SIVARAJAVEL IAS ACADEMY
AN IDEAL INSTITUTE FOR CIVIL SERVICE EXAMS

the CATALYST

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INDIA IS ON THE MOON

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The CATALYST

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The CATALYST is a monthly magazine for current affairs which tries to give aspirants an in-depth comprehension of certain topics which appeared in different sources over the month. The Magazine has been designed in such a way that the reading experience is enriching and insightful for the readers.

The contents have been grouped into a thematic structure to help aspirants focus on the overall GS syllabus.

Inside The Catalyst Magazine

I. Within the Sub themes first few topics will be Prelims oriented followed by indepth coverage of Mains Topics.

II. Cover Story about Chandrayaan-3

III. Book Summary Relevant for UPSC Exam.

IV. Fact Sheet and Quotes have also been provided.

**New sections will be added or removed based on the new updates we include in the forthcoming issues.*

SIVARAJAVEL IAS ACADEMY
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the CATALYST

From the Editor's Desk

Dear Readers,

We understand that UPSC preparation is a rigorous and often overwhelming process. But remember, it's a marathon, not a sprint. Consistency is key. Read widely, revise often, and practice regularly.

This month, we have focused on providing you with an in-depth analysis of current affairs, important for both Prelims and Mains. We have also included a special section dedicated to the Chandrayaan- 3. As Independent India embarks further towards AMRIT KAAL, we all can beam with pride that our nation is most likely to assert its rightful place in the World.

For this Edition (August 1 to Aug 30), we have covered a wide range of topics such as the Chandrayaan-3, **The Debate On Data , Incremental CRR ,Parker Solar Probe**, **Bharat New Car Assessment Programme (NCAP), Maya OS, PM Vishwakarma Scheme** Etc

We hope that this edition proves to be a valuable resource in your UPSC preparation. We wish you all the best for your studies.

We are constantly motivated by the reception given by our dear readers. We aspire to enrich the forthcoming issues. All feedback is welcome and suggestions to improve the magazine can be sent to **sivarajaveliasacademy@gmail.com.**

Sincerely,
P.Mohan

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CHANDRAYAAN-3- A HISTORIC FEAT

Chandrayaan-3 is a follow-on mission to Chandrayaan-2 to demonstrate end-to-end capability in safe landing and roving on the lunar surface. It consists of an indigenous lander module (LM), propulsion module (PM), and a rover.

It will be launched by LVM3 from SDSC SHAR, Sriharikota. The propulsion module will carry the lander and rover configuration till 100 km lunar orbit. The propulsion module has Spectro-polarimetry of Habitable Planet Earth (SHAPE) payload to study the spectral and Polari metric measurements of Earth from the lunar orbit.

Objectives of Chandrayaan 3

The mission had 3 objectives:

1. Demonstration of a Safe and Soft Landing on the Lunar Surface is accomplished
2. Demonstration of Rover roving on the moon is accomplished
3. Conducting in-situ scientific experiments – This step is going on. All payloads are performing normally.

LVM3(Geosynchronous Satellite Launch Vehicle Mk III)

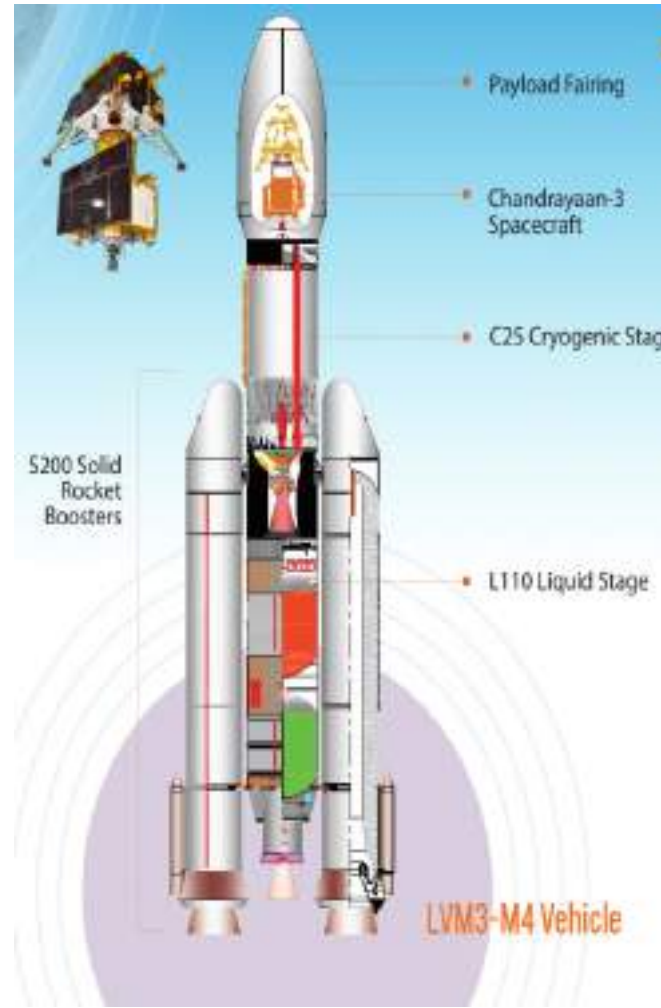
LVM3 is the operational heavy lift launch vehicle of ISRO and has a spectacular pedigree of completing 6 consecutive successful missions. This is the 4th operational flight of LVM3, aims to launch the Chandrayaan-3 spacecraft to Geo Transfer Orbit (GTO). LVM3 has proved its versatility to undertake most complex missions.

Parts of the Chandrayaan 3 Mission

The Chandrayaan-3 Mission consists of two modules - The propulsion module (PM) and the Lander module (LM).

The propulsion module is the one that will take the lander and the rover to the moon.

The lander module contains the rover. After the touchdown, the lander will remain stationary at the landing site, while the rover will explore the moon.



Propulsion Module

Chandrayaan-3 consists of an indigenous propulsion module, lander module (LM), and a rover with an objective of developing and demonstrating new technologies required for inter-planetary missions.

The propulsion module will carry the lander and rover from injection orbit to till 100 km lunar orbit.

It also carries a ***Spectro-polarimetry of Habitable Planetary Earth (SHAPE)*** payload to study the spectral and polarimetric measurements of earth from the lunar orbit. The main function of Propulsion Module is to carry the LM from launch vehicle injection orbit to till Lander separation.

Lander Module

The Lander Module consists of a **Lander (Vikram) and a Rover (Pragyan).** The Lander

Module made the soft landing using the Automatic Landing Sequence (ALS), where the Lander started its engine (thrusters) and maneuvered the speed and direction of the Module as well as the position of the landing site.

After the historic touchdown, the Rover inside it ramped down on the lunar surface to carry out in-situ chemical analysis of the lunar surface during its mission life.

The total lifespan of the Mission (Lander and Rover) is lunar day (14 Earth days). Both the Lander and the Rover have scientific payloads to carry out experiments on the lunar surface.

Payloads

The Chandrayaan-3 carries six payloads that would help ISRO understand the lunar soil and also get the blue planet's photographs from the lunar orbit.

1. **Radio Anatomy of Moon Bound Hypersensitive ionosphere and Atmosphere (RAMBHA**) will measure the near-surface plasma density and its changes with time.

2. **Instrument for Lunar Seismic Activity (ILSA)** will measure seismicity around the landing site and delineate the structure of the lunar crust and mantle.

3. **The Laser-Induced Breakdown Spectroscope**

(LIBS) will determine the elemental composition of lunar soil and rocks around the landing site.

4. **Chandra's Surface Thermo physical Experiment (ChaSTE)**: To carry out the measurements of thermal properties of lunar surface near polar region.

5. **Alpha Particle X-Ray Spectrometer (APXS)** will derive the chemical composition and infer the mineralogical composition of the moon's surface.

6. **Spectro-polarimetry of HAbitable Planet Earth (SHAPE)** will study the spectro-polarimetric signatures of the earth in the near-infrared wavelength range.

This could be used in the search for life on exo-planets beyond the solar system.

Lunar lander Vikram will click photos of the rover Pragyaan as it studies the seismic activity on the moon.

Using laser beams, it would try to melt a piece of the lunar surface -- the regolith -- to study the gases emitted during the process.

What are the changes done in Chandrayaan-3 to overcome the failure of Chandrayaan-2?

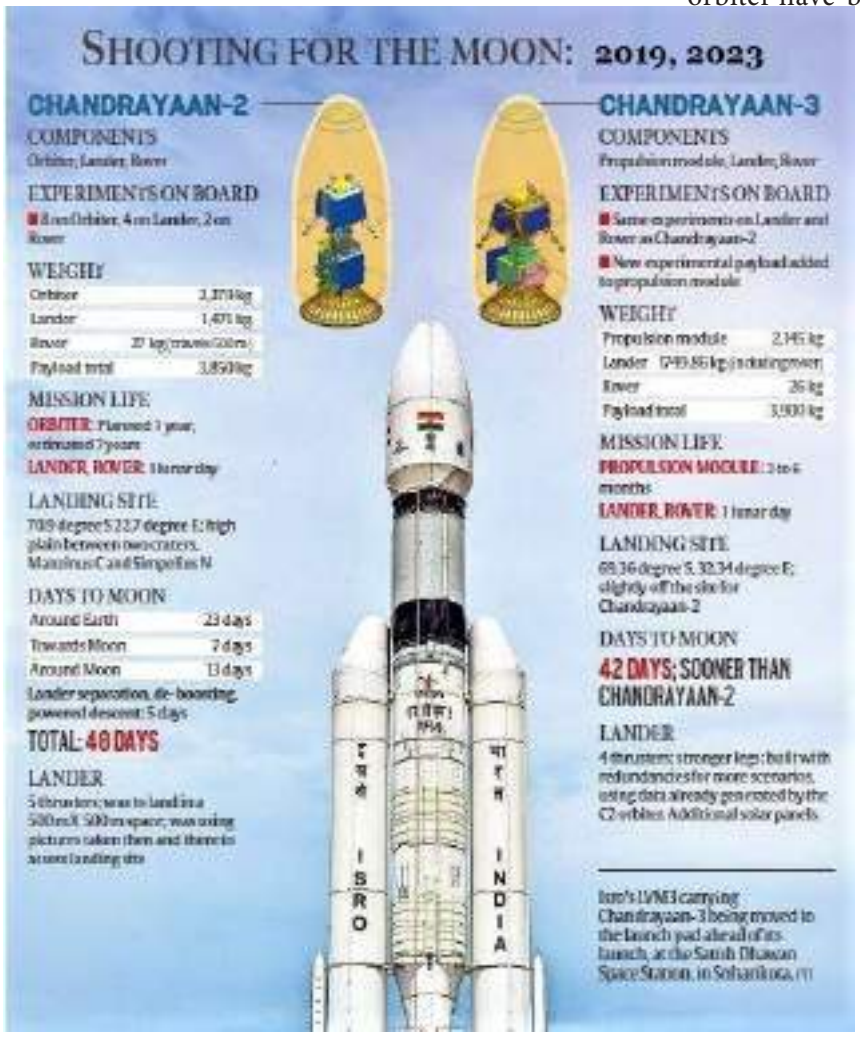
Instead of a success-based design in Chandrayaan-2, ISRO scientists are **doing a failure-based design in Chandrayaan-3.**

One, the landing area has been expanded. Instead of trying to reach a specific 500mx500m patch for landing as targeted by Chandrayaan-2, the current mission has been given instructions to land safely anywhere in a 4kmx2.4km area.

Second, ***the lander has been provided more fuel*** so it can travel longer distances to the landing site or an alternate landing site, if need be.

Third, ***the lander will no longer depend only on the pictures it click***s during the descent to determine a landing site.

High resolution images from the Chandrayaan-2 orbiter have been fed into the lander and it will click images just to confirm that it has reached the correct location.



Then, changes have also been made to the physical structure of the lander. ***The central thruster on the lander has been removed, reducing the number from five to four.*** The legs have been made sturdier to ensure it can land even at a higher velocity. More solar panels have been added to the body of the lander.

Important findings of Chandrayaan-3

Ionosphere Measurements:

Radio Anatomy of Moon Bound Hypersensitive Ionosphere and Atmosphere—Langmuir Probe (RAMBHA-LP) has checked out the plasma in the region near the moon's surface and has assessed that "the plasma near the lunar surface is relatively sparse."

The probe onboard Vikram made the first measurements of the

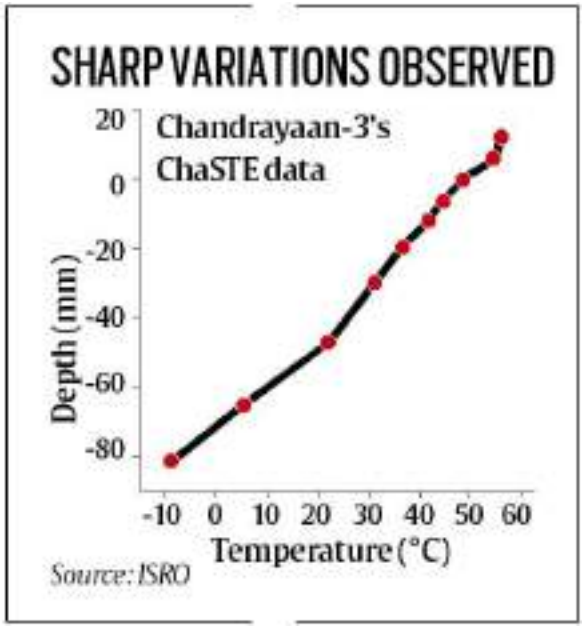
Moon's ionosphere near the south pole. It revealed a relatively sparse mix of ions and electrons in the electrically charged plasma layer surrounding the Moon's surface, with densities ranging from 5 million to 30 million electrons per cubic meter.

This information is crucial for lunar communication and navigation systems, as it affects the transmission of radio signals. Fortunately, the sparse plasma suggests minimal delays for such systems.

Lunar Soil Temperature:

Indian Space Research Organisation (ISRO) released first-of-its-kind data from the observations made by ChaSTE (Chandra's Surface Thermophysical Experiment), one of the four instruments on the lander module.

The first set of data released by ISRO showed a very sharp difference in temperatures just above and below the surface of the Moon.



A graphical plot put out by ISRO showed that while ***temperatures on the surface were over 50 degrees Celsius, they dropped to nearly -10 degree Celsius just a few millimetres below the surface***. The measurements suggested that the topsoil of the lunar surface did not conduct heat very well, and insulated the sub-surface from heat.

The measurements are consistent with what is known about the thermal profile of the Moon from previous expeditions and experiments. But this is the first direct measurement of temperatures of the topsoil and the subsoil near the South Pole of the Moon.

Temperature variation on the Moon is relatively well-known. Even on the surface, there is a huge difference between day-time and night-time temperatures.

Some places on the Moon are known to be colder than -200 degree Celsius at night time while others can get hotter than 100 degrees Celsius during the day.

The data from Chandrayaan-3 reveals that the lunar surface is significantly warmer than previously recorded by NASA's Lunar Reconnaissance Orbiter.

These temperatures are still too warm for water ice to be stable, suggesting that water is in the gaseous state on the Moon's surface. At greater depths, temperatures are expected to stabilize at approximately -80 °C.

Suspected Moonquake: The lander's seismograph recorded a brief seismic event, which may have been a small moonquake or the impact of a tiny meteorite. Such events are common on the Moon, and a global seismic network and long-term observations are needed to understand their significance fully.

Presence of Sulfur and other elements:

The Laser-Induced Breakdown Spectroscopy (LIBS) instrument onboard the Chandrayaan-3's rover has made the first-ever in-situ measurements on the elemental composition of the lunar surface near the south pole.

These in-situ measurements confirm the presence of Sulphur (S) in the region unambiguously.

The rover's tests confirmed the presence of sulfur in the lunar surface near the south pole. This discovery is significant because sulfur is a key component of molten rock. It can shed light on the Moon's geological history, indicating whether it was once covered in molten rock or if sulfur came from impacting asteroids.

Preliminary analyses have unveiled the presence of Aluminum (Al), Calcium (Ca), Iron (Fe), Chromium (Cr), and Titanium (Ti) on the lunar surface. Further measurements have revealed the presence of manganese (Mn), silicon (Si), and oxygen (O). Thorough investigation regarding the presence of Hydrogen is underway,

These findings can contribute to a better understanding of lunar geochemistry and its evolution.

Significance of Chandrayaan 3

The Chandrayaan-3 mission by India holds immense significance across various domains and has the potential to advance the nation's lunar exploration efforts:

Continuing Lunar Exploration: Chandrayaan-3 is a critical step in India's pursuit of establishing a human presence on the moon. The success of this mission can pave the way for collaborative efforts with organizations like JAXA (Japan Aerospace Exploration Agency) on projects such as Lunar Polar Exploration (LUPEX) or Chandrayaan-4.

Promoting Space Education: This mission aims to promote space education and scientific curiosity within India. It serves as an inspirational endeavor for both the scientific community and aspiring space enthusiasts, nurturing interest in space exploration.

Lunar Surface Exploration: Building on the insights gained from Chandrayaan-2, Chandrayaan-3's lander and rover are designed to study lunar rocks, soil, and geological features. This exploration, particularly focused on the moon's south pole, promises to uncover valuable information about moon geology and resources.

Scientific Discoveries: Chandrayaan-3 carries scientific instruments to study moonquakes and underground heat. Seismometers on its surface will provide insights into the moon's interior, while thermal probes will reveal crust movements, enhancing our understanding of lunar processes.

Boosting Private Investment: India's growing aerospace technology sector has attracted investment in private rocket launches and satellite deployments. The success of Chandrayaan-3 is expected to boost investor confidence, further attracting private investment in aerospace technology projects.

Job Creation: India's thriving aerospace sector has already generated numerous job opportunities. Successful lunar missions and subsequent programs are poised to create additional high-tech jobs, both directly and indirectly.

Nurturing Startups: Chandrayaan-3's success could serve as a technological showcase, enhancing India's standing in the global space community. This may lead to joint ventures and business opportunities for Indian startups to develop space systems for the global market.

Strengthening International Reputation: Completion of Chandrayaan-3 will make India the fourth country to successfully land on the moon, earning global recognition and bolstering confidence in spacecraft manufactured by Indian companies. This achievement may foster international cooperation.

Strategic Positioning: The success of Chandrayaan-3 can position India as a prominent player in the international space arena, potentially rivalling China's influence. Additionally, alignment with initiatives like the Artemis Accords will expand India's footprint in space exploration.

Points on the Moon	Remarks
Shiv Shakti Point	The point where the Chandrayaan-3 lander touched down on the lunar surface.
Tiranga Point	The point where Chandrayaan-2 crashed in 2019.
Jawahar Point	The point where the Probe strikes the lunar surface during India's first lunar orbiter mission Chandrayaan-1.

POLITY & GOVERNANCE

What's Inside?

HATE SPEECH IN INDIA

Why in News?

Two-judge bench of the Supreme Court observed that defining hate speech is complex but the real problem in tackling hate speech lies in the implementation and execution of law and judicial pronouncements.

About Hate Speech:

- Hate speech covers many forms of expressions which advocate, incite, promote or justify hatred, violence and discrimination against a person or group of persons for a variety of reasons.
- It poses grave dangers for the cohesion of a democratic society, the protection of human rights and the rule of law.
- If left unaddressed, it can lead to acts of violence and conflict on a wider scale.
- In this sense, hate speech is an extreme form of intolerance which contributes to hate crime.

Article 19 and Hate Speech:

Article 19(1)(a) of the Constitution guarantees freedom of speech and expression to all citizens of India.

This article is subjected to certain restrictions [Article 19(2)], namely, sovereignty and integrity of India, the security of the State, friendly relations with foreign States, public order, decency or morality or in relation to contempt of court, defamation or incitement to an offence.

Legal Provisions for Hate Speech:

Hate speech has not been defined in any law in India. However, legal provisions in certain legislations prohibit select forms of speech, which are in contravention to freedom of speech.

