

Factly Monthly

Compilation

2024

**For UPSC CSE Prelims
Exam**

April, 2024

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Subject: Polity and Nation

National Consumer Disputes Redressal Commission (NCDRC)

Why in the News?

The Supreme Court has issued notice to two members of the National Consumer Disputes Redressal Commission (NCDRC) seeking an explanation from them for issuing non-bailable warrants ignoring a previous interim order of the Supreme Court.

About National Consumer Disputes Redressal Commission (NCDRC)

1. The National Consumer Disputes Redressal Commission (NCDRC) is a quasi-judicial commission which was set up in 1988 under the Consumer Protection Act of 1986.
2. Its head office is in New Delhi.
3. The Commission is headed by a sitting or a retired Judge of the Hon'ble Supreme Court of India or a sitting or a retired Chief Justice of an Hon'ble High Court.
4. The Commission is presently headed by Hon'ble Mr. Justice Amreshwar Pratap Sahi, former Chief Justice of Patna and Madras High Courts.

5. Mandate:

- a) Section 21 of Consumer Protection Act, 1986 posits that the National Commission shall have jurisdiction to entertain a complaint valued more than two crore and also have Appellate and Revisional jurisdiction from the orders of State Commissions or the District fora as the case may be.
- b) Section 23 of Consumer Protection Act, 1986, provides that any person aggrieved by an order of NCDRC, may prefer an Appeal against such order to Supreme Court of India within a period of 30 days.

About quasi-judicial commission

1. A quasi-judicial body is a body which has powers and procedures resembling those of a court of law or judge such as an arbitrator or tribunal board.
2. It is obliged to objectively determine facts and draw conclusions from them so as to provide the basis of an official action.
3. Their powers are usually limited to a very specific area of expertise and authority, such as land use and zoning, financial markets, public standards etc.
4. National Human Rights Commission, National Commission for Women, National Commission for Minorities, etc. are examples of quasi-judicial bodies.

Supreme Court bans uncontrolled soil removal for linear projects

Why in the News?

The Supreme Court has cancelled a notification from the Environment Ministry issued three years ago. This notification exempted the extraction of ordinary earth for linear projects like road and railway construction from needing Environmental Clearance (EC).

What was the notification that exempted earth extraction for Linear Projects?

1. First notification– In 2006, the Environment Ministry released a notification under the Environment (Protection) Act 1986 (EPA), specifying activities necessitating prior Environmental Clearance (EC).
2. Second notification– Later in 2016, a second notification was issued, granting exemptions to certain project categories from this requirement.
3. Third notification– In 2020, a third notification was issued, adding “Extraction or sourcing or borrowing of ordinary earth for linear projects such as roads, pipelines, etc.” to the list of exempted activities.

Basis for Challenging the 2020 Exemption/Notification 1. Violation of Article 14– The exemption faced a challenge in front of the National Green Tribunal (NGT), arguing that permitting unrestricted earth extraction was arbitrary and infringed upon Article 14 of the Constitution of India, as only linear projects were exempted.

2. Violation of SC guidelines on environmental clearance– The petitioner contended that the exemption contradicted the necessity for prior Environmental Clearance outlined by the Supreme Court in the case of Deepak Kumar versus the State of Haryana (2012).
3. Government Response– The Center delayed action on the NGT order until the appellant approached the Supreme Court.

What does the Supreme Court held?

1. Violation of Article 14– The court ruled that the blanket exemption without clear guidance was arbitrary and violated Article 14 because the 2020 notification lacked definitions for ‘linear projects’ and specifics on extraction quantity and area.
2. No extraction limit set– Additionally, it did not clarify environmental authority’s responsibilities or set extraction limits for soil removal.
3. Question government’s haste in notification issuance– The court questioned the government’s haste in issuing the notification, especially during a nationwide lockdown when linear project construction was halted.

New rules for childbirth registration

Why in the News?

The Ministry of Home Affairs has drafted model rules for childbirth registration. These rules must be adopted and notified by state governments before implementation.

What is proposed in the new rules for childbirth registration?

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Specify the religion of both parents separately: a. When registering a child's birth, parents will now need to specify the religion of both the father and mother separately. b. Previously, birth registers only noted the family's religion. c. The new "Form No.1-Birth Report" will include separate sections for the child's religion, as well as the religion of both the father and mother. d. This update also applies to parents of adopted children.

signed in 1976 restricted fishermen from both nations from fishing in each other's exclusive economic zones. However, uncertainty about fishing rights has persists till date.

suSuvidha portal

Why in the News?

Since the announcement of General Elections 2024, over 73,000 applications have been received on Suvidha Portal.

About Suvidha portal

1. The Suvidha portal represents a technological advancement dedicated to upholding the principles of openness, fairness, and transparency in elections, ensuring a fair playing field.
2. This portal was developed by the Election Commission of India (ECI).
3. It operates on first-come-first-served basis.
4. It caters to permissions for organizing rallies, opening temporary party offices, door-to-door canvassing, video vans, helicopters, obtaining vehicle permits, distributing pamphlets.
4. It provides a convenient online system for political parties and candidates to apply for permissions at any time from anywhere. It has offline submission options also, which guarantee universal access.
5. The Suvidha portal enhances the electoral process by offering real-time tracking of applications, updates on status, and SMS notifications. This improves both efficiency and transparency.
6. It also supports the scrutiny of election expenditures by making permission data readily available. Thus it fosters greater accountability and integrity. Read more: Election Commission of India

SC ruling on candidate's right to privacy from voters

Why in the News?

Recently, the Supreme Court ruled that electoral candidates have a right to privacy, asserting that they are not obligated to disclose every detail of their personal and financial history for public scrutiny.

About the judgement

1. It has been held that a candidate's decision to keep private those details which do not pertain to or affect their suitability for public office should not be considered a 'corrupt practice' under Section 123 of the Representation of People Act, 1951. Such non-disclosure would not amount to a "defect of a substantial nature" under Section 36(4) of the 1951 Act.
2. The Supreme Court observed that it is not necessary for a candidate to declare every item of movable property that he or his dependent family members owns.

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3. Items which constitute a sizeable asset in itself or reflects upon the candidature, in terms of his lifestyle, must be disclosed.
4. The Court also highlighted that candidates must declare their assets to enhance democratic participation and ensure voters have the necessary information to make informed choices.
5. It recognized the voters' right to essential information about candidates but also noted the importance of balancing this with the candidates' privacy rights, suggesting that disclosure of every personal detail is not necessary.

Curative Petition

Why in the news?

The Supreme Court has recently set aside the 2017 arbitral award that required the Delhi Metro Rail Corporation (DMRC) to pay nearly Rs 8000 crore to Anil Ambani-owned Reliance Infrastructure. However, exercising curative jurisdiction in a commercial case pushes the envelope and raises questions on the finality of a ruling of the highest court in the country.

About Curative Petition

Description- It is the final and last option for the people to acquire justice. The concept of curative petition originated from the case of Rupa Ashok Hurra Vs. Ashok Hurra and another case (2002). It may be filed after a review plea against the final conviction is dismissed.

Objective- To ensure there is no miscarriage of justice and to prevent abuse of process.

Criteria for admission:-

- 1) It can be entertained if the petitioner establishes that there was a violation of the principles of natural justice.
- 2) It can be admitted where a judge has failed to disclose facts that raise the apprehension of bias.
- 3) A curative petition needs a senior advocate's certification that mentions a good number of reasons to consider it.

Who hears Curative petitions?

- 1) A curative petition must be first circulated to a bench of the 3 senior-most judges, and the judges who passed the concerned judgment (If available).
- 2) It only gets listed for a hearing if most of the judges agree that it is necessary and, ideally, it is heard by the same Bench as before.
- 3) Curative petitions are usually decided by judges privately, unless someone asks for an open-court hearing.
- 4) At any point, the Bench can ask a senior counsel to assist as amicus curiae during the curative petition review.
- 5) If the Bench decides at any point that the petition is baseless and without any merit, it can make the petitioner pay extra costs. Read more-Article 136 of Indian Constitution

signed in 1976 restricted fishermen from both nations from fishing in each other's exclusive economic zones. However, uncertainty about fishing rights has persists till date.

Registration of Births and Deaths (Amendment) Act, 2023

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According to the Registration of Births and Deaths (Amendment) Act of 2023, information on birth and death registrations will be maintained in the national database.

What is Registration of Births and Deaths (Amendment) Act, 2023? This act amended the Registration of Birth and Death (RBD) Act, 1969. According to Registration of Birth and Death (RBD) Act, 1969 a birth or death must be registered within 21 days. If not registered within this period, it can be registered under the RBD Act with an order from a First-Class Magistrate, verifying the details of the event.

Key features of Registration of Births and Deaths (Amendment) Act of 2023

1. National database– According to 2023 act, the birth and death database will be maintained at the national level.
2. Connecting database– It may be used to update various databases including the National Population Register (NPR), electoral rolls, Aadhaar number, ration card, passport, driving license, property registration, and any other databases as notified.
3. Digital records: a. All births and deaths in the country must be digitally registered through the Centre's Civil Registration System portal (crsorgi.gov.in). b. Digital birth certificates issued through this system will serve as a single document to verify the date of birth for various services, including admission to educational institutions.
4. Mandatory data sharing obligation for states– States will be required to register births and deaths on the Centre's Civil Registration System (CRS) portal and to share the data with the Registrar General and Census Commissioner of India (RGI), operating under the Union Home Ministry.

Allocation of symbols to political parties

Why in the News?

This article discusses the allocation of symbols to political parties.

What do the rules specify?

1. Responsible authority- The allocation of symbols in elections falls under the jurisdiction of the Election Commission of India (ECI).
2. Law governed symbol allotment– This process is governed by The Election Symbols (Reservation and Allotment) Order, 1968, which aims to define, reserve, and assign symbols for recognized political parties.
3. Symbols Classification– Symbols are classified as either reserved (reserved solely for recognized parties) or 'free' (accessible to unacknowledged registered parties).
4. Gazette publication– The Election Commission publishes lists of parties along with their symbols in the Gazette of India.
5. Recognised Political party symbol allotment– Exclusive symbols are allocated to recognized national and state parties.
- 6- Unrecognized registered parties symbol allotment– Candidates from unrecognized registered parties can select from free and non-exclusive symbols.

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Note- Rule 10B of the Symbols Order states that a 'registered unrecognized party' can use a common free symbol for two general elections.

Are political parties allowed to express their preferences?

1. The 1968 order gives the Election Commission power to handle symbol selection and allocation for parliamentary and assembly elections, aiming to recognize political parties.
2. Unregistered parties need to provide ten preferred symbols from the commission's list. They can also propose three new symbols with designs and names for consideration by the Commission.
3. These new symbols must meet certain criteria, avoiding similarity to existing symbols and steering clear of religious or communal connections or animal depictions.
4. If a recognized political party splits, the Election Commission decides on symbol allocation.

State vs. Centre: Control Over Industrial Alcohol Excise Duty

Why in the News?

The Supreme Court Constitution Bench started hearing arguments on whether states or the Centre holds exclusive control over regulating industrial alcohol excise Duty.

Excise Duty Levied on Alcohol

Excise duty on alcohol is a major part of a state's income. States often raise additional excise duty on alcohol to boost their revenue. For example, in 2023, Karnataka increased the Additional Excise Duty (AED) on Indian Made Liquor (IML) by 20%.

Note– Currently, excise duty applies only on petroleum and liquor.

However when it comes to 'industrial alcohol,' do states have the authority to regulate and tax it?

Industrial alcohol 1. It is also known as denatured alcohol or ethanol, is alcohol that is not meant for human consumption. 2. It is typically used for industrial purposes such as solvent extraction, fuel, antifreeze, and as a precursor in the production of chemicals and pharmaceuticals.

What are the arguments presented before the bench?

1. **States**– They argue that they possess authority under Entry 8 of the State List in the Constitution, which pertains to "intoxicating liquors," to regulate all types of alcohol, including industrial varieties.
2. **Centre**– The Centre asserts exclusive control over it through the Industries (Development and Regulation) Act, 1951 (IDRA). Entry 52 of the Union List and Entry 33 of the Concurrent List pertain to industries regulated by Parliament in the interest of the public.

Note– Subjects in the Concurrent List can be legislated upon by both states and the Centre. However, if there is a central law, state laws cannot contradict it.

Supreme Court previous judgements

1. In the case of Synthetics & Chemicals Ltd. v. State of Uttar Pradesh (1989), it was established that states do not have the authority to levy taxes on industrial alcohol. However, they retain the power to regulate its usage to prevent misuse for drinking purposes.

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2. In the case of Ch Tika Ramji v State of UP (1956), it was affirmed that states possess the authority to regulate industries listed in the Concurrent List (Entry 33), even if the Centre holds some level of control.

Subject: Indian Economy

Shrinkflation

Why in the News?

Recently, an increasing trend of shrinkflation has been observed in the Indian FMCG industry.

About Shrinkflation

1. About: Shrinkflation is a combination of two words “shrink” and “inflation,”. It refers to the reduction in product size.
2. It is a form of hidden inflation. It occurs when a product’s size decreases as a response to increasing production costs or market competition. For ex- Reducing the size of a chocolate bar from 55 grams to 50 grams but the price remaining the same or cutting the number of days of an internet data pack from two months to 56 days but keeping the price unaltered.
3. Causes: Businesses often resort to shrinkflation primarily due to high production costs and intense market competition. This tactic is primarily used in the food and beverage sectors. It increases the cost per unit to enhance profit margins.
4. Impact: It can complicate accurate inflation assessments. It can potentially drive consumers away if they realize they are receiving less value for the same price.

Gross Fixed Capital Formation

Why in the News?

The failure of private investment to pick up pace has been one of the major issues plaguing the Indian economy.

About Gross Fixed Capital Formation

1. GFCF refers to the growth in the size of fixed capital in an economy. Fixed capital require investment for their creation.
2. GFCF serves as a rough indicator of how much the private sector in an economy is willing to invest.
3. GFCF includes capital formation as a result of investment by the government.
4. Why does it matters:
 - a) GFCF helps in creation of fixed capital that helps to boost economic growth and improve living standards.
 - b) Fixed capital largely determines the overall output of an economy.

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Developed economies such as the U.S. possess more fixed capital per capita than developing economies such as India.

About the trend seen in private investment in India

- 1) In India, private investment began to pick up significantly mostly after the economic reforms of the late 1980s and the early 1990s that improved private sector confidence.
- 2) From independence to economic liberalisation, private investment largely remained either slightly below or above 10% of the GDP. Public investment as a percentage of GDP, on the other hand, steadily rose over the decades from less than 3% of GDP in 1950-51 to overtake private investment as a percentage of GDP in the early 1980s.
- 4) Public investment began to drop post-liberalisation with private investment taking on the leading role in fixed capital formation. The growth in private investment lasted until the global financial crisis of 2007-08. It rose from around 10% of GDP in the 1980s to around 27% in 2007-08.
- 5) From 2011-12 onwards, however, private investment began to drop and hit a low of 19.6% of the GDP in 2020-21.

India allows FIIs to Invest in Green Bonds

Why in the News?

Recently, the Reserve Bank of India (RBI) has allowed investments in the country's Sovereign Green Bonds (SGrBs) by Foreign Institutional Investors (FIIS).

This decision will expand the available capital for the country's ambitious objectives, as committed by Prime Minister Narendra Modi at the 2021 COP26 in Glasgow.

About Foreign Institutional Investors (FIIS) 1. Foreign institutional investors (FIIs) are those institutional investors who invest in assets belonging to a different country other than that where these organizations are based.

2. Investors such as pension funds, mutual funds, insurance companies, banks, and other significant financial institutions from abroad are included in Foreign Institutional Investors (FIIs).

