 2020 — an amount equivalent to the total water used in the U.S. for the entire year of 2015.

- It also noted that more than half of the reservoirs located in peninsular India have witnessed substantial water storage decline, mainly due to sedimentation. Moreover, among the worst affected natural lakes in the country is Ladakh's Tso Moriri.

- The continued shrinking of lakes has led to a decline in freshwater supply, environment degradation and deterioration of water quality for humans and livestock.

- Meanwhile, water shortage beyond a certain level in reservoirs of hydroelectric dams could adversely impact the generation of hydroelectricity.

- As per researchers, if lakes are encroached upon (such as the case in India with smaller lakes), they disappear as a water source but also contribute to severe urban flooding. Loss of lake levels leads to groundwater pumping and depletion, leading to a host of other issues.

Methodology of this study

- For their study, the research team examined 1,975 of the world's largest lakes, including 1,052 natural lakes and 921 reservoirs — researchers studied lakes which are larger than 100 sq km and reservoirs with more than 1 cubic km of storage capacity.

- The analysis was done following a novel methodology that involved combining two-dimensional water areas with one-dimensional water levels to estimate the three-dimensional change in water storage.

- Researchers used 250,000 lake-area snapshots captured by satellites between 1992-2020 to survey the area of 1,972 of Earth's biggest lakes. They collected water levels from nine satellite altimeters and used long-term water levels to reduce any uncertainty.

- For lakes without a long-term level record, they used recent water measurements made by newer instruments on satellites.

- Combining recent level measurements with longer-term area measurements allowed the team to reconstruct the volume of lakes dating back decades.

Findings

- The researchers found that out of the 1,052 natural lakes, 457 had significant water losses in the past three decades. Meanwhile, 234 natural lakes gained water and 360 of such water bodies didn't show any notable trend.

- They attributed 57% of the net decline in the water quantity in natural lakes to human activities, such as unsustainable consumption of water, and increasing temperature and potential evapotranspiration (PET) — loss of water due to both evaporation and transpiration. The latter two indicated the role of climate change.

- The study also pointed out the worst affected largest lakes across the world and why they are shrinking in size. For e.g., the Aral Sea in Central Asia, Lake Mar Chiquita in Argentina, the Dead Sea in the Middle East, and the Salton Sea in California have mainly dried due to unsustainable water consumption.

- Whereas, increasing temperature and PET caused the complete disappearance of Lake Gowd-e-Zareh in Afghanistan, Toshka lakes in Egypt, and marked drying of Lake Kara-Bogaz-Gol in Turkmenistan, Lake Khyargas in Mongolia, and Lake Zonag in China.   (more ahead)

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- The Arctic lakes have shrunk as a result of a "combination of changes in precipitation, runoff, temperature, and PET, which are likely a concurrent result of natural variability and climate change." Notably, lakes have shrunk or disappeared completely across 82% of the Arctic's lake-rich regions in the past 20 years, as per a 2022 study.

- In India, apart from Tso Moriri Lake, Andhra Pradesh's Pulicat Lake and Kolleru Lake have been affected but they didn't feature in the study as they were below the threshold limit.

- Another finding is that contrary to previous studies, natural lakes located in humid tropics and high altitudes are also experiencing water shortages.

- Besides this, two-thirds of all reservoirs across the globe have experienced significant storage declines. Reservoirs, however, showed a net global increase in water levels, owing to 183 recently filled reservoirs.

- The main reason behind the drop in water levels is sedimentation — the process of particles such as sand and stones settling to the bottom of a body of water.

- As per researchers, sedimentation has a larger impact than hydroclimate variability, i.e., droughts and recovery from droughts.

Consequences

- According to the study, nearly two billion people, or 1/4th of the global population in 2023, will be affected as they live in basins with large water bodies that have witnessed a significant drop in their water levels in the past three decades.

- The reduced size of these lakes not only results in freshwater decline and environmental degradation but also disrupts the water and carbon cycles.

- Widespread water shortage in these water bodies particularly accompanied by rising lake temperatures, could reduce the amount of absorbed carbon dioxide and increase carbon emissions to the atmosphere given that lakes are hotspots of carbon cycling.

Remedial steps

- As per experts, in order to save the shrinking lakes, there is a need to manage them in an integrated manner. Steps like restrictions on water consumption and climate mitigation to bring down global temperatures are some of the ways to conserve them.

- This will also help in reducing sedimentation in reservoirs as the rate of sedimentation is linked to climate change — it increases when there is extreme precipitation, as well as land disturbance such as wildfires, landslides and deforestation.

World Environment Day: A glossary of terms related to plastic pollution

Relevance: Prelims & Mains Paper III; Environment

Why in news?

- Since the early 20th century, plastics have become a ubiquitous part of human life, despite their many adverse impacts on the environment.

- This year's World Environment Day (June 5) has the theme of #BeatPlasticPollution, calling for global solutions to combat the pandemic of plastic pollution.

50th anniversary of the World Environment Day

- The World Environment Day, led by the United Nations Environment Programme (UNEP), has been held annually on June 5, since 1973. The date was chosen by the UN General Assembly during the historic 1972 Stockholm Conference on the Human Environment – considered to be the first world conference to make the environment a major issue.

- Over the years, it has grown to become the largest global platform for environmental outreach, with millions of people from across the world engaging to protect the planet.

#BeatPlasticPollution

- Hosted by Côte d'Ivoire (Ivory Coast) and supported by the Netherlands, this year's World Environment Day campaign is aimed towards discussing and implementing solutions to the problem of plastic pollution – one of the most prescient issues of our time.

- According to UN data, more than 400 million tonnes of plastic is produced every year worldwide, half of which is designed to be used only once. Of that, less than 10 per cent is recycled. Consequently, an estimated 19-23 million tonnes end up in lakes, rivers and seas annually.

- Studies have found that discarded or burnt single-use plastic harms human health and biodiversity, while polluting every ecosystem from mountain tops to the ocean floor.

- This year's world environment day is a reminder that people's actions on plastic pollution matters – steps taken by govts and businesses to tackle plastic pollution are the consequence of this action.

Terms related to plastic pollution

- The word plastic is derived from the Greek word plastikos, meaning "capable of being shaped or moulded."

- It refers to a wide range of synthetic or semi-synthetic materials that use polymers as a main ingredient with their defining quality being their plasticity – the ability of a solid material to undergo permanent deformation in response to applied forces. This makes them extremely adaptable, capable of being shaped as per requirement.

- Most modern plastics are derived from fossil fuel-based chemicals like natural gas or petroleum. However, recently, variants made from renewable materials, such as corn or cotton derivatives have also emerged.

- Around 70% of global plastic production is concentrated in six major polymer types – referred collectively as commodity plastics. These include: Polyethylene terephthalate or PET, High-density polyethylene or HDPE, Polyvinyl chloride or PVC, Low-density polyethylene or LDPE, Polypropylene or PP, and Polystyrene or PS.

- Each of these have different properties and can be identified by their resin identification code (RIC) denoted by symbols found on plastic products.
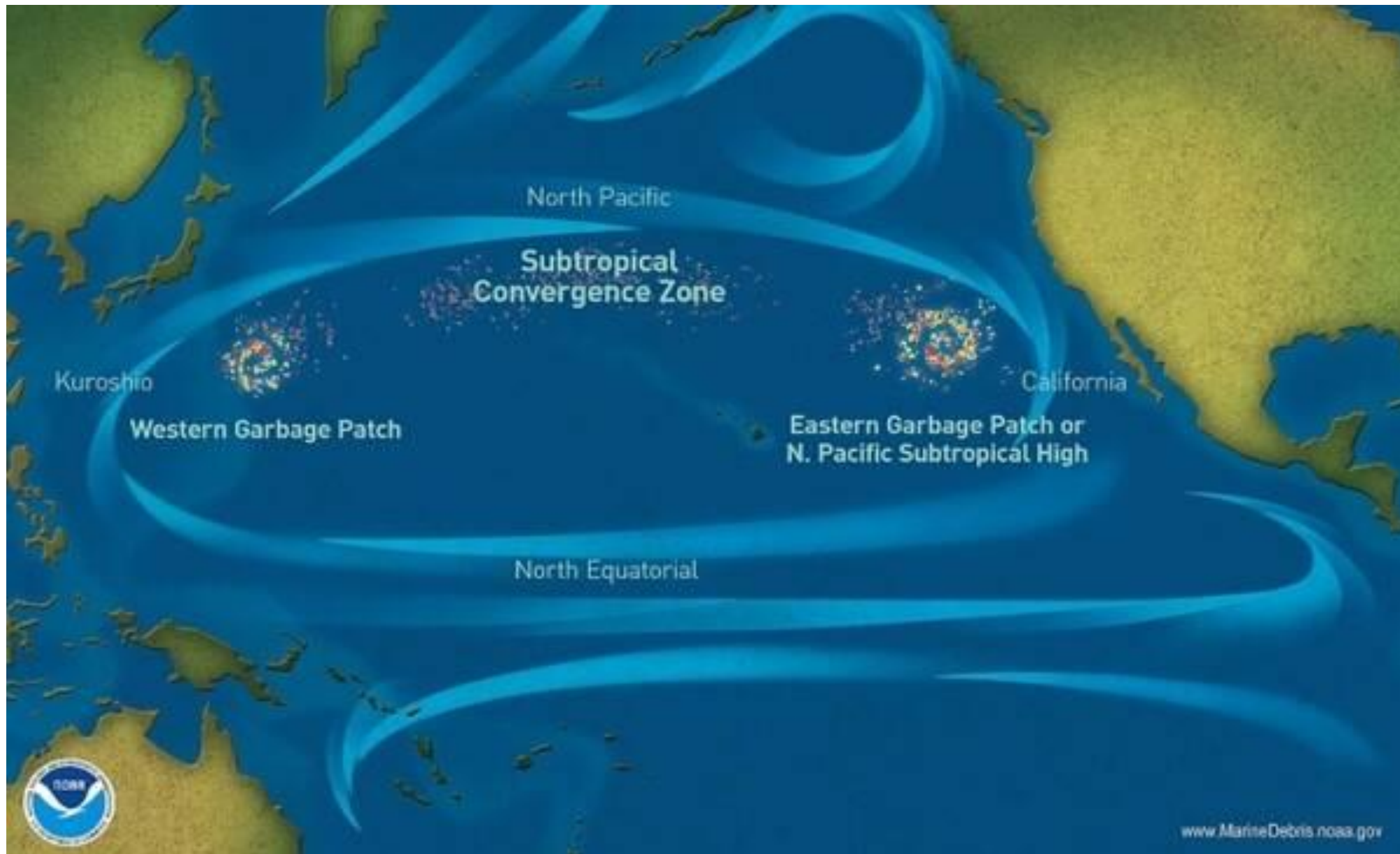
The harmful impact of plastics

- While plastics have revolutionised human civilisation – today, they are everywhere, from automobiles to toys, health devices to packaging – their adverse environmental impact has been alarming.

- This is primarily due to their slow decomposition rate in natural ecosystems. Decomposition rate refers to the rate at which a material breaks down into its constituent parts through chemical processes – plastics are remarkably durable in this sense. While they do crumble into smaller particles, these particles themselves do not break down into more simpler substances.

- Instead, what we get are microplastics – officially defined as plastics less than five millimetres in diameter. There are two categories of microplastics. Primary microplastics are tiny particles designed for commercial use, such as in cosmetics or textiles.

- On the other hand, secondary microplastics are particles that are a product of the breakdown of larger plastic items due to exposure to environmental factors such as sun's radiation or ocean's waves.

- The problem with microplastics, like all plastics, is that they do not break down easily into more harmless particles. Instead, they find their way across the planet, from the depths of the Pacific Ocean to the heights of the Himalayas. According to the most recent global estimates, an average human consumes at least 50,000 microplastic particles annually due to contamination of the food chain, potable water, and air.

- Notably, microplastics contain a number of toxic chemicals which pose severe risks to human health. The biggest health risk associated is with the chemical BPA or Bisphenol A , which is used to harden plastic. BPA contaminates food and drinks, causing alterations in liver function, insulin resistance, foetal development in pregnant women, the reproductive system and brain function.

The Great Pacific Garbage Patch

- Every year, as plastics enter water bodies and find their way into the ocean, they show remarkable resiliency, floating around where the current takes them until they get stuck in a gyre or large circular ocean currents.

- The largest such collection of plastics and microplastics in the ocean is in the North Pacific. It is called the Great Pacific Garbage Patch. Also known as the trash vortex, it is located between California and Japan, and formed due to converging ocean currents.

- As per estimates, the GPGP covers a surface area of 1.6 million sq km– roughly half the size of India! There are other, smaller such garbage patches in other oceans.

- The GPGP comprises majorly of single-use plastics. Broadly speaking, single-use is a term which can refer to any plastic items which are either designed to be used for one time by the consumer before they are thrown away or recycled, or likely to be used in this way.

- Many countries, including India, have passed legislation to either ban or severely restrict their use.

The Great Pacific Garbage Patch

The naming process and the debate around species with 'objectionable' scientific names

Relevance: Prelims & Mains Paper III; Environment

Why in news?	Species with problematic names
- In recent years, the field of taxonomy, the science of naming and classifying all living beings, has been witnessing a raging debate — whether species with objectionable scientific names should be renamed. - These are names largely taken from problematic people, such as those linked to slavery and racism, or are linked to derogatory terms and racial slurs. Moreover, many want to entirely do away with the practice of naming animals and plants after a person. - Although such discussions have always existed, they became mainstream only recently, especially after the emergence of Black Lives Matter (2013-present) in the USA. - The movement, which highlights police brutality and systematic racism against Black people, also focuses on efforts to remove statues of slave traders, anti-abolitionists and White supremacists and rename institutions and facilities named after such people.	- The best known example of such a living being is Anophthalmus hitleri. Named after the former German Führer, Adolf Hitler, this rare blind beetle, popularly known as the Hitler beetle, was discovered in 1933 by "Oscar Scheibel, a German amateur entomologist and ardent Hitler fan, and is found in only around 15 caves in central Slovenia.," - Although the insect was initially shunned away by scientists as it didn't have any special attributes, it gained widespread prominence among Neo-Nazis in the later years. - The popularity of the Hitler beetle touched such heights that it became nearly extinct. **(more ahead)**

- Another example is the common small-blotched lizard. With the scientific name Uta stansburiana, the reptile, in 1852, was named after the American Howard Stansbury, who collected lizard's type specimens in Utah state.

- He was also, however, "a vocal supporter of and played a key role in a locally-infamous massacre of Timpanogos Native Americans in which more than 100 were killed.

- The flowering shrub Hibbertia scandens is one more case in point. The plant has been named after George Hibbert, an English amateur botanist, who was one of the leading members of the pro-slavery and anti-abolition lobby during the late 1700s.

- Among the species which have been named after derogatory terms is the Hottentotta tamulus scorpion — "colonialists in the 17th century used "Hottentot" as a derogatory term for Indigenous Black people in Africa.

- One more example is Rauvolfia caffra, commonly known as the quinine tree, which gets its name (moniker from) another offensive term regarded as hate speech against Black communities in South Africa.

How species get their scientific names?

- Every animal or plant species has two scientific names. The first name denotes the genus to which the species belongs. It is a generic name and is always capitalised. The second name identifies the species within the genus and is never capitalised. Both names are italicised.

- A genus may comprise several closely related species. Thus many large hawks are placed in the genus Buteo… Similarly, closely related genera (the plural of "genus") are grouped into a family. Jaguars, tigers, and house cats all belong to the family Felidae."

- These names are usually of Latin or Greek origin. Oftentimes, species are named based on their distinctive features. For e.g., the Sonoran mountain kingsnake, a beautiful red-, white-, and black-ringed creature, is called *Lampropeltis pyromelana*. The genus name means "beautiful shield" in Greek, and the species epithet means "black fire".

- But other times, organisms are named after people who discover them. They are also sometimes named in honour of somebody. These practices, as mentioned before, have been quite controversial in recent times.

Authorities behind it

- Although anybody can propose a name for a type of organism they think hasn't been formally identified by anyone else. There are certain rules, or nomenclature codes, that they have to follow.

- For instance, a new name is considered to be valid only when it is published in an "openly distributed publication, and it must be accompanied by a detailed description of the specimens the author claims are typical for the group.

- These nomenclature codes are governed by international bodies such as the International Commission of Zoological Nomenclature (ICZN) which governs the naming of animals, the International Code of Nomenclature for algae, fungi, and plants (ICNafp) that sees the naming of plants (including cyanobacteria), and the International Code of Nomenclature of Bacteria (ICNB) that governs the naming of bacteria (including Archaea) and the International Committee on Taxonomy of Viruses (ICTV) that governs virus names.

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Can offensive names be changed?

- Doing away with a species' offensive scientific name is very unlikely. The primary reason is that "international committees generally don't want to be drawn into debates on what is and isn't potentially offensive.