Indian Penal Code (IPC) Provisions –

Under Section 153A of IPC, 'promotion of enmity between different groups on grounds of religion, race, place of birth, residence, language, etc., is an offence punishable with three years imprisonment.

Under Section 505 of IPC, making "statements leading to public mischief" is an offence.

Representation of the Peoples Act, 1951 –

Section 8 disqualifies a person from contesting election if s/he is convicted for indulging in acts amounting to illegitimate use of freedom of speech and expression.

Protection of Civil Rights Act, 1955 –

Section 7 penalizes incitement to, and encouragement of untouchability through words, either spoken or written, or by signs or by visible representations or otherwise.

Religious Institutions (Prevention of Misuse) Act, 1988 –

It prohibits religious institution or its manager to allow the use of any premises belonging to, or under the control of, the institution for promoting or attempting to promote disharmony.

Important Judgements:

In ***Pravasi Bhalai Sangathan v. Union of India***, the SC held that the implementation of existing laws would solve the problem of hate speech to a great extent.

In ***Jafar Imam Naqvi v. Election Commission of India***, the petitioners filed a writ petition challenging the vitriolic speeches made by the candidates in the election.

The petitioner prayed for issue of writ of mandamus to the Election Commission for taking appropriate steps against such speeches.

However, the Court dismissed the petition on the ground that the petition under Article 32 of the Constitution regarding speeches delivered during election campaign does not qualify as public interest litigation.

Also, the apex court held that the Court cannot legislate on matters where the legislative intent is visible.

Guidelines Issued by SC to curb Misuse of Legal Provisions w.r.t. Hate Speech:

In Tahseen Poonawalla vs Union of India (2018), the SC had issued comprehensive guidelines to the Union and State Governments regarding prevention of mob violence, lynching.

Again, in Kodungallur Film Society case (2018), directions were issued to control vandalism by protesting mobs.

Major guidelines include –

- Fast-tracked trials,
- Victim compensation,
- Deterrent punishment,
- Disciplinary action against lax law-enforcing officials,
- Nodal officers to be appointed to take note of hate crimes and register FIRs across the nation.

Suggestions:

The Law Commission has proposed that separate offences be added to the IPC to criminalize hate speech more specifically instead of being subsumed in the existing sections concerning inflammatory acts and speeches.

Similar proposals to add sections to the IPC to punish acts and statements that promote racial discrimination or amount to hate speech have been made by the ***M.P.Bezbaruah Committee and the T.K. Viswanathan Committee.***

At present, the Committee for Reforms in Criminal Laws, which is considering more comprehensive changes to criminal law, is examining the issue of having specific provisions to tackle hate speech.

SELECT COMMITTEE OF THE PARLIAMENT

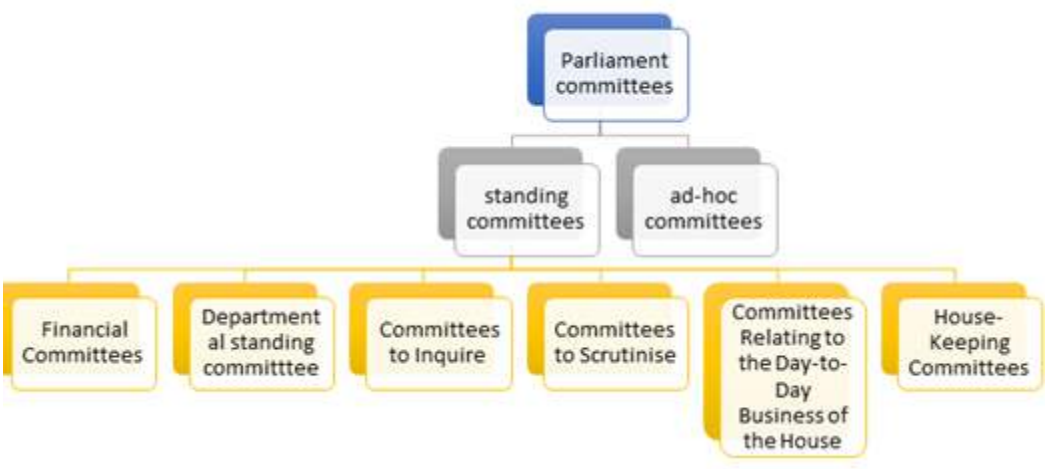
Why in the News?

After at least four MPs complained that their names had been included in a proposed Select Committee for the Delhi Services Bill without their consent. The Select Committee was proposed by Aam Aadmi Party (AAP) MP Raghav Chadha in the **Upper House Rajya Sabha**

About Select Committee

India's Parliament has several types of committees which discharge different functions. There are **Standing Committees that are permanent in nature**, with their members nominated from time to time by the Chairman.

Then there are **ad hoc or temporary committees**, which are set up for a specific purpose, such as examining a particular Bill, and are dissolved once that purpose has been served.A Select Committee belongs to this category.



Procedure followed by the Select Committee

While a Select Committee is temporary in nature, the procedure it is to follow is laid down in the Rules of Procedure.

Under **Rule 125 of the Rajya Sabha Rules and Procedures**, ***any member may move an amendment that a Bill be referred to a Select Committee.*** I.e., the motion to refer a Bill to a Select Committee can either be moved by the member in-charge of the Bill, or by any other MP.

Members of the Select committee

According to the Rajya Sabha rules, "On a motion moved in and adopted by the House, Bills are from time to time referred to Select Committees, the members on which are specifically named in the motion.

The members of the Select Committee on a Bill are appointed by the House when the motion that the Bill be referred to a Select Committee is made. No member is appointed to a Select Committee if he is not willing to serve on the Committee.

The mover has to ascertain whether the member proposed by him is willing to serve on the Committee. The rules do say that a proposed member's consent has to be taken before he can serve on a Select Committee. However, they do not specifically mention collecting signatures of those whose names have been proposed.

The actual number of memberships of the Select Committee is not fixed; it varies from Committee to Committee. If it is a Joint Committee, the proportion of members from the Rajya Sabha and the Lok Sabha is **1:2.**

The Chairman of the Committee is appointed by the Chairman of the Rajya Sabha from among the members of the Committee. **The member or Minister in-charge of the Bill is generally included as a member of the Committee.**

How does a Select Committee work?

The quorum for each sitting needs to be one-third of the total number of members of the committee. In case of equality of votes on any matter, the chairman (or any other person presiding) will have a second or casting vote.

A select committee may appoint a sub-committee to examine any special points connected with the Bill. The report will be signed on behalf of the committee by the chairman. Any member can record dissent. The report, along with notes of dissent, will be presented to the Rajya Sabha, printed and circulated among all members.

Functions of a Select Committee

The Committee's job is to go through the text of the Bill, clause by clause. This is to ascertain that the Bill reflects clearly the intention behind the measure and the object proposed to be achieved is adequately brought out.

The Committee may, for this purpose, invite memoranda from or take oral evidence of experts or interested persons and organisations. The Committee may also ask the Government officials to explain the policy behind the various provisions of the Bill and to supply to it such information and background material as may be required by it.

After hearing the evidence, the Committee considers the various provisions of the Bill and formulates its conclusions and may amend the clauses, etc. of the Bill to bring about the intention clearly. The Committee may also visit organisations and institutions, etc. for on-the-spot study of a matter connected with the Bill.

What happens once a Select Committee's report is submitted?

The report of the committee is of a recommendatory nature. The government can choose to accept or reject its recommendations.

A Select Committee can also include its version of the Bill. If they do so, the minister in charge of that particular Bill can move for the committee's version of the Bill to be discussed and passed in the House.

NO CONFIDENCE MOTION

Why in the News?

Lok Sabha Speaker Om Birla accepted a no confidence motion moved by the Opposition against the government on July 26. The motion was brought amidst the Opposition's ongoing protests demanding a statement on the situation in Manipur from Prime Minister Narendra Modi.

About No confidence Motion

Article 75(3) of the Constitution says that the council of ministers shall be collectively responsible to the Lok Sabha. It means that the **ministry stays in office so long as it enjoys confidence of the majority of the members of the Lok Sabha (not Rajya sabha).**

A no-confidence motion can be moved only in the Lok Sabha. It cannot be moved in the Rajya Sabha.

What is the Procedure?

There is no Confidence or No Confidence Motion mentioned in the Indian Constitution.

Under Rule 198 of the Rules of Procedure and Conduct of Business in the Lok Sabha, a No Confidence Motion is a formal request made by the opposition against the current administration in the Lok Sabha.

Any Lok Sabha MP, who can garner the support of 50 colleagues, can, at any point of time, introduce a motion of no-confidence against the Council of Ministers. The motion **needs the support of 50 members to be admitted.**

Implications of No Confidence Motion

If the motion is passed, the ruling party is required to quit if it cannot demonstrate its majority in the Lok Sabha.

If the government wins the vote on the no-confidence motion, the motion is defeated and the government remains in power.

List of No-Confidence Motions

There have been around 27 no-confidence motions introduced in the Lok Sabha since independence. The first no-confidence motion against the administration of the then Prime Minister Jawaharlal Nehru was presented in the Lok Sabha in August 1963.

SPECIAL DEVELOPMENT COUNCILS (SDCS) INITIATIVE

Why in news?

The Odisha government has expanded the jurisdiction of the Special Development Council (SDC), a unique targeted intervention in tribal areas, from nine to 23 districts intending to directly touch the lives of 84 lakh indigenous people.

About

While the Central government has introduced several developmental projects for tribal people, it has a one-size-fits-all approach that divorces tribal development from tribal cultures. Even in schemes such as the Aspirational Districts Programme, the focus is exclusively on development-driven indicators; the cultural and societal contexts of those districts are sidelined.

In a significant move towards preserving, promoting, and popularising tribal culture while also continuing with the development process, the Odisha government launched the Special Development Councils (SDCs) initiative in 2017.

This is an active effort to preserve the culture and heritage of 62 tribes in the State under one umbrella while keeping economic development on course in the regions.

The scheme, which covered nine tribal-dominated districts and 60 lakh tribal households in 117 blocks, ***has now been expanded to 23 districts covering more than 84 lakh tribal people***.

Objectives of the council

The Council will take up with the following objectives:

- Conservation of tribal culture aligned with development objectives
- Propagation of tribal culture for retaining tribal identity
- Recognition of the indigenous knowledge system of the Tribals and its promotion to help support retention of tribal culture
- Documentation of tangible and intangible tribal culture, tradition and practices
- Identification of tribal resources and making the indigenous knowledge/unique culture as a means of livelihood
- Organization of exposure visits on the range of development issues
- Promotion of tribal languages and dialects for developmental communication
- Optimal utilization of available resources in tribal areas resulting in sustainable tribal development as per the felt needs of Tribals.
- Area/culture specific development interventions, which will address the felt needs of the Tribals.

In this model, important cultural markers that are a reflection of tribal identity are identified and promoted.

First, ***language*** is recognised as an important marker of culture. As Odisha is a land of over 22 diverse tribal languages, the focus is on the use and propagation of these languages. Over 21 tribal proficiency centres have been established. These have modules to educate frontline workers like ASHA workers and non-Odia speakers about tribal culture and dialect.

Second, more than 4,500 ***sacred groves*** that were close to vanishing from the village landscape are now being conserved. These groves hold immense cultural and conservational value for the tribal population, as they are considered to be inhabited by the gods. Resource extraction in these groves is strictly prohibited. More than 4,730 sacred groves are under protection in nine districts, and 1,609 tribal cultural clubs have been set up.

Third, ***artisan ID cards*** have been issued to over 40,000 tribal artisans. This initiative not only preserves culture, but also enables employment opportunities.

Fourth, to ensure an ***efficient transfer of knowledge,*** more than 50 Tribal Resource Centres have been constructed in Sundargarh district. More are coming up in the remaining districts.

The SDCs is ***a completely state-funded programme***. This helps the government factor in the cultural context, which is sorely missing in most Central schemes. The projects are taken up by the Council Fund, which is given complete autonomy over the utilisation of these funds.

Structure and Functioning-

The SDC model also helps to preserve the culture and tradition of small tribal groups by giving them a role in decision-making processes. Thus, it takes care of intra-tribal majoritarianism.

The Councils not only have people from major tribes, but also the PVTGs. The Boards are formed under the chairmanship of an eminent tribal person of the locality.

The Council consists of the chairperson, vice chairperson (where one among the two has to be a female), and members from various tribal groups nominated by the government. This makes the bodies truly representative of the community.

PRIVILEGE MOTION

Why in News?

Rajya Sabha Chairman referred complaints related to the privilege of the House against two MPs (TMC's Derek O'Brien and AAP's Raghav Chadha) to the privileges committee.

This comes amid differences between the ruling party and some opposition parties that have plagued the ongoing Monsoon Session of its sittings.

What is a Privilege Motion?

The parliamentary privilege are certain rights conferred to the Members of Parliament (MPs) for conducting the business of the Parliament.

There is no codified list of the exact privileges, but it includes the right of free expression in the course of Parliamentary debates and MPs will not be liable for court proceedings for this.

If such a privilege is breached, a motion can be raised by any member and can be admitted by the Chairman.

They can then refer it to the Privileges Committee under Rule 203 of Rules of Procedure and Conduct of Business in the Council of States/ RS.

What is the Committee of Privileges in Parliament?

This committee consists of 15 members in Lok Sabha (10 in case of RS) nominated by the Speaker (Chairman in case of RS) from time to time.

In the RS, the deputy chairperson is appointed (by the RS Chairman) as the head of the committee of privileges.

In the Lok Sabha, the Speaker nominates the head of the committee of privileges.

The committee examines every question involving a breach of privilege of the House or of the members or of any Committee referred to it by the Speaker/Chairman and makes suitable recommendations in its report.

If the House has not fixed any time for the presentation of the report, it shall be presented within 1 month of the date on which reference to the Committee was made.

Once presented, a motion has to be passed for the consideration of the report and amendments can be suggested.

The right to raise a question of privilege is based on satisfying two conditions - the question shall be restricted to a specific matter of recent occurrence and the matter requires the intervention of the Council.

The Speaker/RS Chairman is the first level of scrutiny of a privilege motion. Therefore, the Speaker/Chairman can decide on the privilege motion himself or herself or refer it to the privileges committee of Parliament.

DIGITAL PORTAL OF THE CENTRAL REGISTRAR OF COOPERATIVE SOCIETIES (CRCS)

Context:

Union Home Minister and Minister of Cooperation will soon launch the digital portal of the Central Registrar of Cooperative Societies (CRCS).

About:

It is aimed at promoting ease of doing business in the cooperative sector and streamlining various processes.

Objectives:

Implementing completely paperless applications, ensuring automatic compliance with the Multi-State Co-operative Societies Act (MSCS Act) and rules through software, enhancing the ease of doing business, enabling digital communication, ensuring transparent processing, and improving

analytics and management information system.

This project of computerization will prove particularly helpful in the registration of new Multi-State Cooperative Societies, simplifying their operations and creating a more efficient and transparent digital ecosystem.

Features:

The digital portal will encompass various modules, including registration, amendment of bye-laws, annual return filing, appeal, audit, inspection, inquiry, arbitration, winding up, liquidation, ombudsman, and election.

It will also incorporate the recently passed amendments to the Multi-State Cooperative Societies (MSCS) Act, 2002, and its rules.

The portal will expedite the processing of applications and service requests through electronic workflow, facilitating a time-bound approach.

It will also feature provisions for OTP-based user registration, validation checks to ensure compliance with the MSCS Act and Rules, hearing through video conferencing, issuance of registration certificates, and electronic communication, read the release.

INDIA'S MINING POLICY SHIFT

Parliament passed the **Mines and Minerals (Development and Regulation) Amendment Bill, 2023, in a bid to attract private sector investment in the exploration of critical and deep-seated minerals** in the country.

The Bill puts six minerals, including lithium — used in electric vehicle batteries and other energy storage solutions — **into a list of "critical and strategic" minerals.**

The exploration and mining of these six minerals, previously classified as atomic minerals, were restricted to government-owned entities.

Provisions of the Mines and Minerals Bill 2023

Expanding Exploration Rights: The Bill allows private sector engagement in the exploration of critical and strategic minerals previously reserved for government entities.

Exploration Licenses (EL): The Bill introduces a new type of license, EL, for private exploration activities. Exploration licenses will be granted through competitive bidding and will be issued for specified critical, strategic, and deep-seated minerals.

Revenue Model: ELs aim to generate revenue through a share of the premium paid by the miner after successfully auctioning a mined deposit.

Critical Minerals and their Importance

Critical minerals are elements that are crucial to modern-day technologies and are at risk of supply chain disruptions.

Recent categorization: Minerals such as antimony, cobalt, gallium, graphite, lithium, nickel, niobium, and strontium are among the 22 assessed to be critical for India.

Global Supply Chain Vulnerabilities: The global supply chains for various commodities, including critical minerals like lithium, cobalt, graphite, and rare earth elements, have been shown to be susceptible to shocks, leading to shortages and rising prices.

Impact on Various Sectors: Critical minerals are essential for manufacturing, infrastructure development, and clean energy transitions. They are crucial for electric vehicle batteries, semiconductors, wind turbines, and other technological advancements.

What is the importance of minerals for India?

Various minerals play a pivotal role in a **nation's manufacturing, infrastructure development, and progress.**

The **shift towards clean energy** in countries

like India relies heavily on the **accessibility of essential minerals** like lithium, cobalt, graphite, and rare earth elements (REEs).

These minerals are also indispensable for **producing semiconductors** utilized in smart electronic devices, defense and aerospace gear, telecommunications technologies.

How much of India's critical minerals are imported?

The scarcity of such minerals in **specific geographic regions** leads to a need for imports. It creates **vulnerabilities in supply chains** and the **potential for disruptions.**

For Example, China has **substantial ownership** of cobalt mines in the Democratic Republic of Congo, responsible for 70% of global cobalt production.

Prominent economies have recently taken measures to bolster their **supply chain resilience** for such minerals, and decrease their **reliance on countries like China for supplies.**

India's **dependence on imports** for the majority of minerals on this list remains significant. India is entirely reliant on countries such as China, Russia, Australia, South Africa, and the United States for essential minerals like lithium, cobalt, nickel, niobium, beryllium.

Even for **deep-seated minerals** like gold, silver, copper, zinc, lead, nickel, cobalt, platinum group elements, and diamonds, India's dependence on imports remains substantial.

In the fiscal year 2022-23, India imported **nearly 1.2 million tonnes of copper** valued at over ₹27,000 crore.

Why is the private sector vital for critical minerals exploration?

Atomic Minerals Directorate for Exploration and Research and the Centre for Social and Economic Progress (CSEP) noted that **India's unique geological and tectonic setting is conducive to hosting potential mineral resources** and that its geological history is similar to the mining-rich regions of Western Australia and Eastern Africa.

Notably, it is estimated **that India has explored just 10% of its Obvious Geological Potential (OGP), less than 2% of which is mined** and the country **spends less than 1% of the global mineral exploration budget.**

Not many significant mineral discoveries have taken place in the country in the last couple of decades and a **majority of exploration projects have been carried out by the government agency** Geological Survey of India and other Public Sector Undertakings (PSUs) like Mineral Exploration Corporation Limited (MECL), with very little private sector participation.

India's mining policy had kept greenfield exploration of minerals out of the purview of private-sector explorers for some years which meant they could only get licences to further prospect and mine resources that had been explored by a government entity.

Companies also saw a **lack of adequate incentives.**

Exploration requires techniques like aerial surveys, geological mapping, and geochemical analyses and is a highly specialised, time-intensive and monetarily risky operation with less than 1% of explored projects becoming commercially viable mines.

Indian PSUs were in a relatively better position to explore surficial and bulk minerals like coal and iron ore, they had **not fared well when it came to deep-seated and critical minerals owing to the high expenditure and long duration of risky projects** while being under pressure to increase the supply of bulk minerals.

The new Bill seeks to bring exploration processes in India at par with that of developed countries by getting private sector capacity into exploration, giving the example of Australia.

In Australia and multiple other jurisdictions globally, private mining firms called junior explorers, engage in risk-taking by putting their expertise and limited financials into explorations to find potential mines.