3. FIIs are crucial to a country's financial markets as they enhance liquidity, boost trading volumes, and affect stock prices.

4. These investors deploy their capital into various financial instruments like stocks, bonds, and derivatives, driven by their strategic investment plans and views on market conditions.

5. The capital influx from FIIs can positively or negatively impact the local economy, influenced by factors including market dynamics, governmental policies, and worldwide economic conditions.

6. FIIs in India are governed by the Securities and Exchange Board of India (SEBI), and the Reserve Bank of India (RBI). They also set the investment limits for them.

7. SEBI has over 1450 foreign institutional investors registered with it.

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What are green bonds? 1. Green bonds are bonds issued by any sovereign entity, inter-governmental groups or alliances and corporates with the aim that the proceeds of the bonds are utilised for projects classified as environmentally sustainable.

The framework for the sovereign green bond was issued by the government on November 9, 2022.

3. Green bonds are specifically designed to fund environmentally friendly initiatives. The projects they finance can include renewable energy, energy efficiency, clean transportation, sustainable agriculture, and more.

4. Green Bonds provide investors with an opportunity to support environmentally sound practices, impacting the strategic decisions of the entities issuing the bonds.

They offer a way to mitigate risks associated with climate change and aim to achieve returns that are comparable to, if not better than, traditional investments.

Well Known Trademark

Why in the news?

Recently, the Delhi High Court has recognised “Haldiram” as a well known trademark.

What is a trademark?

It is a distinctive sign or indicator used by a business organisation to distinguish its products or services from those of other entities.

About Well Known Trademark

Statutory recognition-The Trade Marks Act, 1999, provides protection to well-known trademarks to prevent its misuse. It also obligates the Registrar to safeguard them against similar trademarks.

Rights of the owner- A) The owner can prevent others from registering or using identical or similar marks for different goods and services, once a trademark is declared well known.

B) This trademark mark can be licensed or franchised to others. It provides opportunity to the owner to generate an additional source of revenue.

What is the significance of a Well-known Trademark?

1) They are highly valuable assets for businesses. They contribute to brand recognition, consumer trust, and market competitiveness.

2) It provides an additional protection against unauthorized use, even for goods or services that are not directly related to the original trademark. This protection prevent consumer confusion and safeguards the reputation and distinctiveness of the mark. Read more- Intellectual property rights (IPR)

Funding Winter

Why in the news?

Investments from large foreign investors in Indian startups has declined by 80% in 2023. This is because of Indian startup ecosystem's funding winter.

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About Funding Winter

Source-Inc 42

Description- It is a term used to describe a period of reduced capital inflows to startups. It is a cyclical effect that happens due to multiple factors which impact the free flow of investments in the market.

Duration-The duration of a funding winter is unpredictable. It may last for a long time depending on the multiple factors acting upon it.

Factors responsible for funding winter- It can take place due to geopolitical unrest, or monetary policies and financial irregularities in a country. It can also be centric to the relevant sectors.

What is the effect of Funding Winter?

- 1) It is difficult to raise funding and achieve sky-high valuations during funding winter for founders.
- 2) It requires business owners to reset their priorities in terms of profit maximization.
- 3) During funding winter, start-ups take measures to save their working capital.
- 4) Expenditures like the advertisement expenses, capital expenditures, and expansion plans are put on hold in order to increase the sustainability of the firm.

Note- Capital Expenditure- It is money invested by a company to acquire or upgrade fixed, physical or non-consumable assets. Read more- Prabhaav Report on performance of Fund of Funds for Start-ups (FFS)

Electronic Trading Platforms (ETP)

Source- This post on Electronic Trading Platforms (ETP) is based on the article "Unauthorised FX platforms: Need enhanced vigilance by banks" published in "The Hindu" on 9th April 2024.

Why in the News?

Reserve Bank of India (RBI) Governor has raised concerns over unauthorised Electronic Trading Platforms (such as forex trading platforms) and has asked banks to maintain vigil against such illegal activities.

About electronic trading platforms (ETPs)

1. Electronic Trading Platforms- Electronic Trading Platforms (ETPs) are digital systems where transactions involving various eligible instruments such as securities, money market instruments, foreign exchange instruments, or derivatives can be executed. It is distinct from traditional stock exchanges.

2. Issues related to ETPs- a) Unauthorized ETPs engaged in false advertising, promising forex trading opportunities to people living in India.

b) Scams and significant financial damage to individuals by the agents of these unauthorised ETPs who enticed users with promises of lucrative returns from forex trading or investment plans.

4. Actions Taken:

a) RBI framework for authorisation of electronic trading platforms 2018 (ETPs) for financial market instruments regulated by it.

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b) RBI maintains and updates a list of unlicensed forex trading platform and creates awareness among the public regarding the same.

CDP-SURAKSHA

Why in the news?

Indian government has launched a new platform CDP-SURAKSHA. This platform will be employed for disbursing subsidies to horticulture farmers under the Cluster Development Programme (CDP).

About CDP-SURAKSHA

Description-It stands for System for Unified Resource Allocation, Knowledge, and Secure Horticulture Assistance. This is a digital platform which will allow an instant disbursal of subsidies to farmers in their bank account by utilising the e-RUPI voucher from the National Payments Corporation of India (NPCI).

Features of the CDP-SURAKSHA-It has features such as database integration with PM-KISAN, cloud-based server space from NIC, UIDAI validation, eRUPI integration, local government directory (LGD), content management system, geotagging, and geo-fencing.

What is the Significance of the CDP-SURAKSHA?

1) Boost to Horticulture sector-India's horticulture sector contributes nearly one-third to the agriculture gross value addition (GVA). This platform will push the growth of horticulture sector.

2) Departure from old system-It will provide subsidies to farmers at the time of purchasing the planting material unlike old system where a farmer had to buy planting materials on their own and then had to approach the officials concerned for the release of the subsidy.

About Cluster Development Program (CDP)

Description- It is a component of the central sector scheme of National Horticulture Board (NHB).

Launched by- It was launched by the Ministry of Agriculture and Farmers Welfare (MoA&FW) in 2021.

Objective- To leverage the geographical specialisation of horticulture clusters and promoting integrated and market-led development of pre-production, production, post-harvest, logistics, branding, and marketing activities. Read more-Horticulture Cluster Development Programme

Shrinkflation makes its way back into FMCG

Source- This post on Shrinkflation is based on the article "**Shrinkflation makes its way back into FMCG**" published in "The Financial Express" on 15th April 2024.

Why in the News?

Recently, an increasing trend of shrinkflation has been observed in the Indian FMCG industry.

About Shrinkflation

1. About: Shrinkflation is a combination of two words "shrink" and "inflation,". It refers to the reduction in product size.

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2. It is a form of hidden inflation. It occurs when a product's size decreases as a response to increasing production costs or market competition. For ex- Reducing the size of a chocolate bar from 55 grams to 50 grams but the price remaining the same or cutting the number of days of an internet data pack from two months to 56 days but keeping the price unaltered.

3. Causes: Businesses often resort to shrinkflation primarily due to high production costs and intense market competition. This tactic is primarily used in the food and beverage sectors. It increases the cost per unit to enhance profit margins.

4. Impact: It can complicate accurate inflation assessments. It can potentially drive consumers away if they realize they are receiving less value for the same price. Read more: Inflation

Shrimp farming in India

Why in the News?

Recently, a human rights organization based in Chicago has accused India of human rights and environmental violations in the shrimp farming sector.

Shrimp farming Shrimp farming is the practice of cultivating shrimp in controlled environments such as ponds, tanks, or enclosures, typically in marine or freshwater settings. This is done through aquaculture methods to produce shrimp for human consumption.

About Shrimp Farming in India

1. Second Largest producer- India is the second-largest producer of Whiteleg Shrimp (*Litopenaeus vannamei*).
2. Top Exporter to US- India has become one of the world's top shrimp exporters. Its share in the U.S. market increasing from 21% to 40% in 2022-23.
3. Shrimp dominates seafood exports- In 2022-23, Out of the \$8.09 billion exported seafood, shrimp's share was \$5.6 billion.
4. Top producing State- Andhra Pradesh alone account for almost 70% of India's shrimp output.

RBI proposed two new UPI features

Why in the News? RBI recently announced two new features for Unified Payments Interface (UPI) users, aiming to enhance ease of transactions and cash deposits.

What are the new UPI features?

1. Cash deposit facility through the use of UPI- Customers will now have the option to deposit cash at cash deposit machines (CDMs) in banks and ATMs using the UPI app. Presently, cash deposits at CDMs typically necessitate the use of a debit card, whether at banks or ATMs.
2. Allowing third-party apps to access UPI for Prepaid Payment Instruments (PPIs)- Currently, UPI payments from Prepaid Payment Instruments (PPIs) require using the web or mobile app provided by the PPI issuer. It's now suggested to allow using third-party UPI apps for making UPI payments from PPI wallets.

Other measures announced by RBI

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1. Permit FPIs to invest in Sovereign Green Bonds (SGrBs)– To encourage broader participation of non-residents in Sovereign Green Bonds (SGrBs), the RBI has decided to authorize eligible foreign investors in the International Financial Services Centre to invest in these bonds. Currently, foreign portfolio investors (FPIs) registered with SEBI can invest in Sovereign Green Bonds (SGrBs) through various investment routes available for FPIs in government securities.

2. Mobile app for Retail Direct scheme– The RBI will introduce a mobile app for its Retail Direct scheme, launched in November 2021. This scheme allows individual investors to hold gilt accounts with the RBI and invest in government securities.

Note– Gilt Account means an account opened and maintained for holding Government securities.

RBI draft rules for payment aggregators

Why in the news?

The Reserve Bank of India is proposing new regulations for offline payment aggregators (PAs) to enhance safety.

About the payment aggregators: vinodkothari.com

1. About Payment Aggregators (PAs): PAs are entities responsible for enlisting merchants and streamlining the process of collecting payments from customers for the purchase of goods and services. These aggregators unburden the merchants from creating a payment integration system of their own.

2. Methods employed by PAs to collect payments- PAs utilize various payment channels like online QR codes or physical point-of-sale (POS) machines to collect payments on behalf of the merchants. Subsequently, PAs settle the accumulated funds with the respective merchants.

3. Types of PAs: Two major types of PAs are a part of the payments ecosystem in the country: This includes PA-Online Point of Sale (PA-O) and PA – Physical Point of Sale (PA-P).

4. Inclusion of PA – Physical Point of Sale (PA-P) in the revised definition of payment aggregators- The revised definition of payment aggregators has been modified to include physical point-of-sale payment providers such as Innoviti Payments, Pine Labs, and MSwipe. Thus they have been subjected to regulatory oversight.

About new RBI guidelines for payment aggregators

1. Non-bank PoS providers must notify RBI within 60 days and submit authorization applications by May 31, 2025.

2. Banks must close accounts for non-bank payment aggregators by October 31, 2025, unless authorized.

3. Net-worth requirements for PAs facilitating face-to-face transactions have been changed. PAs net worth requirements will be increased to Rs 25 crore by March 2028.

4. Medium merchants, defined as physical or online merchants with annual business turnover of less than ₹40 lakhs who are not registered under the GST, would also have to undergo contact point verification.

5. PAs have to bolster risk management with KYC norms, tailored for small and medium-sized merchants.

6. PAs can now use escrow accounts for both PA-O and PA-P activities, including goods delivery. All PAs must join the FIU to report suspicious transactions.

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7. Starting August 1, 2025, only card issuers and networks can store card data for face-to-face transactions.

Green taxonomy

Why in the news?

The latest RBI's Monetary Policy Report gives primacy to the impact of climate shocks on the economy's financial stability. This reflects RBI's step towards the adoption of the system of green taxonomy, being used by the ASEAN countries.

About green taxonomy

1. About green taxonomy: Green taxonomy is a framework that is used to determine environmentally sustainable investment in the economy. It helps in classification of whether the economic activities as green and environmentally sustainable.
2. Aim: It aims to increase investment in green activities and assets and facilitate the detection of greenwashing practices.
3. Necessity of incorporation of green taxonomies:
 - a) It helps the financial markets to align their investments with the goal of net-zero emissions.
 - b) It also helps in the cultivation of an environmentally sustainable economy. It also helps to reorient capital towards environmentally sustainable economic activities.
4. How RBI and Finance Ministry can utilise green taxonomy:
 - a) The RBI and Finance Ministry can draw lessons from the ASEAN region. The ASEAN countries have adopted a dynamic green taxonomy, which is continuously updated according to the evolving sustainable practices in different sectors.
 - b) RBI has taken positive steps towards green taxonomy by issuing Sovereign Green Bonds and expanding participation in green government securities by Foreign Institutional Investors.

Critical Minerals Summit

Why in the News?

The Ministry of Mines will hold a two day 'Critical Minerals Summit: Enhancing Beneficiation and Processing Capabilities.'

About the Critical Minerals Summit:

1. About Critical Minerals Summit: It will be held from April 29th to April 30th, 2024, at the India Habitat Centre in Lodhi Estate, New Delhi.
2. Organized by: It was organized by Ministry of Mines, Government of India, in collaboration with the Shakti Sustainable Energy Foundation (Shakti), the Council on Energy, Environment and Water (CEEW), and the Indian Institute of Sustainable Development (IISD).

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3. Goal: The goal of the summit is to equip government and industry stakeholders with the knowledge, connections, and tools necessary to accelerate the domestic production of CRMs. This initiative will contribute to India's economic growth and sustainability goals.

4. Purpose: It is organized to promote collaboration, share knowledge, and drive innovation in the field of critical mineral beneficiaries and processing.

5. Features of the summit:

a) Emphasis on eight key minerals: The summit includes technical sessions on eight key minerals, including Glaucosite (Potash), Lithium – Rare Earth Elements (Laterite), Chromium, Platinum Group, Graphite, Tungsten associated with Graphite, Rare Earths (RE), and Vanadium associated with Graphite.

b) Collaboration among various stakeholders: The summit will unite a diverse range of stakeholders from India and abroad, comprising industry leaders, startups, government officials, scientists, academics, and policy experts.

c) Tackle the growing demand for Critical Raw Materials (CRMs): It will address the growing demand for Critical Raw Materials (CRMs) which is essential for renewable energy systems and electric vehicles in line with India's strategic development objectives.

d) Discussions and interactive workshops: Participants will participate in dynamic discussions and interactive workshops addressing vital issues such as mineral auction progress, policy incentives for CRM ecosystem development, and the promotion of commercially viable and environmentally sustainable solutions.

Subject: Science & Technology

Coordinated Lunar Time

Why in the news?

US government has asked NASA to develop a time system for the Moon to ensure that international groups and private companies working in the moon, can synchronize their activities.

About Coordinated Lunar Time

Description-It will provide a time-keeping benchmark for lunar spacecraft and satellites that require extreme precision for their missions. It will also synchronize the communication between satellites, astronauts, bases and the Earth.

Importance-A unified time standard would ensure coordinated operations, reliability of transactions and managing the logistics of lunar commerce.

How does Earth's time standard work?

Most of the world's clocks and time zones follow Coordinated Universal Time (UTC), which is a globally accepted standard for time. UTC is established by the International Bureau of Weights and Measures in Paris, France.

Measurement-

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1) It is tracked by a weighted average of more than 400 atomic clocks placed in different parts of the globe. Atomic clocks measure time in terms of the resonant frequencies. Resonant frequency is the natural frequency of an object where it tends to vibrate at a higher amplitude of atoms such as cesium-133.

2) In atomic time, a second is defined as the period in which a caesium atom vibrates 9,192,631,770 times. As the vibration rates at which atoms absorb energy are highly stable and ultra-accurate, atomic clocks make for an excellent device for gauging the passage of time.