- As per the International Code of Botanical Nomenclature (ICBN) rules, "The only proper reasons for changing a name are either a more profound knowledge of the facts resulting from adequate taxonomic study or the necessity of giving up a nomenclature that is contrary to the rules."

- Similarly, ICZN recently refused to change problematic names, saying its "commitment to a stable and universal nomenclature remains the priority".

- Several experts, however, disagree with such arguments. As per one palaeontologist at London's Natural History Museum, replacing offensive monikers would make biology a more welcoming discipline.

"Fish Kill" causes thousands of dead fish to wash up on Texas coast

Relevance: Prelims & Mains Paper III; Environment

Why in news?

- Days after tens of thousands of dead fish washed up on multiple beaches of southeast Texas, USA, last week, authorities have removed the carcasses from several spots.

- The corpses first began to surface on June 9, leading officials to ask the public to stay away from the affected beaches until the time they had been cleared, due to the risk of being exposed to bacteria and sharp fins.

- Among the dead fish covering the shores were mostly menhaden but there were also some sharks, trout, bass, catfish and stingrays. As per the local residents, they had never seen that many dead fish in their lives.

What caused this?

- As per the local officials, the incident took place due to a phenomenon called "fish kill".

- It is the sudden and unexpected death of many fish or other aquatic animals over a short period and mostly within a particular area. It occurs mainly due to low levels of dissolved oxygen in the water that causes suffocation of the fish.

- A combination of factors led to the occurrence of the Texas fish kill.

- First was the warm water. When sea surface temperatures rise, it becomes difficult for the fish to breathe as oxygen dissolves easily in colder water in comparison to warmer water. Things take a turn for the worse when a school of fish gets trapped in shallow water, which gets warmer more quickly.

- This causes fish to act more erratically, which in turn, further depletes the oxygen from the water. Low oxygen levels could ultimately lead to the death of the fish.

- Another factor that contributed to the Texas fish kill was calm seas. Experts suggest that one of the ways for oxygen to enter the water is by mixing with wind and waves. But in the past few weeks, the waves along the Texas Gulf Coast have been very calm, causing the depletion of dissolved oxygen.

- One more problem was the overcast weather in Texas. Officials pointed out that due to cloudy skies, phytoplankton were unable to carry out the process of photosynthesis, which is another way of producing oxygen in the water.

- Photosynthesis is driven by sunlight and it slows down on cloudy days, resulting in decreased dissolved oxygen concentration.

Is "fish kill" unusual?

- "Fish Kill" is not an unusual phenomenon. In fact, Texas experiences fish kills every year during summers, when the temperatures of the sea surface rise.

- The phenomenon causes the death of mostly menhaden, much like this time, which serve as food for other fish — this is a crucial part of the region's ecosystem.

Impact of climate change on fish kill

- Although experts haven't found any relation between Texas fish kill and climate change, they say that with rising temperatures of oceans, such incidents will become more prevalent. Warmer oceans will lead to less dissolved oxygen levels, causing more death of fish.

- Warming of the oceans, however, has multiple adverse effects. Studies have found that fish like sardines, pilchards and herring will become smaller in size and not be able to move to better environments. Researchers have also noted that some fish species have started to leave their natural habitat in search of cooler waters, which has disrupted the fish industry.

Key takeaways from the Bonn Climate meet

Relevance: Prelims & Mains Paper III; Environment

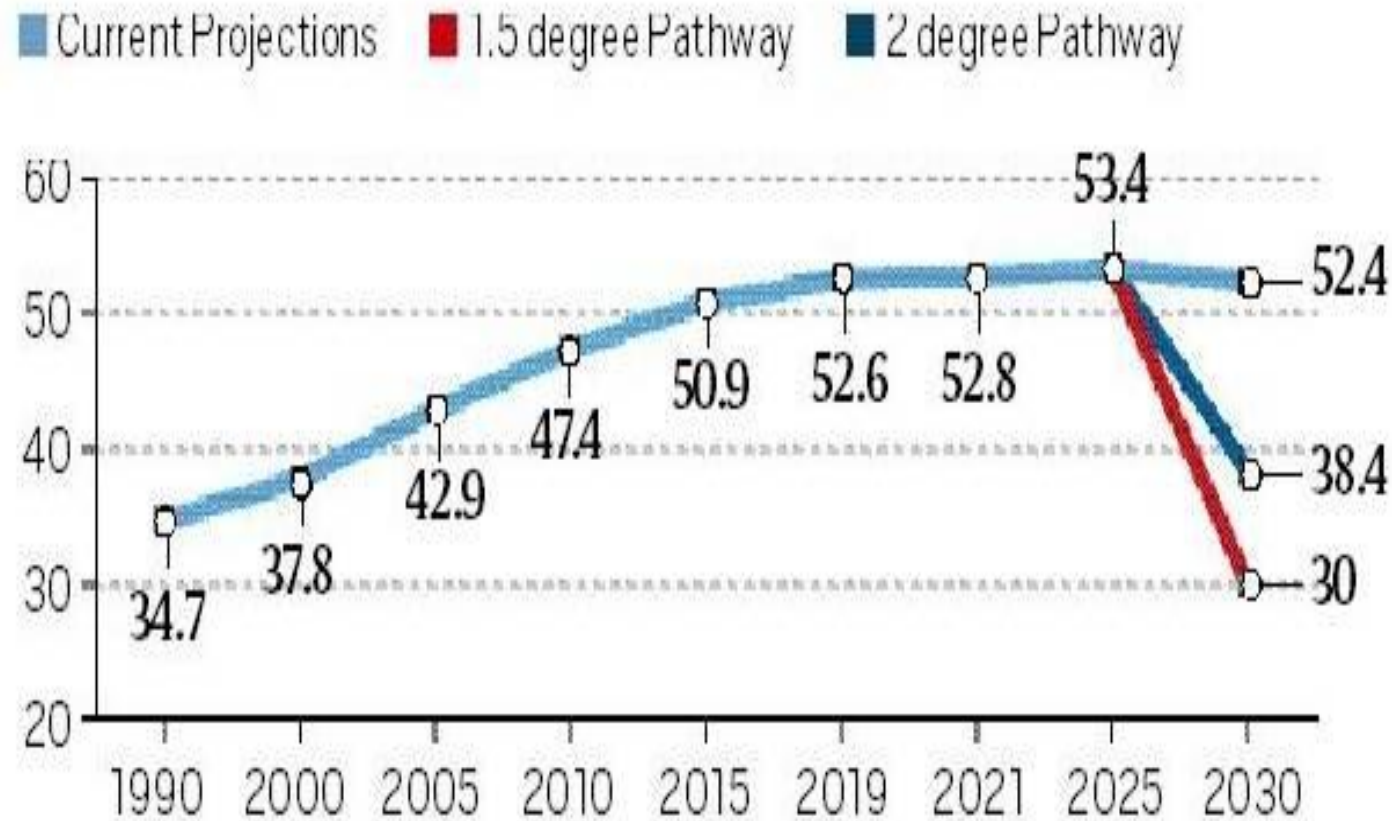## Why in news?

- The Bonn climate change conference that finished recently was built up as an opportunity for course correction.

- With current global efforts to keep rising temperatures in check highly inadequate, a massive and immediate scale-up in climate action is essential to keep alive any realistic chance of meeting the 1.5 degree or 2 degree Celsius targets. Bonn was expected to inspire accelerated action.

- But just like the more famous year-ending climate conferences, Bonn underperformed. Developed and developing countries kept arguing on issues old and new, and could not even agree on the agenda of one of the meetings till the penultimate day.

EMISSIONS STILL GROWING

Emissions in billion tonnes of CO2 eq

- Current Projections
- 1.5 degree Pathway
- 2 degree Pathway

Projected Emissions in 2030	52.4 billion tonnes CO2eq
2030 Emissions for 2-degree pathway	38.4 billion tonnes **Gap:** 14 billion tonnes
2030 Emissions for 1.5-degree pathway	30 billion tonnes **Gap:** 22.4 billion tonnes

Projected rise in global temperatures with current level of climate action by 2030: 2.1 to 2.9 degree Celsius

Chart values: 34.7 (1990), 37.8 (2000), 42.9 (2005), 47.4 (2010), 50.9 (2015), 52.6 (2019), 52.8 (2021), 53.4 (2025), 52.4 / 38.4 / 30 (2030)

- One thing that the countries did manage to wrap up, however, was the third and final round of technical discussions on global stocktake, or GST.

- Mandated by the 2015 Paris Agreement, GST is an exercise aimed at assessing the progress in the fight against climate change, and deciding ways and means to enhance global action to bridge the adequacy gap. The Paris Agreement says GST must be conducted every five years, starting in 2023.

- The actual work at GST would begin at COP28, the year-ending climate conference, this time being held in Dubai. The technical discussions just produced a short 'framework' on the elements to be included in the stocktake exercise.

- Even this saw repeated quarreling between the developed and developing countries, mainly over provisions related to finance and 'historical responsibility' of the rich countries.

- But what angered the developing countries the most was a statement from Australia seeking to downplay the 'historical responsibility' of the developed countries in causing global warming.

- A bulk of the accumulated greenhouse gas emissions, the reason for global warming, have come from a group of about 40 rich and industrialised countries, usually referred to as Annex I countries because they were mentioned in Annexure I of the 1992 UN Framework Convention on Climate Change, or UNFCCC. This historical responsibility has been the basis for the differentiated burden-sharing on developed and developing countries in the climate change framework.

(more ahead)

- Australia argued that the historical emissions happened at a time "when there was no alternative to fossil fuel based energy sources", and when there was little understanding or consensus on the harm caused by greenhouse gases.

- It pointed out that since 1992, about 57% of the carbon dioxide emissions had come from non-Annex I countries. It said that 70% of the incremental warming since 1992 due to emissions from carbon dioxide, methane and sulphur dioxide had come from non-Annex I countries.

- While maintaining that developed countries would take the lead in climate action, Australia said it did not believe there was "an unambiguous debt" owed by the developed countries for past actions.

- The stand was similar to the one taken by the US at the start of the Bonn meeting, which said bridging the adequacy gap was not the sole responsibility of the developed nations and that it would not agree to references to pre-2020 commitments in the GST.

- Erasure of historical responsibility is the most sensitive red line for developing countries. This issue would likely come back at COP28 and has the potential to result in major fireworks.

- Apart from GST, another mechanism was set up at COP26 in Glasgow in 2021 for climate action. Called Mitigation Work Programme (MWP), this is a temporary emergency exercise focused only on increasing emission cuts.

- The Intergovernmental Panel on Climate Change says global emissions have to come down by 43% from 2019 levels by 2030 to keep alive hopes of meeting the 1.5 degree target. As of now, emissions are still growing and, in 2021, were higher than 2019 levels.

- Discussions at the MWP ran into trouble after developing countries complained that while they were being asked to strengthen their climate actions, developed countries were yet to offer the enabling finance and technology transfers. Most developing countries, including India, have said they would be able to act more if international support in the form of money and technology transfer was made available.

- Developed countries are under an obligation to support the implementation of climate action plans of developing countries through money and tech transfers. But money has always been in short supply.

- According to one assessment, developing countries need as much as US$ 6 trillion between now and 2030 just to implement their climate action plans. The loss and damage needs of developing countries are assessed to be about US$ 400 billion every year. More funds are needed for all kinds of other purposes, the total estimated to be running in several trillions of dollars every year. Against this, even a tiny-looking US$ 100 billion per year that the developed countries had committed to raise from 2020 is not fully available.

Meeting in Paris

- A fresh effort at raising financial resources for climate change is being made in Paris soon with a two-day meeting that several heads of states are slated to attend.

- The Summit for a New Global Financial Pact is an attempt at redirecting global financial flows and raising new money to fight climate change, and dealing with associated problems like biodiversity loss and poverty.

The New Collective Quantified Goal

Relevance: Prelims & Mains Paper III; Environment

Why in news?

- The recently-concluded Bonn climate conference in Germany, expected to outline the political agenda for the crucial end-of-year Conference Of Parties-28 (COP28) in Dubai, was critical for reviewing and reforming the climate finance architecture.

- As per a prominent climate activist, this conference has "exposed a gaping hole in the funding needed to pay for climate action". This comes from a long standing impasse between developed and developing countries, over where money for climate change policies should come from and in what form.

What is the NCQG?

- A commitment of '$100 billion per year till 2020' to developing nations from developed countries was a target set at the Conference of Parties (COP) in 2009.

- But estimates since then show addressing climate change may cost billions, and even, trillions of dollars. Therefore, the 2015 Paris Climate Agreement agreed on setting a New Collective Quantified Goal (NCGQ) for climate financing prior to 2025 — a reference point which accounts for the needs and priorities of developing nations.

- The NCGQ is thus, termed the "most important climate goal". It pulls up the ceiling on commitment from developed countries, is supposed to anchor the evolving needs and priorities of developing countries based on scientific evidence and should respond "to the ever-increasing sums of funding necessary for Loss and Damage in response to failed and/or delayed financial support".

Need for a new finance goal

- Out of the promised $100 billion per year, developed countries provided $83.3 billion in 2020, as per a report by the Organisation for Economic Co-operation and Development.

- These figures may be misleading and inflated by as much as 225%, as per an Oxfam analysis.

- Moreover, the $100 billion target set in 2009 was seen more as a political goal, since there was no effort to clarify the definition or source of 'climate finance'.

- The economic growth of developed countries has come at the cost of high carbon emissions, and thus they are obligated to shoulder greater responsibility.

- While funds available for climate finance have quantitatively increased, they are inaccessible, privately sourced, delayed and not reaching countries in need.

- A recent study by the Centre for Science and Environment found roughly 5% of climate finance comes from grants; the rest through loans and equity which burden developing countries with a "debilitating" debt crisis.

- Countries most in need of finances have to wait years to access money and pay interest high rates, thus increasing their debt burden.

Developed countries' argument

- Developed countries argue that NCQG must be viewed as a "collective goal" for all developed and developing countries.

- Experts worry this argument pushes the "net zero" pathways onto developing countries, which cannot feasibly pay for mitigation, adaptation, loss and damage, along with sustainably developing key elements of infrastructure.

- Countries also argue for mobilising private-sector investments and loans as the critical component of climate finance. The Global Stocktake at COP28 will chart a pathway for the long road of climate action.

What's at stake in 2023?

- Countries are on a tight deadline to agree upon the NCQG ahead of 2024. There's no official number yet, but a global transition to a low-carbon economy requires investments of at least $4 trillion to $6 trillion a year, as per last year's Sharm el-Sheikh Implementation Plan.

- Some argue that instead of identifying a single aggregate figure, the NCQG could also set separate targets (or sub-goals) for focus areas such as mitigation, adaptation and loss and damage.

- The aim is to focus on scaling up concessional financing, stopping debt creation and allowing NCQG to be more of a "process" rather than a goal towards equitable and people-led transition.

ISRO begins work on XPoSat, India's first polarimetry mission

Relevance: Prelims & Mains Paper III; Science & Technology

Why in news?

- The Indian Space Research Organisation is collaborating with the Raman Research Institute (RRI), Bengaluru, an autonomous research institute, to build the X-Ray Polarimeter Satellite (XPoSat) that is scheduled to be launched later this year.

- Recently, ISRO chairman S Somanath urged Indian scientific institutions to identify talented students and take steps to motivate them in effectively using the data emerging from science-based space missions. He mentioned the XPoSat in this regard.
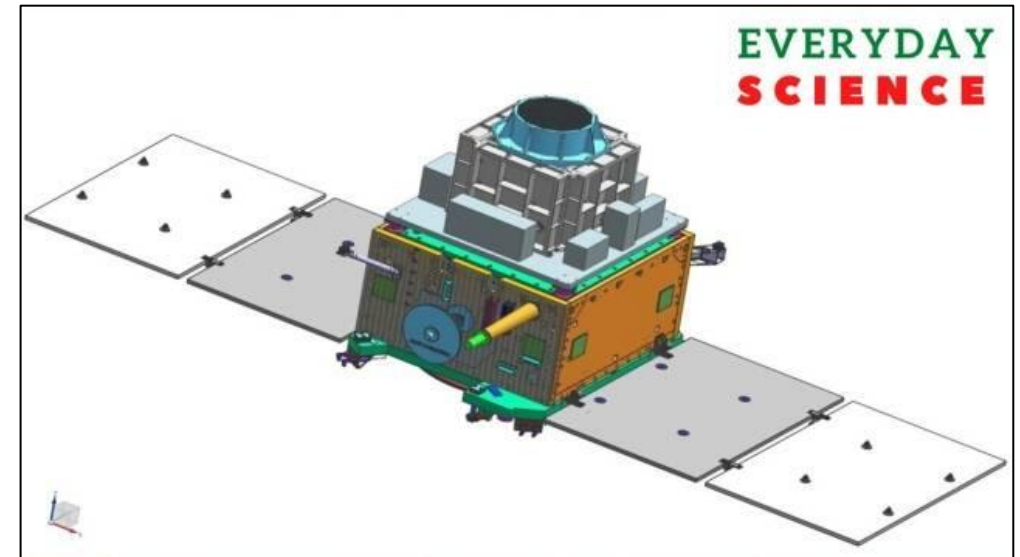
XPoSat mission details

- According to ISRO, XPoSat will study various dynamics of bright astronomical X-ray sources in extreme conditions.