Once discovered, these **private companies can sell these to bigger mining companies who then develop and run** these mines.

This helps multiply exploration projects and accelerate the pace of exploration owing to private participation.

What are some of the possible issues with the Bill's proposals?

Industry experts and organizations like CSEP had pointed out certain issues and made recommendations on the proposed amendments.

The primary way of generating revenue for a private company that has an exploration licence would be a share of the premium paid by the miner, which would come only after a successfully discovered mine is auctioned and operationalized.

Trends show that such a process could take years to materialise owing to government timelines for clearances or may not happen at all considering the complexity of the deposit and geography.

The **CSEP mentions the example of the Ghorabhurani-Sagasahi Iron Ore Mine,** a greenfield captive mine, which was auctioned in 2016.

Even though it was a bulk mineral, production started only in late 2021, taking close to six years to receive the necessary clearances.

The explorer would not know how much revenue they will receive as the auction premium would be known only when a mine is successfully auctioned.

Another issue is with the auction method of allocation for exploration licences. While it's feasible to auction something that has a known value (like a spectrum or a discovered mineral deposit), it is difficult to auction something for which exploration has not begun.

The Supreme Court in its 2012 ruling observed that since big capital investments go into discovering natural resources through exploration and mining contracts, companies would only want to spend big amounts if they're assured of utilising any discovered resources.

In the new policy, only the government can auction what an explorer has discovered and the latter would only get a share of the premium at an unknown stage.

This is unlike other global jurisdictions where private explorers can sell their discoveries to miners.

NATIONAL RESEARCH FOUNDATION BILL CLEARED

The Anusandhan National Research Foundation Bill, 2023 was introduced in Lok Sabha on August 4, 2023. It repeals the Science and Engineering Research Board Act, 2008 and dissolves the Science and Engineering Research Board set up under it. The Bill provides for establishing the Anusandhan National Research Foundation (NRF).

Functions of NRF:

NRF will be the apex body in the country to provide strategic direction for research, innovation, and entrepreneurship in the fields of:

- Natural sciences including mathematics,
- Engineering and technology,
- Environmental and earth sciences,
- Health and agriculture,
- Scientific and technological interfaces of humanities and social sciences.

Key functions of NRF include:

Preparing short-term, medium-term, and long-term roadmaps and formulating programs for research and development (R&D),

Facilitating and financing the growth of R&D and related infrastructure in universities, colleges, and research institutions,

Providing grants for research proposals,

Supporting translation of research into capital intensive technology,

Encouraging international collaboration,

Encouraging investments in the Foundation by private and public sector entities, and

Undertaking annual survey of scientific research, outcomes, and spending.

Funds for NRF: The Foundation will be financed through:

- Grants and loans from the central government,
- Donations to the fund,
- Income from investments of the amounts received by the Foundation,

All amounts with the Fund for Science and Engineering Research set up under the 2008 Act.

The following Funds will be constituted by the Foundation for allocation purposes:

1. The Anusandhan National Research Foundation Fund for salaries, allowances, and administrative purposes,
2. The Innovation Fund for funding outstanding creativity in the areas supported by the Foundation,
3. The Science and Engineering Research Fund for the continuation of projects initiated under the 2008 Act, and
4. One or more special purpose funds for any specific project or research. The central government will prescribe rules for the utilisation of these Funds. CAG will audit the accounts of the Foundation annually.

Governing Board: NRF will have a Governing Board headed by the Prime Minister of India. The Board will provide strategic direction to the Foundation and monitor the implementation. Other members of the Board are:

The Union Ministers of Science and Technology, Education as Vice Presidents,

The Principal Scientific Advisor as Member Secretary, and

Secretaries to the Departments of Science and Technology, Biotechnology, and Scientific and Industrial Research.

The President of the Board may appoint or nominate additional members to the Board. These may include:

Up to five members from business organisations or industries,

One member from the fields of social sciences and humanities, and

Up to six experts from natural sciences, engineering, and technology. The President may appoint a Chief Executive Officer, who should be of the rank of an Additional Secretary, or above.

Executive Council: The Foundation will have an Executive Council to undertake implementation. The functions of the Executive Council include:

Considering applications for the grant of financial assistance,

Prescribing regulations regarding applications for financial assistance, requirements for extension of assistance, and grounds for revocation of assistance, and

Preparing budget of the Foundation and maintaining its accounts. The Council will have the power to authorise an officer to visit the applicants for grants and verify the accuracy of submissions made by them.

The Principal Scientific Advisor will be the chairperson of the Council. Other members of the Council include:

Secretaries to various departments of the central government including Science and Technology, Higher Education, Health Research, Agricultural Research, and Defence Research, and

The Chief Executive Officer of the Foundation. The President of the Foundation may nominate or appoint to the Council:

Up to two secretaries of departments not covered under the Bill, and up to three experts

What is the significance of NRF?

Focus on universities - The main objectives of the NRF is to get colleges and universities involved in scientific research.

Research in social sciences - It promote research not just in natural sciences but also in humanities, social sciences and art.

National priorities - It also aims to identify priority areas such as clean energy, climate change, sustainable infrastructure, etc. in which S&T interventions can help larger national objectives.

Democratisation - The focus area for NRF is peripheral, rural and semi urban areas which are often neglected.

Uniformity – It also aims to bring uniformity in funding and reduce the bureaucratic hurdle associated in raising money.

Internationalization - It will promote international competition and find solution to complexities of Indian society.

What is the status of R&D in India?

R&D expenditure - India spends around 0.7% of GDP in R&D which is lesser than many other countries.

Gross expenditure on R&D in India is declined from 0.84% in 2008 to 0.69% in 2018.

Research funding - Eminent institutions like the IITs and IISc get a bulk of research funding but State universities get very little about 10% of the research funds.

Patents - According to the World Intellectual Property Organisation (WIPO), although India registered a 16.5% growth in patent grants in 2021, the patent applications are very much less than China and US.

Other challenges - Other challenges that constraints the scientific community includes:

- Inconsistent funding stream
- Complex application processes (multiple guidelines & rules)
- Bias towards established researchers and institutions
- Straight-jacketed themes which allow little intellectual freedom
- University bureaucracy and procedures result in delays in decisions

What are the challenges associated with NRF?

Financial crunch- 50% of the funding mechanism is dependent on private sector.

While the participation of the private industry in the NRF is an important and welcome step, it is unclear how the government will raise Rs 36,000 crore from the industry.

Autonomy - The top positions in the NRF board are reserved for members of the government, including the PM and the Ministers of Science, Technology and Education.

Time period - Although the NRF draft mentions that the peer-review process will be completed within 6 months, releasing funds may take time, pending financial clearance.

What is the need of the hour?

The time between applying for a research grant and receiving the money must be minimal, preferably within 6 months.

All the paperwork must be digitally processed without sending stacks of papers in hard copies to the NRF.

All finance-related queries, paperwork, approval, and acceptance need to be between the NRF and the finance department of the university/ research institution keeping the scientist free to focus on research.

The NRF needs explicit spending guidelines away from the General Financial Rules (GFR) and the government's e-Marketplace (GeM) usage.

Although the NRF draft mentions timely disbursal of funds, a mechanism needs to be in place to facilitate and implement this.

KERALA LOP OBJECTS TO SHRC CHIEF APPOINTMENT

Leader of the Opposition says he was not intimated of the move to appoint S. Manikumar to the post though he is a member of the selection panel, sends government a dissent note

Concerns over Selection Process:

V.D. Satheesan, Leader of the Opposition, objects to being left out of the decision-making process.

Claims that the government's decision lacks political propriety by not involving all panel members.

Criticizes the government for presenting only one name instead of a panel of candidates for consideration.

Alleges the government's approach is arbitrary and lacks democratic principles.

What is the Protection of Human Right Act, 1993?

The Protection of Human Rights Act, 1993 came into force with retrospective effect from September 28, 1993.

It applies to the whole of India and in the case of J&K, it applies to matters pertaining to Union List and the Concurrent List only.

The Protection of Human Rights Act, 1993 was enacted to provide for the constitution of:

- National Human Rights Commission (NHRC),
- State Human Rights Commission (SHRC) and
- Human Rights Courts for the protection of human rights.

National Human Rights Commission (NHRC):

Watchdog for human rights which was founded on October 12, 1993.

Enforces rights guaranteed by Indian Constitution and international covenants.

Conforms to Paris Principles for human rights protection.

Composition:

- Chairperson and four members.
- Chairperson: Retired Chief Justice or Supreme Court judge.
- Members: Eminent persons with experience in human rights, law, public administration, etc.

Appointment by the president on the recommendation of a six-member committee.

Committee for Appointment: Six-member committee headed by the Prime Minister, Speaker of Lok Sabha,Deputy Chairman of Rajya Sabha, Leaders of the Opposition in both Houses, and Union Home Minister.

Tenure:

Chairperson and members hold office **for three years or until they attain the age of 70 years**, whichever is earlier.

Reappointment is possible for members if not yet 70 years old.

- Not eligible for further employment under union/state government.

Role and Powers:

- Investigate human rights violations, suo motu, or complaints.
- Intervene in court proceedings related to human rights.
- Monitor jails, and recommend improvements.
- Review safeguards and recommend measures.
- Study treaties and promote human rights literacy.
- Collaborate with NGOs and international

bodies.

Limitations:

- Recommendations are not binding on the government.
- Limited investigation mechanism.
- The time limit for complaint registration (within one year of occurrence).
- No enforcement power.

State Human Rights Commission (SHRC):

Inquires into human rights violations in state matters.

Composition:

- Chairperson and two members.
- Chairperson: Retired Chief Justice or High Court judge.

Members: Serving/retired HC judge or district judge with at least seven years of experience as a District Judge..

Powers:

- Similar to NHRC.
- Can recommend compensation and prosecution.

Limitations:

- Lack of transparent selection process.
- Unclear criteria for member selection.
- Political considerations influence appointments.
- Presence of political figures in selection.
- Expertise and Qualifications:
- Appointments may lack the required expertise.
- Qualifications are not consistently prioritized.
- Members appointed to other roles post-tenure.
- Potential conflicts of interest arise.
- Public Engagement Gap:
- Limited civil society and public involvement.
- Lack of diverse voices in selection.
- Appointment Delays:
- Delays affect commission effectiveness.
- Quorum issues may arise.
- Politicization Concerns:
- Allegations of bias due to political affiliations.
- Impartiality could be compromised.

PRADHAN MANTRI AWAS YOJANA – URBAN (PMAY-U) PROGRAMME

Recently, Prime Minister in his address on 77th Independence Day, unveiled a new scheme aimed at alleviating the housing crisis faced by the urban poor.

- The new scheme complements the Pradhan Mantri Awas Yojana Urban (PMAY-U), a flagship government initiative launched in 2015.

About PMAY-U

- It is a flagship Mission of Government of India being implemented by the Ministry of Housing and Urban Affairs (MoHUA).
- It was launched on 25th June 2015 and addresses urban housing shortage among the EWS/LIG and MIG categories including the slum dwellers by ensuring a pucca house to all eligible urban households by the year 2022, when Nation completes 75 years of its Independence.

PMAY(U) adopts a demand driven approach wherein the Housing shortage is decided based on demand assessment by States/Union Territories.

Coverage:

The Mission covers the entire urban area consisting of Statutory Towns, Notified Planning Areas, Development Authorities, Special Area Development Authorities, Industrial Development Authorities or any such authority under State legislation which is entrusted with the functions of urban planning & regulations.

Features

- All houses under PMAY(U) have basic amenities like toilets, water supply, electricity and kitchen.
- The Mission promotes women empowerment by providing the ownership of houses in the name of female members or in joint name.
- Preference is also given to differently abled persons, senior citizens, SCs, STs, OBCs, Minority, single women, transgender and other weaker & vulnerable sections of the society.
- A PMAY(U) house ensures dignified living along with a sense of security and pride of ownership to the beneficiaries.
- COVID-19 pandemic has resulted in reverse migration of urban migrants/ poor in the country. Urban migrants stay in slums/ informal settlements/ unauthorised colonies/ peri-urban areas to save cost on housing.

Therefore, The Ministry of Housing & Urban Affairs has initiated Affordable Rental Housing Complexes (ARHCs), a sub-scheme under Pradhan Mantri Awas Yojana - Urban (PMAY-U).

This will provide ease of living to urban migrants/ poor in the Industrial Sector as well as in a non-formal urban economy to get access to dignified affordable rental housing close to their workplace.

Components

The scheme has hence been divided into four verticals as given below:

- In-situ Slum Redevelopment (ISSR)
- Central Assistance of Rs. 1 lakh per house is admissible for all houses built for eligible slum dwellers under the component of ISSR using land as Resource with participation of private developers.
- Credit Linked Subsidy Scheme (CLSS):

Beneficiaries of Economically Weaker Section (EWS)/Low Income Group (LIG), Middle Income Group (MIG)-I and Middle Income Group (MIG)-II seeking housing loans from Banks, Housing Finance Companies and other such institutions for acquiring, new construction or enhancement* houses are eligible for an interest subsidy of 6.5%, 4% and 3% on loan amount upto Rs. 6 Lakh, Rs. 9 Lakh and Rs. 12 Lakh respectively.

Affordable Housing in Partnership (AHP):

Under AHP, Central Assistance of Rs. 1.5 Lakh per EWS house is provided by the Government of India.

An affordable housing project can be a mix of houses for different categories but it will be eligible for Central Assistance, if at least 35% of the houses in the project are for the EWS category.

Beneficiary-led Individual House Construction/ Enhancement (BLC-N/ BLC-E)

Central Assistance up to Rs. 1.5 lakh per EWS house is provided to eligible families belonging to EWS categories for individual house construction/ enhancement.

The Urban Local Bodies validate the information and building plan submitted by the beneficiary so that ownership of land and other details like economic status and eligibility can be ascertained.

THE CENTRE MUST REVISIT THE PM-USHA

Why in news?

Fourteen States and Union Territories, including Kerala, Tamil Nadu, and West Bengal, have not yet signed a crucial Memorandum of Understanding (MoU) with the Union Education Ministry to implement the National Education Policy (NEP) as part of the Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA) scheme.

Why have states not joined PM-USHA?

PM-USHA scheme mandates that States implement the National Education Policy in order to avail funds worth almost ₹13,000 crore for the next three years. Also, 40% of the fund has to be arranged by States themselves. States argue they don't have funds for bringing in NEP-related changes.

What is the PM-USHA Scheme?

In the light of the National Education Policy , RUSA (Rashtriya Uchchatar Shiksha Abhiyan) Scheme has been launched as "Pradhan Mantri Uchchatar Shiksha Abhiyan (PM- USHA)" in June 2023.

RUSA, as a Centrally Sponsored Scheme launched in October 2013, aiming at providing strategic funding to higher education institutions throughout the country.

It focuses on:

- Equity Access and inclusion in higher education
- Developing Quality Teaching & Learning processes,
- Accreditation of Non Accredited Institutions and improving accreditation.
- ICT – based Digital Infrastructure.
- Enhancing Employability through Multidisciplinary.

Objective:

To improve the overall quality of existing state higher educational institutions by ensuring their conformity to prescribed norms and standards and adoption of accreditation as a quality assurance framework.

Ensure governance, academic, and examination reforms in the State higher educational institutions and establish backward and forward linkages with school education on one hand and employment market, on the other hand, to facilitate self-reliance and thus creating an Atma-Nirbhar Bharat

Create an enabling atmosphere in the higher educational institutions to devote themselves to research and innovations.

Key Features:

MERU Transformation: It supports 35 accredited state universities with Rs 100 crore each to facilitate multi-disciplinary education and research.

Model Degree Colleges: The scheme provides provisions for establishing new model degree colleges.

Enhancing Universities: Grants are allocated to strengthen universities.

Focus on Remote and Aspirational Areas: PM-USHA targets remote, Left-Wing Extremism (LWE) affected regions, aspirational districts, and areas with low Gross Enrolment Ratio (GER).

Support for Gender Inclusion and Equity: The scheme aids state governments in promoting gender inclusion and equity, as well as upgrading skills for better employability through Information and Communication Technology (ICT).

EVOLUTION OF CRIMINAL PROCEDURE CODE AND THE RECENT BILLS

The Criminal Procedure Code (CrPC) in India has evolved over the years to provide a comprehensive framework for the conduct of criminal proceedings in the country.

Code of Criminal Procedure - Historical Background

The evolution of the Code of Criminal Procedure can be traced back to 1861 when the first code was enacted following the passage of the Indian Penal Code in 1860.

The Code was then superseded by Act 10 of 1882.

Since 1882, sixteen acts relating to criminal procedure have been passed.

In 1898, the Code was again replaced by the Code of Criminal Procedure.

Following that, the Code of Criminal Procedure Amendment Act of 1923 amended the 1898 code.

The First Law Commission in its 14th Report (1958) made extensive recommendations on criminal justice reform.

The committee's recommendations were taken into account, and the Code was amended.

The Code of Criminal Procedure, 1973, was enacted by Parliament in 1973 in response to the recommendations of the ***Fifth Law Commission's Forty-First Report.***

Recent Bills

The government ha introduced three Bills in the Lok Sabha to replace laws that form the backbone of criminal jurisprudence in India:

The Indian Penal Code (1860), the Indian Evidence Act (1872), and the Criminal Procedure Act (1898) would be replaced by

1. Bharatiya Nyaya Sanhita (BNS),

2. Bharatiya Sakshya (BS), and

3. Bharatiya Nagarik Suraksha Sanhita (BNSS)

Main Features of the Bharatiya Nyay Sanhita Bill, 2023

The bill ***defines terrorism and offenses such as separatism, armed rebellion*** against the government, challenging the sovereignty of the country, which were earlier mentioned under different provisions of law.It also lists man made floods as an act of terrorism

It repeals the offense of sedition, which was widely criticized as a colonial relic that curbed free speech and dissent.***while a new section, 150, is being proposed*** for acts of endangering the sovereignty, unity and integrity of India.

It prescribes ***capital punishment as the maximum sentence for mob lynching,*** which has been a menace in recent years.

It proposes 10 years imprisonment for sexual intercourse with women on false promise of marriage, which is a common form of deception and exploitation.

The bill ***introduces community service as a form of punishment*** for specific crimes, which can help in reforming offenders and reducing overcrowding in prisons.

The bill fixes a maximum limit of 180 days to file a charge sheet, which can speed up the trial process and prevent indefinite delays.

Main Features of the Bhartiya Nagrik Suraksha Sanhita Bill, 2023

It ***promotes the use of technology for trials, appeals, and recording depositions, allowing video-***conferencing for proceedings.

The bill makes ***video-recording of statement of survivors of sexual violence compulsory***, which can help in preserving evidence and preventing coercion or manipulation.

The bill mandates that police must inform about the status of a complaint

in 90 days, which can enhance accountability and transparency.

The bill ***mandates the forensic tests for offences with sentence of more than seven years.*** It grants states with a maximum five years to leverage the required capacity

Section 41A of the CrPC will be renumbered as Section 35. This change includes an added safeguard, stipulating that ***no arrest can be made without prior approval from an officer at least at the rank of Deputy Superintendent of Police (DSP),*** especially for offenses punishable by less than 3 years or for individuals above 60 years.

The bill requires that police consult the victim before withdrawing a case punishable by seven years or more, which can ensure that justice is not compromised or denied.

It allows absconding criminals to be tried in-absentia by court and sentenced too, which can deter fugitives from escaping justice.

It empowers magistrates to take cognizance of offences based on electronic records such as emails, SMSs, WhatsApp messages etc., which can facilitate evidence collection and verification.

Mercy petitions in death sentence cases to be filed within 30 days to the Governor and within 60 days to the President. No appeal shall lie against the President's decision in any court.

Main Features of Bharatiya Sakshya Bill, 2023

The bill defines electronic evidence as any information generated or transmitted by any device or system that is capable of being stored or retrieved by any means.

It lays down specific criteria for admissibility of electronic evidence such as authenticity, integrity, reliability etc., which can prevent misuse or tampering of digital data.

It provides for special provisions for admissibility of DNA evidence such as consent, chain of custody etc., which can enhance accuracy and reliability of biological evidence.