What is the need to develop a time system for the moon?

1) UTC cannot be used to determine time on the Moon. Since there is less gravity on the Moon, time ticks slightly faster as compared to time on the Earth. For ex- an Earth-based clock will appear to lose on average 58.7 microseconds per Earth day with "additional periodic variations. However, even a small difference in time can cause issues for things like spacecraft docking on the moon, timing data transfers, communication, and navigation.

2) With the rise in number of moon missions in future, it will be difficult to synchronize their mission operations standard with each other, and it may lead to collisions. Thus, it is important to have Coordinated Lunar Time. Read more- Chandrayaan-3: Significance and Way Forward

PSLV Orbital Experimental Module (POEM)- ISRO's Zero Debris Milestone

Why in the news?

ISRO's PSLV-C58/XPoSat mission successfully deployed the XPoSat satellite and converted the PSLV's last stage into the POEM-3 module, leaving no debris in Earth's orbit.

About PSLV Orbital Experimental Module (POEM)

1. The PSLV Orbital Experimental Module is a platform that will help perform in-orbit experiments using the final stage of the Polar Satellite Launch Vehicle (PSLV).

2. It was developed by the Vikram Sarabhai Space Centre (VSSC). 3. It was used for the first time in the PSLV-C53 mission in June 2022. ISRO had POEM orbit the earth to perform in-orbit scientific experiments with various payloads onboard.

4. How it works:

a) POEM is powered by solar panels mounted on the fuel tank of the rocket's fourth stage and a lithium-ion battery. b) It has a navigation, guidance, and control (NGC) system to stabilise its altitude along with helium control thrusters. c) The NGC system has four Sun sensors, a magnetometer, and gyroscopes. It also has a telecommand system to communicate with the ground station. d) It communicates to ISRO's NavIC satellite constellation for navigation.

5. Earlier use of PS4 rocket junk: ISRO first demonstrated the capability of using PS4 as an orbital platform in 2019 with the PSLV-C44 mission that injected Microsat-R and Kalamsat-V2 satellites into their designated orbits. The fourth stage in that mission was kept alive as an orbital platform for space-based experiments.

Achievement of POEM-3

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1. ISRO's PSLV C-58 mission successfully launched the XPoSat satellite into a 650 km orbit and converted its fourth stage into the POEM-3 module at 350 km for experiments. 2. It features nine payloads. POEM-3 completed 400 orbits and conducted several experiments over 25 days. 3. After two months, POEM-3 re-entered Earth's atmosphere on March 21, 2024, disintegrating successfully with all objectives met.

Man Portable Anti-tank Guided Missile (MPATGM) Weapon System

Source-This post on Man Portable Anti-tank Guided Missile (MPATGM) Weapon System is based on the article "DRDO & Indian Army conduct successful trials of indigenous Man Portable Anti-tank Guided Missile Weapon System" published in "PIB" on 14th April 2024.

Why in the News?

Recently, DRDO & Indian Army conducted successful trials of indigenous Man Portable Anti-tank Guided Missile Weapon System.

About Man Portable Anti-Tank Guided Missile Weapon System

Aspects Description

About The MPATGM (Man Portable Anti-Tank Guided Missile) Weapon System is a portable missile launcher to engage and destroy enemy tanks and armoured vehicles.

Developed by It was indigenously designed and developed by Defence Research & Development Organisation (DRDO).

Components MPATGM, Launcher, Target Acquisition System, and the Fire Control Unit

Features 1. It is lightweight and portable. Its design allows it to be easily carried and operated by a single soldier. This enhances the mobility of infantry units. 2. The MPATGM system can effectively hit armored targets from a considerable distance, providing infantry with crucial anti-tank functionality on the battlefield. 3. It has versatility and equipped with day/night and top-attack capabilities which enhances its effectiveness across a wide range of operational scenarios. 4. It has dual mode seeker functionality which is a great value addition to the missile capability for tank warfare. Note: The dual-mode seeker combines imaging IR and SAL capabilities into a single system. Read more: Defense Research and Development Organization (DRDO)

Hydrocarbon extraction

Why in the News?

Hydrocarbons have been the foundational elements of crucial energy resources around the globe.

What is hydrocarbon and where are they located?

1. A hydrocarbon is an organic compound made solely of carbon and hydrogen atoms.
2. These naturally occurring substances are the foundational elements of crucial energy resources such as crude oil, natural gas, coal, and others.

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3. Hydrocarbons are primarily located in subterranean rock formations. Hydrocarbons are also found in plants, animals, and their fossils.
4. They exist in various forms such as natural gas, coal, crude oil, and petroleum.
5. These hydrocarbons accumulate in reservoirs underground when a more resistant rock type overlays a less resistant one, creating a lid that causes hydrocarbons to accumulate below it.
6. The primary source of hydrocarbons in this rocky underground is called kerogen, which are lumps of organic matter.

Note: The type of kerogen determines the type of hydrocarbon that is produced.

How are hydrocarbons extracted?

1. Location Determination: Petroleum geologists evaluate rock porosity and permeability to locate hydrocarbon reservoirs.

They identify source rocks rich in kerogen, the main hydrocarbon source, and use data-driven modeling and exploratory drilling to estimate hydrocarbon volumes.

2. Drilling: Drilling and reservoir engineers aim to maximize extraction without harming the reservoir. They drill a production well, the main channel through which hydrocarbons are brought to the surface.
3. Preparation: The plant material is prepared by grinding or breaking it down into smaller pieces for increased surface area.
4. Extraction: The prepared material is placed in the extraction vessel, and the hydrocarbon solvent is passed over it to dissolve the desired compounds.

125 years of Kodaikanal Solar Observatory

Why in the News?

This year (2024) marks the 125th Year of the Kodaikanal Solar Observatory (KoSO).

What is Kodaikanal Solar Observatory (KoSO)?

1. About- It is a solar observatory owned and operated by the Indian Institute of Astrophysics.
2. Origin- The concept of an Indian solar observatory began in the late 19th century, and the government approved the establishment of the Solar Physics Observatory in Kodaikanal in August 1893.
3. Location- Kodaikanal in the Palani hills of Tamil Nadu was picked for the observatory because of its good atmospheric conditions, based on surveys by Charles Michie Smith (a Professor of Physics at the Madras Christian College).
4. Foundation- Lord Wenlock, the Governor of Madras at the time, laid the foundation stone for KoSO in 1895.
5. Systematic observations at KoSO commenced on March 14, 1901.

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6. Instruments at KoSO– Initially, KoSO had telescopes to study sunspots, prominences, and solar radiation. Now, it has advanced instruments like the H-alpha telescope and the White Light Active Region Monitor (WARM) for high solar imaging.

What is the need for such observatory?

1. Great Drought of 1875-1877– The event, caused by low rainfall, highlighted the need for thorough solar studies to understand its effects on weather patterns.
2. India's Geographical significance– India's drought was part of a broader global issue, impacting multiple countries and resulting in widespread famine.

Significant achievements of KoSO

1. The observatory played a crucial role in solar physics, such as identifying the radial motion of sunspots, referred to as the Evershed Effect.
2. Over the years, KoSO broadened its research scope to encompass cosmic rays, radio astronomy, ionospheric physics, and stellar physics.

Unstructured Supplementary Service Data (USSD)

Why in the News?

The Department of Telecom has directed telecom operators to deactivate USSD-based call forwarding by April 15 and transition to alternative methods for reactivation.

The DoT noted that USSD-based call forwarding, particularly the *401# service for unconditional call forwarding, is being misused for inappropriate activities.

What is Unstructured Supplementary Service Data (USSD)?

1. About– It is a communications protocol utilized in Global System for Mobile Communications (GSM) networks for sending short text messages. USSD is similar to Short Message Service (SMS).
2. USSD format: a. A USSD message usually begins with either an asterisk (*) or a hash symbol (#) and ends with a hash symbol (#).
b. These messages consist of digits for commands or data, often separated by additional asterisks. c. USSD messages can contain up to 182 alphanumeric characters.
3. Advantage over SMS– In contrast to SMS messages, USSD establishes a real-time connection throughout a session, enabling a two-way exchange of data sequences. This real-time connection makes USSD faster than SMS-based services.
4. Applications: a. Wireless Application Protocol (WAP) browsing, mobile money services, prepaid callback service, menu-based information services, and location-based content services. b. It is used to show balance deductions on mobile phones, with a notification appearing on the screen after a call or outgoing SMS. c. It is also employed for checking IMEI numbers of mobile devices.

Mother of Dragons Comet

Why in the News?

The “Mother of Dragons” comet, formally designated as Comet 12P/Pons-Brooks, is currently making a rare appearance in the skies of the Northern Hemisphere.

About Mother of Dragons Comet

1. Type- It is as a ‘Halley-type’ comet, orbiting roughly every 71 years.
2. Naming- It is named by the European Space Agency (ESA).
3. Classification- It falls under the classification of a Jupiter-family comet. Its orbit is affected by the gravitational force of Jupiter.
4. Composition- It is made up of ice, dust, and rocky elements. When it approaches the Sun, the heat transforms the comet’s ice from solid to gas.
5. It’s Nearest approach to Earth will occur in June 2024.

Punnett square

Why in the News?

This article explains Punnett squares, which predict the genetic combinations of offspring from two individuals with known genotypes.

About Punnett square

1. The name “Punnett Square” originates from the British geneticist Reginald Punnett who devised the approach in 1905.
2. Biologists use this diagram to figure out the chance of an offspring having a specific genotype.

How does it work?

1. The potential genetic traits of one parent listed on one side, and the traits of the other parent listed on the other side.
2. Each square is filled by combining the traits from each parent. Each square represents a potential combination of traits that their offspring might inherit.
3. It provides a straightforward method for visualizing the likelihood of various traits appearing in the offspring.

Applications

1. It finds frequent applications in biology to understand inheritance patterns, such as the study of dominant and recessive genes typically encountered in school settings.
2. This valuable tool aids in forecasting the potential variations and probabilities arising from crossbreeding.

Shallow fakes

Why in the News?

With Lok Sabha elections starting on April 19, social media is flooded with misinformation, mostly in shallow fakes forms.

What are Shallow fakes?

1. About- Shallowfakes, similar to deepfakes, involves altering people's images, videos, and voice clips for malicious purposes. However, unlike deepfakes, which requires advanced AI software, shallowfakes can be made using basic editing software like Photoshop.
2. Why term "shallow"? – Shallow Fakes are called so because they involve lower-quality image and video editing compared to the sophisticated techniques used in Deep Fakes.
3. Used for: a. To fabricate false proof of identity or address, such as photo ID documents like passports and driver's licenses. b. To produce counterfeit supporting evidence for claims or transactions, such as contracts, agreements, invoices for services, c. Spreading political narratives and defaming opponents, for example, a video depicting AIMIM leader Asaduddin Owaisi singing Shiv Tandav stotra.
4. Impact- Due to their simpler creation process, many experts see shallowfakes as posing greater threats than deepfakes.

India achieves target to eliminate 'Kala-Azar'

Why in the News?

According to data from the National Centre for Vector Borne Diseases Control (NCVBDC) Programme, India has successfully met its goal of eradicating visceral leishmaniasis, commonly referred to as kala-azar.

The National Vector Borne Disease Control Programme (NVBDCP) started in 2003-04 to prevent and control diseases like Japanese Encephalitis (JE), Dengue, Kala-azar, Lymphatic Filariasis, Malaria, and Chikungunya.

Decline in Kala Azar Cases in India

1. According to the most recent data from NCVBDC, India recorded a total of 520 cases of kala-azar in 2023 nationwide, thus fulfilling the elimination criteria established by the World Health Organization (WHO).
2. WHO criteria stipulates that no area within the country should report more than one case per 10,000 people.
3. According to WHO, in 2020, India represented 18% of the world's kala-azar cases.

What is Kala-Azar?

Aspect Details

About 1. Kala-azar, also known as visceral leishmaniasis, is a parasitic disease caused by Leishmania parasites (Leishmania donovani in India). 2. It is a neglected tropical disease and is the second-largest parasitic killer in the world (after malaria).

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Transmission It is transmitted through the bite of infected sandflies.

Symptoms Fever, weight loss, enlargement of the spleen and liver, and anemia

Impact Kala-azar primarily affects the spleen, liver, and bone marrow.

Fatality rate 95%, if left untreated.

Treatment 1. Injectable liposomal amphotericin B is administered. 2. 12-week course of Oral Miltefosine is prescribed for PKDL (Post Kala-Azar Dermal Leishmaniasis).

Note- Post Kala-Azar Dermal Leishmaniasis (PKDL)- It occurs when Leishmania donovani invades and multiplies in skin cells, causing skin lesions. PKDL typically appears after kala-azar treatment.

Strategies Adopted to Eliminate Kala Azar in India

1. Spraying: Intensive indoor residual spraying to target and reduce sandfly breeding grounds.
2. Wall Plastering: Coating walls with a specific soil (Gerrard Soil) to deter sandflies from nesting.
3. Treatment Compliance: Engaging the ASHA (Accredited Social Health Activist) network to oversee treatment completion for PKDL patients.

Three main forms of the Kala-azar

1. Visceral leishmaniasis (VL)- Impacts multiple organs and represents the most severe illness.
2. Cutaneous leishmaniasis (CL) is the most common form, causing skin ulcers, mainly on exposed body parts, which can result in lifelong scars and disability or stigma.
3. Mucocutaneous leishmaniasis destroys mucous membranes in the nose, mouth, and throat, leading to severe damage.

Subject: Environment

Science Based Target Initiative

Why in the News?

The recent decision by the Science Based Targets Initiative (SBTi) to allow carbon offsetting for Scope 3 emissions has sparked controversy and skepticism.

About Science Based Targets Initiative (SBTi)

1. About: The Science Based Targets Initiative (SBTi) is a global initiative that aims to encourage and support companies to set science-based targets (SBTs) to reduce greenhouse gas emissions and limit global warming to well below 2°C above pre-industrial levels.
2. It was established in 2015.
3. Partner organisations: CDP, United Nations Global Compact, We Mean Business Coalition, World Resources Institute (WRI), and the World Wide Fund for Nature (WWF).

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4. Functions: The Science Based Targets initiative (SBTi):

- a) Establishes and encourages exemplary practices in emissions reduction and net-zero goals consistent with climatological research.
- b) Creates frameworks, resources, and guidelines to assist companies and financial institutions in establishing targets based on rigorous scientific evidence.
- c) Evaluates and certifies the targets set by companies and financial institutions through its verification services to ensure they are scientifically grounded.

5. It distinguishes between near- and long-term goals and commitments:

- a) Near-term targets show how organizations intend to reduce emissions over the next 5-10 years, crucial for significant progress by 2030 and a prerequisite for net zero targets.
- b) Long-term targets indicate how organizations need to reduce their emissions to achieve net zero, according to the criteria of the SBTi Corporate Net-Zero Standard, by 2050 at the latest (2040 for the energy sector).

6. SBTi oversees the SBTi Net-Zero Standard which is the world's only framework for corporate net-zero target setting in line with climate science.

About scope 1, 2 and 3 emissions

These scopes are defined by the Greenhouse Gas Protocol to prevent double counting and provide a comprehensive view of their greenhouse gas impacts.

- a) Scope 1 Emissions: This includes direct emissions from owned or controlled sources.
- b) Scope 2 Emissions: This includes indirect emissions from the generation of purchased electricity, steam, heating, and cooling consumed by the organization.
- c) Scope 3 Emissions: This includes other indirect emissions not owned or controlled by the organization.

Global Alliance for Incinerator Alternatives (GAIA) Asia Pacific

Why in the News?