- It has been billed as India's first, and only the world's second polarimetry mission that is meant to study various dynamics of bright astronomical X-ray sources in extreme conditions. The other such major mission is NASA's Imaging X-ray Polarimetry Explorer (IXPE) that was launched in 2021.

- IXPE carries three state-of-the-art space telescopes. Each of the three identical telescopes hosts one light-weight X-ray mirror and one detector unit.

- These will help observe polarized X-rays from neutron stars and supermassive black holes. By measuring the polarisation of these X-rays, scientists can study where the light came from and understand the geometry and inner workings of the light source.

How are X-Rays witnessed in space?

- X-rays have much higher energy and much shorter wavelengths, between 0.03 and 3 nanometers, so small that some x-rays are no bigger than a single atom of many elements.

- The physical temperature of an object determines the wavelength of the radiation it emits. The hotter the object, the shorter the wavelength of peak emission.

- X-rays come from objects whose temperature is in millions of degrees Celsius — such as pulsars, galactic supernova remnants, and black holes.

- Like all forms of light, X-rays consist of moving electric and magnetic waves. Usually, peaks and valleys of these waves move in random directions. Polarised light is more organised with two types of waves vibrating in the same direction. Fishermen use polarised lenses to reduce glare from sunlight when they are near water.

- The field of polarimetry studies the measurement of the angle of rotation of the plane of polarised light (that is, a beam of light in which the vibrations of the electromagnetic waves are confined to one plane) that results upon its passage through certain transparent materials.

- The emission mechanism from various astronomical sources such as black holes, neutron stars, active galactic nuclei, pulsar wind nebulae etc. originates from complex physical processes and is challenging to understand.

- Space based observatories are also unable to give information about the exact nature of the emission from such sources. Therefore, newer devices can measure specific properties.

XPoSat's payloads

- The spacecraft will carry two scientific payloads in a low earth orbit. The primary payload POLIX (Polarimeter Instrument in X-rays) will measure the polarimetry parameters (degree and angle of polarisation).

- The payload is being developed by RRI in collaboration with ISRO's U R Rao Satellite Centre (URSC) in Bengaluru. POLIX is expected to observe about 40 bright astronomical sources of different categories during the planned lifetime of XPoSat mission of about 5 years. This is the first payload in the medium X-ray energy band dedicated for polarimetry measurements.

- The XSPECT (X-ray Spectroscopy and Timing) payload will give spectroscopic information (on how light is absorbed and emitted by objects). It would observe several types of sources, such as X-ray pulsars, blackhole binaries, low-magnetic field neutron star, etc.

EVERYDAY SCIENCE

India plans to develop oil reserves in salt caverns

Relevance: Prelims & Mains Paper III; S&T

Why in news?

- Govt-owned engineering consultancy firm Engineers India (EIL) is studying the prospects and feasibility of developing salt cavern-based strategic oil reserves in Rajasthan. This is in line with the govt's objective of increasing the country's strategic oil storage capacity.

- If the idea comes into practice, India could get its first salt cavern-based oil storage facility. The country's three existing strategic oil storage facilities — at Mangaluru and Padur in Karnataka, and Visakhapatnam in Andhra Pradesh — are made up of excavated rock caverns.

- Countries build strategic crude oil reserves to ease major supply disruptions in the global supply chain. India, the world's third-largest consumer of crude, depends on imports for more than 85% of its requirement. Strategic petroleum reserves (SPR) could help ensure energy security and availability during global supply shocks and other emergencies.

- India currently has an SPR capacity of 5.33 million tonnes, or around 39 million barrels of crude, that can meet around 9.5 days of demand. The country is in the process of expanding its SPR capacity by a cumulative 6.5 million tonnes at two locations — Chandikhol in Odisha (4 million tonnes) and Padur (2.5 million tonnes).

- India's strategic oil reserves come under the Petroleum Ministry's special purpose vehicle Indian Strategic Petroleum Reserve (ISPRL). EIL was instrumental in setting up the country's existing SPR as the project management consultant.

- Salt cavern-based storage, which is considered cheaper and less labour- and cost-intensive than rock caverns, could add a new, much-needed chapter to India's SPR story.

Salt cavern-based reserves v. rock cavern-based reserves

- Unlike underground rock caverns, which are developed through excavation, salt caverns are developed by the process of solution mining. It involves pumping water into geological formations with large salt deposits to dissolve the salt.

- After the brine (water with dissolved salt) is pumped out of the formation, the space can be used to store crude oil. The process is simpler, faster, and less cost-intensive than developing excavated rock caverns.

- Salt cavern-based oil storage facilities are also naturally well-sealed, and engineered for rapid injection and extraction of oil. This makes them a more attractive option than storing oil in other geological formations.

- The salt that lines the inside of these caverns has extremely low oil absorbency, which creates a natural impermeable barrier against liquid and gaseous hydrocarbons, making the caverns apt for storage. Also, unlike rock caverns, salt cavern-based storages can be created and operated almost entirely from the surface.

- The entire SPR programme of the United States has so far been based on salt cavern-based storage facilities.

- The US Strategic Petroleum Reserve, the world's largest emergency oil storage, consists of four sites with deep underground storage caverns created in salt domes along the Gulf of Mexico coast in Texas and Louisiana. The US strategic oil reserves have a cumulative capacity of around 727 million barrels.

- Salt caverns are also used to store liquid fuels and natural gas in various parts of the world. They are also considered suitable for storing compressed air and hydrogen.

Potential in India for storing crude, petroleum products

- Rajasthan, which has the bulk of requisite salt formations in India, is seen as the most conducive for developing salt cavern-based strategic storage facilities.

- Plans over the past decade to build a strategic oil reserve in Bikaner did not take off! The exploration of the possibility of salt cavern-based strategic storage in Rajasthan can be seen as a renewal of that proposal.

- A refinery is coming up in Barmer. Rajasthan also has crude pipelines. Such infrastructure is conducive for building strategic oil reserves.

- However, no Indian company, including EIL, had the requisite technical know-how to build salt cavern-based strategic hydrocarbon storage. This gap in access to technology has been bridged by EIL's recent partnership with Germany's DEEP.KBB GmbH — a company that specialises in cavern storage and solution mining technology.

- However, it is still too early to identify a specific site or make an estimate of the project cost.

Strategic petroleum reserves programme

- India's strategic oil reserves are part of the effort to build sufficient emergency stockpiles on the lines of the reserves that the US and its Western allies set up after the first oil crisis of the 1970s.

- The three existing rock cavern-based facilities were built during the first phase of the programme.

- Crude oil from the reserves are to be released by an empowered committee set up by the govt, in the event of supply disruptions due to a natural calamity or an unforeseen global event leading to an abnormal increase in prices.

- The International Energy Agency (IEA), a Paris-based autonomous intergovernmental organisation in which India is an 'Association' country, recommends that all countries should hold an emergency oil stockpile sufficient to provide 90 days of import protection.

(more ahead)

- In India, apart from the SPR that are sufficient to meet 9.5 days of oil requirement, the oil marketing companies (OMCs) have storage facilities for crude oil and petroleum products for 64.5 days — which means there is sufficient storage to meet around 74 days of the country's petroleum demand.

- India has also decided to commercialise its strategic petroleum reserves. As a part of it, the Abu Dhabi National Oil Company (ADNOC) stored about 0.8 million tonnes of crude oil in the Mangaluru strategic reserve.

- In the second phase of this programme, the govt wants to develop strategic reserves through public-private partnerships so as to reduce govt spending and exploit the commercial potential of the reserves.

- Taking advantage of low crude oil prices in April-May 2020, the govt completely filled these reserves, leading to estimated savings of around Rs 5,000 crore. In late 2021, India released 5 million barrels from its strategic reserves as part of a coordinated US-led action by major oil consuming countries against the joint decision of major oil producing nations to curb output.

Researchers use AI to find an antibiotic against a superbug

Relevance: Prelims & Mains Paper III; Science & Technology

Why in news?

- In a major breakthrough for the use of Artificial Intelligence (AI) in the field of medicine, scientists from the United States and Canada have found a new antibiotic – powerful enough to kill a superbug – using AI.

- Superbugs are bacteria that are resistant to several types of antibiotics. Each year these drug-resistant bacteria infect more than 2 million people in the US and kill at least 23,000, according to the US Centers for Disease Control and Prevention (CDC).

What is Acinetobacter baumannii?

- Acinetobacter baumannii was identified in 2017 by the World Health Organization (WHO) as one of the world's most dangerous antibiotic-resistant bacteria.

- A. baumannii which is notoriously difficult to eradicate can cause pneumonia, meningitis and infect wounds, all of which can lead to death. A. baumanni is usually found in hospital settings, where it can survive on surfaces for long periods.

- The WHO's list of superbugs highlighted bacteria that are having built-in abilities to find new ways to resist treatment and can pass along genetic material that allows other bacteria to become drug-resistant as well.

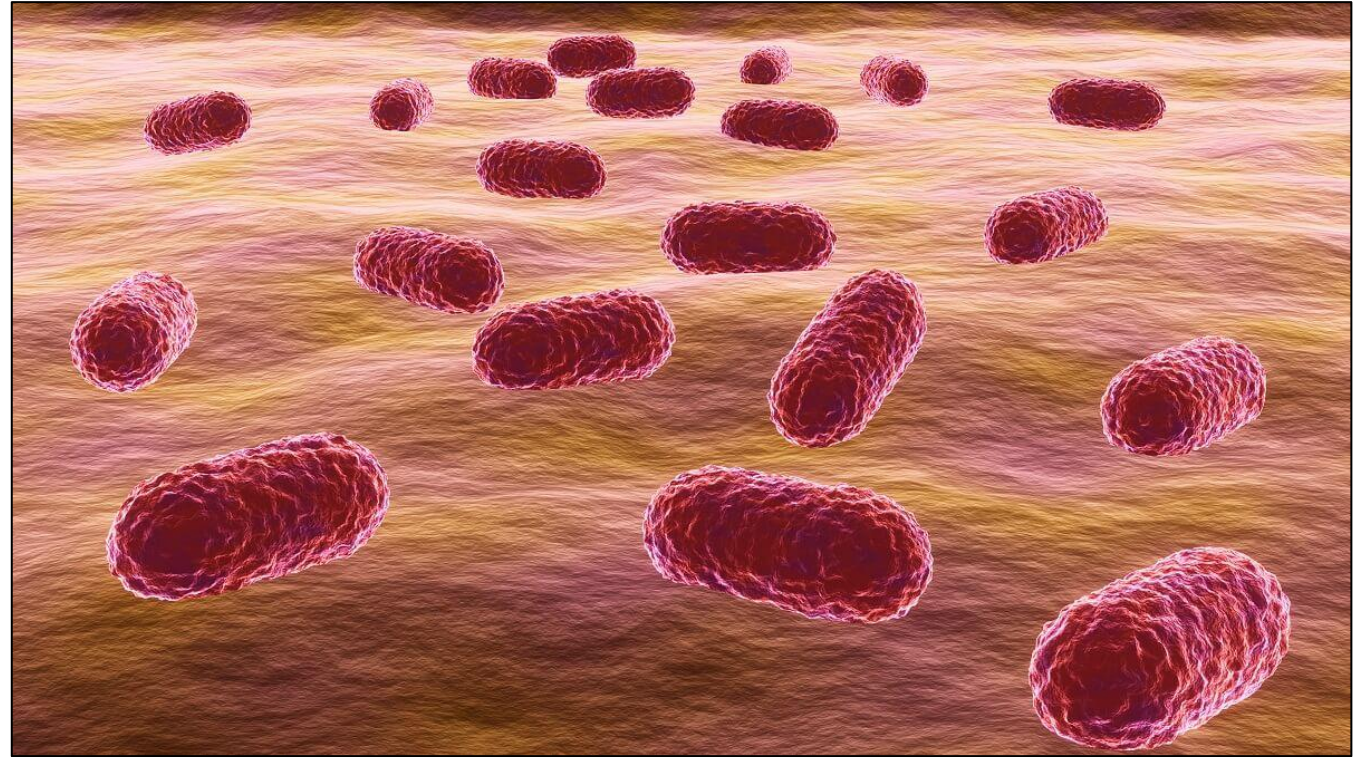## How do bacteria become resistant to drugs?

- Antibiotics are medicines used to prevent and treat bacterial infections. Antibiotic resistance occurs when bacteria change in response to the use of these medicines. This ultimately threatens the ability of medicines to treat common infectious diseases.

- As per WHO, where antibiotics can be bought for human or animal use without a prescription, the emergence and spread of resistance is made worse. It cautions against overconsumption of medicines without medical professionals' recommendation for treating common illnesses.

- The WHO lists infections such as pneumonia, tuberculosis, and foodborne diseases as becoming harder to treat with existing medication due to increasing anti-bacterial resistance.

AI's help in this research

- Narrowing down the right antibacterial chemicals against bacteria can be a long, difficult process. This is where algorithms come in because the concept of AI is based on the process of machines being given large amounts of data and training themselves on identifying patterns and solutions based on them.

- According to MIT, the researchers first exposed A. baumannii grown in a lab dish to about 7,500 different chemical compounds, to see which ones could help pause the growth of the bacterium.

- Then they fed the structure of each molecule into the machine-learning model. They also told the model whether each structure could prevent bacterial growth or not. This allowed the algorithm to learn chemical features associated with growth inhibition.

- Once the model was trained, the researchers used it to analyse a set of 6,680 compounds. This analysis took less than two hours and yielded a few hundred results. Of these, the researchers chose 240 to test experimentally in the lab, focusing on compounds with structures that were different from those of existing antibiotics. **(more ahead)**

Cont'd

- Those tests yielded nine antibiotics, including one that was very potent and effective at killing A. baumannii. This has been named abaucin.

Acinetobacter baumannii'

Foucault's Pendulum installed in the new Parliament building

Why in news?

- India's new Parliament building was inaugurated recently. Suspended from the ceiling of its Central Foyer is a Foucault pendulum that all but touches the floor as it rotates on its axis.

- The pendulum hangs from a skylight at the top of the Constitution Hall, and signifies the "integration of the idea of India with the idea of the cosmos".

- Created by the National Council of Science Museum (NCSM) in Kolkata, the pendulum is being dubbed as the largest such piece in India, 22 metre in height, and weighing a staggering 36 kg.

- On the ground, a circular installation has been created to allow the pendulum's movement, with a short grill around it, allowing the visitors to stand around. At the latitude of the Parliament, it takes 49 hours, 59 minutes, and 18 seconds for the pendulum to complete one rotation.

- The first such Foucault's Pendulum was installed in 1991 at the Inter-University Centre for Astronomy and Astrophysics (IUCAA) in Pune. While there were initially some fittings problems on its installation, the one at the new parliament building has a new design.

- The original Foucault's pendulum, named after 19th century French scientist Leon Foucault, is a simple experiment to demonstrate the earth's rotation.

- When Foucault carried out this experiment for the public in 1851, it was the first direct visual evidence of the fact that the earth rotates on its axis.

- The experimental set-up involves a heavy object hung from a height with a string, free to swing in any direction.

- Once set in to-and-fro motion, the pendulum is seen to change its orientation slowly over time. For e.g, if the initial motion imparted to it was in the north-south direction, after a few hours it could be seen moving in the east-west direction. It keeps on changing its orientation, till it is back in its original orientation after 24 hours.

- At other latitudes, it takes longer for the pendulum to return to its original orientation of swinging. That is because the pendulum is not aligned with the axis of rotation of the earth.

- At the equator, the pendulum is perpendicular to the axis of rotation, and hence it never changes its orientation of the swing. Meaning, a Foucault's pendulum at the equator would not show any deviation from its original course. At other latitudes it will, and would return to the original course after fixed time periods.

- Foucault's pendulum is a standard fixture in many science museums across the world, meant to be an educational tool for children to learn about the rotation of the earth.

- Till quite recently, the Earth's spherical shape, and its rotation on the axis, were not intuitively accepted by most people. That is why experiments like Foucault's pendulum also represent the spirit of scientific inquiry and scientific temper.

- All the components of the pendulum installed at the new Parliament building have been completely made in India. Creating the entire piece took around 10-12 months.

- The Central Research & Training Laboratory (CRTL) is the R&D unit of NCSM, which in turn, functions under the guidance of the Ministry of Culture.

- The piece, made using gunmetal, has been fixed with an electromagnetic coil to ensure hassle-free movement.

- There is continuous power supply so there are no obstacles to the pendulum's movement.

Hackers target YouTube creator accounts with large followings

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Relevance: Prelims & Mains Paper III; Science & Technology

Why in news?