It recognises expert opinion as a form of evidence such as medical opinion, handwriting analysis etc., which can assist in establishing facts or circumstances relevant to a case.

It introduces the presumption of innocence as a fundamental principle of criminal justice system, which means that every person accused of an offence is presumed to be ***innocent until proven guilty beyond reasonable doubt.***

ASSAM DELIMITATION – ITS ISSUES

The Election Commission recently released a draft delimitation document for Assam, suggesting modifications to the boundaries of several Lok Sabha and Assembly constituencies. However, the proposal has sparked protests and controversies in the state.

Key highlights of the proposal:

Sheduled Castes assembly seats increased from 8 to 9, and ST assembly seats increased from 16 to 19.

One assembly seat increased in West Karbi Anglong District, and three assembly seats increased in the Bodo Territorial Region.

Kaliabor Lok Sabha constituency renamed as 'Kaziranga.'

While the number of seats remains the same (126 Assembly and 14 Lok Sabha), the draft suggests changes in geographical boundaries and an increase in reserved constituencies for Scheduled Tribes (ST) and Scheduled Castes (SC).

Groups from the Bodo Territorial Council and Karbi Anglong district have hailed the proposal because it secures at least 102 constituencies for the "indigenous" people.

Need of delimitation in Assam:

Assam currently has 14 Lok Sabha, 126 Assembly constituencies.

The last delimitation of constituencies in Assam was done in 1976 on the basis of the 1971 Census.

While the delimitation process was done in the rest of the country in 2008, it was deferred in Assam (and some other NE states) citing security concerns of the time.

In 1971, Assam's population was 1.46 crore, which increased to 2.66 crore (2001) and to 3.12 crore (2011).

Process and Controversies:

The constituencies were delimited based on the 2001 Census data, while considering the suggestions of political parties and organizations.

However, the draft has faced allegations of being partisan and divisive. Opponents, particularly the AIUDF representing Bengali-origin Muslims, argue that the proposal divides voters along religious lines and disadvantages their community politically.

They claim that Muslim-majority areas have been merged with Hindu-majority populations, reducing the number of constituencies where Muslim legislators can be elected.

What is delimitation?

It is the act of redrawing the boundaries of an Assembly or Lok Sabha seat to reflect changes in population over time, based on the most current Census data.

The process may alter the number of seats in a state so that the population of all seats is as uniform as possible across the state.

The objective is to ensure equal representation for population segments and prevent any political party from gaining an unfair advantage.

Legal/constitutional provisions:

Article 82: Following each census, the allocation of Lok Sabha seats to the states, as well as the division of each state into territorial constituencies, shall be readjusted by such authority as Parliament may by law determine.

Section 8A of the Representation of the People Act, 1950: It allows for delimitation of Parliamentary and Assembly constituencies in Arunachal Pradesh, Assam, Manipur or Nagaland.

Article 170 (Composition of the Legislative Assemblies): Census figures (2001) shall be used for the purpose of readjustment of constituencies in the State.

Reservation of seats for the SCs/STs will be provided as per Articles 330 (Lok Sabha) and 332 (State Assemblies) of the Constitution.

Responsibilities of the Delimitation Commission:

Determining the Number and Boundaries of Constituencies: The Delimitation Commission carefully considers the population data and strives to ensure an equal number of people in each constituency, thereby maintaining the principle of 'one person, one vote.'

Ensuring Equal Population Representation in Each Seat through a meticulous analysis of census data, it determines constituency boundaries that minimize disparities in population size, ensuring that every vote carries equal weight.

Designating Reserved Seats for Scheduled Castes and Scheduled Tribes to empower marginalized communities by identifying the areas with a significant population of Scheduled Castes and Scheduled Tribes.

Resolving Disagreements through Majority Decisions which ensures that decisions are made in the way of democratic approach.

Significance of the Delimitation Commission:

The Delimitation Commission operates independently of the executive branch and political parties, ensuring its impartiality and non-partisan nature. This independence is crucial for the

credibility and integrity of the delimitation process.

Once the Delimitation Commission issues its final order, its decisions are considered binding and cannot be challenged in court or overturned through legislative means. This ensures stability and avoids unnecessary disputes regarding constituency boundaries.

The commission's focus on equal population representation in constituencies helps prevent disparities and ensures that every vote has an equal impact. It enhances the democratic fabric of the country by promoting fair representation and preventing concentration of power.

The Delimitation Commission bases its decisions on the most recent census data. By using reliable and accurate demographic information, it ensures that constituency boundaries are redraw

Public Participation in the Delimitation Process:

- Draft Proposals: Publication and Review
- Open Meetings: Engaging the Public
- **Amendments:** Adapting the Proposal as Needed

The commission takes into account the feedback received during public consultations and carefully considers the validity of the concerns raised. If deemed necessary, amendments are made to the draft proposals, ensuring that the final decision reflects the collective inputs of both the commission members and the public.

How Delimitation affects the Representation of People's Act (RPA):

The provisions of Delimitation Act, 2002, says that as of date, all Assembly and Parliamentary constituencies are to be delimited on the basis of the 2001 Census.

According to the guidelines of the EC and the 84th and 87th amendments to the Constitution, the "state average per assembly constituency" is obtained by dividing the total number of the state population (as per 2001 census) by the total number of constituencies in the state.

This method is aimed at having an equal population in each constituency.

However, a deviation of plus-minus 10 per cent is acceptable if the geographical features, means of communication, public convenience, contiguity of the areas, and necessity to avoid breaking of administrative units so demand.

As per the guidelines, seats have to be reserved for the SCs and STs in the proportion of their population separately both for the Assembly and Parliamentary constituencies in each state.

The commission, after completing the process from its end, puts out papers and draft proposals for discussions and holds public meetings on the same.

These proposals are notified in the Gazette of India and the state's gazette after the President's approval.

The commission's order cannot be challenged in any court as it has the force of law.

The copies of orders are also presented before the Lok Sabha and the State Legislative Assembly concerned, but both these houses are not allowed to make modifications in that.

Conclusion

The Assam delimitation draft proposes changes to constituency boundaries, leading to protests and controversies. While some groups welcome the proposal for securing the representation of certain communities, others, particularly the Bengali-origin Muslim community, argue that it marginalizes them politically. The final outcome and its implications will unfold after considering objections, conducting public hearings, and making necessary revisions to the draft.

INDIA- A MARVEL THAT CONTINUES TO ENDURE

India's journey from Independence to the modern age has had its ebbs and flows; today, **the nation stands at the precipice of greatness**

The East is awakening

Our nation, a mosaic of religious, ethnic, linguistic and cultural plurality, celebrates its modern rebirth today.

This journey has been filled with love and hate, pain and joy, and highs and lows. And yet we march on. Our tryst with destiny continues.

In 1947, the western world gave only a little chance for India to survive as a democracy.

What the West failed to realise then was a reawakening of a civilisation with a cultural history that dates back millennia.

In the 21st century, as western civilisations decline, an epoch is fading. And in its place the civilisations of the east, finally unshackled from the chains of bondage, are awakening.

The journey of modern India has not been without its ebbs and flows. ***What the West considered our Achilles heel, i.e., our diversity, has proven to be India's greatest strength.***

South and West India became the manufacturing hubs of the country, the East its resource repository, and the North its bread basket.

The founding fathers of our Republic had the foresight to establish a constitutional scheme which harnessed the power of our diversity.

Secularism, Federalism, Universal franchise, and the Freedom of speech and Religion created a spirit of fairness and justice that accommodated our linguistic, regional, religious divides under the rule of law.

Consequently, India engineered the green and white revolutions. ***We reached the stars and split the atom. We fought wars for moral reasons. Our Constitution continues to endure.***

Hurdles to overcome

There have been stumbles along the way.

Communal majoritarianism has reared its ugly head time and again. We continue to pay the toll for our original sin — ***the caste system and its poisonous inequities.***

While great strides have been made since Independence to achieve political, social and economic freedom, ***true social and economic equality eludes us.***

Extreme poverty and a social marginalisation of minorities persist.

The potential of the daughters of India remains trapped in the ***absence of a gender-equal society.***

The ***North-East remains distant from our hearts and minds*** and must be integrated to the mainland in spirit.

Attempts to homogenise the Indian identity are gaining ground.

But the faith in our ability as a people to overcome these challenges remains steadfast, because at our core we are a just, spiritual and peace-loving people. We are the children of Buddha and Ashoka, Ambedkar and Gandhi, Thiruvalluvar and Periyar.

Way forward

Democracy and freedom require constant vigil. If and when state power becomes tyrannical, every Indian must possess the courage and will to rise.

She must always imbibe its national consciousness and spirit with equality, justice and fairness towards each other.

Today, as technological advancements usher in ***knowledge democratisation, we can finally fulfil Bapu's dream of achieving Village Swaraj.***

Imagine the day when every village is self-sustaining, state institutions and infrastructure are capable of unleashing the potential of our demographic dividend, and Indian culture dominates the global zeitgeist.

Conclusion

We dream of an India where no child is born in poverty or goes to sleep hungry and whose universities such as Nalanda are the intellectual centres of the world again. We dream of an India whose cultural, spiritual and economic prowess reignites a race from the West to reach its shores.

NEWS MEDIA VERSUS OPEN AI'S CHATGPT

Context

Recently, prominent media outlets like New York Times, Reuters, CNN, and ABC blocked OpenAI due to copyright concerns and potential legal actions.

What does OpenAI do?

The company is best known for creating 'ChatGPT', which is an AI conversational chatbot.

Users can ask questions on just about anything, and ChatGPT will respond pretty accurately with answers, stories and essays.

It can even help programmers write software code.

What started the face-off between news outlets and OpenAI?

The reason given by media against OpenAI was;

Basis of LLMs: Large language models (LLMs) like ChatGPT require extensive training data to comprehend human language patterns effectively.

Data Collection: Tech giants such as Google, Meta, and OpenAI rely on web-crawlers to gather data from online sources like social media, news articles, and e-books.

Privacy and Usage Concerns: News outlets, including The New York Times, reacted against OpenAI's data collection via web-crawlers, blocking access to their content.

Training Material: News organizations objected to their published content being used to train AI chat bots without consent.

Ethical Implications: The standoff highlights debates on data scraping, copyright, and ethical considerations in AI model training.

Reason for opposing OpenAI by media:

No monetary benefits: Search engines like Google or Bing use web crawlers to index websites and present relevant results when users search for topics.

The only difference is that search engines represent a mutually beneficial relationship. OpenAI, on the other hand, provides no benefit, monetary or otherwise, to news companies.

It simply collects publicly available data and uses it for the company's own purposes.

What are concerns associated with 'OpenAI'?

Data Usage Rights: The use of data to train AI models raises questions about whether unauthorized usage constitutes a violation of data owner's rights.

Financial Feasibility: The financial sustainability of AI endeavors, like OpenAI, hinges on the compensation required for data usage, with a balance to avoid becoming financially unviable.

Value of Online Content: The argument arises that while AI models can function without specific sources, an aggregate of diverse content enhances quality.

Quality Impact: Widespread denial of data access from media sources could potentially lower the quality of AI-generated content like ChatGPT.

Licensing Arrangements: OpenAI's licensing deal with The Associated Press exemplifies the willingness to compensate for data usage, while legal battles with other content creators underscore complexities.

Legal Implications: Legal battles over copyright infringement will influence journalism, intellectual property rights, and shape the future of AI development.

INTERNATIONAL RELATIONS

What's Inside?

AYUSH VISA

Why in the News?

The Ministry of Home Affairs recently notified the creation of a new category of Ayush visa for foreign nationals for treatment under Ayush systems/Indian systems of medicine.

About Ayush Visa

It is specifically designed for **foreign nationals** looking to **receive medical treatment in India through traditional Indian systems of medicine.**

This visa aims to cater to those interested in Ayurveda, Yoga, and other traditional forms of therapeutic care and wellness.

A new chapter, e., **Chapter 11A, Ayush Visa,** has been incorporated after Chapter 11 - Medical Visa of the Visa Manual, which deals with treatment under the Indian systems of medicine, and accordingly, necessary amendments have been made in various chapters of the Visa Manual, 2019.

The introduction of the Ayush Visa category is part of the country's roadmap for the **Heal in India initiative.**

Heal in India initiative: It seeks to provide **"integrated and holistic treatment"** to the world in India and enhance patient mobility for access to world-class, **affordable, and quality healthcare services".**

About AYUSH

AYUSH, which stands for Ayurveda, Yoga, Unani, Naturopathy, Siddha, and Homoeopathy, is an acronym devised in 2003 to change the name of the Department of Indian Systems of Medicine and Homoeopathy (ISM & H).

ISM & H was created in March 1995 under the Ministry of Health and Family Welfare.

On November 9, 2014, the government elevated **AYUSH to a separate ministry.**

The word AYUSH is derived from a Sanskrit phrase **"ayusmanbhava" meaning long life.**

ACTO - BELEM DECLARATION

Why in news?

At the Amazon Summit, leaders from the eight countries across the Amazon have adopted the Belem Declaration.The summit was organized by the Amazon Cooperation Treaty Organization (ACTO).It was after 14 long years that the member states of the Amazon Cooperation Treaty Organization (ACTO) had met, with the aim of establishing definite goals to avoid a point of no return for the vital rainforest. Instead, the joint declaration issued in the Brazilian city of Belem announced the creation of an alliance for combating forest destruction, with countries left to pursue their own individual deforestation goals.

About

Amazon Cooperation Treaty Organisation

The Amazon Cooperation Treaty (ACT), signed on July 1978 by Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela, is a legal instrument that recognizes the transboundary nature of the Amazon

The Amazon Cooperation Treaty Organization (ACTO) is an intergovernmental organization formed (on 1995) by the eight Amazonian countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela, which signed the Amazon Cooperation Treaty (ACT), becoming the ***only socio-environmental block in Latin America.***

It was founded to promote the preservation of the Amazon basin and regulate Amazonian development through international cooperation.

ACTO, with a broad vision of the South-South cooperation process, works in different dimensions within the framework of the implementation of the ACT: political-diplomatic, strategic, and technical, building synergies among governments, multilateral organizations, cooperation agencies,

organized civil society, social movements, scientific community, productive sectors and society as a whole.

ACTO played a pivotal role in formulating the ***Manaus Declaration in 2004***, which coordinated the development of the vast rainforest area covering approximately 2.9 million square miles.

Secretariat: Brasilia, Brazil

What is the Belem Declaration?

The Balem Declaration was adopted at the Amazon Summit.

The declaration recognises Indigenous knowledge as a condition for biodiversity conservation and calls for ensuring full and effective participation of Indigenous Peoples in decision-making and public policy formulation processes.

The declaration created an alliance for combatting forest destruction, with countries left to pursue their individual deforestation goals.

It also created a science body for annual reports on Amazon rainforest like the UN's Climate Change Panel.

GREEN MINERAL POLICY OF GHANA

Why in News?

Ghana recently approved a new policy for the exploitation, management and regulation of lithium and other green minerals in the country, to keep pace with the rising global demand for minerals critical for transitioning to clean energy.

The policy provides clear guidelines and a fiscal regime for mining so-called green minerals, in a manner that ensures Ghana derives as much benefit as possible from its resources.

What are Green minerals?

Often referred to as "minerals of the future", green minerals are metals and other mineral resources that are needed to support the transition to clean energy technologies aimed at reducing carbon emissions. These include — **bauxite, cobalt, copper, lithium, granite, manganese and nickel.**

According to the International Energy Agency, Electric Vehicles (EV) and battery storage account for about half of the mineral demand growth from clean energy technologies over the next two decades.

Mineral demand for use in EVs and battery storage is expected to grow around 30 times in the period to 2040.

Key features of the new policy framework

Maximum benefits to Ghana from its resources of 'Green Minerals'.

Maximum involvement of local people.

The goal of the policy is to retain a significant proportion of the value chain of these future and other critical minerals in our country, as far as possible.

It prohibits export of critical minerals including lithium, bauxite and iron, among others, in their raw state since this denies the country the opportunity to add real value to the economy.

More details

The Ewoyaa lithium project is the first lithium-producing mine in Ghana being developed by Atlantic Lithium, a Sydney-based, Africa-focused lithium exploration and development company.

Recently, Namibia and Zimbabwe banned the export of lithium ore.

The Namibia government banned the bulk export of unprocessed minerals including lithium, graphite and cobalt, known in the industry as direct shipping ore (DSO).

Zimbabwe prohibited export of raw lithium from its mines to stop losing billions of dollars in mineral proceeds to foreign companies.

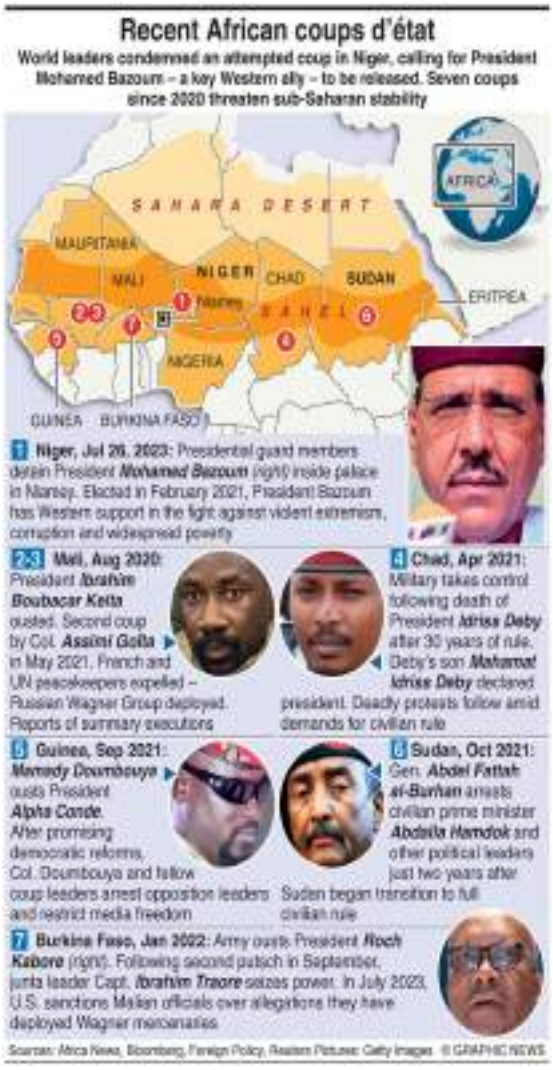
Africa's store of critical rare earth elements: As global demand for critical rare earth elements rises, many countries have looked to Africa's abundant stores of cobalt, lithium, copper and other minerals vital to the manufacturing of modern technologies.

NIGER COUP

Why in news?

Amping up pressure on Niger's mutinous military junta on July 29, the African Union demanded the country's military "return to their barracks and restore constitutional authority" within 15 days. The European Union also announced the suspension of security and funding cooperation with Niger, declaring that the 27-country bloc would not recognise the putschists who have confined the democratically elected President Mohamed Bazoum to his official residence since Wednesday.

On July 28, the ***leader of the coup General Abdourahamane Tchiani, the Presidential Guard since 2011, appeared on state television to declare himself the new leader of the troubled West African country.*** This is the seventh coup in western and central Africa since 2020, including two each witnessed by Niger's neighbours Burkina Faso and Mali.



About Niger

Niger is a vast, arid country in West Africa, twice the size of France. Having a population of about 25 million, the largely-agrarian country is one of the poorest in the world and has ranked low on the Human Development Index over the decades, vulnerable to the extreme weather effects of climate change which threatens food security. Niger, however, also has gold mining reserves and 5-7% of the global production of uranium.

Causes of the Niger Coup

The causes of the Niger coup can be identified from the information provided:

Security Deterioration: One of the primary reasons cited by the coup leaders was the "continued deterioration of the security situation" in Niger. The Sahel region, where Niger is located, has been facing ***a rise in Islamist extremist groups, armed militias, and jihadist threats.*** The inability of the government to effectively counter these security challenges likely contributed to dissatisfaction among certain factions within the military.