The Global Alliance for Incinerator Alternatives (GAIA) Asia Pacific has called on the ASEAN to take decisive action in response to plastic pollution.

About Global Alliance for Incinerator Alternatives (GAIA) Asia Pacific

1. This is a global network of over 1,000 grassroots groups, non-profits, and individuals.
2. It aims to power a transition away from our current linear and extractive economy and towards a circular system which supports people's right to a safe and healthy environment.
3. Their vision is a fair, zero-waste world that honors ecological boundaries and community rights, ensuring people are not harmed by toxic pollution and that resources are conserved responsibly rather than discarded or incinerated.

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4. Their efforts include combating pollution and promoting regenerative practices in urban areas through local advocacy, policy and financial changes, research, public communication, and coalition-building.

5. They focus on four main areas: stopping incineration, achieving zero waste, reducing plastic use, and tackling climate issues.

About Incineration

1. Incineration is a waste treatment method that burns waste material.

2. Facilities that perform this are often called waste-to-energy plants because they convert waste into energy.

3. This process can reduce the amount of waste significantly, usually decreasing solid mass by 80-85% and volume by 95-96%, depending on what the waste is made of and whether materials like metals are recovered from the ashes for recycling.

4. Despite its effectiveness, incineration has raised environmental concerns, particularly with older facilities that may not have had effective gas cleaning or combustion controls.

5. Contemporary waste-to-energy plants focus on being safe, efficient, and environmentally friendly.

Supreme Court judgment on Forests as a national asset

Why in the News?

Recently, in a judgement the Supreme Court has asserted that forests in India are a national asset and a major contributor to the nation's financial wealth.

About the judgement

1. This judgment is particularly relevant given the ongoing controversy surrounding the Forest Conservation (Amendment) Act of 2023 (FCAA)

2. Highlighting the role of forest, the court held that concepts of carbon credit and green accounting to evaluate a nation's wealth had become a reality.

3. A country with surplus forest cover can sell its additional carbon credits to those lacking in forests. This underlines the significance of forests in contributing to the financial wealth of a country.

4. The judgment said India's forests serve as a major sink of carbon dioxide (CO₂).

The value of mitigation has put a conservative value of \$5 per tonne of CO₂ locked in our forests, this huge sink of about 24,000 mt of CO₂ is worth \$120 billion, or ₹6 lakh crores.

Protective role of forests against climate change

1. The court referred to a 2022-2023 report of the Reserve Bank of India on the macroeconomic impact of climate change and changing patterns of rainfall.

2. These factors could cost the economy 2.8% of its GDP and depress the living standards of nearly half of its population by 2050.

Invasive alien species threatening Natural ecosystem

Why in the news?

In order to manage the rising chital population on Ross Island (now Netaji Subhash Chandra Bose Island), the Andaman and Nicobar administration has sought assistance from the Wildlife Institute of India.

About Invasive Alien Species:

1. Invasive alien species (IAS) are the species which are introduced and/or spread outside their natural past or present distribution threatens biological diversity.
2. These include animals, plants, fungi, and even microorganisms. It can influence all kinds of ecosystems.
3. Characteristics of Invasive Alien Species is described as “arrive, survive and thrive.” These species are introduced either through natural or human intervention. They survive on native food resources, reproduce at a fast rate and edge out native species in the competition over resources.
4. Example of Invasive Alien Species in India: The list of invasive wildlife in India is dominated by certain species of fish such as the African catfish, Nile tilapia, red-bellied piranha, and alligator gar, and turtle species such as the red-eared slider.
5. Impact on Flora: In habitats where there is no competition, invasive species can dominate the entire ecosystem. For ex- The increased population of chital in the Andamans has affected the regeneration of native vegetation, as the deer are known to consume seeds and seedlings.
6. Impact on Fauna: Invasive species act as disruptors in the food chain and disturb the balance of the ecosystem. For ex- In Keoladeo Park, Bharatpur in Rajasthan, the African catfish has been known to prey on waterfowls and migratory birds as well.
7. Impact on economy: In September 2023, the IPBES reported that 37,000 alien species have been introduced globally, adding around 200 new species annually and costing over \$423 billion each year in economic damages. For ex- The cotton mealybug from North America has significantly impacted India’s cotton yields. Read more : Spotted Deer

Manga disease

Why in the news?

The forest department is monitoring an outbreak of mange among a pack of Asiatic wild dogs in the Mudumalai Tiger Reserve (MTR) in the Nilgiris.

About Manga disease

Aspects Details

Description It is a skin disease of animals caused by mite infestations.

Caused by *Sarcoptes scabiei* mite, which also causes human scabies.

Is it contagious? 1. They are transmitted between animals by direct contact and by objects that have been in contact with infected animals. 2. Humans can contract certain types of mange from infected dogs and can temporarily infest human skin, leading to itching and discomfort.

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Symptoms Inflammation, itching, thickening of the skin, and hair loss.

Prevention Prevention includes maintaining a clean environment, disinfect belongings, and avoid contact with infected or stray animals.

Treatment Treatment options aim to eliminate the mites, alleviate symptoms, and promote skin healing. Topical medications are commonly prescribed to target localized mange areas.

About Asiatic Wild dogs

Aspects Description

About 1) It is a member of the family Canidae and the class Mammalia. 2) Asiatic Wild dogs also known as Dhole (Cuon alpinus).

Distribution

1) It is an apex social carnivore in the tropical forests of South and Southeast Asia. 2) In India, Dholes are found in three clusters namely the Western and Eastern Ghats, central Indian landscape and North East India. 3) According to a 2020 study, Karnataka, Maharashtra and Madhya Pradesh rank high in conservation of dhole.

Habitat Dense jungles, steppes, mountains, scrub forests, and pine forests.

Threat Competition and disease transmission from domestic dogs are a threat to this species.

Conservation

status

IUCN Status: Endangered CITES: Appendix II Wildlife Protection Act: Schedule II

Alternate wetting and drying technique

Why in the news?

According to a Food and Agriculture Organisation report 2023, rice paddies contribute 8% of all human-made methane in the atmosphere. The Vietnam farmers are reducing methane emissions by employing alternate wetting and drying technique to grow rice.

About Alternate wetting and drying (AWD)

1. Alternate wetting and drying (AWD) is a water-saving technology that lowland (paddy) rice farmers can apply to reduce their water usage in irrigated fields.
2. In AWD, irrigation water is applied to flood the field a certain number of days after the disappearance of ponded water.

Hence, the field is alternately flooded and dried.

3. The number of days of non-flooded soil in AWD between irrigations can vary from 1 day to more than 10 days depending on the soil type.

4. They also employ large drones to spray organic fertilizer onto the knee-high rice seedlings below.

Benefits of Alternate wetting and drying (AWD)

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1. It produce less methane and thus environment friendly.
2. Using the drone to fertilize the crops saves on labour costs.
3. It also guarantees the precise application of fertilizers. Excessive amounts can lead to the release of nitrogen gases from the soil, contributing to Earth-warming effects.

Aspect Details

Location 1. It is situated within the Yamunanagar District of Haryana, nestled in the foothills of the Shiwalik ranges of the Himalayas. 2. Rajaji National Park, situated in Uttarakhand, is located to the northeast of this park. 3. Simbalbara National Park located in the Shivalik Hills, lies to the north, sharing a border with Himachal Pradesh. Morni Hills can be found to the west.

Unique features 1. The terrain ranges from plains to hills, reaching elevations of up to 700 meters, with narrow valleys known as “khol” scattered between the hills. 2. These valleys contain seasonal rivulets, referred to as “soats,” which typically remain dry for the majority of the year. 3. Within the sanctuary stands the Kalesar Fort, believed to have been constructed during the reign of the Mughal emperor Aurangzeb. 4. The park is renowned for its Dak bungalows, colonial-era administrative architectural structures.

Status It was declared as a national Park in 2003.

River flowing

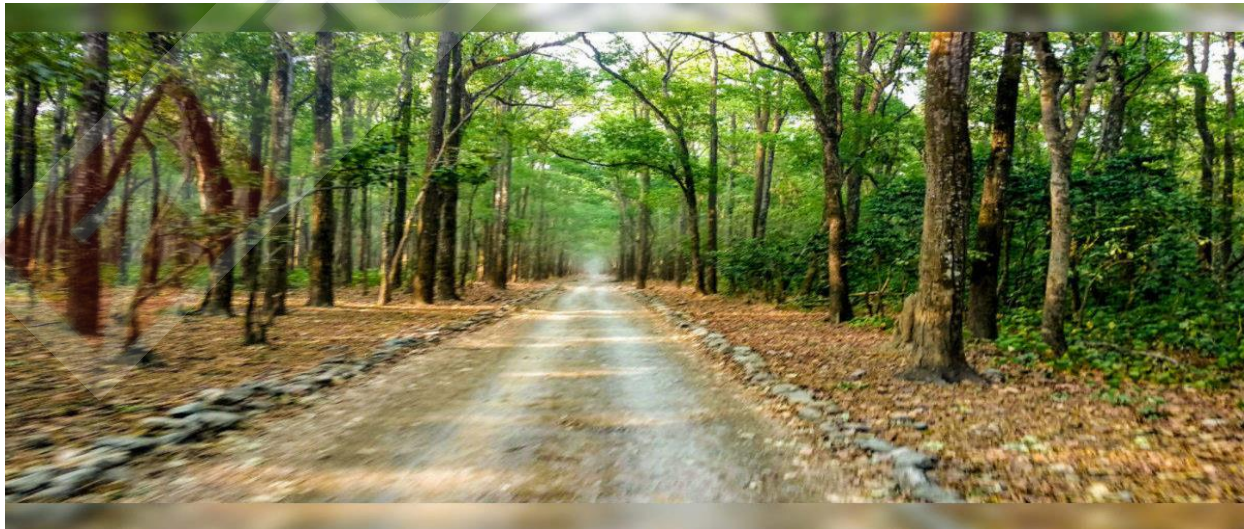
through River Yamuna lies to its east.

Kalesar Wildlife Sanctuary

Why in the News?

The Supreme Court stayed the construction of four proposed dams inside Kalesar Wildlife Sanctuary in Haryana.

About Kalesar Wildlife Sanctuary



Source: Times of India

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Aspect	Details
Location	<ol style="list-style-type: none">1. It is situated within the Yamunanagar District of Haryana, nestled in the foothills of the Shiwalik ranges of the Himalayas.2. Rajaji National Park, situated in Uttarakhand, is located to the northeast of this park.3. Simbalbara National Park located in the Shivalik Hills, lies to the north, sharing a border with Himachal Pradesh. Morni Hills can be found to the west.
Unique features	<ol style="list-style-type: none">1. The terrain ranges from plains to hills, reaching elevations of up to 700 meters, with narrow valleys known as "khols" scattered between the hills.2. These valleys contain seasonal rivulets, referred to as "soats," which typically remain dry for the majority of the year.3. Within the sanctuary stands the Kalesar Fort, believed to have been constructed during the reign of the Mughal emperor Aurangzeb.4. The park is renowned for its Dak bungalows, colonial-era administrative architectural structures.
Status	It was declared as a national Park in 2003 .
River flowing through	River Yamuna lies to its east.
Flora	<ol style="list-style-type: none">1. The majority of the forest is densely populated with tall sal trees.2. Other trees that are found in the forest are Semul, Bahera, Amaltas, Shisham, Khair, Sain, Chhal and Jhingan.
Fauna	It is home to many threatened animals like leopards, Ghoral, Barking deer, Sambar, Chital, Python, King Cobra, Monitor lizard etc.

UPSC Syllabus: Environment

Decreasing trend in solar radiation for electricity in India

Why in the News?

A recent study conducted by the India Meteorological Department (IMD) in Pune has warned of a "decreasing trend" in solar radiation available for electricity conversion in several locations in India.

Findings of the study

1. A recent analysis reveals that there is an alarming decreasing trend in solar radiation available for cost-effective conversion into electricity using solar panels in various locations across India.
2. Factors causing a decreasing trend in solar radiation available for conversion into electricity: The decline is attributed to increased aerosol load and clouding, which are caused by factors such as carbon emissions, fossil fuel combustion, and dust.
3. Why aerosol is a causative factor: The efficiency of solar panels is affected by the sunlight exposure they receive. Aerosols play a role in reducing sunlight's impact by absorbing it and redirecting it away from the Earth's surface. They also contribute to the formation of dense clouds, which further obstruct sunlight.
4. The Solar Photovoltaic (SPV) potential has generally declined across various stations, such as Ahmedabad, Chennai, Goa, Jodhpur, Kolkata, Mumbai, Nagpur, New Delhi, Pune, Shillong, Thiruvananthapuram, and Vishakhapatnam.

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5. Although India's largest solar parks are situated in the northwest region, cities in these regions are also experiencing a decrease in SPV potential.

Status of India's installed solar power capacity

1. Current status of installed solar power capacity: Currently, India's installed solar power capacity stands at approximately 81 GW. This accounts for around 17% of its total installed electricity.

2. Target: The country aims to obtain nearly half of its electricity needs from non-fossil fuel sources by 2030. This would require around 500 GW of power generation.

3. What India is doing to achieve the target:

a) India plans to install at least 40 GW of solar capacity annually from 2021 onwards. India has added about 13 GW in the past five years.

b) The government is expecting the annual addition of solar capacity to range between 25-40 GW in the coming years.

c) Prime Minister Narendra Modi announced a significant initiative to finance rooftop solar installations in at least 1 crore (10 million) households across the nation.

Unclassed Forests in India

Why in the News?

In response to a Supreme Court order, the MoEFCC has uploaded State Expert Committee reports on its website in April. It was done following a PIL challenging the Forest (Conservation) Act Amendment 2023 which raised concerns over the identification of unclassified forests.

About unclassified forests

1. About unclassified forests: The term "unclassified forests" refers to forest areas that fall outside the categories of reserved and protected forests.

2. Unclassified forests are not officially notified: These unclassified forests include both government-owned and privately held lands, as well as community forests. Unlike reserved and protected forests, unclassified forests are not officially notified.

Why these unclassified forests have been a point of concern?

1. Legal Safeguard: Traditionally, unclassified forests benefited from legal protection, as per the T.N. Godavarman Thirumalpad case of 1996. This safeguard prevented their use for non-forest purposes.

2. Forest (Conservation) Act Amendment (FCA) 2023: The FCAA's amendment in 2023 endangered the legal shield of unclassified forests and making them vulnerable to diversion for non-forest activities.

3. Delayed State Expert Committee (SEC) Reports: The SECs were assigned the task of identifying unclassified forests across India. However, a significant delay of 27 years in submitting these reports left the status of unclassified forests ambiguous.

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4. Ministry of Environment, Forests, and Climate Change (MoEFCC) Assurances: The MoEFCC assured that the amended FCAA would apply to SEC-identified unclassified forests, aligning with the Godavarman judgment. However, an RTI inquiry uncovered the lack of necessary reports.

5. Missed Conservation Goals: The failure to identify and protect unclassified forests represents a lost opportunity to fulfil the objectives outlined in the Indian Forest Policy, which aims for 33.3% forest cover in plains and 66.6% in hills.

Clean Energy Transitions Programme

Why in the News?

Recently, the International Energy Agency (IEA) launched the Clean Energy Transitions Programme annual report 2023.

About the Clean Energy Transitions Programme

1. It is the flagship programme launched by IEA in 2017 for taking action to achieve a clean energy transformation worldwide.
2. The program utilizes the Agency's expertise and influence to offer analysis, technical assistance, and capacity building to developing countries for Clean Energy transition.
3. The CETP's work is structured across three pillars of activity:
 - a) supporting emerging and developing countries to establish clean energy transition goals, in line with the objectives of the 2015 Paris Agreement and the Sustainable Development Goals established by the United Nations.
 - b) facilitating coordination among multilateral organisations such as the Group of 20 (G20) and UN-affiliated collaborations.
 - c) to enable and accelerate clean energy transitions at global level.