- Veteran Indian journalist Barkha Dutt recently said that the email and YouTube channels of her digital news platform - The Mojo Story were hacked by cybercriminals.

- Upon gaining access to the channel, the hackers deleted the videos. YouTube froze the account after receiving a complaint from the journalist. The account with all its content was later retrieved.

- Accounts of comedian Tanmay Bhat and YouTuber Abdu Rozik were also reportedly compromised. While the content of these YouTube channels differ, they had one thing in common — a high subscriber count. Tanmay Bhat's YouTube channel had around 4.4 million subscribers and other channels had well over 500k subscribers.

Reasons behind this

- Hackers attack such accounts to demand a ransom in return, or to gain access to the accounts' audience base to distribute scam links or other malware.

- When hackers intend to use stolen YouTube accounts to distribute links to malicious websites or malware, they change the name, profile, and content of these channels often imitating the accounts of a larger company or well-known individuals to increase the scope of the attack.

- Hackers also tend to remove content from the original publisher, posting content that lures subscribers to click on malicious links shared by them.

- Attackers also place restrictions or disable comments entirely on hacked channels. Conditions could include only allowing subscribers who have subscribed to the channel for 15 or even 20 years to post messages.

- The hackers also ensure the original owner of the channel is unable to warn subscribers in the comments.

- Hackers do not need to steal any credentials to compromise such channels. They can make use of socially engineered phishing campaigns to access and use session tokens to compromise accounts.

- Cookie theft or attacks to steal session tokens have been around for some time now, and are also known as "pass-the-cookie attacks".

- A typical attack begins with an email, pretending to be from a genuine company to a blogger. The first email does not contain any suspicious links or files and is used to lure victims into a false sense of security by proposing product placement and collaboration opportunities.

- Subsequent emails are used to share zipped folders or links to a cloud service masquerading as contracts or important information. These zip folders contain malware and are often masked by Word or PDF files, along with fake forms.

- Malware protection software and mail servers are unable to scan these files for viruses and malware due to their large size. The virus is delivered to the victim's system when the folder is unzipped to access the files within. The malware contained within the files is then used to steal session tokens from the victim's browsers, which in turn are used to access the victim's account.

- Most of the shared malware is capable of stealing both user passwords and cookies.

- Hackers make use of browsers' "remember" feature with the help of stolen session cookies, thereby bypassing the need for login credentials. Thus, they are able to gain control and access the victim's account without the need for credentials or two-factor authentication.

(more ahead)

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- Session cookies are composed of data created by a server and shared with the user's browser to authenticate the user. Cookies are stored by the users' browser and shared with the server to authenticate the user — removing the need for login credentials every time the user visits their user account.

- Cloud links are similarly used by attackers to gain access to victims' session tokens to bypass the need for login credentials.

Google's efforts to stop such attacks

- Google, in 2021, said it is continuously trying to improve its detection methods with tools and features that can automatically identify and stop threat actors.

- YouTube has also implemented features and protections to make channel transfer more stringent. Additionally, the platform has also implemented features for the auto-recovery of hijacked accounts.

- However, judging by the reported incidents and comments of YouTubers it seems that these measures may not be enough.

- YouTubers have complained that the platform does not require users to enter their password or two-factor authentication code to change profile pictures and remove all videos from the channel.

Security Measures

- Content creators can take measures to reduce the probability of their YouTube accounts being hijacked by threat actors.

- Some of these measures include knowing and identifying typical signs of phishing attacks, being aware of social-engineering attacks, not following suspicious links, especially those from unverified sources, and not downloading archived attachments from untrusted sources.

Researchers predict exploding of the red giant star – Betelguese in the not-so-distant future!

Relevance: Prelims & Mains Paper III; Science & Technology

Why in news?

- Researchers from Japan and Switzerland recently reported that Betelgeuse, a bright red giant star is likely to 'die' and collapse into a supernova.

- They made this observation by observing the periodic contraction and expansion of the star.

- However, other researchers have disputed this conclusion and estimated that the star will become a supernova only much later.

More about Betelgeuse

- The bright red star Betelgeuse, called 'Thiruvathirai' or 'Ardra' in Indian astronomy, is easily spotted in the constellation Orion.

- In massive stars like Betelgeuse, the carbon-burning stage lasts only up to a few hundreds of years, after which the star 'dies' and collapses into a supernova within a few months.

- In humans, slow or abnormal heartbeats indicate a possible blockage of the heart. Likewise, the researchers say Betelgeuse's observed pulsation matches theoretical estimates of a late carbon-burning stage, suggesting the red supergiant is in the final stages of its lifetime.

A star's lifecycle

- Most stars, including the Sun, fuse the simplest element in the universe, hydrogen, to produce helium and some energy as a byproduct. This energy's outward push balances gravity's inward pull, and keeps the star from collapsing.

- Massive stars like Betelgeuse run out of hydrogen fuel in only a few crore years, after which they switch to using helium to make carbon. The energy released in the fusion of helium is less than that of hydrogen, so the star burns more helium to stay stable and not collapse. The helium runs out in about ten lakh years.

- At this time, red giants like Betelgeuse burn carbon, then silicon, and briskly consume one by one the elements of the periodic table, until finally their core brims with iron — whose fusion requires more energy than it releases — and some cobalt and nickel.

- Each of these stages is shorter than the predecessor. In a star like Betelgeuse, carbon burns in a few hundred years whereas silicon lasts about a day. Therefore, the late-carbon stage is its terminal phase.

- Once the core is rich in iron, the temperature and pressure within the star drops. Gravity then compresses the core and turns it into a neutron star or a black hole. The shock wave resulting from the collapse blasts the surrounding layers into interstellar space and the star explodes in a celestial firework display.

How is it all detected?

- Like the lid covering a pot of boiling water, which periodically lifts to release the built-up steam, red giant stars expand and contract due to the periodic heating and cooling of hydrogen in their outermost layers.

- The temperature of hydrogen in the outermost part of the envelope of a red giant star is 3,800-4,000 K. As it soars to more than 7,000 K, each hydrogen atom's lone electron is stripped away and the hydrogen is ionised.

- Astronomers detect the expansion and contraction of a distant star by dispersing its starlight into its various colours, and examining the resulting spectrum.

- This pulsation also corresponds roughly to periodic variations in the observed brightness of the star. For Betelgeuse, astronomers have observed four approximate semi-regular pulsations with periods of 2,190, 417, 230, and 185 days.

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- The membrane of a drum oscillates at a certain frequency depending on the beat. In addition to this fundamental vibration, the membrane also vibrates at other frequencies called overtones.

- Likewise, the heartbeats of stars also have a fundamental pulsation and overtones. Earlier, a team took the 417-day period to be fundamental, placing Betelgeuse at its early core helium-burning phase. This means the star has roughly one lakh years before it explodes.

- However, another team took the 2,190-day pulse to be the fundamental and concluded that Betelgeuse is in the final stage of burning carbon.

More disagreements!

- Both aforesaid research teams were also divided over Betelgeuse's assumed radius. While one pegged it at 1,300 solar radii, the other put this figure at 600-1,000 solar radii.

- Moreover, there is also a dispute over how far away and how large Betelgeuse is. While estimates of its distance range from 550 to 730 lightyears; its estimated luminosity is also in the range of 90,000-1,50,000 (times that of the Sun).

Gujarat, Maharashtra and Telangana say no to test transgenic cotton seed

prep mate

Relevance: Prelims & Mains Paper III; Science & Technology

Why in news?

- Three States, Gujarat, Maharashtra and Telangana, have deferred a proposal, approved by the Centre's Genetic Engineering Appraisal Committee (GEAC), to test a new kind of transgenic cotton seed that contains a gene, Cry2Ai, that purportedly makes cotton resistant to pink bollworm, a major pest.

- This conflict shows that a broad acceptance of genetically modified crops continues to be elusive.

Status of transgenic crops in India

- There is a range of crops — brinjal, tomato, maize, chickpea — in various stages of trials that employ transgenic technology.

- However, cotton remains the only transgenic crop that is being commercially cultivated in India. After a long gap, the GEAC, the apex technical body charged with evaluating proposals for testing genetically modified (GM) seeds, approved the environmental release of Mustard hybrid DMH-11 and its parental lines in 2022 for seed production and testing. This is one step away from full commercial cultivation.

- However, the GEAC, which is under the Union Environment Ministry, isn't the final arbiter in the case of GM crops.

- There is a long-standing litigation in the Supreme Court on the permissibility of allowing transgenic food crops in farmer fields based on petitions filed by activist Aruna Rodrigues and Gene Campaign, an NGO.

(more ahead)

- Following the GEAC approval for DMH-11, the petitioners approached the apex court asking for a stay on the release of the crop because it would encourage farmers to spray herbicides, which are banned in India. - Hearings on this case are still ongoing. In 2017, the GEAC had accorded a clearance for GM mustard, but went back on its decision and imposed additional tests. - In 2010, the GEAC had approved GM brinjal, but this was put on an "indefinite moratorium" by the UPA govt.	- The process of developing transgenic crops is an elaborate one as inserting transgenic genes into plants to draw a sustained, protective response is a mix of both science and chance. - There are multiple safety assessments done by committees before they are cleared for further tests in open plots of lands, which are located at either agricultural universities or are plots controlled by the Indian Council for Agricultural Research (ICAR). - A transgenic plant can apply for commercial clearance, only after it has proven to be demonstrably better than comparable non-GM variants on claimed parameters (for instance, drought tolerance or insect resistance) without posing ecological harm to other species that may be being cultivated in the vicinity. - Open field trials often take place over multiple crop seasons, and types of geographical conditions, to assess its suitability across different States.

States reject GEAC proposals!

- The cotton seed has been developed by the Hyderabad-based Bioseed Research India with Cry2Ai which makes it resistant to pink bollworm.

- The first generations of transgenic cotton had been developed to protect cotton against a more widespread pest called American bollworm.

- The Cry2Ai seed has passed preliminary, confined trials and was recommended by the GEAC to be tested in farmer's fields at Telangana, Maharashtra, Gujarat and Haryana.

- Agriculture being a State subject in most cases, companies interested in testing their seeds need approvals from the States for conducting such tests. Only Haryana gave permission for such tests.

- In May, Telangana rejected a GEAC proposal by responding that it would not allow trials to be conducted in the current cropping season.

- Gujarat later responded that the proposal was "unacceptable" to them, but did not furnish reasons.

- Following these responses, the GEAC has asked the Department of Biotechnology (DBT) and the ICAR to "jointly organise capacity-building activities with regard to GM crops for apprising the State/UT Government(s) about the technology involved and the regulatory framework in place for evaluation of these GM crops."

- Activist groups objected to the GEAC asking States to furnish reasons for disapproval and said that it was equivalent to a "biased lobbying approach".

Proposed changes in regulatory process of GM crops

- The GEAC consists of a panel of plant biotechnologists and is headed by a senior official of the Environment Ministry and co-chaired by the scientist of the DBT.

- To resolve the issue of States not according approvals on testing, because of differing attitudes to GM crops, the GEAC is considering a proposal by the DBT to declare some regions across India as 'notified testing sites'.

- There are 42 such proposed sites and, if it goes through, companies wanting to conduct trials of GM crops at these locations won't need the permission of States for trials.

India to buy Predator UAVs from the US

Relevance: Prelims & Mains Paper III; Science & Technology

Why in news?

- The apex body responsible for clearing all capital acquisitions for the Indian Armed Forces, the Defence Acquisition Council (DAC) has approved the procurement of armed Predator Unmanned Aerial Vehicles (UAV) from General Atomics Aeronautical Systems (GA-ASI), an aeronautics company based in the United States, at a cost of over $3 billion.

- The move came just a week before PM Narendra Modi's visit to the US, pointing at a possible announcement of the deal during the visit.

- The procurement is now awaiting the final nod from the Cabinet Committee on Security.

What is the Predator UAV?

- The MQ-9 UAV has an endurance of over 27 hours, speeds of 240 KTAS, can operate up to 50,000 feet, and has a 3,850 pound (1,746 kg) payload capacity that includes 3,000 pounds (1,361 kg) of external stores.

- The aircraft can carry 500% more payload and has nine times the horsepower in comparison to the earlier MQ-1 Predator. Moreover, MQ-9 UAV provides long-endurance, persistent surveillance, and strike capability for the warfighter.

- The maritime variant of the MQ-9 UAV, known as Sea Guardian, has an endurance of over 30 hours.

- Earlier this year, the US Air Force (USAF) had ditched an MQ-9 Reaper in the Black Sea after a confrontation with two Russian Su-27 jets over international waters west of Crimea.

How will it boost Indian defence capabilities?

- The purchase of this UAV got delayed due to the emphasis on self-reliance in the defence sector and limitations imposed on imports.

- If the deal comes through, India will have 31 MQ-9s for its Armed Forces, including 15 for the Navy and eight each for the Army and the Indian Air Force (IAF).

- These High-Altitude Long Endurance drones can carry out and boost the Indian Armed Forces' Intelligence-Surveillance-Reconnaissance (ISR) capabilities. Armed with payloads, the weaponized UAV will be able to strike strategic targets in mountains and the maritime domain during long-endurance missions.

- MQ-9 UAV is employed primarily as an intelligence-collection asset and secondarily against dynamic execution targets.

- Its significant loiter time, wide-range sensors, multi-mode communications suite, and precision weapons provide a unique capability to perform strike, coordination, and reconnaissance against high-value, fleeting, and time-sensitive targets.

- It can also undertake close air support, combat search and rescue, precision strike, buddy-lase, convoy and raid overwatch, route clearance, target development, and terminal air guidance.

Has India employed these UAVs earlier?

-   In the aftermath of the Galwan Valley clashes in 2020, the Navy had leased two MQ-9 UAVs and the lease was since extended.

-   In Nov. 2022, General Atomics Aeronautical Systems (GA-ASI) announced that these leased UAVs had completed 10,000 flight hours during a period of two years and have helped the Indian Navy to cover over 14 million square miles of operating area.

Other countries that use the MQ-9 UAV

-   The MQ-9 UAV has been acquired by the US Air Force, the US Department of Homeland Security, NASA, the UK's Royal Air Force, the Italian Air Force, the French Air Force and the Spanish Air Force.

Alleged CoWIN data leak reignites privacy fears

Relevance: Prelims & Mains Paper III; Science & Technology

prepmate

Why in news?

- Recently, reports emerged that a bot on the messaging platform Telegram was allegedly returning personal data of Indian citizens who registered with the COVID-19 vaccine intelligence network (CoWIN) portal for vaccination purposes.

- The bot gave out personal details like name, Aadhaar and passport numbers upon entry of phone numbers.

- On the same day, the Health Ministry denied reports of a data breach, and said the allegations were "mischievous in nature."

- It added that the Indian Computer Emergency Response Team (CERT-In) was reviewing existing security infrastructure of the portal.

- Separately, as per the Electronics and IT Ministry, the nodal cyber security agency had reviewed the alleged breach and found that the CoWIN platform was not "directly breached."

What does the CoWIN portal track?

- CoWIN is a govt-owned web portal set up in 2021 to administer and manage India's COVID-19 vaccine rollout.

- The health register-style platform leverages existing public digital infrastructure like the Electronic Vaccine Intelligence Network (eVIN), an app that provides data on vaccine cold chains in the country; Digital Infrastructure for Verifiable Open Credentialing (DIVOC), a vaccine certificate issuer; and Surveillance and Action for Events Following Vaccination (SAFE-VAC), a vaccine adverse event tracker.

- The platform, on a real-time basis, tracks vaccines and beneficiaries at the national, State, and district levels. It monitors vaccine utilisation and wastage, and maintains an inventory of the vials.

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- For citizens, CoWIN verifies identity, helps schedule vaccine appointments, and issues a vaccine certificate. The database captures information flowing from four separate input streams — citizen registration; health centres; vaccine inventory; and vaccine certificates.

- Each stream functions independently, and at the same time exchanges data to minimise redundancies. The platform is a microservices-based, cloud-native architecture developed from the ground up on Amazon Web Services (AWS).

- A microservice architecture is a pattern that arranges an application as a collection of loosely linked, fine-grained services. These services interact with each other through certain set protocols.

Background to the data breach

- This is not the first time reports about data leaks have emerged. In Jan. 2022, the personal data of thousands of people in India were reportedly leaked from a govt server.

- The information included COVID-19 test results, phone numbers, names and addresses of citizens. The data could be accessed via online search. In Dec. 2022, in a separate security breach, an Iranian hacker claimed to be in possession of data from the CoWIN database.

- Both the reports of the data leak were rubbished by the Ministry of Electronics and Information Technology (MeitY). There is no record of any investigation being carried out by CERT-In in connection with these data leaks. Even the vulnerability notes which the nodal cybersecurity agency shared on a regular basis made no reference to these breaches.

- On the recent data leak too, the cybersecurity agency has not directly put out any update that it is either investigating or has filed a review on the breach.