Poor Economic and Social Governance: The coup leaders also pointed to "poor economic and social governance" as a reason for their actions. Niger is one of the poorest countries in the world and has faced challenges related to economic development, social welfare, and governance. The ***perception that the civilian government was unable to address these issues*** effectively might have fueled discontent within the military.

History of Instability: Niger has a history of political instability, including multiple military coups since its independence from France in 1960. This history of coup attempts could create a precedent and fertile ground for military actors to consider similar actions as a means of addressing perceived problems.

Regional Instability: The wider Sahel region has been grappling with instability due to ethnic conflicts, extremist groups, and the adverse impacts of climate change. Niger's proximity to countries like Mali and Burkina Faso, which have experienced coup attempts and political violence, could contribute to a sense of regional instability that influences events within Niger.

Ethnic and Socioeconomic Factors: Ethnic and socioeconomic divisions can contribute to political instability. Niger's diverse population and the challenges of managing these diversities could play a role in creating tensions that are exploited by coup plotters.

Anti-Foreign Sentiment: In some cases, military coups are driven by anti-foreign sentiment or opposition to external influences.The military leaders considering the interference of foreign countries in the internal affairs of the country to be increasing.

Effect on India

There is minimal cause for India to be concerned, given that concerning Africa, India's stance aligns better with democratic or political leadership. The majority of India's engagements in the region are business-oriented. Consequently, there is lesser interference in any way in terms of the political development across Africa with respect to India

Niger may not have a direct impact on the bilateral relations between the two countries, since Indian help and capacity-building assistance is widely appreciated there.

IMPACT OF GEOPOLITICS ON CLEAN ENERGY TARGETS

Context

The move to clean energy is complicated by geopolitical factors, particularly in the case of Indonesia's nickel reserves, which are crucial for battery manufacturing.

Geopolitical Factor

Resource Dependence:

Reliance on specific countries for critical minerals like lithium, cobalt, and rare earth elements.

Eg: China's dominance in rare earth production impacts clean energy industries relying on these minerals.

Trade Disputes: Trade conflicts affecting supply chains for renewable energy components. E.g. US-China trade tensions disrupt solar panel and wind turbine supply chains, increasing costs.

Investment Sources: Dependence on foreign investment for clean energy infrastructure. E.g. Indonesia's reliance on Chinese investment for nickel processing affects its clean energy plans.

Technology Transfer: Reliance on foreign technology for clean energy production. Restrictions on technology transfer impact the development of advanced renewable energy technologies.

Political Stability: Instability in producing countries affecting energy security. Political turmoil in oil-producing countries can disrupt global energy markets, impacting renewables.

Sanctions: limiting access to clean energy technologies and resources. US sanctions on Iran restrict its ability to access international clean energy technologies.

National Interests: National interests conflict with global clean energy goals. Countries prioritize fossil fuel industries for economic reasons, hampering renewable energy efforts.

Climate Policy Agendas: Differing climate policies affecting international cooperation. Countries with divergent climate policies may resist cooperating on global clean energy initiatives.

Measures that need to be taken

Develop partnerships with multiple countries to ensure a stable and diversified supply of key materials. International Collaboration, strategic alliances and technology transfer

Advocate for fair trade practices and open markets to prevent trade disputes that disrupt clean energy supply chains.

Provide incentives and subsidies for local manufacturing of renewable energy equipment.

Support **training and knowledge sharing** to enhance local expertise in renewable energy technologies.

Encourage ***countries to set ambitious renewable energy targets*** and contribute to reducing carbon emissions.

Facilitate access to green bonds and other sustainable financing options for clean energy initiatives.

Develop and promote guidelines for sustainable sourcing of materials used in renewable energy technologies.

INDIA-GREECE BILATERAL RELATIONS

Context

Prime Minister Narendra Modi landed in the Greek capital, Athens, for a one-day visit, marking the first visit of an Indian Prime Minister to Greece in 40 years.

About Greece

Greece has the longest coastline in Europe and is the southernmost country in Europe.

Capital is Athens.

Greece is bordered to the east by the Aegean Sea, to the south by the Mediterranean Sea, and to the west by the Ionian Sea.

It lies at the juncture of Europe, Asia, and Africa and is heir to the heritages of Classical Greece, the Byzantine Empire, and nearly four centuries of Ottoman Turkish rule.

The Pindus mountain range on the mainland contains one of the world's deepest gorges, Vikos Gorge.

Mount Olympus is Greece's highest mountain at 9,570 feet (2,917 meters) above sea level.

The largest Greek island by both area and population is Crete, located at the southern edge of the Aegean Sea.

What is the history of India-Greece bilateral relations?

Historical relation- India's contacts with Greece began over 2500 years ago.

Trading between the Mauryan Kings and Greece is evidenced by coinage and writings.

In 326 BC, he invaded the North-Western part of the Indian subcontinent as far as the Hyphasis (Beas River).

He fought with Raja Puru, King of Pauravaa - between the River Jhelum and Chenab, and Ambhi who ruled at Taxila, he didn't cross India and apparently went back to Babylon.

Literature- Chanakya, in Chandragupta's Court records in Arthashastra about Yavan Ambassador in the Kings' court, named Megasthenes.

Art- Gandhara art is believed to be a fusion of Indian and Greek influences.

Establishment of Modern Diplomatic Ties

Diplomatic relations established in 1950.

Embassies set up in Athens and Delhi, reflecting mutual cooperation.

Greece respected India's decisions on various internal matters and the Non-Alignment Movement (NAM).

Collaboration on nuclear issues and international platforms showcased strong ties.

Greece's support for India on geopolitical and global matters.

Key Areas of Collaboration

(1) Defence and Security

Enhancing collaboration in maritime security, counter-terrorism, cyber security, and defence industry.

Establishment of an India-Greece dialogue framework at the level of National Security Advisors (NSAs) for comprehensive discussions.

(2) Maritime Security and International Law

A shared vision for a free, open, and rules-based Mediterranean Sea and Indo-Pacific.

Pledged adherence to the United Nations Convention on the Law of the Sea (UNCLOS) and respect for sovereignty, territorial integrity, and freedom of navigation.

(3) Culture and Tourism

Commitment to promoting art exchanges and cooperation.

Joint efforts to preserve and safeguard ancient sites are bolstered through collaboration within UNESCO.

(4) Trade and Investment

The ambitious goal of doubling bilateral trade by 2030.

Exploration of opportunities in sectors including renewable energy, infrastructure, pharmaceuticals, agriculture, and innovation.

(5) Mobility and Migration Partnership Agreement (MMPA)

Recognition of the mutual benefits of an early finalization of the MMPA.

Aims to facilitate the free movement of the workforce between the two nations.

Recent Visit: An In-depth Analysis

PM Modi's visit marked the first by an Indian Prime Minister in 40 years.

Collaborative efforts focused on military cooperation, counter-terrorism, and cybersecurity.

National Security Advisor-level dialogue was held to facilitate comprehensive discussions on mutual concerns.

Both nations committed to maritime security, promoting free and open seas in the Mediterranean and Indo-Pacific.

Adherence to UNCLOS, sovereignty, territorial integrity, and navigation freedom are emphasized.

Strengthening cooperation across defence, science, culture, tourism, and agriculture sectors.

Greek membership in the International Solar Alliance and Coalition for Disaster Resilient Infrastructure.

Future Outlook

Both leaders stressed cultural exchanges and people-to-people connections.

PM Modi invited PM Mitsotakis to India, highlighting further deepening of relations.

India-Greece ties play a significant role in the broader India-Europe commercial corridor plans.

Shared vision for progress and commitment to diplomatic resolutions.

Strengthening civilizational bonds through cultural interactions.

Conclusion

The historical and modern India-Greece relations exhibit a strong foundation and evolving collaboration.

Recent joint efforts underscore a robust partnership across various domains and a positive outlook for the future.

SOCIETY & SOCIAL JUSTICE

What's Inside?

ETHNIC CLEANSING

Why in news?

The Nuh and Gurugram districts of Haryana have just witnessed the demolition of dwellings and business establishments of people who are accused in criminal cases especially offences having communal sensitivity without following the procedure as established by law. The Punjab and Haryana High Court made a rare interference by taking judicial notice suo motu and stayed the demolition drive. The High Court's question whether an exercise of ethnic cleansing is being carried out by the State brings us to the heart of the issue.

Ethnic Cleansing

Ethnic cleansing is not defined by the Indian Penal Code or international law.

Its first use is attributed to a ***UN appointed Commission of Experts (1992) chaired by Prof. Cherif Bassiou***ni, a father figure in international criminal law, mandated to look into the war crimes in former Yugoslavia.In its final report, the five member commission referred to ethnic cleansing as "… ***a purposeful policy designed by one ethnic or religious group to remove by violent and terror-inspiring means the civilian population of another ethnic or religious group from certain geographic areas***."

The commission enumerated state actions like

- Arbitrary arrest and detention
- Destruction of property
- Forcible removal
- Displacement
- Deportation of civilian population
- Extra judicia executions in the list of coercive practices that constitute ethnic cleansing.

Despite the lack of statutory recognition, any such subversive act is grossly inimical to the constitutional guarantees under Part III of India's Constitution. Hence, the concern and judicial intervention under Article 226 of the Constitution of India.

STATE OF ELEMENTARY EDUCATION IN RURAL INDIA REPORT

Why in the News?

Recently, the **Ministry of Education** has released the State of Elementary Education in Rural India - 2023 report, highlighting the Prevalence of Smartphone Usage among students.

About

The report was based on a survey conducted by the Development Intelligence Unit (DIU), a collaboration between NGO Transform Rural India and Sambodhi Research and Communications.

The survey gathered responses from 6,229 parents of schoolchildren aged 6–16 in rural communities across 21 States.

Aspiring for higher education

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

Dropping out: Parents of a section of girls said their daughters dropped out of school to help out in the family's earnings R. RAGU

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

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

Key findings of the Report

Parental Aspirations and Engagement

78% of parents aspire for their children to attain graduation-level education or above, however, there is a gap in parental engagement. Only 40% of parents have daily conversations with their children about their school learning, while 32% engage in such conversations a few days a week.

School Dropout

For girls, 36.8% of parents mentioned that the need to contribute to family earnings led to their daughters dropping out. Meanwhile, 31.6% attributed the dropout to their child's lack of interest in studies, and 21.1% believed household responsibilities played a role.

For boys, the primary reason for dropping out was a lack of interest in studies, cited by 71.8% of respondents, followed by 48.7% stating the need for boys to contribute to family earnings.

Learning Environment

84% of parents reported regular attendance. Nonetheless, the two main reasons for non-attendance, are short notice and a lack of willingness. Additionally, the availability of age-appropriate reading materials other than textbooks was reported by 40% of parents, highlighting the need for further resources to support children's learning at home.

Highlights of the Report

Smartphone Usage and Entertainment

Smartphone access varies across different class levels. Students in higher classes (Class VIII and above) have greater access to smartphones (58.32%), while even younger students (Classes I–III) show considerable access (42.1%).

49.3% have access to smartphones. 76.7% of parents indicated that their children primarily use smartphones for playing video games, indicating a preference for entertainment over educational activities.

Additionally, 56.6% of students use smartphones to download and watch movies, while 47.3% use them to download and listen to music.

In contrast, only 34% of students use smartphones for study-related downloads, and a mere 18% access online learning via tutorials.

This indicates that smartphone usage for **entertainment is prevalent across age groups, potentially impacting their educational engagement.**

Recommendations

UNESCO endorses banning smartphones from schools

UNESCO recommended a universal ban on the usage of smartphones in schools, saying that it was needed to tackle classroom disruption, improve learning, and help protect children from cyberbullying

Globally, one in four countries has imposed such bans either as law or as a policy out of concern for data privacy, safety, and child's well-being, a report by the UN body says.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has warned against an **uncritical rush toward embrace of digital products in educational settings, noting that "there is little robust evidence on digital technology's added value in education" and that "a lot of the evidence comes from those trying to sell it".**

It cited the example of how "Pearson funded its own studies, contesting independent analysis that showed its products had no impact". At the same time, there was ample evidence of a negative link between excessive screen time and a child's educational performance and emotional stability, it said.

The report findings emphasize the need for **targeted efforts** to enhance the educational environment at home and promote a balanced use of smartphones for both entertainment and learning purposes.

GOOD NUTRITION REDUCES TB INCIDENCE

Why in the News?

Trial done in India shows nutrition support prevents TB, related deaths.

About

A large **trial undertaken in India** has underscored the **role of nutritional supplementation in sharply cutting down tuberculosis (TB) disease rate** in the household contacts of an index patient, and mortality reduction in people diagnosed with active pulmonary TB.

The trial was conducted in four districts in Jharkhand between August 2019 and August 2022. The results of the study were published on August 9 in **The Lancet and The Lancet Global Health.**

Findings of the study

Improved nutrition can reduce the incidence of ***all forms of TB by up to 40 per cent, and of infectious TB by up to 50 per cent*** among those in contact with patients suffering from infectious lung TB.

Early weight gain among underweight patients with TB could ***reduce the risk of mortality by up to 60 per cent,*** as it ensured higher treatment success.

According to the study, ***to prevent a single case of TB, about 30 households (111 household contacts) and about 47 patients would need to be provided nutritional support.*** The monthly cost of a food basket was Rs 1,100 per patient, and Rs 325 per contact (at 2019 prices).

The TB patients currently receive a monthly 10 kg food basket (rice, pulses, milk powder, oil) and multivitamins for six months. Among family members, the intervention group received 5 kg rice and 1.5 kg pulses per head per month.

Jharkhand was chosen as a trial site because it has a high burden of TB (52,179 cases notified in 2021) and the second highest level of multidimensional poverty.

Importance of the finding

The study is the first of its kind in the world and the question was can nutritional intervention reduce TB incidence.

These findings, which come at a time ***when the Centre is seeking to eliminate TB by 2025***, can have implications at the policy implementation level.

The study offers the first evidence of how nutritional support reduces the risk of mortality among TB patients.

The results of the trial are significant as it shows that ***improved nutrition in family members has worked at the community level.***

The studies are significant because under-nutrition has now emerged as the leading risk factor for TB globally and simple dietary interventions have been found to be effective.

The findings shed light on how we can tackle TB in the future.

About Tuberculosis

It is caused by a bacteria called ***Mycobacterium tuberculosis***. It can practically affect **any organ of the body**. The most common ones are lungs, pleura (lining around the lungs), lymph nodes, intestines, spine, and brain.

It is an airborne communicable disease that spreads through **close contact with the infected,** especially in **densely populated spaces** with poor ventilation.

Common symptoms of active lung TB are cough with sputum and blood at times, chest pains, weakness, weight loss, fever and night sweats.

Treatments

Drug Regimen: TB is treated with a combination of antibiotics, usually for a minimum of six months. The most common drugs include isoniazid, rifampin, pyrazinamide, ethambutol, and streptomycin.

Directly Observed Treatment (DOT): In India, the Directly Observed Treatment, Short-Course (DOTS) strategy is followed. Healthcare workers or trained volunteers ensure that patients

take their medications as prescribed.

Drug-Resistant TB: For drug-resistant TB, treatment regimens are longer and more complex, often involving second-line drugs. These cases require close monitoring and may have more side effects.

Patient Education: Patients are educated about the importance of completing their full course of treatment to prevent the development of drug resistance and to ensure a cure.

Contact Tracing: Close contacts of TB patients are screened for the disease to prevent its spread.

Nutritional Support: Adequate nutrition is essential for TB patients to support their recovery.

Global and National efforts

India aims to make the nation TB-free by 2025, whereas the Global Target for TB elimination is 2030.

The WHO has launched a joint initiative "Find. Treat. All. #EndTB" with the Global Fund and Stop TB Partnership.

National Strategic Plan (NSP) for Tuberculosis Elimination (2017-2025), The **Nikshay Ecosystem** (National TB information system), Nikshay Poshan Yojana (NPY- financial support), **TB Harega Desh Jeetega Campaign**.

KOOSINA MANE SCHEME

Why in the News?

Karnataka government announced plans to set up "Koosina mane" across 4,000-gram panchayats for children of working mothers.

About

Koosina mane" translates to **child homes or creches** and is aimed at providing healthcare, nutrition, and safety for children whose mothers are employed under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), as well as for other mothers living in the vicinity.

Significance of the Scheme

Female LFPR: It exemplifies a **demand-side solution** to **boost women's labour force participation** by supporting working mothers through childcare infrastructure. It acknowledges that women are not just mothers but also active contributors to the workforce, an aspect often missed in public programmes.

Building 'koosina mane' at scale, spanning more than 60% of the gram panchayats in the State and recognising it as **"essential public infrastructure"** is a significant step toward **redistributing the gendered burden of childcare**. This can ameliorate the strain women encounter as they balance childcare and paid work, as well as other young girls who substitute for mother's care.

Child Safety: In the absence of care support, women must take their children, especially those who are very young, to their place of work so they can breastfeed and care throughout the day. However, this exposes children to heat stress and other harsh weather conditions and puts them at risk of injury and accidents. **A childcare infrastructure which is managed by well-trained caregivers can address concerns of safety, nutrition, and overall well-being of the child.**

Need for the scheme

The MGNREGA stipulates that at least "**one-third of its beneficiaries shall be women who have registered and requested for work"**. The Union government's data show that women comprise a little over 50% of the person-days under MGNREGA in Karnataka, lower than in neighbouring States like Tamil Nadu and Kerala (80% each).

In India, childcare responsibilities are deeply gendered, a reliable childcare infrastructure that provides beyond basic provisions can aid, increase, and sustain this labour force participation.

Triple burden - Working women encounter "triple burden" of work — paid work, childcare and domestic chores.

Motherhood Penalty - Motherhood pushes women to take up work that is flexible, part-time,

low-paid casual work or self-employment as they are unable to find care support.

Why not ICDS could be utilized?

Integrated Child Development Services (ICDS) primary focus is improving maternal and child **health**. It caters to the needs of children at various stages of early life**, starting from six months to six years.**

However, the working hours of the centres are not designed to support working women. Without maternity protection in the early stages of childbirth, **women require care infrastructure before six months, but also until the child is much older, something that is possible in 'koosina mane'**.

Public infrastructure like 'koosina mane' can reorganize the physical space within which care takes place, moving some of the care work out of the household. This shift could enable women to sustain work, upskill on the job and seek better paying work. This initiative aligns with the goals of both the MGNREGA and the Women and Children Development Department is an excellent example of convergence.

WHO REPORT ON TOBACCO CONTROL

The World Health Organisation (WHO) has recently released a report on tobacco control measures.

This was the 9th WHO report on the global tobacco epidemic. It tracks the progress made by countries in tobacco control since 2008.

About MPOWER measures

In line with the WHO Framework Convention on Tobacco Control (WHO FCTC), WHO introduced the MPOWER measures in 2008.

MPOWER are a set of 6 cost-effective and high-impact measures that help countries reduce demand for tobacco.

These measures include,

- **M**onitoring tobacco use and prevention policies
- **P**rotecting people from tobacco smoke
- **O**ffering help to quit tobacco use
- **W**arning about the dangers of tobacco
- **E**nforcing bans on tobacco advertising, promotion and sponsorship, and
- **R**aising taxes on tobacco.

Key findings

In the 15 years since the **MPOWER measures** were first introduced, 5.6 billion people in the world – or 71% of the entire population – remain protected by at least one of the measures. This has increased from just 5% of the population in 2008. The number of countries implementing at least one MPOWER measure has increased from 44 countries in 2008 to 151 in 2022.

E-cigarettes which are promoted as a safer alternative to cigarettes are harmful to both the people using them and those around them, especially when used indoors. This is undermining the progress made on tobacco control.

Second-hand smoking: (Being in the presence of someone who is smoking). The report talks about creating smoke-free public areas and also de-normalising the act of smoking in society. Of the estimated 8.7 million tobacco-related deaths each year, 1.3 million are of non-smokers exposed to second-hand smoke. Moreover, severe asthma, respiratory tract infections, and sudden infant death syndrome are more common among children exposed to second-hand smoke.