Caracals

Why in the News?

It has been observed that caracal is on the verge of extinction and thus needs conservation.

About caracal

Aspects Description

About 1) It is a medium-sized wild cat native to Africa, Middle East, Central Asia, and South Asia including India. 2) In India, Caracal is called Siya gosh, a Persian name that translates as 'black Ear'. 3) A Sanskrit fable (short story) exists about a small wild cat named deergha karn or 'long-eared'.

Characteristics 1) The caracal has long legs, a short face, long canine teeth. It has distinctive ears that are long and pointy with tufts of black hair at their tips. 2) It is an elusive, primarily nocturnal animal. Its sightings are not common. 3) It is a carnivore. It typically preys upon small mammals, birds, and rodents. 4) It has traditionally been valued for its flexibility and its extraordinary ability to catch birds in flight.

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Habitat 1) Earlier they could be found in arid and semi-arid scrub forest regions of 13 Indian states. 2) The most significant potential habitat for caracals is in Rajasthan, followed by Gujarat, Madhya Pradesh, Haryana, Uttar Pradesh and Maharashtra.

Threats Large-scale hunting, illegal trading and loss of natural habitats are major threats.

Conservation

status IUCN Red List: Least Concern Wildlife Protection Act, 1972: Schedule I CITES: Appendix I

Criollo: Cattle breed capable of withstanding climate change

Why in the News?

Recently, Irish researchers found that Criollo cattle have adapted well to climate change by thriving in hot and humid conditions, a trait they have developed over many years.

About Criollo cattle

Aspect Details

Origin 1. Originating in the Americas, Criollo cattle descended from cattle introduced by Spanish explorers during colonization. 2. The First cattle in the Americas, from La Gomera in the Spanish Canary Islands, were transported to Hispaniola (now Haiti and the Dominican Republic) during Christopher Columbus's second voyage in 1493.

Physical attributes 1. Compact-bodied cattle of small to medium size. 2. Sporting short, glossy coats, typically found in shades like black, brown, or red.

Adaptability Capable of thriving in various climates, including tropical and subtropical regions, as well as hot and humid areas, and arid, rugged terrains.

Disease Resistance: Developed natural immunity to common diseases like ticks and parasites in their native habitats.

Significance: Criollo cattle serve as a sustainable food source, providing meat and dairy for local communities, while also contributing to sustainable agriculture and conservation efforts in the Americas.

Subject: History and Art & Culture

Fort Emmanuel

Why in the News?

Historians are exploring measures to preserve the laterite-brick remains of Fort Emmanuel, which the Portuguese constructed along the beachfront in 1503.

About Fort Emmanuel

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1. Fort Emmanuel was built in 1503 by the Portuguese. It is one of the earliest European forts built in India.
2. It is a ruined fort located at Fort Kochi Beach in Kochi, Kerala.
3. Fort Emmanuel was a large structure that enclosed an entire township, strengthening Portuguese control in the area.
4. It remained under Portuguese rule until 1683 when it was captured by Dutch colonial forces, who destroyed Portuguese institutions.
5. The Dutch held the fort until 1795, when the British took over and by 1806, had demolished most of its walls and bastions.
6. It was a symbol of the strategic alliance between the Maharajah of Kochi and the Monarch of Portugal, after whom it was named.
7. Foreign control of Fort Kochi ceased in 1947 when India gained independence.

Portuguese strategy of building forts in coastal colonies

1. The Portuguese strategy of building forts in coastal colonies such as Fort Kochi, Goa, Kollam, Kozhikode, and Kodungalloor which were crucial for their defense.
2. These forts not only secured their colonies but also supported their naval capabilities.
3. This fortification was essential for protecting the lucrative trade in spices such as pepper, which the Portuguese exported from Kerala back to Europe.

Pahariyas tribe

Why in the News?

Jharkhand's Pahariya tribe aims to achieve seed independence by depositing native varieties in community-led banks

About Pahariyas tribe

1. The Pahariyas primarily reside in Jharkhand and West Bengal, with smaller populations in Uttar Pradesh, Maharashtra, and Odisha. Some of the Mal Paharia tribes also identify them as Malto, Malti, Maltu, Maler, etc
2. They are forest dwellers and mainly engage in jhum or shifting agriculture.
3. In Jharkhand, the Pahariyas are divided into two groups:
 - a) Mal Pahariya: These individuals inhabit the southern hills of Damin-i-koh and the southern and eastern regions of the Santhal Parganas. They belong to the Proto-Australoid race.
 - b) Shauria Pahariya (or Maler Paharia): This group is predominantly found in the Santhal Parganas. Historically, their main settlement was in the region of Karnataka, but today they are primarily located in the mountainous areas of Rajmahal and Santhal Pargana.

They speak Malto, their native language, which shows influences from Havli and Chharisgarhi languages.

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4. Religious Practices: The Pahariyas worship deities specific to their households, clans, and villages, such as Mait, Maa, Gangadi, Sunadi, Rupadi, and Budharaj. They also believe in naturalism and worship natural objects like sun, river, mountain, tree, animal, birds, plants and bushes.

5. Language: They speak mal Pahariya language. This language is influenced by local dialects Havli and Chharisgarhi. Their language is mixture of Santali, Bengali and Hindi.

Vaikom Satyagraha

Why in the News?

This article talks about Vaikom Satyagraha, which began on March 30, 1924. Lasting for over 600 days, it was the first of many temple entry movements in India.

About Vaikom Satyagraha

1. First anti-caste movement: a. The Vaikom Satyagraha in Travancore, now part of Kerala, is recognized as the first anti-caste movement. b. This campaign aimed to challenge the caste system by opposing restrictions that barred students from depressed classes and untouchables from entering the temple.

2. Origin- The movement began and centered around Vaikom, which was part of the princely state of Travancore, near the Mahadev temple in the Kottayam district of Kerala during 1924-1925.

Background of Vaikom Satyagraha 1. During the AICC (All India Congress Committee) meeting in Kakinada in 1923, T. K. Madhavan, alongside Sardar Panikkar and KP Kesava Menon, presented a petition to the Travancore legislative council. 2. The petition advocated for granting the right to temple entry and worship of gods to all members of society, regardless of caste, creed, or community.

3. Beginning of the Movement- It was launched on 30th March 1924.

4. Prominent Satyagrahis- Kunjappay, Venniyll Govinda Panicker, and Bahuleyan

5. Support to the movement: a. 'Periyar' E.V. Ramasamy was asked to lead the campaign. b. Sikhs from Punjab, known as Akalis, supported by opening a community kitchen (langar) for the volunteers. c. Chattampi Swamikal and Sree Narayana Guru supported the movement. d. Mahatma Gandhi arrived at Vaikom in March 1925 to negotiate a compromise and resolve the issue definitively.

Significance of Vaikom Satyagraha

1. The movement set the stage for the significant Temple Entry Proclamation (1936) by the Maharaja of Travancore, which abolished the longstanding prohibition on marginalized castes entering temples in Travancore.

2. The Vaikom Satyagraha was a testing ground for the Gandhian principles of Satyagraha. It was tested and proved as the most effective means for the first time.

3. This movement were helped in establishing equal rights and curbing discrimination against Scheduled Castes in Indian Society.

Subject: Geography & Places in news

Ringwoodite

Why in the news?

Scientists have recently discovered a hidden ocean which is 700 km below earth's Surface. The ocean is located within a mineral called ringwoodite.

About Ringwoodite

Description-It is a fascinating mineral that exists in the Earth's transition zone.

Formation-It is a rare type of mineral that forms from olivine under very high pressures and temperatures. The heavy weight of rocks hundreds of kilometers thick and extremely high temperatures above 1,000 degrees Celsius (1,832 Fahrenheit) break down water into its components.

Properties- 1) This mineral has a special crystal structure that can soak up water and hydrogen, like a sponge. It can hold a lot of water.

2) When these water-containing minerals reach specific depths, they break down through dehydration, releasing the water to create magmas. Such "dehydration melting" is common in the shallow mantle and forms the source for magmas in many volcanoes.

What is the significance of this discovery?

1) This ocean is much larger than all the surface oceans combined. Its size raises questions about current theories on the source of earth's water and suggests new inquiries into the planet's formation and development.

2) This finding strongly suggests that Earth's water might have come from deep within the planet. With the passage of time, it slowly leaked out from the core, explaining why earth has so much water.

3) This internal water source could also play a role in volcanic activity and the formation of new crust.

Mount Erebus

Why in the news?

Mount Erebus, an active volcano in Antarctica, has been in the news for emitting gold dust valued at \$6000 daily. About Mount Erebus

Description-It is the most southerly active volcano on Earth. It was discovered in 1841 by the British explorer Sir James Clark Ross, who named it after his ship, the Erebus.

Location-It is situated on Ross Island, Antarctica.

Type of volcano-It's a stratovolcano that is characterized by a conical shape and layers of hardened lava, tephra, and volcanic ash.

Lava lake-It is known for its persistent lava lake. The lake has been active since at least 1972 and is one of only a few long-lived lava lakes on Earth.

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Frequency of eruption-It constantly churns and occasionally spews bombs of molten rock in Strombolian eruptions. It is being monitored by satellites, primarily because of its remote location.

What is a Stratovolcano?

Description-It is a tall, steep, and cone-shaped type of volcano. Unlike flat shield volcanoes, they have higher peaks. At the top, stratovolcanoes usually have a small crater. It may hold water, ice, or even a volcanic dome when it's not very active.

Location-They're usually found above subduction zones and are part of big, volcanic areas like the Ring of Fire around much of the Pacific Ocean.

Type of lava-Strata Volcanoes make up about 60% of the Earth's volcanoes. They mostly erupt with andesite and dacite, which are cooler and viscous lavas compared to basalt. These more viscous lavas allow gas pressures to build up to high levels. Therefore, these volcanoes often suffer explosive eruptions.

NOTE-Strombolian eruptions

- 1) They are moderately explosive eruptions of basaltic magma with moderate gas content.
- 2) They consist of intermittent, discrete explosive bursts which eject pyroclasts as high as hundreds of feet into the air in firework-like incandescent rooster-tails. Strombolian eruptions are louder than Hawaiian eruptions, and generally are of more viscous magma.

Volcanic Vortex Rings

Why in the News?

Mount Etna has been producing a volcanic vortex ring which has captivated scientists.

About volcanic vortex ring

1. Vortex rings are generated when gas which is predominantly water vapour, is released rapidly through a vent in the crater.
2. They are made from a mix of smoke, steam and other gases released from volcanic vents at high speeds.
3. The rings can remain in the air for up to 10 minutes but tend to disintegrate quickly if conditions are windy and turbulent.
3. This phenomenon was first observed at Etna and Vesuvius in Italy in 1724.
5. In more recent times, volcanic vortex rings have been observed at volcanoes such as Redoubt in Alaska, Tungurahua in Ecuador, Pacaya in Guatemala, Eyjafjallajökull and Hekla in Iceland, Stromboli in Italy, Aso and Sakurajima in Japan, Yasur in Vanuatu, Whakaari in New Zealand, and Momotombo in Nicaragua.

About Mount Etna

1. Mount Etna is an active volcano on the east coast of Sicily. It is the largest island in the Mediterranean Sea.
2. Etna's peak is the highest in Italy south of the Alps, and is Europe's largest and one of the most active volcanoes.

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3. Etna's summit has five craters, which are responsible for most of the volcano's eruptions; there are also "flank" eruptions that occur out of 300-odd vents of varying sizes along the slopes of the mountain.

4. Since the year 1600, it has experienced consistent activity, including at least 60 flank eruptions and numerous additional summit eruptions.

Paradip Port

Why in the News?

Paradip Port has become the country's highest cargo-handling major port, surpassing Deendayal Port, Kandla, for the first time in 56 years during the financial year 2023-24.

About Paradip Port

Aspect Details

Type Paradip Port is a natural, deep-water port.

Location 1. It is located on the East coast of India in Jagatsinghpur district of Odisha. 2. It is located at the confluence of the Mahanadi river and the Bay of Bengal.

Port Administration The port is managed by the Paradip Port Trust (PPT), an autonomous corporation operating under the Ministry of Shipping through the Major Port Trusts Act, 1963.

Significance 1. Paradip is one of India's major ports and the sole major port in Odisha. 2. It holds the distinction of being the first major port on the East Coast to be commissioned after independence.

Port Administration in India

1. In India, there are three types of ports: major, minor and intermediate.

2. Major ports are managed by the Central Government, while minor and intermediate ports are overseen by nine coastal states of Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Odisha, Tamil Nadu and West Bengal.

3. India has 205 minor and intermediate ports, along with 13 major seaports (12 government-owned and one private), collectively handling substantial business.

Difference between Major and Minor ports

Major Port Minor Port

They are overseen by port trusts and the central government. They are controlled, managed by the state government.

They handle international trade They handle coastal and fishing trade

Example – Mumbai, Paradip Example- Kannur (Kerala)

Kallakkadal: A phenomenon leading to floods in Kerala

Why in the News?

Recently, numerous homes in Kerala's coastal regions have been flooded due to high sea waves, which are referred to as swell waves. These flooding incidents are termed swell surge or Kallakkadal in Malayalam.

What is Kallakkadal?

1. About- Kallakkadal refers to coastal flooding caused by swell waves during the pre-monsoon season (April-May) and sometimes during post monsoon along the southwest coast of India.
2. Meaning: a. The term "Kallakkadal," coined by local fishermen, combines two Malayalam words: "Kallan," meaning thief, and "Kadal," meaning sea. When spoken, these words were combined as "Kallakkadal," signifying the sea arriving like a thief. b. In 2012, UNESCO formally approved this term.

What causes Kallakkadal?

1. Ocean swell and distant storms: a. It is caused by waves formed by ocean swells, which originate from distant storms such as hurricanes or prolonged periods of intense gale winds. b. These storms transfer significant energy from the air into the water, resulting in the formation of extremely high waves. c. These waves can travel vast distances from the storm centre until they reach the shoreline.
2. Formation- Typically, Kallakkadal occurs due to strong winds in the southern Indian Ocean, where ocean swells are generated. These waves then travel northward, taking around two to three days to reach the coastline.

Challenges in its Preparedness

1. Kallakkadal happens suddenly without local wind activity, making it hard for coastal residents to receive advance notice.
2. Yet, systems like the Swell Surge Forecast System, initiated by the Indian National Centre for Ocean Information Services (INCOIS) in 2020, provide a seven-day warning.

How it is different from Tsunami?

Kallakkadal Tsunami

Kallakkadal is a sudden flash flood event that happens without any apparent change in local winds. A tsunami is a massive wave series caused by underwater disturbances.

It is caused by strong winds. It is caused by earthquakes.

Leap Second

Why in the News?

According to a recent study, Earth's changing rotation, influenced by factors such as climate change and geological shifts, may result in clocks skipping a second, potentially leading to the need for a "negative leap second" around 2029.

What is Leap Second?

1. About- It is a one-second adjustment used to address the gradual slowdown of Earth's rotation, caused by the continuous melting and refreezing of ice caps.

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2. Introduced by- International Earth Rotation and Reference Systems Service in 1972.
3. Addition of leap second- It is periodically added to Coordinated Universal Time (UTC) to keep clocks worldwide synchronized with atomic time and to compensate for the Earth's gradually slowing rotation. So far, 27 positive leap seconds have been added.
4. Reason for addition- Earth's rotation on its axis is not consistent; it can speed up or slow down due to factors like the moon's gravitational pull, which leads to ocean tides.
5. Usual date of addition- A leap second is typically added either on June 30th or December 31st.