- However, as per a newspaper report, the agency is in discussion with at least 11 State govts that had developed their own databases.

How did the latest alleged data breach happened?

- There are few ways to look into this data breach to know where things could have gone wrong. Cloud providers like AWS, Microsoft's Azure and Google Cloud typically provide security only for the underlying infrastructure, and not for securing the applications and databases.

- Customers hosting their data are responsible for what they build in a cloud environment. The absence of AWS in CERT-In's vulnerability notes last year could mean there was no security lapse at the cloud infrastructure's end.

- While the cloud offers superior security compared to traditional data centres, legacy systems deployed in virtual servers are the weak links in the chain. Such links are a perfect route for hackers to gain entry into a database.

- This shifts the focus to CoWIN, which was built leveraging legacy software tools. So, an entry point for those behind the bot may have been an old system that was connected to the portal.

- In past data breaches, cybersecurity experts have attributed data leaks to human error or negligence in setting up databases in the cloud. Misconfiguring a system, or involvement of third-party apps with limited privacy features, could have also exposed user data to unauthorised people.

The larger picture

- Whatever the outcome of the CERT-In probe, the fact remains that sensitive personal data of millions of Indian citizens who signed up for the COVID-19 vaccination is in the hands of cybercriminals. It is unclear how they plan to use this information. But such leaks reveal India's unfinished data protection business.

- A data protection law could be a useful tool in fixing accountability and building safeguards around the use and processing of personal data.

- In 2017, the Supreme Court of India recognised privacy as a fundamental right, highlighting the need to protect personal information. But the country is still struggling to frame a personal data protection policy.

prep mate

Why in news?

- Recently, two California-based companies - Good Meat and Upside Foods were cleared to make and sell cell-cultivated chicken. The latter is the 'official' name of chicken meat that is grown in a laboratory for human consumption.

- As a concept, it is being hailed by stakeholders as a major step towards reducing carbon emissions associated with the food industry worldwide.

What is cell-cultivated chicken?

- To make cell-cultivated meat, the two companies isolate the cells that make up the meat (the meat that we consume), and put them in a setting where they have all the resources they need to grow and make more copies of themselves.

- These resources are typically nutrients, fats, carbohydrates, amino acids, the right temperature, etc. The 'setting' in which this process transpires is often a bioreactor (also known as a 'cultivator'), a sensor-fit device — like a container — that has been designed to support a particular biological environment.

- Once there are enough of these cells, which takes around two to three weeks in Upside's process, they resemble a mass of minced meat. They are collected and processed with additives to improve texture.

Forms of existing cell-cultivated meat

- Chicken is the second most widely consumed meat in the world, according to the UN Food and Agriculture Organization (FAO).

- However, in the U.S. it has been the highest consumed meat since 2010.

- Good Meat and Upside have focused on chicken, and plan to expand their offerings to include other meats in the future. Notably, beef, with its higher fat content and more complex flavour, is harder to replicate.

- Researchers are also developing cell-cultivated versions of sea bass, tuna, and shrimp. A 2021 report estimated that there were 107 companies in 24 countries working on developing similar alternatives to meat (two companies were from India).

Why was cell-cultivated meat created?

- The advocates of such meats have listed the following arguments, among others — emissions, land use, prevention of animal cruelty, and food security.

- The first two are related to climate mitigation. The FAO has estimated that global livestock is responsible for 14.5% of all anthropogenic greenhouse-gas emissions. Of this, the production of beef as a commodity accounted for 41% whereas chicken meat and eggs accounted for 8%.

- Similarly, the 2021 report estimated that lab-cultivated meat would use 63% less land in the case of chicken. Alternative meat's supporters have advanced it as a way to meet the world's nutritional security needs.

The challenges!

- There are broadly four kinds of challenges.

- First is consumer acceptance. Perfectly substituting animal meat with alternative meat requires it to match the original in taste, texture and appearance. Researchers have achieved some success on these counts but it remains a work in progress.

- Second, the cost of cell-cultivated meat is expected to remain high in the near future. One 2020 analysis concluded that it may never be cost-competitive, while there are also concerns about the costs imposed by quality control, especially at scale.

- Third, for cultivation, researchers require high quality cells, a suitable growth-medium in which the cells can be cultured, plus other resources required to maintain the quality of the final product.

- Fourth are the uncertainties associated with it. A recent study found that if cell cultivation requires a "highly refined growth medium", like that used in the pharma industry, the "environmental impact of near-term [cell-cultivated meat] production is likely to be orders of magnitude higher than median beef production.

Home Minister Amit Shah announces measures for violence hit Manipur

Relevance: Prelims & Mains Paper III; Internal Security
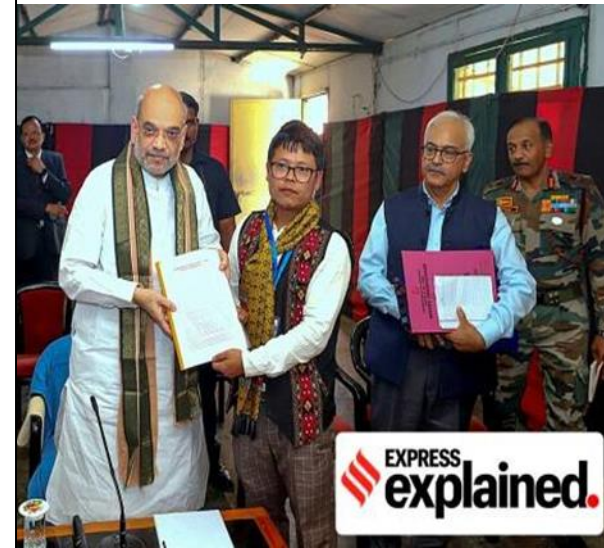
prep mate

Why in news?

- The Union Home Minister Amit Shah has announced that a probe panel led by a retired High Court judge will investigate the recent violence in Manipur.

- The clashes led to the death of at least 80 people and left several injured. He said the reasons behind the month-long bout of violence and those responsible for it will be probed.

- Shah held a press conference towards the end of his four-day visit in the state and announced several measures for the state.

- He met victims from both the Meitei and Kuki communities of the state a day earlier in relief camps, assuring them of adequate security, and said the govt's focus is to ensure their safe return home.

Background of this crisis

- Ethnic clashes broke out in the state nearly a month ago after a 'Tribal Solidarity March' was organised in the hill districts to protest the Meitei community's demand for Scheduled Tribe (ST) status.

- The trigger for the violent clashes was a contentious order of the Manipur High Court that boosted a longstanding demand by the valley-dwelling Meiteis to be designated as a ST in order to protect their "ancestral land, traditions, culture and language".

- Protests by tribal groups such as the Kukis against the HC order in all the hill districts on May 3 led to violence, first in Kuki-dominated Churachandpur, and then in the Imphal valley.

- After a relative lull for over a fortnight, the state again witnessed a spurt in clashes and gunfights between militants and security forces very recently. There had been a direct confrontation between armed militants and the Manipur Police in five different areas on the outskirts of Imphal Valley.

- Meanwhile, IPS officer Rajiv Singh of the Tripura cadre (1993 batch), was recently appointed Manipur's Director General of Police.

Announcements made by Amit Shah

- Apart from the formation of the probe panel, he announced following measures:

➤ Under the chairmanship of Manipur governor Anusuiya Uikey, the Indian govt will form a peace committee which will have representation of everyone – industrialists, sportspersons, political parties representatives, elected representatives and those from civil society organisations.

➤ A relief and rehabilitation package has been readied. For every person who has lost their life, Rs 10 lakhs will be given. For those who have been injured or suffered a loss of property, a detailed announcement on this will come from the Central govt soon.

➤ Fencing of around 10 km of the Myanmar-Manipur border has been done and tendering has been done for 80 km of the border. The survey work for the rest of its length will be started. Biometric and eye scans of those coming from abroad will be carried out.

➤ 30,000 metric-tonne of rice will be provided to Manipur for the next two months. Gas, petrol and vegetables will also be brought in. Medicines will be made available here. Some 15 petrol pumps will be kept open during the night and day.

➤ To address the issues of holding competitive exams and to keep educational institutions going, a plan is also being formulated. Options such as online education are being discussed. For courts too, virtual hearings and appearances are being planned.

EXPRESS explained.

DISASTER MANAGEMENT

The 'interlocking' system, a change which led to the Odisha train accident

Relevance: Prelims & Mains Paper III; Disaster Management

Why in news?

- Minister for Railways Ashwini Vaishnaw has said that interlocking system had led to the Coromandel Express smashing into the stationary goods train from behind.

- This triggered the three-way train accident in Odisha in which 275 people have died so far.

What is 'interlocking' in railways?

- Interlocking in railway signalling systems is a crucial safety mechanism used in the operation of train movements on railway tracks. It ensures that train movements continue without any conflicts with each other, preventing accidents.

- There are three main components that comprise an interlocking system: the point, the track occupancy sensing devices, and the signal. The Interlocking system coordinates the functions of these three components to control train movements.

- Function of each of these three main components:

➢ Signals (which are lights of green, red, and yellow colour) are installed along the tracks to indicate the status of the track ahead.
➢ Track circuits are electrical circuits (also known as track-occupancy sensing devices) that detect the presence of trains.
➢ Points allow trains to change tracks.

How do the points work?

- The points (also called 'switch rails') are movable rails that guide the wheels of a train towards either a straight or a diverging track. They are typically placed at the point of divergence of two tracks going to different directions. Once a direction of a train is determined, the point gets locked at a particular position. This means that once a direction is set, the point cannot budge until the train has passed.

- The digital interface of this system is a computer screen (or multiple screens) that shows the full view of the station layout and the live (real-time) movement of trains on tracks, the signals, and the position of the points.

- This is the configuration that runs all trains everywhere. This computer interface is called a data logger.

System's sensing Capabilities

- There are various kinds of track-occupancy sensing devices. Generally, sensors are installed on the tracks that detect the passage of wheels on the rails. These are also called axle counters.

- They count how many sets of wheels or axles have passed over them in order to determine whether the entire train has passed through.

System configurations

- A 'sound logic' of what is safe train operation is fed into the interlocking system, that is controlled remotely from the station.

- In earlier days, when technology was more basic, this job would be done manually, wherein a pointsman would physically operate the point to change its direction for an incoming train, and to lock it.

- Someone would then physically flag a green signal for the train after checking that the track is clear of any obstacle. The driver would watch the flag and proceed.

- Today, out of the 7,000-odd stations in the Indian Railways network, only around 100 small stations still have manual levers to control these points.

- The rest operate electronically, even though the basic principles of the logic are taken from the old and time-tested standard operating procedure for safety.

- In the case of the Coromandel Express, the logic in the computer would be that if the Up line (on which the Coromandel was) is vacant, and if the point is directed to the Up line and is locked for the Coromandel, then the signal to the train should be green.

Sensing of track occupation

- If any of the three components (signals, points, and track occupancy sensors) does not correspond to the overall 'safe' logic fed into the computer, the system will work to stop the oncoming train.

- This means if the point is not locked, or not set to the desired direction, and/ or if the sensing device detects that the track is not clear, the signal will automatically turn red — indicating to the oncoming train that something is wrong and that it should stop.

- This is called a "fail safe" system — one that errs on the side of safety.

Operating and monitoring

- The interlocking system is usually operated and monitored by trained personnel from the signalling and telecommunications department in Railways, often known as 'signallers' or signal operators.

- They are responsible for setting the signals, monitoring track circuits, and ensuring the safe movement of trains.

Worldwide scenario

- Interlocking systems are used in railway networks worldwide.

- Countries may have variations in their signalling practices and technologies, but the underlying principle of preventing conflicting train movements remains the same.

Can it be tampered with?

- As per an Indian Railways official any machine is "prone to failure even if it runs smoothly 99.9% of the time".

- "Things like digging work may snap cables, wear and tear and short circuit etc can cause failures. Generally these things don't happen. But that .1% possibility of failure due to any reason is always there in any kind of system".

Indian Railways' Kavach system

Relevance: Prelims & Mains Paper III; Disaster Management

Why in news?

- The death of over 288 passengers in the ghastly train accident on June 2 at Bahanaga Bazaar railway station in the Balasore district of Odisha has brought into sharp focus the safety mechanisms needed to prevent such tragedies. One of them is Kavach.
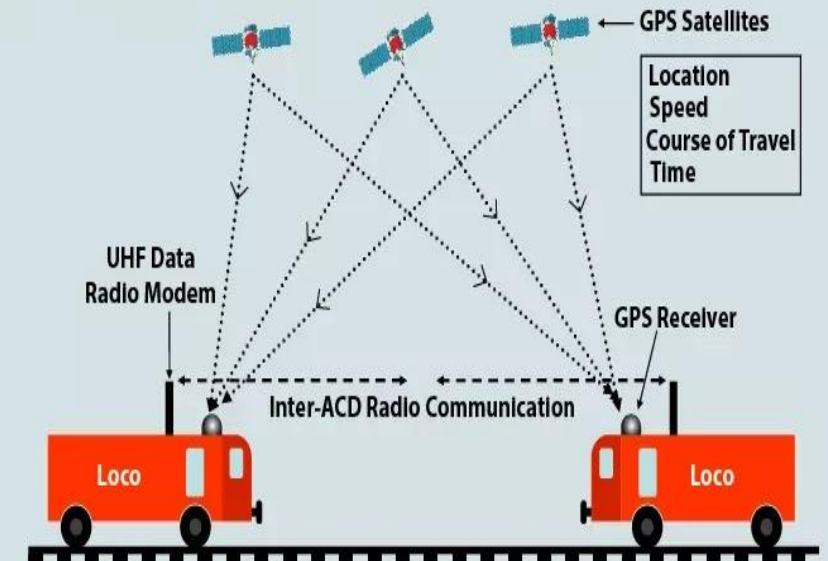
What exactly is Kavach?

- The KAVACH is an indigenously developed Automatic Train Protection (ATP) system by the Research Design and Standards Organisation (RDSO) in collaboration with the Indian industry. The trials were facilitated by the South Central Railway to achieve safety in train operations across Indian Railways.

- It is a state-of-the-art electronic system with Safety Integrity Level-4 (SIL-4) standards. It is meant to provide protection by preventing trains to pass the signal at Red (which marks danger) and avoid collision.

- It activates the train's braking system automatically if the driver fails to control the train as per speed restrictions. In addition, it prevents the collision between two locomotives equipped with functional Kavach systems. The system also relays SoS messages during emergency situations.

- An added feature is the centralised live monitoring of train movements through the Network Monitor System. 'Kavach' is one of the cheapest, SIL-4 certified technologies where the probability of error is 1 in 10,000 years.

How does Kavach work on Railway Systems?

- The Traffic collision avoidance system (TCAS), with the help of equipment on board, the locomotive and transmission towers at stations connected with Radio Frequency Identification (RFID) tags, helps in two-way communication between the station master and loco-pilot to convey any emergency message.

- The instrument panel inside the cabin helps the loco-pilot know about the signal in advance without visual sighting, and the permissible speeds to be maintained. If a red signal is jumped and two trains come face to face on the same line, the technology automatically takes over and applies sudden brakes.

- Additionally, the hooter activates by itself when approaching a level crossing which serves as a big boon to loco-pilots during fog conditions when visibility is low.

- Both the Shalimar-Chennai Coromandel Express and the Yeshwanthpur-Howrah Express were not fitted with KAVACH-TACS. The Kavach system project is yet to be implemented on the Howrah-Kharagpur-Chennai line.

- However, a Railway Board official has reasoned that the reaction time and distance were very short as the train was travelling at a very high speed. "If an obstruction comes suddenly in front of a high-moving vehicle then no technology in the world would prevent an accident".

Kavach to Boost Safety in Trains

GPS Satellites

Location
Speed
Course of Travel
Time

UHF Data
Radio Modem

GPS Receiver

Inter-ACD Radio Communication

Loco

Loco

Implementation of Kavach

- The Union Railway Minister Ashwini Vaishnaw inspected the trial of the Kavach working system between Gullaguda-Chitgidda Railway stations on Lingampalli-Vikarabad section in the Secunderabad Division of South Central Railway last March.

- The South Central Railway (SCR) Zone is a pioneer in the implementation of the KAVACH – (TACS). The Kavach system has been deployed over 1,465 kms in the SCR limits in 77 locomotives and 135 stations till March this year.

- Additionally, the Secunderabad-based Indian Railways Institute of Signal Engineering & Telecommunications (IRISET) hosts the 'Centre of Excellence' for Kavach. IRISET has been mandated by the Railway Board to train the inservice railway staff on Kavach.

- The Institute's Kavach lab carries out round the year training programmes.

The Kavach deployment strategy

- Kavach implementation is being taken up in a focused manner by the Railway Board.

- The first priority are the High Density Routes and the New Delhi-Mumbai and New Delhi-Howrah Sections, as they have higher chances of accidents because the trains run closer to each other.

- The second priority lines are the Highly Used Networks, the third ones are other Passenger High Density Routes and the final priority is of course to cover all other routes.