Findings on India

India has the highest level of achievement when it comes to putting health warning labels on tobacco products and providing tobacco dependence treatment.

With 85% of cigarette packs carrying health warnings both on the front and back, India figures among the top 10 countries in terms of the size of health warnings. The cigarette packets in the

country also carry a toll-free number for a quit-line.

India has also banned the sale of e-cigarettes, and banned smoking in healthcare facilities and educational institutions.

India is also implementing warnings on OTT platform content when actors are seen using tobacco products. This would make India the first country in the world to do so.

THE PATHS TO EQUAL: TWIN INDICES ON WOMEN'S EMPOWERMENT AND GENDER EQUALITY

Why in News?

UN Women and UNDP have released the report named ***"The Paths to equal" that shows the status of women's empowerment and gender parity around the world.***

About the Report

The report, prepared by UN Women and UNDP, highlights the global challenges faced by women and provides a roadmap for targeted interventions and policy reforms. The report introduces two new indices:

The Women's Empowerment Index (WEI) measures women's power and freedoms to make choices.

The Global Gender Parity Index (GGPI) assesses gender disparities in key dimensions of human development.

Combined, these indices offer a comprehensive assessment of countries' progress in achieving gender equality.

Today low women's empowerment and large gender gaps are commonplace. Less than 1 per cent of women and girls live in a country with high women's empowerment and a small gender gap. Globally, women are empowered to achieve, on average, only 60 per cent of their full potential, as measured by the WEI, and women achieve, on average, 28 per cent less than men across key human development dimensions, as measured by the GGPI.

These disparities are harmful not just to women's well-being and advancement but also to human progress.

Key Findings of the Report

Only 1% of women globally live in countries with high women's empowerment and gender parity.

Leadership roles and decision-making remain predominantly male-dominated, restricting opportunities for women.

On average, ***women achieve only 60% of their full potential,*** according to the WEI.

Women lag behind men by 28% across key dimensions of human development, as measured by the GGPI.

None of the 114 countries analyzed achieved complete women's empowerment or gender parity.

Over 90% of women worldwide reside in countries with low or middle women's empowerment and low or middle performance in achieving gender parity.

Gender equality challenges persist even in highly developed countries. Among the 114 countries analyzed, over 85, including more than half in the high or very high human development

categories, show low or moderate women's empowerment and gender parity. Economic progress alone does not ensure gender equality.

India has low women's empowerment and gender parity despite moderate human development, highlighting the need for concerted efforts to bridge the gender gap and uplift women's status.

Gender equality alone does not guarantee women's empowerment. The report shows that no country with a gender gap has achieved high women's empowerment.

Additionally, about 8% of women live in countries with low empowerment but high gender parity.

Economic Development & Agriculture

What's Inside?

INCREMENTAL CRR

Why in news?

The Reserve Bank of India (RBI), in its monetary policy review directed banks to uphold an incremental Cash Reserve Ratio (ICRR) of 10 percent on the augmented deposits registered between May 19 and July 28.

ICRR

Banks are mandated to maintain a certain proportion of their deposits and specific liabilities as liquid cash with the RBI, which is called as cash reserve ratio. This serves as a mechanism for the RBI to regulate liquidity in the economy and act as a buffer during periods of financial strain. Presently, banks are required to retain 4.5 per cent of their Net Demand and Time Liabilities as CRR with the RBI.

The RBI possesses the authority to impose an incremental credit reserve ratio in addition to the CRR, particularly during periods of surplus liquidity in the system. This means that ***banks will be obligated to park a higher amount of liquid cash with the RBI***. Such ICRR are later withdrawn by RBI.

Key features

The RBI outlined in its monetary policy that effective from August 12, 2023, all scheduled banks must uphold an additional cash reserve ratio equating to 10 per cent of the surge in their net demand and time liabilities (NDTL) recorded between May 19, 2023, and July 28, 2023.

During this period, the RBI announced the discontinuation of Rs 2,000 notes, leading to substantial deposit inflows in banks. The RBI's intention is to absorb some of this liquidity from the system.

The central bank is assuring banks that this measure is temporary, If liquidity equilibrium is reinstated by september, the RBI might return the impounded funds to the banks prior to the festival season, ensuring minimal impact on credit growth.

Impact of ICRR

RBI's primary objective is to curtail inflation through this tool. As liquidity is withdrawn, banks will have limited funds for lending, thereby decreasing demand for goods and services, and consequently reducing prices.

Short-term interest rates might rise due to tightening of fund supply in the economy, acting as an additional measure to counter inflation. The introduction of an incremental CRR may tie up bank resources and exert upward pressure on market rates.

The ICRR is also expected to help to stabilise the rupee, which has been under pressure in recent months

The ICRR is also likely to impact the stock market. A higher CRR lead to lower stock prices, as investors become more cautious about the economic outlook.

However, if the ICRR helps to reduce inflation and stabilise the rupee, stock prices will look up in the long run. Overall, the impact of the incremental CRR on economic indicators and exchange rates is uncertain as of now. It depends on various factors, including the extent to which the ICRR reduces liquidity in the banking system, the reaction of businesses and consumers to higher interest rates, and the global economic environment.

FITCH DOWNGRADES US RATING

Why in the News?

Global credit ratings agency Fitch has downgraded the credit rating for the United States to AA+ from AAA, its highest possible rating.

About

The Fitch has **cited fiscal deterioration** as well as a **high and growing government debt burden**. In May, it placed the country's rating on negative watch due to the debt ceiling fight. Already S&P in 2011 downgraded the US credit rating from AAA to AA+.

The credit rating **reflects** the creditworthiness of an individual, company, or government. Different rating agencies follow different criteria for assigning ratings.

For Fitch Ratings, an AAA rating is the best, and an AA+ rating refers to high quality. The US credit rating has been reduced to AA+ with a 'stable' outlook, which means the creditworthiness still remains strong. The US credit rating downgrade has the potential to impact global markets.

Impact on US treasury bond prices

The U.S. Treasury bonds are considered a **benchmark for safe-haven assets worldwide**. The downgrade may result in **higher yields on U.S. government debt** as investors demand higher compensation for perceived increased risk. This could lead to a **sell-off of U.S. Treasuries** by investors seeking higher returns, **potentially driving down bond prices.**

Impact on India and other markets

Higher borrowing costs: A lower credit rating means that investors may demand higher interest rates to lend to the US government, which could increase its borrowing costs and widen its fiscal deficit. This could also affect other countries **that borrow in US dollars** or have their **currencies pegged to the dollar**, as they may face higher financing costs and exchange rate pressures.

Lower confidence: A lower credit rating could also undermine confidence in the US economy and its role as a global leader and reserve currency issuer. This could reduce foreign investment and trade flows to the US and affect its growth prospects. This could also have spillover effects on other countries that depend on the US market or have strong economic ties with it, such as India.

Higher volatility: A lower credit rating could also increase volatility in global financial markets, as investors may seek safer assets or diversify their portfolios away from US assets. This could create fluctuations in stock prices, bond yields, currency rates and commodity prices, affecting the stability and performance of various markets.

VIVAD SE VISHWAS-2 SCHEME

Government of India has launched the Vivad se Vishwas-II scheme for settling contractual disputes involving the government and government undertakings.

This scheme was announced in the Union Budget 2023-24.

It aims to resolve the government's contractual disputes with private parties, clear the backlog of litigation and improve the ease of doing business.

The scheme will apply to all domestic contractual disputes where one of the parties is either the Government of India or an organization operating under its control.

Under the scheme, for court orders passed on or before 30 April 2023, the settlement amount offered to the contractor will be up to 85 per cent of the net amount awarded or upheld by the court.

For arbitral orders passed on or before 1 January 2023, the settlement amount offered is up to 65 percent of the net amount awarded.

Eligible claims will be processed only through the government e-marketplace.

FUND OF FUNDS FOR START-UP (FFS) SCHEME

Recently, the government said that the Fund of Funds for Startups (FFS), launched under Startup India initiative in 2016 has committed Rs 7,385 crore to 88 Alternative Investment Funds (AIFs).

These AIFs in turn have invested Rs 11,206 crore in 720 startups.

About Fund of Funds for Startups

- Fund of Funds was announced with a corpus of Rs. 10,000 crores, is a mutual fund scheme that invests in other schemes of mutual funds. It can be domestic as well as overseas.
- FFS has been playing a monumental role in mobilizing domestic capital in the Indian startup ecosystem.
- Under FFS, support is extended to SEBI-registered Alternative Investment Funds (AIFs), which in turn invest in startups.
- Small Industries Development Bank of India (SIDBI) is responsible for operationalising the Scheme.
- The corpus is to be built up over the 14th and 15th Finance Commission Cycles (FY 2016-2020 and FY 2021-2025) through budgetary support by the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry.
- The amount committed under FFS has seen a notable growth over the years recording a CAGR of over 21% since the launch of the Scheme.

Alternative Investment Fund

It means any fund established or incorporated in India that is a privately pooled investment vehicle that collects funds from sophisticated investors, whether Indian or foreign, for investing it in accordance with a defined investment policy for the benefit of its investors.

AIF is defined under regulation 2(1)(b) of the SEBI (Alternative Investment Funds) Regulations, 2012.

Followings are not considered as AIF,

1. Mutual funds
2. Collective investment schemes
3. Employee Stock Options Trusts
4. Employee welfare trusts or gratuity trusts
5. Family benefit trust
6. Holding companies

Types of AIF

Venture Capital Fund (VCF): Venture Capital Funds invest in high-growth start-ups that are experiencing cash constraints in the early stages of their business and require capital to develop or expand their operations.

Infrastructure Fund (IF): The fund invests in public assets like road and rail infrastructure, airports, and communication assets, among other things.

Angel Fund: This is a sort of Venture Capital fund in which fund managers combine money from a number of "angel" investors to invest in early-stage firms.

Social Venture Fund: Socially responsible investment has spawned the Social Venture Fund (SVF), which invests in firms with a strong social consciousness and a desire to have a positive impact on society.

Private Equity (PE) Fund: They invest in private firms that aren't publicly traded with stakeholders. Because the unlisted and unauthorized private enterprises are unable to raise cash with PE funds for help.

UJWAL DISCOM ASSURANCE YOJANA (UDAY) SCHEME

Why in News?

The Comptroller and Auditor General of India (CAG) recently presented its Compliance Audit report (for the year ended March 2021) to assess the implementation of the Ujwal DISCOM Assurance Yojana (UDAY) scheme.

According to the CAG, the main objective of the financial and operational turnaround of the Maharashtra State Electricity Distribution Company (MSEDCL) was not achieved in spite of implementing the UDAY scheme.

What is the UDAY Scheme?

In 2015, the Government of India (Ministry of Power) launched UDAY Scheme to aid operational and financial turnaround of Power Distribution Companies (DISCOMs) owned by any state.

UDAY is basically a debt restructuring plan for DISCOMs (to improve their operational efficiency) and was kept optional for states.

Joining states to undertake 75% debts of their respective DISCOMs, while the remaining 25% debts will be issued to DISCOMs in the form of bonds.

These states will receive additional priority funding under numerous schemes such as Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme (IPDS).

This scheme was established with a vision to provide affordable and accessible 24×7 power to all.

It also aims to provide a solution for revenue-side efficiency and cost-side efficiency and envisages reform measures in the following sectors - generation, transmission, distribution, coal and energy efficiency.

Initially, the scheme was targeted for four years until 2019, providing a revival package for electricity distribution companies.

Need for UDAY Scheme:

In India, DISCOMs have been accumulating losses and are under outstanding debt, as these utilities are supplying electricity at tariffs that are far below cost.

These financially-stressed DISCOMs are not able to supply adequate power at affordable rates, hampering the quality of life and overall economic growth and development.

Inefficiencies in power distribution, such as large transmission and distribution losses on power, have further strained finances of DISCOMs, who have been heavily borrowing from banks to operate themselves.

Owing to DISCOMs massive pile of debts and accumulated losses [~Rs. 2.75 lakh crore from 2011-12 to 2014-15], the government decided to develop a financial scheme to aid these DISCOMs and reduce their transmission losses.

Key Objectives of the UDAY Scheme:

- Reduce the aggregate technical & commercial (AT&C) loss (from ~22% to 15%) by 2018-19.
- Improve operational efficiency via ensuring compulsory smart metering, upgrading transformers and meters.
- Adopt energy efficiency measures such as initiate promotion of energy-efficient LED bulbs, etc.
- Reduce power costs, interest burden and power losses in the distribution sector.
- Encourage states to actively participate in

the scheme by providing incentives to the performing state.

In addition, the following advantages will be provided:

- Increased supply of domestic coal
- Rationalization of coal prices
- Faster completion of interstate transmission lines

Power purchase through transparent competitive bidding, etc.

Achievements of UDAY Scheme:

Large number of states joined the scheme. This led to the improvements in the liquidity situation of DISCOMs and in the power supply situation.

The participating states have achieved an improvement in AT&C or distribution losses.

Challenges Faced by the UDAY Scheme:

AT&C losses are still high: For example, some states have losses of over 40% and only 7 states (TN, Kerala, Gujarat, etc.) have recorded losses of less than 15%.

Rising share of renewable energy (RE): As the rising share of RE is displacing the low-cost coal in the distribution system, it raises the average cost of supply.

Bonds are not very profitable: For example, for every 1 lakh crore of UDAY bonds issued results in a loss of up to 6,000 crores for banks and financial institutions that have lent money to them.

Putting the onus on the states to deal with the situation: This has further strained the State finances.

PROJECT AMBER

About

Project AMBER (**Accelerated Mission for Better Employment and Retention**) is a collaborative effort between the National Skill Development Corporation (NSDC), operating under the Ministry of Skill Development and Entrepreneurship (MSDE), and GIF (Global Innovation Fund) to create opportunities for employment and retention.

This initiative is part of the SANKALP program by MSDE, with a specific emphasis on promoting gender diversity in the technology industry and supporting underprivileged groups.

The primary objective of **Project AMBER is to provide training to 30,000 young individuals, with a target of having 50% of them be women.**

This project is designed to offer participants access to **AWS (Amazon Web Services)** re/Start, a workforce development program aimed at unemployed and underemployed individuals.

The training covers essential AWS cloud skills and includes practical guidance on aspects like resume writing and interview preparation.

Through hands-on exercises, labs, and coursework based on real-world scenarios, participants receive training in various technologies, such as Linux, Python, networking, security, and relational databases.

Furthermore, it connects program participants with job interview opportunities in the cloud and IT sectors with local employers.

The significance of Project AMBER lies in its ability to introduce entry-level talent into the workforce, assisting individuals in launching successful careers in the cloud industry, aiding organizations in gaining a competitive advantage by acquiring in-demand talent, and benefiting communities at large.

As for the SANKALP Program, **it was initiated in 2018** and is led by the **Ministry of Skill Development and Entrepreneurship (MSDE)**. This program is supported by a World Bank loan

The primary focus of SANKALP is to revamp and improve India's skilling ecosystem, encompassing both central and state-level agencies to enhance overall skill development outcomes.

SORGHUM

Context:

According to a new study, new sorghum varieties developed by scientists from the United States Department of Agriculture (USDA) can help meet the nutritional needs of mothers and children in sub-Saharan Africa.

Key findings:

The new varieties are enhanced with ***both provitamin A and non-provitamin A carotenoids***.

These varieties also contain a more efficient phytase enzyme, a protein that breaks down phytic acid. This improves the absorption of nutrients from the diet.

The results show that sorghum made from the strain of this new variety can produce 32 times more provitamin A carotenoids than regular sorghum varieties.

New healthier sorghum varieties with significant concentrations of provitamin A carotenoids increase mineral absorption.

These sorghum lines also contained high concentrations of lutein and zeaxanthin, carotenoids which are important for eye health and brain development.

Key facts about Sorghum:

It is also called great millet, Indian millet, milo, durra, or shallu, cereal grain plant of the grass family (Poaceae) and its edible starchy seeds.

The plant likely originated in Africa, where it is a major food crop.

It is the fifth major staple cereal after wheat, rice, maize and barley.

It is cultivated worldwide in warmer climates and is an important food crop in semiarid tropical areas of Africa, Asia and Central America.

In India sorghum is known as jowar, cholam, or Jonna. Different varieties of sorghum range in colour from white and pale yellow to deep red, purple and brown.

Sorghum is especially valued in hot and arid regions for its resistance to drought and heat.

It is tolerant to drought because of its root system.

It performs better than maize during drought and occupies areas unsuitable for maize in stress-prone semiarid areas.

It is tolerant of salinity and to some extent to waterlogging for a short period. It is sensitive to frost and to sustain flooding.

In recent years, there has been a shift in sorghum production from the drier western production areas to the wetter eastern.

MSCI INDEX

Context:

Rural Electrification Corporation Limited under the Ministry of Power, has secured a coveted place in the esteemed Morgan Stanley Capital International (MSCI) Global Standard Index, effective from 1st September 2023.

About MSCI Index:

It is owned by the multinational investment management and financial services company Morgan Stanley.

It is an investment research firm that provides stock indexes, portfolio risk and performance analytics, and governance tools to institutional investors and hedge funds.

It is a leading provider of critical decision support tools, including stock indexes, and services for the global investment community.

MSCI indices facilitate the construction and monitoring of portfolios in a cohesive and complete manner, avoiding benchmark misfit. It has over 160,000 indices in its portfolio.

MSCI has indexes for countries, regions, emerging markets, developed markets, small cap,

all cap and even Islamic indexes.

It selects stocks for its equity indexes that are easily traded and have high liquidity, with companies having high free float getting more weightage.

It prefers stocks that have active investor participation, and are without owner restrictions.

What is MSCI India Index?

The MSCI India Index is designed to measure the performance of the large and mid-cap segments of the Indian market.

With 113 constituents, the index covers approximately 85% of the Indian equity universe.

The index is reviewed quarterly.

PUSHP PORTAL

Context:

Recently, the National Power Committee (NPC) has asked States to provide suggestions for offering incentives to buyers and sellers on the surplus power portal PUSHp,

About PUShP portal:

A High Price Day Ahead Market (HP-DAM) and Surplus Power Portal (PUShP) was launched by the Ministry of Power.

It was launched to ensure greater availability of power during the peak demand season at a price higher than the ceiling of Rs 12 per unit by certain category of sellers.

The power distribution companies (DISCOMs) will be able to indicate their surplus power in block times / days / months on portal.

Those DISCOMs who need power will be able to requisition the surplus power.

The new buyer will pay both variable charge (VC) and fixed cost (FC) as determined by Regulators. Once power is reassigned, the original beneficiary shall have no right to recall as entire FC liability is also shifted to the new beneficiary.

This will reduce the fixed cost burden on the DISCOMs, and will also enable all the available generation capacity to be utilized.

What is Day Ahead Market?

It is a physical electricity trading market where power is delivered within 24 hours of the next day starting from midnight.

They are traded in 15-minute time blocks and the prices and quantum of electricity closed the auction bidding process.

INDEX OF INDUSTRIAL PRODUCTION (IIP)

India's Index of Industrial Production in India declined to a three-month low of 3.7 per cent in June, mainly due to poor showing by the manufacturing sector.

About Index of Industrial Production:

It is one of the Prime indicators of economic development for the measurement of trends in the behavior of Industrial Production over a period of time with reference to a chosen base year.

It indicates the relative change of physical production in the field of industries during a specified year as compared to the previous year.

It is computed and published by the National Statistical Office (NSO) on a monthly basis.

Base Year:

The base is always given a value of 100.

The current base year for the IIP series in India is 2011-12.

So, if the current IIP reads as 116, it means that there has been 16% growth compared to the base year.

Index of Eight Core Industries (ICI):

ICI measures the collective and individual performance of production in selected eight core industries Coal, Crude Oil, Natural Gas, Petroleum Refinery Products, Fertilizers, Steel, Cement and Electricity.

The objective of the ICI is to provide an advance indication of production performance of industries of 'core' nature before the release of IIP by the Central Statistics Office.

These industries are likely to impact general economic activities as well as industrial activities.

The Index is compiled and released by the Office of the Economic Adviser (OEA), Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry, Government of India.