What is Negative leap Second?

1. About- It is a second that is removed from our clocks to maintain synchronization with the Earth's rotation. So far, no negative leap second has been needed because the Earth's rotation has generally been slightly slower over the past few decades.
2. Administration- The International Earth Rotation and Reference Systems Service (IERS) oversees Earth's rotation and determines when to add or subtract a leap second.
3. Recent impact- Recently, because the Earth has been spinning faster than usual, timekeepers thought about using negative leap seconds for the first time.

Africa's Afar Triangle

Why in the News?

Recent geological discoveries indicate that the Afar Triangle in Africa may become the origin of a new ocean within the next 5 to 10 million years.

About Africa's Afar Triangle

1. The Afar Triangle, located in the Horn of Africa, is a geological depression where three tectonic plates- the Nubian, Somali, and Arabian plates- meet.
2. In addition to its geological importance, the Afar Triangle has a rich palaeontological history, revealing fossils of some of the earliest hominins.
3. It is part of the Great Rift Valley in East Africa.
4. It spans across Eritrea, Djibouti, and the Afar Region of Ethiopia.
5. It contains Lake Assal, which is Africa's lowest point.
6. It is bordered by the Ethiopian Plateau, the Danakil block, the Somali Plateau, and the Ali-Sabieh block.

What are the causes for the rift in Afar region?

Tectonic movements and rift expansion:

1. The Afar region has undergone gradual tectonic shifts over millions of years. In 2005, a big crack appeared in the Ethiopian desert, showing how Africa is still splitting apart due to these forces.

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2. A significant contributor to the rifting process is thought to be a massive plume of superheated heated rocks ascending from the mantle beneath East Africa.

3. The presence of magma in the area, especially around the Erta Ale volcano, provides insights into the tectonic shift.

Note– Rifting is a geological process when the Earth’s outer layer gets stretched and thinned, creating rift valleys or basins. This happens mostly at divergent plate boundaries, where tectonic plates move apart.

Katchatheevu Island

Why in the News?

PM Narendra Modi recently criticized the Congress for giving away the strategic Katchatheevu island to Sri Lanka in the 1970s.

About Katchatheevu Island

1. Location– Katchatheevu is a small, uninhabited island covering 285 acres located in the Palk Strait, between India and Sri Lanka. Katchatheevu lies 33 km northeast of Rameswaram and about 62 km southwest of Jaffna.

2. Sole Structure on Island– The island’s sole structure is St. Anthony’s Church, built in the early 20th century. Every year, during a festival, Christian priests from India and Sri Lanka jointly conduct services, drawing pilgrims from both countries.

3. Lack of potable water source– Katchatheevu is not suited for permanent settlement as there is no source of drinking water on the island.

What is the history of the Island?

1. Formation– It originated from volcanic activity during the 14th century.

2. Administration: a. During the early medieval era, the Jaffna kingdom of Sri Lanka governed it. b. By the 17th century, control shifted to the Raja of Ramnad (present-day Ramanathapuram, Tamil Nadu), who owned Katchatheevu island. Later, it became part of the Madras Presidency.

3. Dispute– In 1921, both India and Sri Lanka, at the time British colonies, claimed Katchatheevu in order to determine fishing boundaries.

What is 1974 Indo-Sri Lankan maritime agreement?

1. In 1974, an agreement signed by Prime Ministers Indira Gandhi of India and Sirima R.D. Bandaranaike of Sri Lanka acknowledged Katchatheevu as part of Sri Lanka’s territory, leading to a change in ownership.

2. The agreement allowed Indian fishermen to access Katchatheevu as before, but didn’t settle fishing rights. Sri Lanka understood that Indian fishermen could only access Katchatheevu for resting, drying nets, and visiting the Catholic shrine without needing a visa.

3. Another treaty signed in 1976 restricted fishermen from both nations from fishing in each other’s exclusive economic zones. However, uncertainty about fishing rights has persists till date.

Subject-International Relations

Washington treaty

About Washington treaty

Description-The Washington Treaty, or North Atlantic Treaty, forms the basis of the North Atlantic Treaty Organization (NATO). It is a short treaty containing only 14 articles.

Date of signing of treaty-The Treaty was signed in Washington, D.C. on 4 April 1949, by 12 founding members.

Authority-The Treaty derives its authority from Article 51 of the United Nations Charter. This article reaffirms the inherent right of independent states to their individual or collective defence.

Collective defence-It means that an attack against one Ally is considered as an attack against all Allies. This is at the heart of the treaty and is enshrined in Article 5.

What is the significance of Washington treaty?

- 1) The Alliance has ensured peace, democracy and prosperity for its members, now counting 32 Allies and one billion people on both sides of the Atlantic
 - 2) Despite the change in the security environment in the last few decades, the original treaty has remained unchanged, and each ally has the potential to implement it according to their capabilities and circumstances.
- Read more-North Atlantic Treaty Organization IPEF's Clean Economy Investor Forum

IPEF Clean Economy Investor Forum

Why in the News?

Recently, the IPEF organized a Clean Economy Investor Forum in Singapore.

About IPEF Clean Economy Investor Forum

1. The IPEF Clean Economy Investor Forum is one of the initiatives under the IPEF. The Forum aims to mobilize investments into sustainable infrastructure, climate technology and renewable energy projects.
2. It brings together the region's top investors, philanthropies, financial institutions, innovative companies, start-ups and entrepreneurs.
3. Managed by: Invest India (India's National Investment Promotion Agency).

What are opportunities for the Indian industry?

The Forum will have opportunity for the Indian industry in the two following track:

- a) Climate Tech Track: This track is open for top climate tech companies and startups from member countries, including India, to present their innovations to global investors. It focuses on recognizing leading enterprises in climate technology.

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b) Infrastructure Track: This track highlights ready-to-invest sustainable projects in energy (solar, wind, hydrogen), transport (EVs, charging stations), and waste management, to be showcased at the 2024 Forum in India.

About Indo-Pacific Economic Framework for Prosperity (IPEF)

1. The Indo-Pacific Economic Framework for Prosperity (IPEF) is an economic initiative launched by U.S.A President Joe Biden in 2022.
2. Objective: It provides a platform for countries in the region to collaborate on advancing resilient, sustainable, and inclusive economic growth, and aims to contribute to cooperation, stability and prosperity in the region.
3. Members: It has 14 partners – Australia, Brunei Darussalam, Fiji, India, Indonesia, Japan, the Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, U.S.A and Vietnam.
4. Nodal agency: Department of Commerce for the IPEF engagements
5. The IPEF comprises four pillars of cooperation namely: Trade, Supply Chain, Clean Economy and Fair Economy. Read more: IPEF agreement

Defence Attache

Why in the news?

India has started to post military and defence attachés to several new countries. This is being done to expand strategic ties with key regions across the globe.

About Defence Attache

Description-A Defence Attache is a member of the armed forces who serves in an embassy as a representative of his/her country's defence establishment abroad. Representation-A Defence Attaché (DA) can represent all branches of the military, but in bigger countries, they may represent an individual service branch, such as an air force or naval attaché.

Duties- A) They have to protect, develop, and promote the defence interests of their country in the nation they are assigned, B) They have to protect, develop, and promote the defence interests of their country in bilateral military and defence relations as well. C) They may be deployed to work on specific issues, like migration.

D) They may serve as part of a military mission with organisations such as NATO, the EU, or the UN.

Designation-They usually operate as the head of the mission or a military adviser. Diplomatic immunity-The Vienna Convention on Diplomatic Relations of April 18, 1961, gives immunity to individuals based on their position in a diplomatic mission. Article 7 of the convention defines the legal status of the Defense Attaché.

What is Vienna Convention on Diplomatic Relations of 1961?

Objective- To ensure that diplomats can conduct their duties without threat of influence by the host government.

Provisions-

A) It outlines the rules of diplomatic relations to facilitate friendly relations between States and to enable States to develop economic, cultural and scientific relations.

B) It provides the legal basis for diplomatic immunity.

Subject-Report & Indices

Glycaemic index (GI)

Why in the News?

Recently a study has found that consuming low glycaemic index diets might prevent the development of type 2 diabetes.

About Glycemic index (GI) and Glycemic load (GL)

1. The glycemic index (GI) ranks foods containing carbohydrates according to their effect on blood glucose levels after eating.
2. High Glycemic Index (GI) foods are digested and absorbed by the body quickly, leading to a rapid spike in blood sugar levels. For ex- Sugary foods and beverages, white bread, potatoes, and white rice.
3. Low and medium GI foods are digested more slowly, causing a more gradual increase in blood sugar levels. For ex- Fruits and vegetables, pulses, and whole grains like porridge oats.

Glycemic Index and Glycemic load advantages

1. The glycemic index (GI) is beneficial for individuals with type 2 diabetes as consuming low GI foods aids in managing blood glucose levels.
2. The glycemic load (GL) evaluates the quality and quantity of carbohydrates in a particular food item and the amount of carbohydrate consumed in one serving.

Findings of the study

- a) People with the highest Glycemic Load (GL) intake faced greater diabetes risks than those with the lowest.
- b) The link between glycemic index (GI) and diabetes risk was notably stronger in individuals with higher body mass indexes (BMIs).

Subject: Defence Exercise in news

DUSTLIK- Military Exercise

Why in the News?

The Indian Army contingent has departed for the 5th edition of India- Uzbekistan joint military Exercise Dustlik.

About Exercise Dustlik

Aspects Description

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About 1. Exercise DUSTLIK is a yearly event conducted alternatively in India and Uzbekistan. 2. The Exercise is scheduled to be conducted from 15th to 28th April 2024 at Termez, the Republic of Uzbekistan. 3. The last edition was conducted at Pithoragarh (India) in February 2023.

Participating Nations India and Uzbekistan

Objectives The aim of Exercise Dustlik is: a) to foster military cooperation and enhance combined capabilities to execute joint operations in mountainous as well as semi-urban terrain. b) to enhance tactical, technical, and procedural interoperability and strengthen defense cooperation and bilateral relations between the two participating nations.

Focus The exercise will emphasize high physical fitness, joint planning, tactical drills, and the basics of special arms skills.

Exercise Poorvi Lehar

Why in the news?

The Indian Navy carried out Exercise Poorvi Lehar on the East Coast under the operational command of the Flag Officer Commanding-in-Chief, Eastern Naval Command.

About Exercise Poorvi Lehar

Description-It is a maritime exercise conducted by the Indian Navy along the East Coast, under the operational direction of the Flag Officer Commanding-in-Chief, Eastern Naval Command.

Aim of the exercise-The exercise is aimed at assessing the ability of the Indian Navy to handle maritime security challenges in the region by testing its procedures.

Participation-The exercise witnessed participation of Ships, Submarines, Aircraft and Special Forces.

Phases-The exercise had different stages. In one part, there was combat training in a realistic scenario, and in another, they successfully fired various weapons to show the Indian Navy's ability to hit targets accurately.

Interoperability-Apart from assets from the Eastern Naval Command, the exercise also included assets from the Indian Air Force, Andaman & Nicobar Command, and Coast Guard. This demonstrated a high degree of interoperability amongst the Services

What is the significance of the Exercise Poorvi Lehar?

- 1) It provided important lessons to the participating forces. This has helped them to prepare themselves in a better way to respond effectively to real maritime challenges in the region.
- 2) It has helped in maintaining continuous Maritime Domain Awareness throughout the Area of operations by using aircraft from diverse locations.

Subject: Science and technology

Rampage Missile

Why in the news?

Israel has recently used the Rampage missile to attack an Iranian military base. Rampage missile is a powerful air-to-surface missile.

About Rampage Missile

Aspect Details

Description It is a long-range, supersonic, air-to-ground, seekerless, precision strike missile.

Developed by It was developed by Israel Aerospace Industries and Israeli Military Industries Systems.

Objective To destroy high-quality, well-protected targets, such as communication and command centres, air force bases, maintenance centres, and infrastructure.

Features 1) Length-It is 4.7m (15.4ft) long and has a total weight of 570kg. 2) Speed-It may travel at supersonic speeds, making it difficult to identify and intercept with air defence systems. 3) Range-It has a range of over 190 miles. 4) Delivery-It can be fired from an aircraft or as a stand-alone system and uses GPS/INS guidance navigation and anti-jamming capabilities. 5) It can adjust its path mid-flight, to precisely hit the target it was programmed to hit. 6) It can operate in any weather conditions, day or night.

Biomarkers

Why in the news?

For the potential detection of cancer in its earlier stages, screening of blood biomarkers is being suggested as a possible method by researchers.

According to the researchers, a new AI-powered test can be used to accurately and quickly detect three major types of cancer, by using only a single spot of dried blood. This dried blood spot can serve as a biomarker for cancer detection.

About Biomarkers

1. According to WHO, Biomarker is defined as any measurement which reflects an interaction between a biological system and a potential hazard. This potential hazard may be chemical, physical, or biological. The measured response is measured in functional, physiological or biochemical terms.
2. It is an objective measurement that captures what is happening in a cell or an organism at a given moment. It is often referred to as molecular markers or signature molecules.
3. Biomarkers consist of biomolecules like carbohydrates, proteins, lipids, genes, DNA, RNA, platelets, enzymes, and hormones.

4. Biomarkers play a crucial role in disease diagnosis, appropriate drug prescription, dosage determination, and drug development.

World Cybercrime Index

Why in the news?

Recently, an international team of researchers has compiled the 'World Cybercrime Index'.

About World Cybercrime Index

1. The 'World Cybercrime Index' identifies the globe's key cybercrime hotspots by ranking the most significant sources of cybercrime at a national level.
2. The index was developed through a collaborative effort between the University of Oxford and UNSW Canberra.
3. It is based on data collected from a survey involving 92 top global experts in cybercrime, who specialize in intelligence and investigations related to cyber activities.
4. It ranks roughly 100 countries and identifies key hotspots according to various categories of cybercrime.
5. The five major categories of cybercrime assessed by the study were technical products/services, attacks and extortion, Data/identity theft, Scams, cashing out/money laundering.
6. Key findings from the World Cybercrime Index:
 - a) Russia tops the list with the highest cybercriminal threat, followed by Ukraine, China, the USA, Nigeria, and Romania.
 - b) The United Kingdom (UK) ranks at number eight in terms of cybercrime threat.
 - c) India was ranked 10th in cybercrime, mostly involving scams that trick people into making advance payments.
 - d) The study indicated that certain types of cybercrime were linked to specific countries. For ex- the U.S.A was predominantly connected with data and identity theft crimes, whereas crimes involving technical products or services frequently traced back to China.
 - e) The study also found that countries that are cybercrime hubs "specialise" in particular categories. For ex- Russia and Ukraine are highly technical cybercrime hubs, whereas Nigerian cybercriminals are engaged in less technical forms of cybercrime.
 - f) The worldwide economic impact of cybercrime is projected to significantly increase over the next four years, escalating from \$9.22 trillion in 2024 to \$13.82 trillion by 2028.

Read more: Cyber attacks and Cyber Security in India

Global Hepatitis Report 2024

Source-This post on Global Hepatitis Report 2024 is based on the article “Why is there a WHO alert on viral hepatitis?” published in “The Hindu” on 15th April 2024.

Why in the News?

Recently, the World Health Organization (WHO) released the Global Hepatitis Report 2024.