- Glitches about vulnerability of a vehicle crossing a closed level crossing, stray cattle or boulders on track, radio communication issues in tunnels, ghat sections, have been tackled.

CRS, the govt. body investigating the Odisha rail accident

Relevance: Prelims & Mains Paper III; Disaster Management

Why in news?

- Investigation into the recent tragic train accident in Odisha, the deadliest train crash in India in over two decades, is being conducted by the Commissioner of Railway Safety for the south-eastern circle.

- Rail safety commissioners are part of the Commission of Railway Safety (CRS), a govt body that acts as the railway safety authority in the country.

- As the name suggests, CRS deals with matters related to safety of rail travel and operations, among some other statutory functions – inspectorial, investigatory, and advisory – as laid down in the Railways Act, 1989. Investigating serious train accidents is one of the key responsibilities of the CRS, which is headquartered in Lucknow, Uttar Pradesh.

- It is, however, worth noting that the CRS does not report to the Ministry of Railways. It is, in fact, under the administrative control of the Ministry of Civil Aviation (MoCA).

- The reason or principle behind this, put simply, is to keep the CRS insulated from the influence of the country's railway establishment and prevent conflicts of interest.

Early days of railways in India

- The first railways in India came into being in the 1800s and were constructed and operated by private companies.

- At the time, the British Indian govt appointed 'consulting engineers' for effective control and oversight on the developing railway network and operations. Their job was to ensure efficiency, economy, and safety in railway operations in India.

- Later, when the British Indian govt undertook construction of railways in the country, the consulting engineers were re-designated as 'government inspectors', and in 1883, their position was recognised statutorily.

(more ahead)

Cont'd

- In the first decade of the 20th century, the Railway Inspectorate was placed under the Railway Board, which was established in 1905.

- As per the Indian Railway Board Act, 1905, and a notification by the then Department of Commerce and Industry, the Railway Board was entrusted with powers and functions of the govt under various sections of the Railway Act and was also authorised to make rules for railway operations in India.

- This effectively made the Railway Board the safety controlling authority for railways in India.

Separation of safety supervision function and Railway Board

- The Government of India Act, 1935 said that functions for securing the safety of railway operations, both for the travelling public and personnel operating the railways, should be performed by an authority independent of the federal railway authority or the Railway Board.

- These functions included conducting railway accident probes. But due to the outbreak of the 2nd World War in 1939, the idea did not take off and the Railway Inspectorate continued to function under the control of the Railway Board.

- In 1939, a panel said that the separation of the Railway Inspectorate from the Railway Board was "very desirable" as it will do away with the abnormality of the Railway Board being the "inspecting as well as the executive authority" for railway operations in India.

Transfer of Railway Inspectorate from Railway Board's control

- In 1940, the Central Legislature endorsed the idea and principle of separation of the Railway Inspectorate from the Railway Board, and recommended that the senior government inspectors of the railways should be placed under the administrative control of a different authority under the govt.

- Consequently, in 1941, the Railway Inspectorate was separated from the Railway Board and put under the administrative control of the then Department of Posts and Air.

- Since then, the Inspectorate, which was re-designated as the CRS in 1961, has been under the control of the central ministry exercising control over civil aviation in India.

OceanGate, the company behind the ill-fated submersible on a Titanic expedition

Why in news?

- Recently, a small submersible vessel named Titan, carrying five people nearly 4,000 metres down the Atlantic Ocean to view the 1912 wreckage of the Titanic - imploded. This resulted in the tragic death of all of them.

- The trip was organised by the company OceanGate Inc, which mentions private "crewed submersible exploration" as part of its offerings. Notably, among the five people who died was the vessel pilot and OceanGate CEO and Founder, Stockton Rush.

What is OceanGate Inc?

- OceanGate Inc is a US-based company founded in 2009. It provides crewed submersible services to enable researchers and explorers to access the oceans' vast resources". The company aims to evolve methods to lower the costs of such explorations.

- As per the company, these submersibles can also be used for carrying out scientific research, allowing people to carry out "real-time sampling, collecting and experimentation", deep-sea testing, and for underwater filming.

- For the Titan trip, no prior diving experience is required and anyone above the age of 18 can go for it, with each ticket costing $250,000.

- The eight-day trip includes time to travel near the site of the wreckage and familiarising people with the basics of diving. Each dive takes about 10 hours.

- The Titanic's wreck lies around 700 km south of St John's, Newfoundland, Canada, the starting point of the trip.

About Stockton Rush

- Rush who was an MBA also had a Bachelor's degree in Aerospace, Aeronautical and Astronautical Engineering from Princeton University. He started his company after spending a few years as a commercial pilot.

- In a 2019 interview, he stressed on ocean exploration over that of space, saying "We're going to colonize the ocean long before we colonize space." While the Titanic expedition was to begin that year, it was delayed after the company failed to secure proper permission for its contracted research support vessel.

- The Titan began deep-sea ventures related to the Titanic in 2021. It has been to the wreckage twice, not including its recent visit.
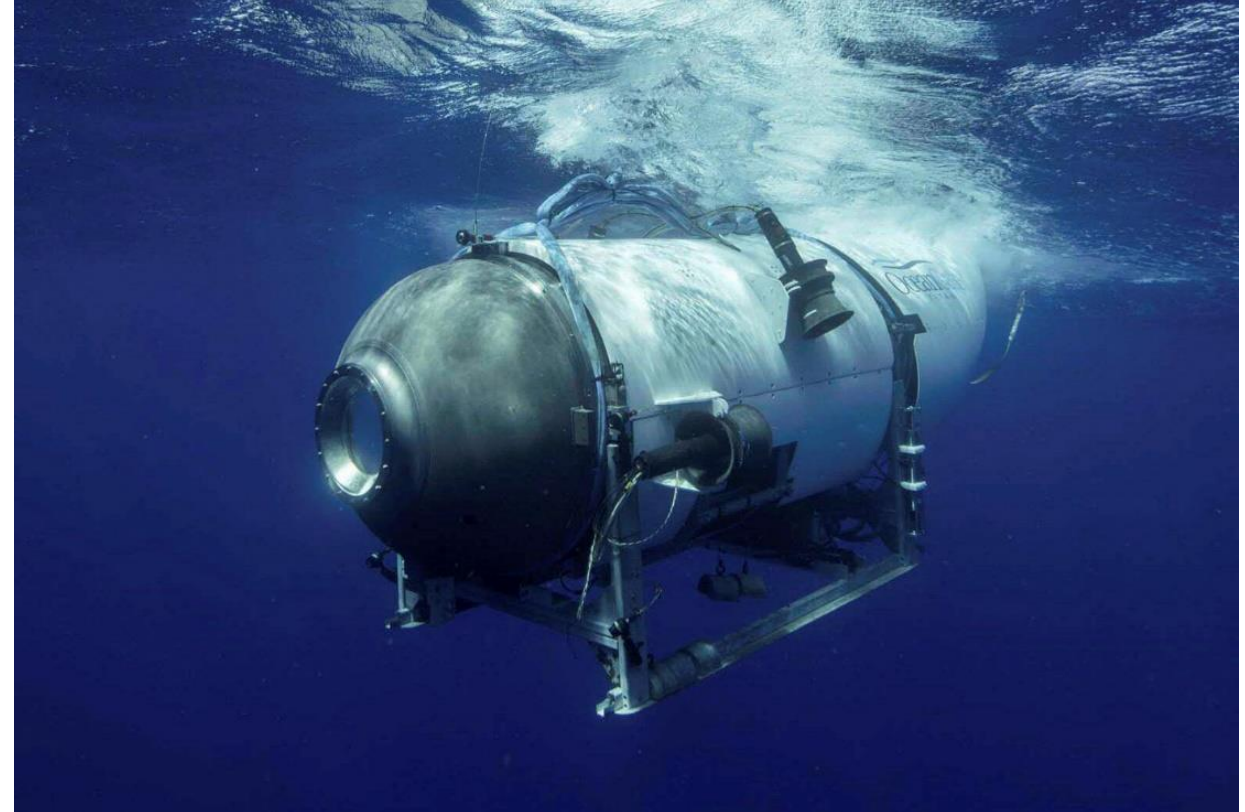
OceanGate's previous expeditions

- OceanGate claims to have completed over 14 expeditions and over 200 dives in the Pacific, Atlantic and Gulf of Mexico.

- It has a fleet of five-person submersibles capable of reaching depths as deep as 4,000 meters. Submersibles, unlike submarines, are not fully capable of staying underwater for long durations. They need the support of a surface vessel, platform, shore team or sometimes a larger submarine.

- Their fleet includes Titan, the submersible that recently imploded, Antipodes, a 5-person submersible that can reach a depth of 305 m and Cyclops 1, that can go up to a depth of 500 m. However, the depth of the Titanic wreckage is greater than that of other expeditions.

- OceanGate offers packages, including for the Bahamas and off the Portugal coast, along with customisable trips.

Relevance: Prelims & Mains Paper III; Disaster Management

prep mate

Why in news?

- The four day-long search for the missing Titan submersible came to a tragic end, with all of the five people on board the vessel believed to be dead. This was announced by the US Coast Guard (USCG).

- Rescuers had uncovered a "debris field" in the area where Titan was travelling to the wreck of the Titanic. These pieces of debris were about half a km away from the bow of the sunken Titanic on the ocean floor.

- The debris found indicates "a catastrophic implosion of the vessel".

How did the submersible implode?

- There is no definitive proof of what happened, but experts assume the implosion happened on the first day of the dive.

- The Titan was made of carbon fiber and titanium, materials thought to withstand the pressure at depths of up to 4,000 m. The craft's hull was designed to protect the crew from the water pressure.

- The water pressure 3,800 m down at the site of the Titanic wreck is roughly 400 atmospheres (6,000 PSI) — about the same as having 35 elephants on your shoulders.

- Experts have questioned the use of titanium and carbon fiber for deep diving, as they have different properties.

- Titanium is elastic and can adapt to ranges of stresses and pressures without permanent strain on the material. Carbon fiber on the other hand is stiffer and non-elastic, often prone to cracking.

- As per an expert, the differences in the materials could have created a defect in the hull, triggering "an instantaneous implosion due to the underwater pressure." It would have killed everyone within less than 20 milliseconds, a speed faster than the brain can even process the information.

Exploring the ocean depths

- This is not the first deep-sea expedition in which tourists have explored the deepest recesses of the ocean.

- In 2012, Canadian filmmaker James Cameron set off on a deep-sea expedition to the deepest point on Earth in the Mariana Trench aboard the submersible Deepsea Challenger. He collected data and footage at depths of around 10,900 m.

- In 2019, American explorer Victor Vescovo set a world record in the Mariana Trench, where he reached 10,928 m.

- Together with billionaire Hamish Harding (passenger on the Titan believed to be deceased), Vescovo also set a world record for the longest time spent in the deepest part of the ocean on a single dive when they spent four hours and 15 minutes navigating the Mariana Trench in 2021.

HISTORY & CULTURE

Maharashtra's Ahmednagar to be renamed Ahilyanagar after the Maratha queen Ahilyabai Holkar

Why in news?

-   Marking the 298th birth anniversary of Maratha queen Ahilyabai Holkar on May 31, Maharashtra CM Eknath Shinde announced that his govt would rename Ahmednagar after her.

-   The city will now be known as Ahilyanagar.

Origin of Ahmednagar's name

-   Located in the Western region of Maharashtra, Ahmednagar has been a part of some prominent kingdoms, starting from 240 BC.

-   In the Medieval period, the region was ruled over by the Rashtrakuta Dynasty, the Western Chalukyas, and then the Delhi Sultanate.

-   In the last case, the rule was not direct, and a revolt by Afghan soldier Alladin Hasan Gangu led to the establishment of the Bahmani kingdom in the Deccan.

-   In the following years, Ahmednagar, then known as Nizamshahi, became one of the five independent kingdoms to emerge from that empire.

-   In 1486, Malik Ahmad Nizam Shah assumed the position of the Bahmani Sultanate's prime minister. He successfully defeated the king of the Bahmani kingdom, who tried to dislodge him from power, in 1490.

-   Four years later, he laid the foundation of a city close to where he had defeated the army, on the left bank of Sina river. This city was named after him: Ahmednagar.   **(more ahead)**

Cont'd

- Nizam Shah also later captured the fort of Daulatabad. Through his kind behaviour, he won the loyalty of the local and foreign Muslims and also of the Maratha peasants and warriors.

- Jawaharlal Nehru, in his book A Discovery of India (1946), wrote of him, "Ahmad Nizam Shah, the founder of Ahmadnagar in 1490, was the son of Nizam-ul-Mulk Bhairi, a minister of the Bahmani kings. This Nizam-ul-Mulk was the son of a Brahmin accountant named Bhairu…Thus the Ahmednagar dynasty was of indigenous origin."

- Since his origin was Hindu, he found no difficulty in winning over the confidence of Brahmins, who were highly regarded by the Hindus.

Who was Ahilyabai Holkar?

- Ahilyabai was born in Chondi village of Ahmednagar to the village head Mankoji Shinde, who ensured that his daughter received an education, which was quite rare at that time.

- It is believed that Malhar Rao Holkar, the army commander to Peshwa Bajirao, spotted eight-year-old Ahilyabai at a temple service in Chondi. Impressed by her devotion and character, he decided to get his son, Khande Rao, married to her.

- After her husband's death in the Battle of Kumbher against the king of Bharatpur in 1754, Ahilyabai took control of Malwa. She excelled at administrative and military strategies under the guidance of her father-in-law, who believed she should lead her people, and not die by Sati after Khande Rao passed away.

- After the death of her father-in-law and son a few years later, she petitioned the Peshwa to become the ruler, backed by the support of her army.

Role in administration and temple-building

- In his book, Nehru said Holkar's rule, which lasted for thirty years (1765-1795), was "almost legendary as a period during which perfect order and good government prevailed and the people prospered. She was a very able ruler and organizer, highly respected during her lifetime."

- Notably, her role in the restoration of Hindu temples is often talked about.

Nehru's name dropped from Teen Murti House museum and library

Relevance: Prelims & Mains Paper I; History & Culture

Why in news?

- The nomenclature of the Nehru Memorial Museum & Library (NMML) situated in the Teen Murti Complex has been changed to Prime Ministers' Museum & Library (PMML).

EXPRESS explained.

A timeline of Teen Murti House

- Built in 1929-30 as part of Edwin Lutyens' imperial capital, Teen Murti House, then known as Flagstaff House, was the official residence of the Commander-in-Chief of the British armed forces in India.

- In August 1948, it became the official residence of India's first Prime Minister, Jawaharlal Nehru, who lived there for 16 years until his death on May 27, 1964. Soon after, the govt decided that the Teen Murti House should be dedicated to him and house a museum and a library.

- On Nehru's 75th birth anniversary on Nov 14, 1964, President S Radhakrishnan dedicated the Teen Murti House to the nation and inaugurated the Nehru Memorial Museum. Two years later, the NMML Society was set up to manage the institution, and has remained in charge since then.

- The society aims to encourage academic research on modern and contemporary history.

New ideas and legacy

- In 2016, PM Modi had proposed the idea of setting up a museum dedicated to all Prime Ministers of India on the premises.

- The idea was met with fierce criticism and opposition from the Congress, with former PM Manmohan Singh even writing a letter to PM Modi, raising concerns over an "agenda" to "change the nature and character" of the NMML and the Teen Murti complex. Notably, Congress president Sonia Gandhi, had submitted her resignation from NMML's membership in 2014, just a week ahead of the swearing in of PM Modi.

- However, the govt played down the doubts, saying that no part of the Nehru Memorial Museum will be touched during or after construction of the new museum, also adding that there should be no controversy over ownership of the land since it "belongs to the govt".

- In 2018, the govt effected major changes to the 34-member NMML Society, appointing BJP leader Vinay Sahasrabuddhe, TV anchor Arnab Goswami, head of Indira Gandhi National Centre for the Arts Ram Bahadur Rai, and former foreign secretary S Jaishankar to the society.

The new museum

- The Pradhanmantri Sangrahalaya was inaugurated by PM Modi in April 2022. The Rs 271-crore museum creates awareness about all 14 prime ministers of the country with ample space for future leaders as well. The space recognises their contributions irrespective of ideology or tenure in office.

- The erstwhile Nehru Museum building is now integrated with the new museum building.

- Incidentally, the Sangrahalaya is now readying a gallery on PM Modi, which is likely to be inaugurated in a few months.

PM Modi gifts Biden Yeats' 'Ten Principal Upanishads'

Relevance: Prelims & Mains Paper I; History & Culture

Why in news?

- PM Narendra Modi recently met the US President Joe Biden and the First Lady Jill Biden at the White House in Washington DC. The first couple which hosted Mr. Modi for a private dinner received a number of gifts from him.

- They include a 7.5 carat lab-grown diamond, an exquisite sandalwood box, and a first edition print of the book The Ten Principal Upanishads from 1937.