FLOATING INTEREST RATE

Context:

The Reserve Bank of India (RBI) recently issued detailed guidelines to reset floating-interest rates on Equated Monthly Instalments (EMI)-based personal loans.

About Floating Interest Rate:

A floating interest rate is an interest rate that changes periodically.

The rate of interest moves up and down, or "floats," reflecting economic or financial market conditions.

A floating interest rate can also be referred to as an adjustable or variable interest rate because it can vary over the term of a debt obligation.

The change in interest rate with a floating rate loan is typically based on a reference, or "benchmark", rate that is outside of any control by the parties involved in the contract.

The reference rate is usually a recognized benchmark interest rate, such as the prime rate, which is the lowest rate that commercial banks charge their most creditworthy customers for loans (typically, large corporations or high net worth individuals).

How is floating interest rate calculated?

A floating interest rate uses a reference rate as the base.

In order to arrive at the floating rate, a spread (or margin) is added to the reference rate.

Floating Interest Rate = Base Rate + Spread

Floating interest rates can be modified quarterly, half-yearly or annually.

Several factors tend to influence the calculation of floating interest rates. Some of the economic factors are,

- Repo rate
- Government's monetary policies
- Inflation rate
- Fiscal deficit
- Global and foreign interest

When is Floating Rate Relevant?

<u>While applying for a loan:</u>

Typically, intending borrowers pick a loan with a floating rate when they expect a reduction in the interest rate or a dynamic rate through their loan tenure.

Additionally, such an interest type enables individuals to make prepayments easily and pay off their debt faster and at a much lower interest burden.

<u>While investing:</u>

Individuals can choose investment instruments with floating rates when they anticipate the base rate will be the same, or an expected change will be in their favour.

Under such situations, the interest earned on investments made either stays the same or is likely to increase.

Limitations of Floating Rate:

The fluctuation of rate is beyond the control of both parties in a contract, namely – the lender and borrower in a lending institution setup.

Similarly, investors and investment firms have to make their way around the fluctuations to generate earnings while cushioning their capital.

Even the slightest increase in the interest rate can push loan EMI burden significantly for loan borrowers. It often makes the repayment process challenging and disrupts a functioning financial plan.

A small decrease in the interest rate generates a return on investment which is much lower than what one had anticipated before. As a result, investors may take a longer time to reach their respective financial goals.

Both borrowers and investors often find it quite challenging to manage their budget plan and regulate savings when dealing with a floating rate based financial or investment option.

GOOD MANUFACTURING PRACTICES (GMP) STANDARDS

Context:

Recently, the government of India has set a deadline for mandatory implementation of the Good Manufacturing Practices (GMP) for pharmaceutical companies which were revised in 2018, bringing them on par with World Health Organisation (WHO) standards.

About GMP:

Good manufacturing practice (GMP) is a system for ensuring that products are ***consistently produced and controlled according to quality standards.***

It is designed to ***minimize the risks involved in any pharmaceutical production that cannot be eliminated through testing the final product.***

It covers all aspects of production; from the starting materials, premises and equipment to the training and personal hygiene of staff.

The GMP system was ***first incorporated in India in 1988*** in Schedule M of the Drugs and Cosmetics Rules, 1945, and the last amendment was done in June 2005. WHO-GMP standards are now part of the revised Schedule M.

There are around 10,500 manufacturing units in India out of which around 8,500 falls under Micro, Small and Medium Enterprises (MSME) category.

The country has about 2,000 units in MSME category in the country having WHO-GMP certification.

What are the new regulations?

Companies with a turnover of over Rs 250 crore will have to implement the revised GMP within six months,

Medium and small-scale enterprises with turnover of less than Rs 250 crore will have to implement it within a year.

IMF QUOTA REVIEW

Context

Reserve Bank of India (RBI) Governor Shaktikanta Das said that countries facing financial issues prefer approaching bodies beyond International Monetary Fund (IMF) due to "perceived stigma" or lack of access. He also batted for an "expeditious completion" of quota review at the IMF in order to help distressed countries better.

The support of the IMF to a country is based on the quota size of the nation and keeping that in mind, RBI Governor pitched for "the sixteenth general review of quotas and its attendant

requirements, including governance reform needs to be completed expeditiously".

What are IMF quotas?

Quotas are the building blocks of the IMF's financial and governance structure. An individual member country's quota broadly reflects its relative position in the world economy. Quotas are denominated in Special Drawing Rights (SDRs), the IMF's unit of account.

Latest review of quotas

The 14th General Review of Quotas was part of a package of reforms to IMF quotas and governance. It was completed in 2010 and became effective in 2016. The reforms represented a major step toward better reflecting in the institution's governance structure the increasing role of dynamic emerging market and developing countries.

These reforms shifted more than 6% of the quota shares to emerging and developing countries from the US and European countries.

Under this, India's voting rights increased by 0.3% from then 2.3% to 2.6% and China's voting rights increased by 2.2% from then 3.8% to 6%.

Presently, India holds 2.75% of SDR quota, and 2.63% of votes in the IMF.

The 15th General Review of Quotas concluded in 2020 with no increase in quotas and provided guidance for the 16th Review. The 16th Review is currently ongoing and expected to be completed by mid-December 2023.

Need for the review of Quotas

Recent experiences suggest poor countries facing financial difficulties go to other bodies beyond the IMF because of the perceived stigma or lack of access.

Therefore, a bigger and stronger IMF that is capable of managing the levels of country risks assumes crucial importance.

The crucial role of the IMF and the World Bank in addressing global debt vulnerabilities cannot be overstated as they are at the centre of international monetary and financial system. Hence it is incumbent upon them to do more for countries in debt distress.

GI TAG TO 'MUSHKBUDJI RICE'

Context

An aromatic rice named "Mushkbudji" from Kashmir received a Geographical Indication (GI) Tag recently.

About the Mushkbudji rice

Mushkbudji rice, which was granted the GI tag along with eight other products from Jammu and Kashmir, is known for its short, bold grains and rich aroma.

In the past, the consumption of this aromatic rice was restricted to special events due to its limited availability and high cost.

The government's efforts to revive this rice

variety in 2007 after its decline in the 1970s due to blast disease have also contributed to its resurgence. More farmers are now drawn to cultivate this unique and fragrant rice variety due to its promising qualities and potential for higher income.

What is a Geographical Indication Tag?

It is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.

This is typically used for agricultural products, foodstuffs, wine and spirit drinks, handicrafts and industrial products.

The Geographical Indications of Goods (Registration and Protection) Act, 1999 seeks to provide for the registration and better protection of geographical indications relating to goods in India.

This GI tag is valid for 10 years following which it can be renewed

RBI TO UNVEIL PILOT TO ENABLE EASIER CREDIT

The Reserve Bank of India (RBI) has unveiled a Public Tech Platform for Frictionless Credit to transform credit accessibility and lending efficiency.

About the Public Tech Platform

It is developed by the RBI's subsidiary Reserve Bank Innovation Hub (RBIH).

It aims to streamline the credit delivery process by enabling seamless digital information flow to lenders.

It intends to simplify the credit assessment by providing an end-to-end digital ecosystem that facilitates the smooth exchange of essential digital data among stakeholders.

Features of the Platform

Open Architecture: The platform adopts an open architecture model, fostering interoperability and collaboration among various financial sector players.

Plug and Play Model: The open Application Programming Interfaces (APIs) and standards enable seamless integration and interaction among participating entities.

Efficiency and Scalability: The platform aims to enhance lending efficiency, reduce costs, expedite disbursement, and scale up lending operations.

Launch and Scope

Calibrated Rollout: The platform is set to launch as a pilot project on August 17, 2023, with gradual access to information providers and use cases.

Initial Focus: The pilot phase will focus on credit products like Kisan Credit Card loans, dairy loans, collateral-free MSME loans, personal loans, and home loans.

Integration and Services: The platform will integrate services such as Aadhaar e-KYC, state government land records, satellite data, PAN validation, Aadhaar e-signing, account aggregation, and more.

LOANABLE FUNDS THEORY

Context:

The term "Loanable funds theory" is in the news.

Details

According to the loanable funds theory, interest rates are the result of the supply and demand of funds in the loan market. This theory, developed by Swedish economist Knut Wicksell, applies not only to loans but also to other forms of credit, such as bonds.

Key Highlights

According to the loanable funds theory, also known as the neo-classical theory of interest, the market for loanable funds determines the interest rates on loans.

This theory assumes that the interest rate is the price that equilibrates the supply of and demand for loanable funds.

The supply of loanable funds comes from savers, such as households, who are willing to lend their money at a certain interest rate.

The demand for loanable funds comes from borrowers, such as businesses and governments, who are willing to borrow money at a certain interest rate.

The theory predicts that an increase in the supply of loanable funds will lower the market interest rate, while a decrease in the supply of loanable funds will raise the market interest rate. Conversely, an increase in the demand for loanable funds will raise the market interest rate, while a decrease in the demand for loanable funds will lower the market interest rate.

The loanable funds theory explains how the interest rate is determined by the interaction of savers and borrowers in the credit market.

According to this theory, savers are willing to lend their money to borrowers because they receive interest as compensation for postponing their consumption. The interest rate is the price that savers charge for lending their money.

Borrowers, on the other hand, demand loans because they want to invest in productive projects that will yield a return higher than the interest rate. The interest rate is the cost that borrowers pay for using someone else's money.

The market interest rate is the result of the equilibrium between the supply of savings and the demand for loans. At this interest rate, savers and borrowers are both satisfied and there is no excess or shortage of credit in the market.

As given in the graph, the interest rate is determined by the intersection of the supply and demand curves for loanable funds. When the supply of loanable funds is greater than the demand for loanable funds, the interest rate will fall. When the demand for loanable funds is greater than the supply of loanable funds, the interest rate will rise.

Conclusion

The loanable funds theory can be used to explain a number of economic phenomena, such as changes in interest rates, economic growth, and the business cycle. For example, if the supply of loanable funds increases, the interest rate will fall. This will lead to increased investment and economic growth. Conversely, if the demand for loanable funds increases, the interest rate will rise. This will lead to decreased investment and economic growth.

THE DEBATE ON DATA

Recently, there has been a spate of writing on India's statistical system and the data produced by it. The Independent India planned for a well-designed statistical system and embarked on the journey of setting it up at both at the Centre and in the States. As noted by journalist Pramit Bhattacharya in a paper, "India's statistical system was the envy of the world till the early 1970s". However, over time, this saw a steady decline and has reached its present state. Once admired globally, the system's reliability has declined. There are issues with data credibility, multiple agencies providing conflicting data, and delays in publishing essential data. The author emphasizes the need for an overhaul to provide credible data for better policymaking.

Issues faced by Indian statistical system

Quality and credibility of data

Policy formulation, implementation, and research are not possible without accurate and credible data.

Credibility is closely connected with the form of the data and the value of information, and is dependent on the reliability of the source.

Accuracy is when the data is a true representation of the expected values.

A recent paper by the EAC-PM argues that **surveys do not adequately capture the urban part of the economy.** While this is a crucial issue, the data and definitions of 'urban' itself need to be re-examined.

Providing different numbers

There are multiple agencies providing data on the same set of ***indicators for the same sector, but giving different numbers.*** This poses the problem of choosing an appropriate data set to formulate policies. This is evident in the case of manufacturing.

Data on this sector for calculating GDP is from the Ministry of Corporate Affairs' MCA21 portal. But this data differs from the data published by the Annual Survey of Industries.

The National Sample Survey Office report 2019 on the services sector found that nearly 36% of companies in the MCA21 system that were used in computing GDP were either not traceable or not classified properly.

About 800-900 companies were being registered every day on the new portal of the MCA. However, there is concern about a large number of shell companies being formed, which undermines the use of this data for GDP calculations.

The competence and ability of the system

In recent times, not only have surveys been delayed, but the publication of processed data of a completed survey has also been withheld.

This has hampered the generation of micro-level data on important variables such as consumption used for assessing the extent of poverty. This is also the case with macroeconomic data.

The wholesale price series used to assess inflation and the consumer price index are overdue for revisions. To assess economic growth, national income estimates need revisions.

Non-availability of updated data

Economic and social data ideally is a public good. Its provision, like many other public goods, is the responsibility of the government.

While there are numerous private data-generating and publishing entities, they exclude data consumers through their pricing and restrictive access policies.

This hinders the assessment of economic growth and poverty reduction.

Improve Data Credibility:

- Use realistic samples to reflect the transforming economy.
- Re-examine definitions, like 'urban', to ensure accuracy.
- Standardize Data Sources:
- Address issues like the MCA21 portal's glitches and inaccuracies.
- Reduce conflicting data from different agencies.
- Enhance System Competence:
- Timely conduct and publication of surveys.
- Revise outdated macroeconomic data series.
- Transparent Data Dissemination:
- Move beyond dashboards for clear data sharing.
- Review Past Recommendations:
- Revisit reports, like the Rangarajan Committee Report (2001), to assess and implement past suggestions.

GEOGRAPHY, ENVIRONMENT, BIODIVERSITY AND DISASTER MANAGEMENT

What's Inside?

WESTERN TRAGOPAN

Why in the News?

Himachal Pradesh's State bird – Western Tragopan (Tragopan-melanocephalus) – has been facing habitat loss in parts of the country.

But because of authorities' efforts, there has been a gradual increase in the population of this rare species at the State's Sarahan pheasantry, the conservation breeding centre, bringing a glimmer of hope for its survival and growth.

Habitat and Diet

Prefers dense forest habitats with dwarf bamboo called ringal.

Diet primarily consists of leaves, shoots, seeds, insects, and other invertebrates.

About

The western tragopan (Tragopan melanocephalus) is a **Vulnerable montane pheasant endemic to the north-western Himalayan region.**

The western tragopan is also known as the **western horned tragopan** and is rare among pheasants.It holds significance as a **flagship species in the Himalayan region** and is the **state bird of Himachal Pradesh.**

Locally referred to as 'jujurana' or 'king of birds' due to its attractive plumage and large size.

Distribution:

Endemic to the northwest Himalaya with a limited range from Hazara in north Pakistan through Jammu and Kashmir to western Garhwal. The Great Himalayan National Park's forest zone hosts the largest known population of western tragopan.

Threats:

- Lack of information about its population and distribution hampers conservation efforts.
- Major threats include habitat fragmentation, poaching, and collection of minor forest products.
- Facing habitat loss due to factors like habitat fragmentation and anthropogenic disturbances such as livestock grazing and collection of minor forest produce.
- Hunting pressure and poaching also contribute to its vulnerability.

Conservation Status:

Classified as Vulnerable by the IUCN

INCLUSIVE CONSERVATION INITIATIVE

Why in news?

A recent report examining the Inclusive Conservation Initiative (ICI) has revealed that although commitments of funding for Indigenous Peoples and local communities (IP and LC) in conservation have risen, the funding landscape remains largely unchanged.

About

Launched in 2022,the initiative facilitates collective efforts to push for direct access to climate and biodiversity finance for Indigenous Peoples and Local Communities (IPs and LCs)

Funded by the Global Environment Facility (GEF) and supported by Conservation International and the International Union for Conservation of Nature (IUCN)

ICI is an important step forward in the realm of IP and LC access to GEF funding. Over recent years, though there are significant increases in conservation finance as well as increasing commitments to IPs and LCs. However, very few initiatives governed and implemented by IPs and LCs are funded and supported.

ICI provides site-based investments in nine subprojects to prioritize Indigenous and local community organizations to take the lead in carrying out inclusive, culturally appropriate processes for decision-making and strategy development that they have defined, implementing activities within their respective territories, landscapes and/or seascapes.

The projects implemented are as follows

Asia (the Nepal Federation of Indigenous Nationalities (NEFIN) in Nepal and the Indigenous Peoples' Foundation for Education and Environment (IPF) in Thailand);

The Pacific (the Bose Vanua o Lau in Fiji and the House of Ariki in the Cooks Islands);

Meso-America (a consortium led by Sotz'il in Guatemala);

South America (a consortium led by the Native Federation of Madre de Dios River and tributaries (FENAMAD) in Peru and the Futa Mawiza initiative in Chile and Argentina);

and sub-Saharan Africa (the Alliance Nationale d'Appui et de Promotion des Aires et territoires conservés par les Peuples Autochtones et Communautés locales en République

Démocratique du Congo (ANAPAC) in the Democratic Republic of the Congo (DRC), the Indigenous Movement for Peace Advancement and Conflict Transformation (IMPACT) in Kenya and the Ujamaa Community Resource Team (UCRT) in Tanzania).

Global Environmental Facility

- It is an independently operating financial organization
- GEF is multilateral financial mechanism that provides grants to developing countries for projects that benefit global environment and promote sustainable livelihoods in local communities.
- It was setup as a fund under World Bank in 1991
- In 1992, at the Rio Earth Summit, the GEF was restructured and moved out of the World Bank system to become a permanent, separate institution.
- Since 1994, however, the World Bank has served as the Trustee of the GEF Trust Fund and provided administrative services.
- It is based in Washington DC, United States.
- It addresses six designated focal areas:
  1. Biodiversity,
  2. Climate Change,
  3. International Waters,
  4. Ozone Depletion,
  5. Land Degradation And
  6. Persistent Organic Pollutants.
- GEF serves as financial mechanism for :
- Convention on Biological Diversity (CBD)
- United Nations Framework Convention on Climate Change (UNFCCC)
- UN Convention to Combat Desertification (UNCCD)
- Stockholm Convention on Persistent Organic Pollutants (POPs)
- Minamata Convention on Mercury
- India is both donor and recipient of GEF.

PM 2.5 AND ANTIBIOTIC RESISTANCE

Why in news?

In a recent study published in The Lancet Planetary Health, researchers investigated the impact of particulate matter (PM2.5) in the environment on the spread of genetic elements responsible for antibiotic resistance. The study aimed to quantify the relationship between PM2.5 and antibiotic resistance using data from over 11.5 million cultured isolates, testing 43 types of antibiotics against nine pathogens.

About

Antibiotic Resistance Urgency Antibiotic resistance is a critical public health concern, causing millions of deaths annually due to infections caused by bacteria resistant to multiple antibiotics. The misuse of antibiotics leads to gene transfer responsible for resistance. These genes and bacteria can spread globally and across ecosystems.

PM2.5 and Antibiotic Resistance

Particulate matter (PM2.5) in the air, which contains antibiotic-resistant bacteria and genes, is a significant carrier for the spread of antibiotic resistance. PM2.5 can enhance the transfer of antibiotic resistance genes between bacteria. This contributes to faster evolution of antibiotic resistance elements.

Study Findings: PM2.5 and Antibiotic Resistance

The study demonstrated a substantial link between PM2.5 and antibiotic resistance globally. This association was consistent across various antibiotic-resistant bacteria, growing stronger over time. PM2.5 outweighed other factors like antibiotic use, water quality, and health expenditure.

Specific Findings:

Even a 1% increase in PM2.5 was associated with a rise in antibiotic resistance, e.g., a 1% increase in PM2.5 led to a 1.5% rise in carbapenem resistance.

PM2.5 was a significant driver, responsible for about 11% of variations in antibiotic resistance.

In certain regions like North Africa and West Asia, antibiotic resistance rose significantly, reaching about 20%.

Implications and Interventions:

Achieving the World Health Organization's recommended PM2.5 standard by 2050 (5 μg/m3) could decrease global antibiotic resistance by about 17%, preventing 25% of premature deaths and saving $640 billion USD annually.

Without intervention, antibiotic resistance is estimated to increase by 17%, leading to 56% of deaths from resistant infections in 2050.

Strategies to mitigate antibiotic resistance include reducing antibiotic use, achieving PM2.5 standards, improving water access, and increasing healthcare expenditure.

INDIAN OCEAN DIPOLE

Why in news?

A report by the Australian Bureau of Meteorology said that the IOD index has risen beyond the positive threshold.The IOD index has risen from +0.34°C to +0.79°C, which is in excess of the positive IOD threshold of +0.4 °C.