About Global Hepatitis Report 2024

1. According to the report, this disease is the second most common infectious cause of death worldwide, claiming 1.3 million lives annually.
2. The number of deaths attributed to viral hepatitis rose from 1.1 million in 2019 to 1.3 million in 2022.
3. Hepatitis B was responsible for 83% of these deaths, while hepatitis C accounted for the remaining 17%.
4. Each day, approximately 3,500 individuals worldwide succumb to infections caused by hepatitis B and C.
5. People between the ages of 30 and 54 bear half of the chronic hepatitis B and C disease burden, with children under 18 accounting for 12% of the cases. Men make up 58% of all cases.

About hepatitis

1. Hepatitis is an inflammation of the liver. It causes liver diseases including acute and chronic infections, liver failure, cirrhosis, and hepatocellular carcinoma.

2. Mode of Transmission: Hepatitis can be spread through infectious means such as viruses, contaminated food and water, and sexual contact, as well as through non-infectious means like excessive alcohol consumption, toxins, certain medications, and specific medical conditions.

The predominant mode of transmission for Hepatitis B is from mother to child, accounting for nearly 90% of cases where the infection is passed on during childbirth.

3. There are five primary strains of the hepatitis virus, identified as types A, B, C, D, and E. Each type causes liver disease but they vary significantly in transmission methods, disease severity, and geographic prevalence.

4. Symptoms: a) Hepatitis B often leads to an acute infection, manifesting symptoms such as nausea, vomiting, and jaundice (yellowing of the skin and eyes) that can last for several weeks.

b) Chronic Hepatitis particularly in children, can cause lifelong liver issues, potentially leading to liver scarring, known as cirrhosis, and an increased risk of liver cancer.

c) Hepatitis C symptoms typically develop two to twelve weeks after exposure and can include jaundice (yellow skin or eyes), loss of appetite, nausea, abdominal pain, fever, dark urine, pale stools, joint pain, and fatigue.

5. Diagnosis and Treatment: According to the report, only 2.4% of Hepatitis B cases have been diagnosed, and none have received treatment. In contrast, 28% of Hepatitis C cases were diagnosed, with 21% undergoing treatment.

Hepatitis B is preventable through immunization and Hepatitis C can be effectively cured using antiviral drugs.

Subject- Schemes and Programs

National Curriculum for Early Childhood Care and Education 2024

Why in the News?

The Ministry of Women and Child Development (MWCD) has released the National Curriculum for Early Childhood Care and Education 2024 titled 'Aadharshila,' on the lines of the National Education Policy 2020 and the National Curriculum Framework.

It is expected to bridge foundational literacy and numeracy gaps which may arise in later school years.

About National Curriculum for Early Childhood Care and Education 2024

1. MWCD has released the National Curriculum for Early Childhood Care and Education 2024 titled 'Aadharshila.
2. Aadharshila (translated as foundation stone) is a detailed 48-week curriculum meant for learning in the age group of three to six-year-olds in anganwadis.
3. The curriculum aiming to develop key skills such as listening, vocabulary, imagination, narration, instruction following, creativity, social skills, self-expression, and self-esteem.

These competencies prepare children for a smooth transition into Grade 1.

4. The program is tailored for different ages, detailing required materials, age-appropriate specifications, variations, and teacher guidelines, including targeted educational objectives and competencies.

Activities are designed to observe and respond to the children's interests.

5. The curriculum is structured around a weekly play calendar. Children aged three to six years participate in this mixed-age group setting at the anganwadi.

6. It starts with four weeks of initiation involving academic activities to ease children's transition from home to the anganwadi center through engaging and playful interactions.

7. This is followed by 36 weeks including varied activities such as exploration, free play, conversations, creative arts, and reflection.

It also includes storytelling focused on themes like conflict resolution and cooperation, along with singing and crafting.

8. Children are introduced to various concepts such as colors, shapes, numbers, sensory uses, body parts, and personal relationships.

9. They also engage in activities that develop listening, basic numerical skills, sound recognition and imitation, and knowledge about seasons, festivals, and food.

10. The last eight weeks focus on reviewing and reinforcing previous learning through worksheets and performance assessments.

Prerana Program

Why in the News?

Recently, the Secretary of the Department of School Education and Literacy (DoSEL) addressed the first alumni meeting of the Prerana Program.

About Prerana Program

1. About: Prerana is an experiential and inspirational learning program for students with the best-in-class technology where heritage meets innovation.

2. Launched by: Department of School Education & Literacy, Ministry of Education, Government of India

3. Aim: To offer a meaningful, unique, and inspiring experience to all participants and empowering them with leadership qualities.

4. Salient Features of the programme:

a) It is a week-long residential program for selected students of class IX to XII.

b) PRERANA started in the pilot phase from January to February 2024 in the Vernacular school at Vadnagar, Mehsana, Gujarat. The 6th batch will start from 15th April 2024.

c) In this phase, the Prerana program has been held for five batches of 20 participants each from five states and one Union Territory.

d) Prerana combines experiential learning with cutting-edge technology, bridging traditional heritage with modern innovation.

e) The curriculum is built around nine core values: Dignity and Humility, Valor and Courage, Hard Work and Dedication, Compassion and Service, Diversity and Unity, Integrity and Purity, Innovation and Curiosity, Faith and Trust, and Freedom and Responsibility.

f) These themes aim to instill a deep respect for India's diverse culture and promote the philosophy of "Vasudhaiva Kutumbakam" (the world is one family).

g) The day-wise program includes yoga, mindfulness, and meditation, alongside thematic experiential learning and engaging hands-on activities.

Evening activities will include visits to ancient and heritage sites, inspirational film screenings, mission life creative activities, talent shows etc. ensuring a holistic learning approach.

Subject: Science and technology

How a beam of sunlight was directed on Lord Ram's forehead in Ayodhya temple

Why in the News?

A three-minute-long Surya Tilak ceremony was performed in Ayodhya's newly built Ram temple, marking the occasion of Ram Navami. The ritual symbolises the Sun God's blessings.

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How did technology help Ram Lalla's Surya Tilak?

1. The system is an optomechanical setup designed to focus sunlight directly onto an idol's forehead using a specialized arrangement of lenses and mirrors.
2. It was developed by scientists from the Central Building Research Institute (CBRI) in Roorkee.
3. It includes an infrared filter made from heat-absorbing material at the aperture to block high-energy photons, protecting the idol from heat damage.
4. This aperture allows sunlight to enter the sanctum sanctorum ('garbhagriha') precisely when aligned.
5. The sunlight, passed through the filter, is then concentrated via four lenses and mirrors inside brass pipes angled to direct a single beam onto the idol.
6. To minimize light scattering, the interior surfaces of these components are coated with black powder.
7. The system operates without batteries or electronic devices and can be manually adjusted to ensure longevity and continuous use.

Surya Tilak in other temples in India

- a) Suriyanar Kovil Temple (Tamil Nadu): It was built between 11th-12th centuries, sunlight illuminates specific areas throughout the year, including the deity Suriyanar and his consorts.
- b) Nanarayanawamy Temple (Andhra Pradesh): Sunlight bathes the Matsya avatar of Lord Vishnu from feet to navel progressively during the five-day Surya Puja Mahotsavam festival.
- c) Mahalakshmi Temple (Maharashtra): During the biannual Kiranotsav festival, rays of the sun grace the feet of Goddess Mahalaxmi's idol.
- d) Koba Jain Temple (Gujarat): Each year, during the Surya Abhishek event, the forehead of the Mahaveerswami statue is lit by direct sunlight for three minutes precisely at 2:07 pm.
- e) Unav Balaji Surya Temple (Madhya Pradesh): This temple is designed such that during its annual festival, the first rays of the sun align perfectly to illuminate the deity in the innermost sanctum.
- f) Konark Sun Temple (Odisha): The architectural design of this temple allows the sun's first rays to enter the main entrance and reach the deepest sanctum.
- g) Gavi Gangadhareshwara Temple (Karnataka): On Makar Sankranti, sunlight penetrates this cave temple, lighting up the Nandi and subsequently the Shivlingam.

Exo-Atmospheric Interception

Why in the News?

As tensions between Iran and Israel intensified, a video went viral on social media depicting an Exo-atmospheric interception by Israel.

About Exo-Atmospheric Interception or anti-ballistic missiles

1. About: Exo-atmospheric missiles are surface-to-air missiles designed to counter incoming ballistic missiles. They are also known as anti-ballistic missiles (ABMs).

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2. They are designed to intercept and destroy any type of ballistic threat during the mid-course or terminal phase of their trajectory.
3. They are specifically designed to counter intercontinental ballistic missiles (ICBMs). It operates beyond the Earth's atmosphere.
4. Features: a) It is equipped with advanced technology including infrared sensors and radar systems to detect and track incoming ballistic missiles and terminate them.
b) It travels at a hypersonic speed.
c) These missiles are guided by an inertial navigation system that is updated during flight using contour maps stored in the system's computerized memory.
d) It uses a three-stage solid rocket booster to propel itself out of Earth's atmosphere at near-hypersonic speed.
e) After reaching into space, it activates its sophisticated sensors to identify and track the incoming target.
They have an inbuilt rocket motor to navigate towards the target with exceptional accuracy.

Man Portable Anti-tank Guided Missile (MPATGM) Weapon System

Why in the News?

Recently, DRDO & Indian Army conducted successful trials of indigenous Man Portable Anti-tank Guided Missile Weapon System.

About Man Portable Anti-Tank Guided Missile Weapon System

Aspects Description

About The MPATGM (Man Portable Anti-Tank Guided Missile) Weapon System is a portable missile launcher to engage and destroy enemy tanks and armoured vehicles.

Developed by It was indigenously designed and developed by Defence Research & Development Organisation (DRDO).

Components MPATGM, Launcher, Target Acquisition System, and the Fire Control Unit

Features 1. It is lightweight and portable. Its design allows it to be easily carried and operated by a single soldier. This enhances the mobility of infantry units. 2. The MPATGM system can effectively hit armored targets from a considerable distance, providing infantry with crucial anti-tank functionality on the battlefield. 3. It has versatility and equipped with day/night and top-attack capabilities which enhances its effectiveness across a wide range of operational scenarios. 4. It has dual mode seeker functionality which is a great value addition to the missile capability for tank warfare. Note: The dual-mode seeker combines imaging IR and SAL capabilities into a single system.

Operation Meghdoot

Why in the News?

April 13, 2024, marks 40 years since the Indian Army preemptively seized the Siachen Glacier on the Saltoro Ridge.

About Operation Meghdoot

1. Operation Meghdoot was the Indian Armed Forces' operation that commenced on April 13, 1984, to seize control of the Siachen Glacier which is a strategically significant area in Northern Ladakh.
2. The glacier had been a point of contention between India and Pakistan following the ambiguous delineations of the 1949 Karachi Agreement.
3. This military campaign was led by Lieutenant General Manohar Lal Chibber, Lieutenant General PN Hoon, and Major General Shiv Sharma. It marked the first combat use of the world's highest battlefield.
3. The operation was India's assertive response to counter what it viewed as Pakistan's "cartographic aggression" in the undefined territory north of the NJ9842 map reference, which was the last demarcated point on the Line of Control (LoC) agreed upon by New Delhi and Islamabad.
4. Prompted by intelligence of an impending Pakistani military operation, India moved to preemptively secure the high-altitude passes of Sia La and Bilafond La.
5. The operation involved complex coordination between the Indian Army and the Air Force, deploying troops and dropping supplies via airlift to strategic heights.
6. The successful execution of Operation Meghdoot not only precluded Pakistani control over the crucial passes but also resulted in complete Indian dominion over the Siachen Glacier.

IAF's Role and Evolution in Operation Meghdoot

1. The Indian Air Force (IAF) has played a crucial role in Operation Meghdoot using transport and helicopter aircraft to move troops and supplies.
2. Over time, the IAF expanded its role to include fighter aircraft like the Hunter, MiG-23s, and MiG-29s, operating from high-altitude bases in Leh and Thoise.
3. This expansion allowed for fighter sweeps and simulated bombing runs over the glacier, boosting morale and deterring adversaries.
4. In 2009, the IAF introduced the Cheetal helicopters, specifically modified for high-altitude performance, to its fleet.
5. A notable demonstration of its enhanced capabilities came in 2013 when a Lockheed Martin C-130J Super Hercules successfully landed at Daulat Beg Oldie, the highest airstrip in the world located near the Line of Actual Control in Ladakh.
6. Presently, the IAF employs a diverse array of aircraft, including the Rafale, Su-30MKI, Chinook, and Apache, to support the ongoing Operation Meghdoot, ensuring robust aerial capability over the contested region.

India delivers first batch of BrahMos supersonic missiles to Philippines

Why in the News?

Recently, India delivered the first batch of BrahMos supersonic cruise missiles to the Philippines.

About BrahMos supersonic missiles

1. About: The BrahMos is a ramjet supersonic cruise missile jointly developed by the Indian Defence Research and Development Organisation (DRDO) and Russia's NPO Mashinostroyeniya.
2. The name "BrahMos" is derived from the combination of two rivers: the Brahmaputra in India and the Moskva in Russia. It is based on the Russian P-800 Oniks missile.
3. It is currently the world's fastest anti-ship cruise missile in operation and is capable of reaching speeds of Mach 2.8 to Mach 3.
4. They can hit a target up to a range of 290 kilometers and can be launched from submarines, ships, aircraft, or land platforms.

Strategic significance of BrahMos

1. BrahMos is a two-stage missile with a solid propellant booster engine.
 - a) Its first stage brings the missile to supersonic speed (meaning faster than sound) and then gets separated.
 - b) The liquid ramjet or the second stage then takes the missile closer to three times the speed of sound in cruise phase.
2. It has a very low radar signature, making it stealthy, and can achieve a variety of trajectories.
3. Being a 'fire and forget' type missile, it can achieve a cruising altitude of 15 km and a terminal altitude as low as 10 m to hit the target.
4. BrahMos which are called "standoff range weapons" are fired from a range far enough to allow the attacker to evade defensive counter-fire.
5. The BrahMos has three times the speed, 2.5 times flight range and higher range compared to subsonic cruise missiles.

Fossils of huge prehistoric snake found in Kutch mine

Why in the News?

Researchers at the Indian Institute of Technology (IIT), Roorkee have reported the discovery of fossils of one of the largest snakes that ever existed and likely lived 47 million years ago during a period called the Middle Eocene.

About Fossils of Prehistoric Snake

Source: The WION

1. The fossil was found is located in Panandhro, in the western state of Gujarat. It has been named as vasuki after the mythical snake king Vasuki, who is seen in coil around the neck of the Hindu deity Lord Shiva.

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2. The reptile could have been anywhere between 10 metres and 15 metres long and weighed up to 2,200 pounds (1,000 kilogrammes).
 3. It belonged to the now-extinct Madtsoiidae snake family but represents a unique lineage from India.
 4. 27 vertebrae has been found in which some of them are in their original position within the spine. They believe Vasuki resembled a large python and lacked venom.
 5. They also concluded that Vasuki was a slow-moving predator that would control its prey through constriction like anacondas and pythons.
 6. This snake lived in a marshy swamp near the coast at a time when global temperatures were higher than today.
 7. The diet of Vasuki given its large size, likely included crocodiles, as suggested by the presence of crocodile and turtle fossils found alongside Vasuki's remains.
- Fossils of fish and two early whales, Kutchicetus and Andrewsiphius, were also discovered in the same area, indicating a diverse potential prey range for Vasuki.

Dragonfly Rotorcraft mission

Why in the News?

NASA has confirmed its Dragonfly rotorcraft mission to Saturn's organic-rich moon Titan.