- The Ten Principal Upanishads, translated from Sanskrit by Shri Purohit Swami, a scholar of Hindu scripture, and Irish poet WB Yeats, is considered to be one of the best translations of the Upanishads, some of the most important Hindu religious texts.

- Written in the mid-1930s, the book was a product of Yeats' desire to create a translation which is true to the original text while still being accessible for the layperson.

The two categories of Hindu scriptures

- There are broadly two categories of Hindu sacred texts: shruti (loosely translated as "the revealed") and smriti ("the remembered").

- The first category is considered to be the most authoritative and consists of the four Vedas (Rig, Yajur, Sama and Atharva) and accompanying texts. These include Brahmanas (ritual texts), Aranyakas ("forest" or "wilderness" texts), and Upanishads (philosophical texts).

- The second category of Hindu scriptures is less authoritative – in many ways they are considered to be derived from the first – but more popularly known. These include the great epics of Ramayana and Mahabharata, Dharmashastras, Puranas and all other post-Vedic scriptures.

- The Upanishads, also known as the Vedanta – as they signal the end of the total Veda – speculate about the ontological connection between humanity and the cosmos.

- They serve as foundational texts in many traditions of Hindu theology and have hence attracted far more attention than the Vedas themselves.

- Dated to roughly 800-500 BC, the Upanishads discuss concepts such as transmigration, which have today become central to Hindu tradition.

- The Upanishads were given particular importance in Hindu theology by eighth century Hindu scholar Adi Shankara, whose interpretations synthesised the Advaita Vedanta tradition.

- This is a non-dualistic philosophy that has in modern times, under philosophers such as Swami Vivekananda and S Radhakrishnan, become the most dominant force in Hindu intellectual thought.

- This philosophy emphasises on the illusory nature of the transient phenomenal world around us, and puts forth the idea that the brahman is the only and ultimate real.

- Much of the Upanishads, in fact, are concerned with the relationship between the atman, or the distinct, unchanging self of an individual, and the brahman, the ultimate reality in the universe.

- There are ten main (or principal) Upanishads:

• Esha
• Kena
• Katha
• Prashna
• Mundaka
• Mandukya
• Taittiriya
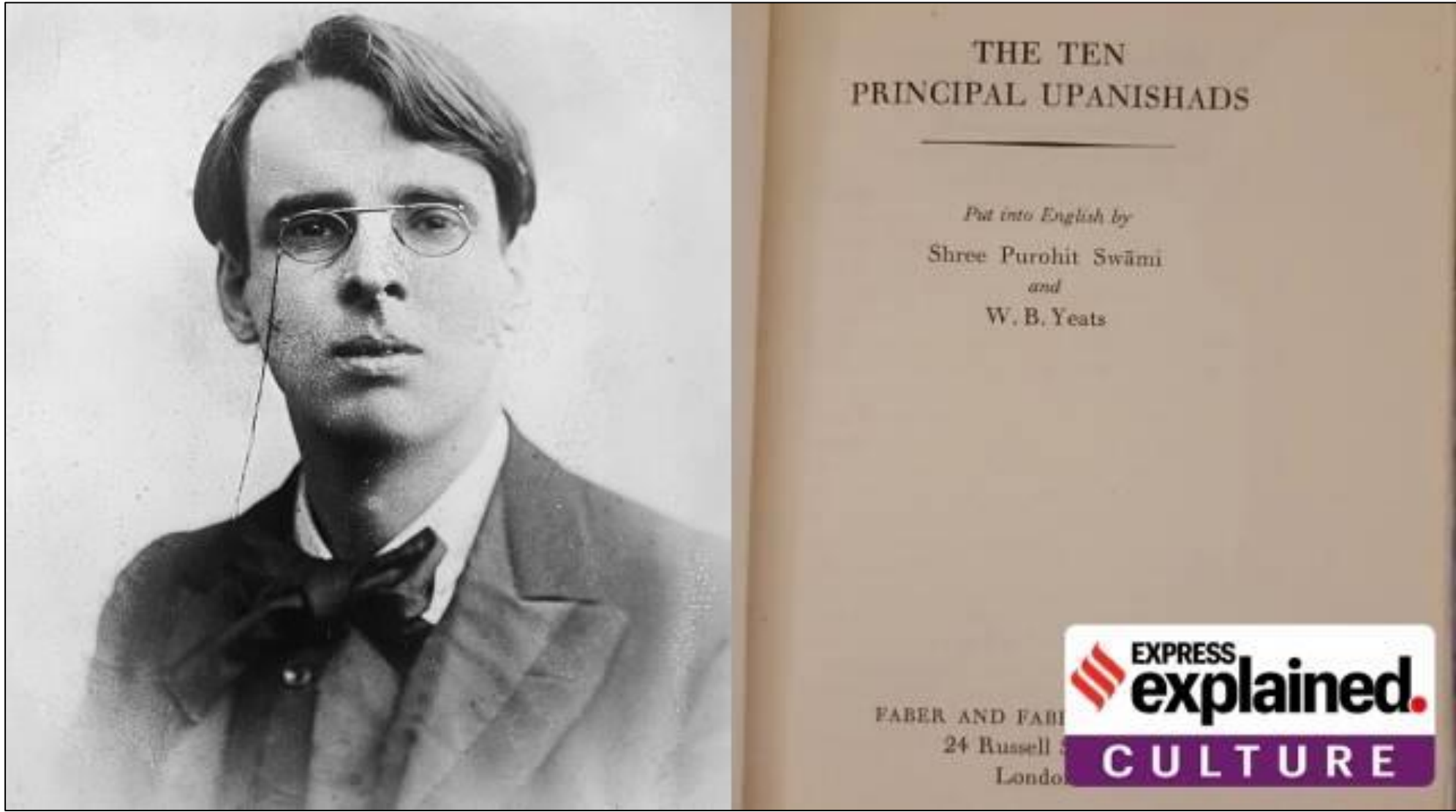• Aitareya
• Chandogya
• Brihadaranyaka

Who was WB Yeats?

- William Butler Yeats (1865-1939) is one of the most influential figures in modern English literature.

- He ranks among the foremost modern poets in English and is the most globally recognisable Irish poet of the 20th century.

- Yeats' work was spread across decades and covered a multitude of themes. While some of his poetry provided insightful political and social commentary, other poems were more complex.

- He was central to what has been termed as the Irish Literary Revival and won the Nobel Prize in Literature in 1923 "for his always inspired poetry, which in a highly artistic form gives expression to the spirit of a whole nation".

Yeats' interest in the Upanishads

- WB Yeats' interest in the Upanishads predates The Ten Principal Upanishads by decades.

- After meeting a prominent Indian theologist in 1885, Yeats wrote three poems (published in 1889) that refered to India: 'The Indian to his Love', 'The Indian upon God', and 'Anushuya and Vijaya'.

- However, WB Yeats' connection to India is perhaps best seen in his friendship with Rabindranath Tagore. They met for the first time in 1912.

- Yeats introduction to Gitanjali was important in bringing the text to the notice of western audiences.

- Yeats then met Purohit Swami in 1930 to whom he pitched the idea to translate the Upanishads for the common people.

- This jointly translated work was first published by a London publishing house in 1937.

THE TEN
PRINCIPAL UPANISHADS

Put into English by

Shree Purohit Swāmi
and
W. B. Yeats

FABER AND FABER
24 Russell
London

Madhya Pradesh govt organizes 'Rani Durgavati Gaurav Yatra'

Relevance: Prelims & Mains Paper I; History & Culture

Why in news?

- The Madhya Pradesh govt. recently organized the six-day Rani Durgavati Gaurav Yatra. It began on June 24 which is marked as a day of sacrifice.

- It is the day when Rani Durgavati is believed to have died while fighting the Mughals in the mid-16th century.

Who was Rani Durgavati?

- Rani Durgavati is said to have been born in 1524, in Mahoba's Chandela dynasty. The region comes under present-day Uttar Pradesh. Her father was Raja Salbahan of Ratha and Mahoba. The Chandelas were known for building the famous Khajuraho temples in the 11th century.

- Durgavati was later married to Dalpat Shah, the son of the Gond King Sangram Shah of the kingdom of Garha-Katanga. This kingdom included the Narmada Valley and parts of northern MP.

- Durgavati was widowed in 1550, a few years after her marriage. Her young son Bir Narayan presided over the throne in name while Durgavati took over the reins.

- Durgavati has been described as a good marksman, skilled at using guns, bows, and arrows.

The Mughal attack on Garha-Katanga

- During her reign, Durgavati fought with Baz Bahadur, the sultan of the neighbouring Malwa who was eventually defeated by Akbar. But the frequent battles between the two adjoining states continued even after the takeover.

- The queen and her generals managed the affairs of the kingdom for 16 years.

- The Mughal governor of Allahabad, Asaf Khan is said to have been sent by Akbar to attack Garha-Katanga. Even left with a small force, Durgavati won the first battle against the Mughal forces.

- However, later, she and her troops got surrounded by the Mughals in a thick forest. While fighting them in battle, she was struck by two arrows and it is believed she stabbed herself with her dagger to not surrender to the Mughal forces. Her son also died in the fighting.

Legacy and present-day politics

- Durgavati today has been championed by politicians as a patriotic ruler who stood by her people, as a defender of her "culture".

- Madhya Pradesh will go to polls later this year. Its tribal population makes up around 21% of the state's total population. It is also the largest tribal population among all Indian states.

- Of the 230 Legislative Assembly Seats in the state, 47 are reserved for members of Scheduled Tribes (STs).

- After the Bhil community, which comprises nearly 40% of the total tribal population comes the Gond tribe, constituting another 34% of the 1.53 crore tribal population.
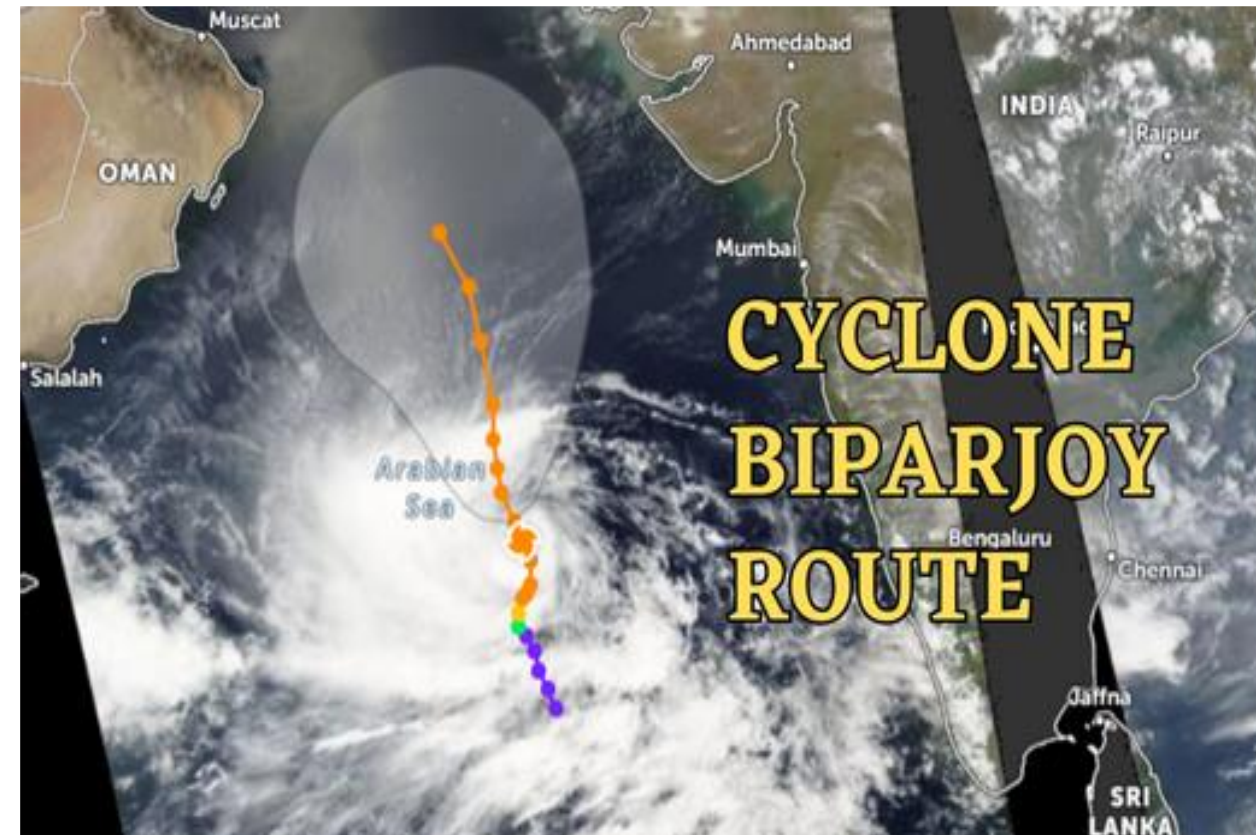
Why in news?

- A cyclonic storm, named Biparjoy, has developed in the Arabian Sea. It is predicted to gain in strength over the next coming days and develop into a very severe cyclonic storm by June 13.

- The Indian Meteorological Department (IMD) has not yet predicted any major impact on countries adjoining the Arabian Sea, including India, Oman, Iran, and Pakistan.

- This cyclone is expected to adversely affect the monsoon to an extent. The IMD announced the onset of the monsoon on Kerala coast on May 8, eight days behind normal schedule. Its northwards progression in the interiors of the mainland could be hampered.

How are cyclones named?

- 'Biparjoy' was suggested by Bangladesh and the word means 'disaster' or 'calamity' in Bengali. The naming of cyclones is done by countries on a rotational basis, following certain existing guidelines.

- Worldwide, there are six regional specialised meteorological centres (RSMCs) and five regional Tropical Cyclone Warning Centres (TCWCs) mandated for issuing advisories and naming of tropical cyclones.

- IMD is one of the six RSMCs to provide tropical cyclone and storm surge advisories to 13 member countries under the World Meterological Organisation (WMO) /Economic and Social Commission for Asia-Pacific (ESCAP) Panel. It includes Bangladesh, India, Iran, Maldives, Myanmar, Oman, Pakistan, Qatar, Saudi Arabia, Sri Lanka, Thailand, United Arab Emirates and Yemen.

- RSMC, New Delhi is also mandated to name the Tropical Cyclones developing over the north Indian Ocean (NIO), including the Bay of Bengal (BoB) and the Arabian Sea (AS).

- So, the tropical cyclones forming over different Ocean basins are named by the concerned RSMCs & TCWCs.

- The WMO/ESCAP Panel on Tropical Cyclones in 2000 agreed in principle to assign names to the tropical cyclones in these seas.

- After deliberations, the naming began in Sept 2004. This list contained names proposed by then eight member countries of WMO/ESCAP PTC, viz., Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand. It was expanded to include five more countries in 2018 — Iran, Qatar, Saudi Arabia, United Arab Emirates and Yemen. The list of 169 cyclone names released by IMD in 2020 was provided by these countries — 13 suggestions from each of the 13 countries.

Rules to be followed while naming cyclones

- The proposed name should be neutral to (a) politics and political figures (b) religious believes, (c) cultures and (d) gender.

- Name should be chosen in such a way that it does not hurt the sentiments of any group of population over the globe.

- It should not be very rude and cruel in nature.

- It should be short, easy to pronounce and should not be offensive to any member.

- The maximum length of the name will be eight letters.

- After Bangladesh, the next cyclone will be named 'Tej' based on India's suggestion.

A rare phenomenon!

- Though there are fewer number of cyclones in the Arabian Sea than the Bay of Bengal, it is not uncommon. In fact, June is one of the favourable months for the formation of cyclones in the Arabian Sea.

- A cyclone is a low-pressure system that forms over warm waters. Usually, a high temperature anywhere means the existence of low-pressure air, and a low temperature means high-pressure wind. In fact, that is one of the main reasons why we see greater number of cyclones in the Bay of Bengal compared to Arabian Sea.

- Bay of Bengal is slightly warmer. Because of climate change, the Arabian Sea side is also getting warmer, and as a result, the number of cyclones in the Arabian Sea is showing an increasing trend in recent years.

- As air warms over hotter regions, it ascends, leading to low pressure at the surface.

prep mate

- As warm air rises and cools, water vapour condenses to form clouds and this can lead to rains. Weather systems formed over the Bay of Bengal in the peak of summer in May are among the strongest in the North Indian Ocean region. Warm seas present ripe conditions for the development and strengthening of cyclones and fuel these systems over the water.

- Historically, the Bay of Bengal has been known for tropical cyclones. But over the years there has been an increase in cyclones forming in the Arabian Sea, as well.

- An analysis of past data of cyclones over the North Indian Ocean from 1891–2020 indicates that the frequency of extremely severe cyclonic storms has increased in recent years over the Arabian Sea since 1990, and remained the same over the Bay of Bengal.

- A 2021 study noted that between 1982 and 2019, a "significant increasing trend in the intensity, frequency, and duration of cyclonic storms and very severe CS" was observed over the Arabian Sea.

- Storms intensify and sustain depending on the energy availability through heat load in oceans and moisture. The aforesaid study has also highlighted that accumulated cyclone energy — total wind energy during the lifespan of a storm — in Arabian Sea has nearly tripled, indicating the extent of warming that it might have undergone in recent years.

SOCIAL ISSUES

Gauhati HC overturns Nagaland govt's notification banning dog meat's sale and trade

Relevance: Prelims & Mains Paper I; Social Issues

Why in news?

- The Kohima bench of the Gauhati High Court recently reversed a 2020 govt notification, which had banned the trade and sale of dog meat in Nagaland.

- In its judgement, the single-judge bench of Justice Marli Vankung made a number of observations on what is considered acceptable for human consumption and the extent to which the state can regulate this.

Govt's notification in question

- The order had been issued on July 4, 2020, by the office of the Chief Secretary of Nagaland. It had banned dog markets, the commercial import and trading of dogs, as well as the commercial sale of dog meat in markets and in dine-in restaurants.

- This had come after a 2014 circular by the Food Safety and Standard Authority of India (FSSAI) stating that the slaughter of any species other than the ones listed in Food Safety and Standards (Food Products Standards and Food Additives) Regulation, 2011 is not permissible.

- The Nagaland government order had stated that the ban was necessary to "regulate the safety of food articles safe for human consumption".

Animals listed in the regulations	Court's comments on this categorisation
- Regulation 2.5.1(a) of the 2011 Regulations defines "animal" as any animal belonging to the species of ovines [sheep family], caprines [goat family], suillines [pig family], bovine [cattle], and including poultry and fish.	- In its judgement, the court observed that the absence of dogs from the listed animals is "not surprising", since the consumption of dog meat in limited to some parts of North Eastern states and since the idea is alien to other parts of the country, the inclusion of dogs in the list would be "inconceivable" since consumption of dog meat "would be considered unthinkable". - However, the court observed that dog meat "appears to be an accepted norm and food amongst the Nagas even in modern times." - Based on the petitioner's submissions, the court noted that the long-standing consumption of dog meat by various tribes in Nagaland has been recorded in multiple texts. - The court also underlined that the definition of 'food' in the FSSA as primarily meaning "any substance, whether processed, partially processed or unprocessed, which is intended for human consumption." The court noted that this definition is "wide and liberal enough" to include dog meat.

The 'Cruelty to animals' factor

- The counsel for respondents People for Animals and Humane Society International/India had argued that dogs have been smuggled and brought into markets in Nagaland "in a pathetic state where dogs are tied and put in gunny bags with their mouth tied for long periods of time with no food or water to drink", and that their trade entails cruelty to dogs.

- The court observed that while photographs submitted by the respondent show that dogs meant for slaughter appear to have been subjected to pain and suffering, this does not justify the ban.

- Instead, the court stated, there can be remedial measures to ensure the enforcement of the Prevention of Cruelty to Animals Act and the Indian Penal Code.

Court's observations on the power of the FSSAI to issue prohibition orders on food items

- The court observed that the authority has been delegated power to ensure the availability of safe and wholesome food for human consumption by making regulations consistent with the FSS Act.

- It also observed that the Duties and Functions of the authority listed in the act does not mention the power issue prohibition orders. It stated that the authority appeared to have acted beyond its duties.

India's efforts to curb unnecessary hysterectomies

Relevance: Prelims & Mains Paper I; Social Issues

Why in news?

- The Union Health Ministry recently urged State govts to audit hysterectomy trends in public and private hospitals.

- This came in response to a Supreme Court petition arguing that women from marginalised locations are at risk of unjustified hysterectomies for economic gains and exploitation.

- The Court also gave a three-month deadline to States, directing them to implement the guidelines previously issued by the Centre.

Criteria for getting a hysterectomy

- The highest percentage of hysterectomies were to treat excessive menstrual bleeding or pain (51.8%); 24.94% for fibroids; 24.94% for cysts and 11.08% for uterine disorder or rupture, according to NFHS-5 data.

- Yet, studies have shown that "many of these causes were considered to be treatable and surgery could be avoided".

- A majority of these cases were reported among socially and economically disadvantaged women.

- The procedure can easily be misused by either private clinics who earn profits (from insurance money) or by contractors in unorganised sectors such as the sugar-cane-cutting industry, where 'wombless women' are the norm to eliminate the need for menstrual care and hygiene among workers.

Measures taken by the govt.

- The Union Health Ministry in 2022 issued guidelines to prevent unnecessary hysterectomies — listing possible indications of when hysterectomy may be required and alternative clinical treatments for gynaecological issues.

- Further, they recommended setting up district, State-level and national hysterectomy monitoring committees to monitor and collect data on age, mortality, and occupations, among other details.

- The monitoring committees are also tasked with creating awareness, among both practitioners and patients, about bodily anatomy, the role of uterus and when hysterectomies are actually indicated.

- A 2017 study from Gujarat found most women assumed that the uterus served no role outside of pregnancy and that removing the uterus would solve their health issues. There is a lack of awareness, experts say, and in the absence of sexual and reproductive health education, "informed consent" to conduct the procedure can never be taken.

- A 2019 investigation found that women from rural areas look at hysterectomies as a way of increasing days of productive work and earning more wages.

- The govt's flagship health insurance programme, the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana provides health cover of ₹5 lakh for 1,949 procedures, including hysterectomies. The govt has authorised 45,434 hospitals to conduct these operations.

An implementation gap!

- The gap thrives in a culture where gynaecological care and disorders — outside of pregnancy — are ignored, experts say.

- The Supreme Court and Centre's reiteration of guidelines came in response to a petition by a public health expert. He argued that despite the provisions, private hospitals in Bihar, Chhattisgarh and Rajasthan are engaged in unethical practices, unnecessary procedures and did not inform women of side effects or take their informed consent.

- Hysterectomies may cause long-term injuries and disabilities, requiring follow-up and post-operative care, both rarely available or affordable.

- In some cases, where hysterectomies are not justified yet still done, women may continue to suffer post-surgery and might need additional surgery.

- As per health experts, if women had pelvic pain due to endometriosis, it might not be solved by hysterectomy alone. In other cases, patients may need medical support such as hormone replacement therapies. But these interventions are limited to private hospitals and remain unaffordable for low-income groups.

World has 50 million 'modern slaves', claims Global Slavery Index 2023

Relevance: Prelims & Mains Paper I; Social Issues

Why in news?

- Last week saw the publication of the Global Slavery Index 2023. According to it, on any given day in 2021, as many as 50 million people were living in "modern slavery".

- Among these 50 million, 28 million suffer from forced labour and 22 million from forced marriages. Of these 50 million, 12 million are children.

What is modern slavery?

- According to the index, "modern slavery" refers to situations of exploitation that a person cannot refuse or leave because of threats, violence, coercion, deception, or abuses of power.

- Modern slavery is an umbrella term and includes a whole variety of abuses such as forced labour, forced marriage, debt bondage, sexual exploitation, human trafficking, slavery-like practices, forced or servile marriage, and the sale and exploitation of children.

- The Sustainable Development Goals (SDGs) of the United Nations also resolve to end modern slavery.

- Target 8.7 of the SDGs states: "Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms."

What is the Global Slavery Index?

The country-wise findings

- The index presents a global picture of modern slavery. It is constructed by Walk Free, a human rights organisation and is based on data provided by the Global Estimates of Modern Slavery, which, in turn, is produced by International Labour Organization (ILO), Walk Free, and International Organization for Migration (IOM).

- This is the fifth edition of the Global Slavery Index and is based on the 2022 estimates.

- However, the initial estimates are regional and to arrive at country-wise estimates, the index uses several representative surveys.

- There are three sets of key findings.

- The first looks at the prevalence of modern slavery. The prevalence refers to the incidence of modern slavery per 1000 population. On this count, the following 10 countries are the worst offenders:

  1.   North Korea
  2.   Eritrea
  3.   Mauritania
  4.   Saudi Arabia
  5.   Turkey
  6.   Tajikistan
  7.   United Arab Emirates
  8.   Russia
  9.   Afghanistan
  10.   Kuwait

- "These countries share some political, social, and economic characteristics, including limited protections for civil liberties and human rights," states the index.

(more ahead)

- Following are the countries with the lowest prevalence of modern slavery:

  1. Switzerland
  2. Norway
  3. Germany
  4. Netherlands
  5. Sweden
  6. Denmark
  7. Belgium
  8. Ireland
  9. Japan
  10. Finland

- However, apart from prevalence, the index also calculates the countries hosting the maximum number of people living in modern slavery. Here the list is as follows:

  1. India
  2. China
  3. North Korea
  4. Pakistan
  5. Russia
  6. Indonesia
  7. Nigeria
  8. Turkey
  9. Bangladesh
  10. United States

- "Collectively, these countries account for nearly two in every three people living in modern slavery and over half the world's population. Notably, six are G20 nations: India, China, Russia, Indonesia, Türkiye, and the US."

Critics don't' agree!

- This index has come in for sharp criticism even from those in the civil society that work on issues such as human trafficking. As per a Thai activist who works to stop women trafficking, a universal, reliable calculation of modern slavery isn't possible because modern slavery has no internationally agreed definition (unlike trafficking in persons which does). "'Modern slavery' is a made-up concept with no international legal definition and, in fact, the definition used in this Index has changed from year to year".

- She adds that the way the authors "estimate" the number of people experiencing modern slavery is partially based on a country's "risk score" which is further based on many of the same factors that are used to determine whether a country is "developed" or "developing."

- She also points out that some of the "so-called statistics" presented in the Index actually contradict qualitative analysis contained within the body of the report. For example, the index prominently displays the UK as having the "strongest govt response to modern slavery." As per her, "ranking countries in this way is stigmatising poorer countries and absolving richer countries of their responsibility for issues like trafficking in persons."

- However, while there may be several issues with an index of modern slavery, the fact remains that workers in countries such as India do face considerable odds. The tortuous reverse migration witnessed during the first Covid lockdown brought this out in discomforting detail. Similarly, poor status of women, especially on the front of economic freedoms, is reflected in metrics such as one of the lowest female labour-force participation rates.

LGBT community gets a new Pride Flag

Relevance: Prelims & Mains Paper I; Social Issues

Why in news?

- The month of June, recognised worldwide as the Pride Month, is marked by many events across India to celebrate the LGBTQIA+ community.

- Most of these events are marked by a flag — a simple red-to-violet rainbow, and in some cases, the more updated version of it, which is known as the Intersex-Inclusive Progress Pride Flag.

- While most organisations in India still use the older rainbow pride flag in their events, the new variation of it is being increasingly accepted as a more inclusive representation for the community.

What is Pride flag?	**History of the pride flag**
- A Pride flag essentially represents the pride associated with LGTQIA+ social movements. For centuries people belonging to the community have had to fight for basic rights in countries across the world. - The struggle continues in many countries. Uganda, for instance, recently passed a law criminalising the LGBTQIA+ community. - In India too, gay sex was decriminalised as recently as 2018. The Pride flag was used by activists, members of the community and allies as a symbol of resistance and acceptance. It was designed by renowned American artist and activist Gilbert Baker.	- The simple rainbow Pride Flag, designed by Baker, made its debut in 1978 at the San Francisco Gay Freedom Parade. The new flag is based on this very flag. - According to Baker, the Rainbow Flag was a "conscious choice, natural and necessary" as it was a symbol of hope in many cultures. Since then, there has been, in spirit of inclusion, a tradition of adding new elements to this flag. - The most significant update of this rainbow flag was in 2017, when social justice advocate Amber Hikes conceptualised a new version of the flag with black and brown stripes to represent people of colour. - In 2018, American graphic designer Daniel Quasar redesigned the flag to include the colours of the transgender flag, blue, light pink and white. Quasar added the transgender colours along with black and brown colours (representing people of colour) in a chevron shape to represent forward movement. - The most recent version of the flag was designed by Valentino Vecchietti in 2021 as an intersex-inclusive Pride flag. A purple circle over a yellow triangle was included in the chevron part of the pride flag. This is a reference to the Intersex pride flag.

prep mate

Why is it called Intersex-Inclusive Progress Pride Flag?

- The intersex has been largely been underrepresented within broader queer narratives. According to the United Nations, intersex people are born with sex characteristics (including genitals, gonads and chromosome patterns) that do not fit typical binary notions of male or female bodies.

- In 2021, Intersex Equality Rights (UK) decided to adapt the Pride Progress flag design to incorporate the intersex flag, creating the Intersex-Inclusive Pride flag. Intersex Equality rights activists did the redesigning.

- The colours yellow and purple are used in the intersex flag as a counterpoint to blue and pink which are traditionally seen as gendered colours.

What do flag's colours signify?

- Red= Life
- Orange= Healing
- Yellow= New Ideas
- Green= Prosperity
- Blue= Serenity
- Violet= Spirit
- Black and brown= people of colour
- White, blue and pink= transpeople
- Yellow with purple circle= Intersex people

Long-term study reveals India's huge diabetes crisis

Relevance: Prelims & Mains Paper I; Social Issues

Why in news?

- The largest, long-term (2008-2020) study on metabolic factors in the Indian subcontinent as part of the ICMR-InDiab study got published recently.

- It was launched in 2008 to estimate the country's NCD (chronic non-communicable diseases) burden, and done over five phases between 2008 and 2020 across the country, with each phase covering five States (all seven northeastern States were covered in one phase).

- Individuals aged over 20 were recruited for the door-to-door survey and 1.24 lakh individuals were part of the survey.

Key findings

- It is estimated that about 11% of the population is diabetic, and 15.3 % of the country is in the pre-diabetic stage. Given that the study was conducted in the most populous nation in the world, the actual numbers are naturally staggering.

- As per these estimates, 101.3 million people in India are diabetic, and in the pre-diabetes stage, there are another 136 million people. Questions are being raised about whether this constitutes an emergent crisis in India and of the urgent methods that need to be employed to handle this situation, and control possible burgeoning of these numbers in the future.

- According to the World Health Organization (WHO), about 422 million people worldwide have diabetes, and 1.5 million deaths are directly attributed to the disease each year.

- Both the number of cases and the prevalence of diabetes have been increasing, and there is a globally agreed target to halt the rise in diabetes and obesity by 2025, as per WHO.

Implications of these statistics

- The thing with metabolic lifestyle disorders, is that with some attention, it is possible to ward off severe complications and a morbid state of life; it is also possible to ensure that the 136 million at the pre-diabetic stage do not proceed to diabetes.

- As per a doctor who conducted this study, the anchor of any intervention programme should be 'prevention' — in the case of diabetics, the aim has to be to prevent the onset of life-threatening complications; and in the case of pre-diabetics, all efforts must be taken to prevent the progress to diabetes, and in rural areas, where the prevalence is still low, the aim should be to keep it that way.

- There are multiple studies that show that poor control of blood sugar leads to complications — cardiovascular disease, kidney disease, neuropathy, blindness, and lower-extremity amputation — which then become a significant cause of increased morbidity and mortality.

- While it is sensible to ensure that there are sufficient facilities to treat the complications, the wise approach would be to launch public awareness campaigns on using lifestyle modifications to keep blood sugar within acceptable limits and complications at bay.

- Education on a mass scale should be launched across the country for control and periodic check-ups, sticking to the recommended drug regimen and reinforcing health-seeking behaviour.

(more ahead)

Cont'd

- Also, while doing the study, researchers encountered a strange phenomenon — that the conversion from pre-diabetes to diabetes was faster in India, in some cases even within six months.

- So immediate attention must be paid to promoting a healthy lifestyle that would lead to retarding the speed of progress to diabetes, or even prevent movement to diabetes.

- Urban India accounts for 16.4% of the prevalence while in the rural population the prevalence is 8.9%. Though the prevalence is lower now, this is an area where the possibility for prevention is greater.

- As traditional lifestyles change and more modern practices take over, it is essential to once again stress on maintaining a healthy diet, getting sufficient moderate to vigorous exercise and periodic testing for those with risk factors and after a certain age group, experts point out.

- Periodic epidemiological screening programmes are very important, they say, to catch new diabetics and bring them into the protective net.

Surprises during the study

- The impression, even among researchers, was that the prevalence was high only in metro cities, They were quite surprised to find that it was similar, or growing in 2-3 tier cities.

- In Kerala, said to be top among States with better social development indicators, the prevalence in rural areas had escalated to surpass that in urban areas.

- This is a side-effect of progress, one that States should be careful to watch over, experts add.

- All the north-eastern States were covered in one phase, and the surprises included high prevalence in Tripura and Sikkim.

- While in Tripura, it was observed that the ethnic composition of the State was different from that of the other States in the region, being populated with Bengalis, leading to a high rate of 13% prevalence; in Sikkim where the prevalence of diabetes and pre-diabetes (31%) was high, it was put down to its smaller size and relatively better socio-economic indicators there.