About Dragonfly Rotorcraft mission

1. It is a "dual quadcopter" designed to fly across the surface of Titan, Saturn's largest moon. It is scheduled to reach Titan in 2034.
2. This mission will be NASA's first to employ a flying vehicle for scientific exploration on another planetary body.
3. The rotorcraft will visit numerous intriguing sites on the moon to study prebiotic chemical processes that are key to understanding both Titan and the early Earth before life began.
4. It is equipped with eight rotors and the rotorcraft operates similarly to a large drone.
5. It will be powered by a radioisotope power system, similar to the one used by the Curiosity rover on Mars.
6. It will spend most of its time on the moon's surface making science measurements.
7. All flights, data transmissions, and the majority of scientific operations will occur during Titan's daytime, which will allow ample time for recharging during the moon's nighttime periods.

Gaia BH3

Why in the News?

Recently, Astronomers have discovered a massive black hole named Gaia BH3.

About Gaia BH3

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1. BH3 is a dormant black hole formed from the collapse of an exploding star. It has a mass 33 times greater than our sun.
2. It is located only 2,000 light years away from Earth in the Aquila constellation.
3. Astronomers discovered the black hole while combing through observations taken by the European Space Agency's Gaia space telescope for an upcoming data release to the scientific community.
4. A wobbling star orbits Gaia BH3 every 11.6 years.
5. The most massive black hole in our galaxy is Sagittarius A* which is the supermassive black hole located at the center of the Milky Way.

It has about 4 million times the mass of the sun, but that is because it's a supermassive black hole, rather than a stellar black hole.

About supermassive black hole and stellar black hole

- a) Stellar-mass black holes originate from the gravitational collapse of a single star or the combination of two neutron stars.
- b) These black holes typically have masses that range from approximately three to fifty times that of sun.
- c) Supermassive black holes are immensely larger, with masses starting at around 50,000 times the mass of sun and can reach up to millions or even billions of times greater.

They are invariably located at the centers of galaxies and present in nearly all galaxies.

- d) The formation of supermassive black holes remains a mystery to scientists, as they are too vast to have been formed from the collapse of individual stars.

Doxxing

Why in the News?

Recently, there has been a rise in cases of doxxing.

About doxxing

1. Doxxing is a form of online harassment where someone's private details are publicly disclosed.
2. This includes sensitive data such as phone numbers, private emails, medical records, government ID numbers, live locations, insurance details, and confidential employment information.
3. Doxxing also involves the release of private or semi-private content without the consent of the individual, who did not intend for it to be shared publicly.
4. This information is often acquired through unlawful means, including ha

Measures to prevent doxxing:

- a) It is recommended to create strong passwords that vary between platforms, incorporating a mix of letters, numbers, and symbols.

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- b) One should add an extra layer of security by setting up multi-factor authentication on your accounts whenever it's available.
- c) One should avoid sharing images that could reveal sensitive information like your home location, house keys, or identifiable landmarks near you. d) Use resources such as the National Cyber Crime Reporting Portal to report any suspicious or malicious cyber activities.

Randomised control trials- Techniques that transformed TB care

Why in the News?

Clinical trials performed using the randomisation technique have been instrumental in shaping modern medicine.

How randomisation technique transformed TB care

1. Clinical trials utilizing randomization have profoundly impacted modern medicine by providing a reliable and impartial means to assess treatment efficacies.
2. These trials are foundational to various medical advancements, such as understanding aspirin's preventative role against heart attacks, crafting antiretroviral therapies for HIV, employing cognitive behavioral therapy for mental disorders, and developing the latest COVID-19 vaccines.
3. Randomized controlled trials (RCTs) were used to test streptomycin, marking it as the first effective antibiotic treatment against tuberculosis (TB). Sir Austin Bradford Hill is credited with the work.
4. This transition changed TB management from a specialized surgical concern to a broadly accessible primary care matter.
5. Beyond TB, Hill's legacy continues with the 'Bradford Hill Criteria,' which are fundamental in modern epidemiology.

These nine criteria strength, consistency, specificity, temporality, biological gradient, plausibility, coherence, experiment, and analogy establish a structured approach to confirming causal relationships between specific factors and health outcomes.

6. This framework has been instrumental in identifying alcohol as a risk factor for cardiovascular diseases and linking sugar-sweetened beverages with obesity.
7. Hill's criteria were crucial in proving the connection between smoking and lung cancer, countering the misinformation spread by the tobacco industry.
8. This research also influenced a major shift in public health policies and the general public's view on tobacco use.

About the Randomised control trials technique

RCTs involve dividing a population into smaller groups, in order to comparatively see the outcomes of an external stimulus.

For ex- If the aim of a study is to understand whether a free grains distribution scheme helped improve the nutrition levels among people living in a district, researchers will first create two groups within the population, and then put people into those groups randomly.

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One group (called the control group) does not receive the grains or the external stimulus, while the other group (treatment group) does. After a designated period of time, details of how both the groups are doing would be collected. In this way, the goal is to understand what the overall impact is of introducing something new could be.

Global Hepatitis Report 2024

Why in the News?

Recently, the World Health Organization (WHO) released the Global Hepatitis Report 2024.

About Global Hepatitis Report 2024

1. According to the report, this disease is the second most common infectious cause of death worldwide, claiming 1.3 million lives annually.
2. The number of deaths attributed to viral hepatitis rose from 1.1 million in 2019 to 1.3 million in 2022.
3. Hepatitis B was responsible for 83% of these deaths, while hepatitis C accounted for the remaining 17%.
4. Each day, approximately 3,500 individuals worldwide succumb to infections caused by hepatitis B and C.
5. People between the ages of 30 and 54 bear half of the chronic hepatitis B and C disease burden, with children under 18 accounting for 12% of the cases. Men make up 58% of all cases.

About hepatitis

1. Hepatitis is an inflammation of the liver. It causes liver diseases including acute and chronic infections, liver failure, cirrhosis, and hepatocellular carcinoma.

2. Mode of Transmission: Hepatitis can be spread through infectious means such as viruses, contaminated food and water, and sexual contact, as well as through non-infectious means like excessive alcohol consumption, toxins, certain medications, and specific medical conditions.

The predominant mode of transmission for Hepatitis B is from mother to child, accounting for nearly 90% of cases where the infection is passed on during childbirth.

3. There are five primary strains of the hepatitis virus, identified as types A, B, C, D, and E. Each type causes liver disease but they vary significantly in transmission methods, disease severity, and geographic prevalence.

4. Symptoms: a) Hepatitis B often leads to an acute infection, manifesting symptoms such as nausea, vomiting, and jaundice (yellowing of the skin and eyes) that can last for several weeks.

b) Chronic Hepatitis particularly in children, can cause lifelong liver issues, potentially leading to liver scarring, known as cirrhosis, and an increased risk of liver cancer.

c) Hepatitis C symptoms typically develop two to twelve weeks after exposure and can include jaundice (yellow skin or eyes), loss of appetite, nausea, abdominal pain, fever, dark urine, pale stools, joint pain, and fatigue.

5. Diagnosis and Treatment: According to the report, only 2.4% of Hepatitis B cases have been diagnosed, and none have received treatment. In contrast, 28% of Hepatitis C cases were diagnosed, with 21% undergoing treatment.

Hepatitis B is preventable through immunization and Hepatitis C can be effectively cured using antiviral drugs.

Voyager 1 and 2 spacecraft

Why in news?

Recently, NASA has announced that its Voyager 1 probe has resumed transmitting valuable data to ground control.

About Voyager 1 spacecraft

1. About the mission and its objective- Voyager 1 is a space probe launched by NASA in 1977. Its primary objective is to explore the outer Solar System and beyond. Voyager 1's mission involved flybys of Jupiter and Saturn, focusing on studying their moons, rings, and magnetic fields.

2. Special Features- In August 2012, Voyager-1 entered interstellar space, becoming the first human-made object to exit the solar system.

3. Significant Discoveries- Significant discoveries by Voyager 1 include identifying a thin ring around Jupiter and two previously unknown Jovian moons, Thebe and Metis. At Saturn, it found five new moons and a newly designated ring, the G-ring.

About Voyager 2 Spacecraft

1. About the mission and its objective- Voyager 2 is a space probe launched by NASA on August 20, 1977, as part of the Voyager program, alongside Voyager 1. Its primary mission was to explore the outer planets of the solar system and their moons, followed by an interstellar mission.

2. Special achievements- It is the only spacecraft to conduct close-range studies of all four giant planets in the solar system. It was the first human-made object to fly by Neptune, where it discovered five moons, four rings, and a feature known as the "Great Dark Spot"

About Interstellar space

1. It is the area between the stars.

2. It contains vast quantities of neutrinos, charged particles, atoms, molecules, dark matter and photons.\

Crystal Maze 2

Why in the news?

The Indian Air Force (IAF) has successfully carried out a test firing of a new version of an air-launched medium-range ballistic missile, Crystal Maze 2 that is capable of hitting targets at a distance exceeding 250 km.

About Crystal Maze 2

1. The Crystal Maze 2 is an air-launched ballistic missile. It is also known as ROCKS. It has originated from Israel and boasts a striking range of 250 kilometers.

2. It was fired from a Su-30 MKI fighter jet stationed in the Andaman and Nicobar Islands.

3. Crystal Maze 2 targets both stationary and relocatable assets of significant value, and is capable of neutralizing enemy long-range radar and air defense systems.

4. The missile can effectively eliminate above-ground or heavily fortified underground targets, even within heavily defended surface-to-air areas.

Nephrotic Syndrome

Why in the News?

Researchers from Kerala have reported a series of cases from Malappuram district where the regular use of fairness creams has been linked to nephrotic syndrome.

About Nephrotic Syndrome

1. About Nephrotic syndrome: It is a kidney disorder characterized by excessive protein loss in urine due to issues with the kidneys' filtration system, specifically the glomeruli.

2. Function of glomeruli: In healthy kidneys, glomeruli filter waste and excess fluids while retaining essential cells and proteins.

3. What happens in nephrotic syndrome: In nephrotic syndrome, inflamed glomeruli allow too much protein leakage. This condition can result from various kidney diseases or systemic disorders like diabetes or lupus.

4. Symptoms: Symptoms include severe swelling, foamy urine, high blood fat levels, weight gain, fatigue, and loss of appetite.

Complications may include blood clots, increased infection risk, high blood pressure, and potential kidney issues, such as chronic kidney disease or kidney failure.

5. Treatment: Treatment involves managing the underlying cause and addressing related concerns, including blood pressure control, cholesterol reduction, swelling mitigation, and infection prevention through medication and dietary adjustments.

Thrombocytopenia Syndrome (TTS)

Why in the News?

Recently, concerns were raised over the rare side effects of the AstraZeneca-Oxford COVID vaccine. AstraZeneca has admitted that its vaccine can cause Thrombocytopenia Syndrome (TTS) in rare case.

About Thrombocytopenia Syndrome (TTS)

1. About Thrombocytopenia Syndrome (TTS): It is a rare condition in which there is simultaneous occurrence of blood clots (thrombosis) and a low platelet count (thrombocytopenia). It is also known as 'vaccine-induced immune thrombotic thrombocytopenia' (VITT).

Note: Thrombosis is the formation of a blood clot, which can reduce normal blood flow in an affected blood vessel.

2. Symptoms: Various symptoms are linked to TTS, such as shortness of breath, chest or limb pain, tiny red spots or bruising on the skin beyond the injection site, headaches, and numbness in certain body regions. TTS may result in restricted blood flow due to clot formation.

3. Diagnosis and treatment:

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Diagnosis- Diagnosis of TTS involves a combination of blood tests and imaging studies, such as CT scans.

Treatment- Treatment for TTS is typically comprised of the following- a. Anticoagulant medications to prevent further clotting. b. Intravenous immunoglobulin (IVIG) which involves infusing a blood product containing antibodies c. High-dose prednisone, which is a form of steroid medication.

How are TTS and blood clots linked to the AstraZeneca vaccine?

1. TTS was a rare syndrome reported in people who received a Covid-19 adenovirus vector-based vaccine. The incidence of TTS has been marginally higher among individuals under 60 years of age.
2. TTS can be seen in various body regions, including the brain, the abdomen, the lungs, limb veins and arteries.
3. The process that causes TTS is not fully understood, but it is believed to be similar to heparin-induced thrombocytopenia (HIT) which is also a rare reaction to a medicine called heparin that affects how platelets works.

Vasuki Indicus

Why in the news?

Researchers have discovered the fossils of one of the largest snakes that ever existed, which has been named Vasuki Indicus.

About Vasuki Indicus

Location-The fossils of Vasuki indicus were found in Kutch, Gujarat.

Description-Vasuki is the name of the mythical snake often seen around the neck of the Hindu god Shiva.

Time period-It lived in the Middle Eocene period (roughly 47 million years ago) in India. The organism lived at a time when temperatures were relatively warm, at roughly 28 °C.

Family-It belonged to the now-extinct Madtsoiidae snake family. However, it represents a unique lineage from India.Madtsoiidae are Gondwanan terrestrial snakes that lived between the Upper Cretaceous (100.5 million to 66 million years ago) and the Late Pleistocene (0.126 million years ago to 0.012 million years ago).

Habitat-These snakes moved from India across southern Eurasia and into North Africa after the Indian subcontinent collided into Eurasia around 50 million years ago.

Features: 1) It reached lengths between 10 and 15 metres long and 1 tonne in weight.

2)It probably had a broad and cylindrical body, hinting at a robust and powerful build.It was as large as Titanoboa, a huge snake that lived on Earth and is said to be the longest ever discovered.

3) It was a slow-moving predator that would catch its prey by squeezing, similar to anacondas and pythons.

State of the Climate in Asia 2023 report

Why in the news?

The World Meteorological Organization has recently published the 'State of the Climate in Asia 2023' report.

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Highlights of the report

1. Asia has faced the most number of disasters in the world in 2023. There have been recorded instances of 79 events associated with extreme weather, climate, and water-related hazards. These events have affected over nine million people in the region and directly resulted in the loss of over 2,000 lives.
2. The majority of disasters which have occurred in Asia are related to flooding and storms. Over 60% of the 2,000 deaths have been associated with flooding and more than 15% of the deaths were linked to storms.
3. Asia has warmed faster than the global average. This warming trend has nearly doubled since the 1961-1990 period.
4. Deterioration of climate change indicators, such as rise in surface temperatures, glacier retreat, and sea level rise, will have significant consequences for Asia's economy, ecosystems, and human lives.

Rashtriya Arogya Nidhi (RAN) scheme

Why in the news?

Recently, the Delhi High Court has held that the new threshold income to claim benefit under the Rashtriya Arogya Nidhi (RAN) scheme is prima facie "extremely low".

Under the new umbrella scheme of RAN, the threshold of monthly income for obtaining benefit is ₹1,571 for rural areas and Rs 1,605 for urban areas. The court is of prima facie view that the threshold limit is extremely low.

About Rashtriya Arogya Nidhi (RAN) scheme yogiyojna.com

Aspects Description

About 1. It is provided by the Ministry of Health and Family Welfare. 2. It provides one-time financial assistance to poor patients living below State/UT wise threshold poverty line and suffering from life threatening diseases relating to heart, kidney, liver, cancer, etc. for treatment at any of Super Specialty Government hospitals/institutes.

Scheme type Central sector scheme

Components The Umbrella Scheme of RAN includes three key components as follows: 1. Rashtriya Arogya Nidhi (RAN): It offers up to 15 lakhs in financial aid for treating critical illnesses related to the heart, kidney, liver etc, at government hospitals or institutions with super specialty services. 2. Health Minister's Cancer Patient Fund (HMCPF): It provides financial assistance up to 15 lakhs for cancer treatment at Regional Cancer Centres (RCCs), Tertiary Care Cancer Centres (TCCCs), and State Cancer Institutes (SCIs). 3. Financial Assistance for Patients with Rare Diseases: It allocates up to 20 lakhs for treatment of specified rare diseases at government hospitals or institutes equipped with super specialty facilities.