Indian Ocean Dipole

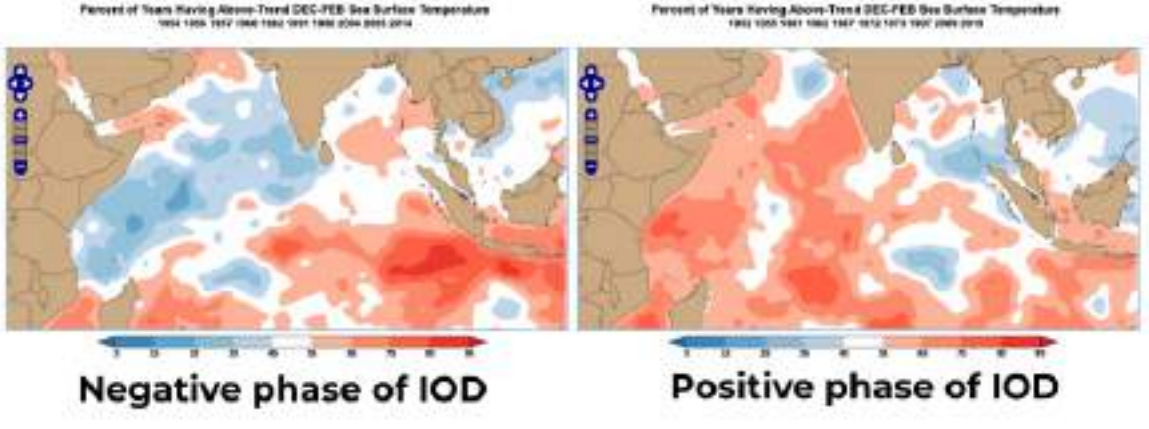
IOD refers to the swing in sea-surface temperatures from warm to cool in the Indian Ocean basin to the South of Sri Lanka. Warmer in the western side of the basin is referred to as a positive IOD event, while the reverse indicates a negative event. Depending on the time of its evolution, a positive IOD event has boosted the performance of India's South-West monsoon.

However, the IOD index must remain above the threshold for a sustained period to officially declare a positive event.

The Indian Ocean Dipole Index is a measure used by meteorologists and climate scientists to quantify the strength and phase of the IOD. It is usually expressed as the difference in sea surface temperatures between the western and eastern equatorial Indian Ocean regions. Positive values indicate a positive IOD, while negative values indicate a negative IOD.

There are two phases of the Indian Ocean Dipole:

Positive IOD: In this phase, the western Indian Ocean becomes warmer than the eastern part. This leads to increased convection and rainfall in the western Indian Ocean region, including parts of East Africa and the Arabian



Peninsula, while causing drier conditions in the eastern Indian Ocean, including Australia and Indonesia.

Negative IOD: In this phase, the eastern Indian Ocean becomes warmer than the western part. This leads to higher rainfall and cooler conditions in the eastern Indian Ocean region, including Australia and Indonesia, while causing drier conditions in the western Indian Ocean region.

HURRIQUAKE

Why in news?

Hurricane Hilary, a major tropical cyclone, struck Southern California, marking an unusual event of a hurricane and an earthquake occurring simultaneously.

About

Hurriquake is a ***rare phenomenon of a hurricane and earthquake occurring at the same time.***

Originating from a disturbance off Mexico's coast, it's the first time a tropical storm warning was issued for Southern California.

The cyclone made landfall in Mexico's Baja California peninsula before affecting California. A magnitude 5.1 earthquake also hit Southern California, though no immediate damage was reported.

The term "hurriquake" trended on social media due to this rare occurrence. Experts link Hurricane Hilary to climate change, which has caused increased natural calamities.

Hurricane:

A hurricane is a powerful and destructive tropical storm characterized by strong winds, heavy rainfall, and low atmospheric pressure.

Hurricanes are also known as cyclones or typhoons in different parts of the world.In the Atlantic Ocean and eastern North Pacific, they are called hurricanes, while in the northwestern Pacific, they are referred to as typhoons, and in the South Pacific and Indian Ocean, they are known as cyclones.

Key characteristics of hurricanes:

Low Pressure Center

Hurricanes have a well-defined centre of low atmospheric pressure, known as the eye.

The eye is typically calm and clear, with light winds, surrounded by a ring of intense thunderstorms called the eyewall.

Strong Winds

Hurricanes are known for their powerful winds that can reach sustained speeds of at least 74 miles per hour or higher.

Heavy Rainfall

Hurricanes produce heavy rainfall, which can lead to flooding, landslides, and storm surges

Formation

Hurricanes form over warm ocean waters when the sea surface temperature is typically above 26 degrees Celsius.

Warm, moist air rises from the ocean's

surface, creating an area of low pressure.

As the air cools and condenses, it releases heat, which fuels the storm's development.

Categories

Hurricanes are categorized on the ***Saffir-Simpson Hurricane Wind Scale*** based on their maximum sustained wind speeds.

The scale ranges from Category 1 (weakest) to Category 5 (strongest), with each category representing a higher wind speed and potential for damage.

Why Hurricane Hillary is so rare:

1. Nature of the ocean:

The Pacific coast rarely experiences tropical storms or hurricanes due to the characteristics of the ocean.

For hurricanes to form, ocean waters must be above 26 degrees Celsius (78.8 degrees Fahrenheit).

Ocean temperatures below this threshold hinder hurricane formation or cause rapid weakening when storms pass over cooler waters.

While warm temperatures prevail during hurricane season along the US east coast, the Pacific's west coast remains significantly colder.

The Atlantic's warm equatorial waters are transported along the US coast via the Gulf Stream.

Conversely, the Pacific's cold current brings cooler waters from higher latitudes towards equatorial regions, making hurricanes less likely.

2. Vertical wind shear:

Vertical wind shear refers to changes in wind speed with altitude in the Earth's atmosphere, particularly in the upper levels.

This plays a critical role in hurricane formation, as hurricanes can extend up to 16 km into the atmosphere.

Strong upper-level winds inhibit hurricane formation by disrupting the storm's structure, displacing warm temperatures above the eye, and limiting vertical ascent of air parcels.

Eastern Pacific winds tend to have stronger wind shear compared to the Gulf of Mexico, leading to fewer hurricanes along the western coast.

3. Influence of wind steering patterns:

Trade winds are significant in directing hurricanes towards the US east coast, while deflecting them away from the west coast.

Hurricanes originating in the eastern Pacific, often near central Mexico's coastline, typically follow a west-northwest trajectory that takes them away from the coast.

PACIFIC DECADAL OSCILLATIONS

Why in news?

Tropical cyclones that originate near the Equator, while being devastating, have been unusually subdued in recent decades. The last major cyclone of this kind in the Indian neighbourhood was the 2017 Cyclone Okchi which devastated Kerala, Tamil Nadu and Sri Lanka. However, a combination of global warming and a cyclical event called the Pacific Decadal Oscillation (PDO) that repeats every 20-30 years, could make such cyclones more frequent in the coming years, a study published on Monday in the journal Nature Communications said.

About

Between 1981-2010, equatorial-origin cyclones decreased by 43% compared to 1951-1980 due to the 'warmer' positive phase of PDO. El Nino warms Central Equatorial Pacific, leading to reduced Indian rainfall. Excessive rain relates to cooler-than-normal temperatures or La Nina.

The El Nino Southern Oscillation (ENSO) phenomenon repeats in the Pacific over seven years. This pattern is collectively called the ENSO phenomenon.

However, the Pacific Decadal Oscillation (PDO) isn't an annual occurrence and, on average,

it corresponds to ***a warmer than average Western Pacific Ocean and relatively cooler Eastern Pacific, though this plays out over much longer time scales***.

PDO is a long-term ocean fluctuation of the Pacific Ocean, which waxes and wanes approximately every 20 to 30 years.

However, unlike an ENSO, researchers can determine the stage of a positive or warmer phase of a PDO only after several years of measuring ocean temperatures and their interaction with the atmosphere.

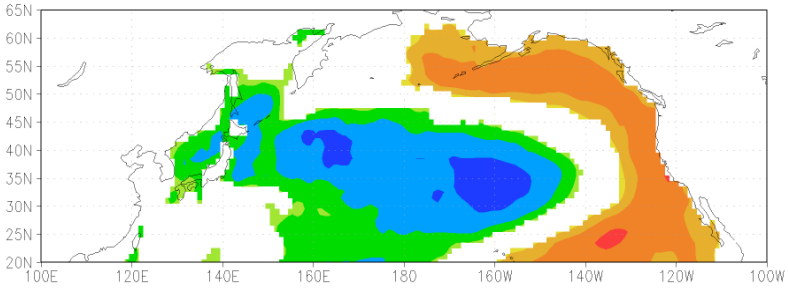
Impacts

PDO phase can have significant implications for the global climate, affecting Pacific and Atlantic hurricane activity, droughts and flooding around the Pacific basin, the productivity of marine ecosystems, and global land temperature patterns.

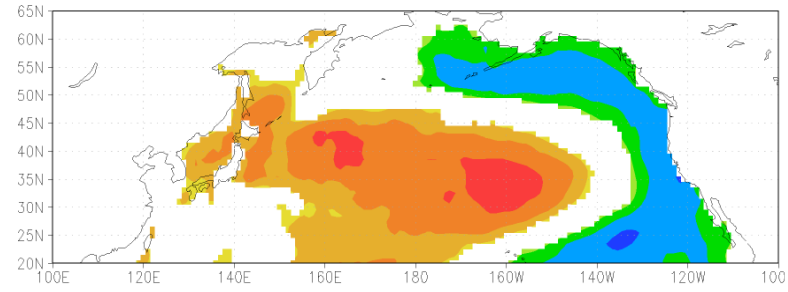
PDO can intensify or diminish the impacts of ENSO according to its phase. If both ENSO and the PDO are in the same phase, it is believed that El Niño/La Nina impacts may be magnified. Conversely, if ENSO and the PDO are out of phase, it has been proposed that they may offset one another, preventing "true" ENSO impacts from occurring.

The Pacific Decadal Oscillation (PDO) Index
Relates to the Spatial Pattern of the Sea Surface Temperature Anomalies in the Extratropical North Pacific
(Not the Sea Surface Temperature Anomalies)

Positive or "Warm" PDO Pattern
(Warmer in the Eastern Portion Than in the Western & Central Portion)



Negative or "Cool" PDO Pattern
(Cooler in the Eastern Portion Than in the Western & Central Portion)



Maps Created at the KNMI Climate Explorer

WHITE-BELLIED SEA EAGLE

Why in the News?

White Bellied Sea Eagles spotted nesting on electric pylons, raise conservation efforts.

About

A study published in the Journal of Threatened Taxa highlights this emerging behavior and its underlying reasons, such as the scarcity of natural nesting alternatives like trees.

The White-bellied Sea Eagles in India are displaying a new nesting behavior by choosing man-made structures such as power towers holding high-tension wires as their nesting sites. The use of power towers indicates a potential lack of suitable natural nesting sites.

It traditionally nests in tall trees such as Mango, Banyan, Tamarind, Devil's Tree, Fig and Coconut near shorelines, tidal creeks, and estuaries.

The adoption of power towers as nesting sites by eagles has ecological implications, including potential interactions with power infrastructure and disturbances to the birds' natural behaviors.

About White-bellied Sea Eagle

Haliaeetus leucogaster is a magnificent and

diurnal monogamous bird of prey mainly feed on sea snakes and fish.

Known for its impressive size, powerful flight, and distinctive appearance, this sea eagle plays a vital role in maintaining the ecological balance of its habitats.

Habitat and Distribution

White-bellied Sea Eagles are resident raptors found along the sea coast of India, from Mumbai to the eastern coast of Bangladesh, Sri Lanka, and

coastal south-eastern Asia to southern China and Australia. The eagles have a wide distribution range across coastal regions. They are occasionally seen in inland waters along tidal rivers and freshwater lakes.

Conservation Status

White-bellied Sea Eagles are currently classified as of **"least concern" on the IUCN Red List of threatened species.**

Monitoring this changing nesting behavior and assessing its long-term impact on the eagles' population and behavior is crucial for their conservation.

BIOCHAR

Why in the News?

Numerous studies have reported that biochar has been implemented in the remediation of organic and inorganic pollutants at the lab scale, and few have demonstrated in-situ applications in treating polluted groundwater.

About Biochar

Biochar is a type of **charcoal** that is produced through the process of **pyrolysis**, which involves heating organic materials, such as agricultural residues, in a **low-oxygen environment**. This process breaks down **the organic matter and converts it into a stable form of carbon-rich material that can be used for various purposes, particularly in agriculture.**

Advantages of Biochar

It be used as **a soil conditioner** by improving soil fertility, enhancing nutrient retention and increasing soil organic matter.

It can also reduce **soil acidity and improve water retention**, which can be particularly

beneficial in areas of the Indo-Gangetic plains that face drought or water scarcity.

It is implemented in **greenhouse gas mitigation**, heavy metals immobilisation and removal of other toxic pollutants from contaminated soil and water.

Biochar pyrolysed from crop residue helps in sustainable crop residue management and climate change mitigation, achieving circular economy and sustainable development goals

Absorption of pollutants- Raw / modified **biochar synthesised from rice husk** showed **significant adsorption of fluoride ions from contaminated surface and groundwater.** Biochar-based adsorbents showed more potential for defluoridation than chemical-based sorbents.

Field application: Fluoride levels in groundwater at the study site in Rajgir, Bihar were found to be above the permissible limit (<1.5 milligram / litre) for drinking purposes. The fluoride removal efficiency (98 per cent for 10mg/l fluoride at pH7) of activated magnetic biochar was significantly higher than raw rice husk biochar.

Cost effectiveness - The cost of fluoride adsorption using bio sorbents provides insights into the economic viability of the adsorption technique, as cost-benefit analysis is a decision-making tool for choosing a treatment method for removing pollutants.

Challenges for the usage of Biochar

Limited research done on biochar's potential to be reused.

Ensuring the sustainable and ethical sourcing of biomass for biochar production

Understanding how biochar interacts with different soil types, and figuring out how to distribute and apply biochar to benefit local communities effectively.

ROOM TEMPERATURE SEMI CONDUCTOR

Why in the News?

Skepticism around LK-99, the Korean scientists' room temperature superconducting material.

About

In July 2023, a group of scientists in South Korea uploaded two preprint papers claiming that a **lead apatite** material was an **ambient condition superconductor.**

The novelty of the South Korean group's work was to replace 10% of the lead ions in lead apatite with copper, to produce the supposed wonder material that they had christened LK-99 (after their own last names).

> Apatites are materials that have a regular arrangement of tetrahedrally shaped phosphate ions (i.e., one phosphorus atom and four oxygen atoms). When lead ions sit in between these phosphate motifs, it is lead apatite. While Apatites have been well-studied, no one had anticipated that they could be superconductors – let alone one in ambient conditions.

The group's two papers elicited a mixture of surprise and scepticism in the scientific community – surprise because of the apatite, and scepticism because of the history of superconductivity.

Researchers in Australia, China, India, the U.S., and several European countries followed them and tried to replicate the South Korean team's findings – but no one found conclusive evidence of superconductivity in their samples

What is a semiconductor?

A superconducting material lets current pass through it without offering any resistance, which means no **"transmission and distribution losses",** because 'resistance' causes a part of the current to be converted, wastefully, into heat.

Two Important properties of a superconducting material

It must offer **zero resistance to current**;

It must display diamagnetism—it should repel magnetic forces.

Good conductors of electricity become superconductors at a certain "critical" temperature, which is extremely low. For example, copper becomes superconducting at near '**absolute zero' temperature, or nearly minus 273 degrees Celsius.**

For well over a century, scientists have been trying to develop a material that does not require to be so cold to be superconducting – preferably, super conduct at room temperature.

Finding such a material means that power transmission, motors, generators, electronics become highly efficient and even transport (super-fast maglev trains) becomes possible. Compact generators mean that offshore wind turbines can be small and hence cost-effective.

Applications of superconductors

Power Transmission and Generation: Superconducting materials can carry electricity without any loss due to resistance. This makes them highly efficient for transmitting and generating electricity. They are used in high-capacity power cables and generators.

Particle Accelerators: Superconducting magnets are used in particle accelerators like the Large Hadron Collider (LHC) to generate the necessary magnetic fields for particle acceleration.

Maglev Trains: Superconducting magnets are used in magnetic levitation (Maglev) train systems to reduce friction and increase efficiency.

Electric Motors and Generators: Superconducting materials can improve the efficiency and power output of electric motors and generators, particularly in applications where size and weight are critical.

Scientific Research: Superconductors are used in various scientific experiments and research applications, such as in quantum computing and in studying fundamental properties of matter.

Medical Devices: Superconducting magnets are essential components in magnetic resonance imaging (MRI) machines. They produce strong, stable magnetic fields, enabling high-resolution imaging of the human body.

Advantages:

Zero Electrical Resistance: The most significant advantage of superconductors is their ability to carry electricity without any resistance. This leads to reduced energy loss and increased efficiency in electrical systems.

Strong Magnetic Fields: Superconducting magnets can generate extremely strong and stable magnetic fields, which is crucial for various applications like MRI machines and particle accelerators.

Energy Efficiency: Superconducting power transmission lines can significantly reduce energy losses during electricity transmission, making the power grid more efficient.

Miniaturization: Superconductors allow for the development of compact and powerful electrical devices, which is especially valuable in applications like electronics and medical devices.

Challenges:

Cooling Requirement: Most superconductors need to be cooled to very low temperatures (usually below -100°C) to maintain their superconducting state. This cooling requirement can be expensive and challenging to implement in practical applications.

Materials Development: Finding or creating superconducting materials that can operate at higher temperatures (i.e., above the boiling point of nitrogen) is an ongoing challenge. High-temperature superconductors can make the technology more accessible and cost-effective.

Materials Cost: Some superconducting materials, especially those with unique properties, can be expensive to manufacture, limiting their widespread adoption.

Maintenance and Reliability: Superconducting systems can be complex, and maintaining them at low temperatures can be challenging. There are concerns about reliability and the potential for failures.

Magnetic Field Limitations: In some cases, superconductors may not be suitable for applications involving very high magnetic fields or rapid changes in magnetic fields.

THE FUJIWHARA EFFECT

Why in the News?

Earlier in California, for a brief moment, the 'Fujiwhara effect' has been observed. As world temperatures rise, increasing the intensity and

frequency of cyclones across oceans, we discuss this atypical phenomenon.

About

As per the National Weather Service (NWS), when two hurricanes (or cyclones, depending on where you live), spinning in the same direction, are brought close together, they begin 'an intense dance around their common center' – this interaction between two cyclones is called the **Fujiwhara effect.**

Identified by Sakuhei Fujiwhara, a Japanese meteorologist, this phenomenon first found mention in a paper published in 1921. Decades after the paper was published, it was observed for the first time over the western Pacific Ocean, when typhoons Marie and Kathy merged in 1964.

If one hurricane's intensity overpowers the other, then the smaller one will orbit it and eventually crash into its vortex to be absorbed. On the other hand, if two storms of similar strengths pass by each other, they may gravitate towards each other until they reach a common center and merge, or merely spin each other around for a while before shooting off on their own paths.

In rare instances, the two **'dancing' cyclones**, if they are intense enough, may merge with one another, **leading to the formation of a mega cyclone capable of wreaking havoc along coastlines.**

Experts have noted the rising frequency of this unusual effect, attributing it to a rapidly warming world and the subsequent heating of ocean waters

PROJECT AMBER

Why in the News?

MSDE, under the SANKALP Programme, focuses on training 1500 aspirants in 'cloud' skills

About

Project AMBER (**Accelerated Mission for Better Employment and Retention**) is a collaborative effort between the National Skill Development Corporation (NSDC), operating under the Ministry of Skill Development and Entrepreneurship (MSDE), and GIF (Global Innovation Fund) to create opportunities for employment and retention.

This initiative is part of the SANKALP program by MSDE, with a specific emphasis on promoting gender diversity in the technology industry and supporting underprivileged groups.

The primary objective of **Project AMBER is to provide training to 30,000 young individuals, with a target of having 50% of them be women.**

This project is designed to offer participants access to **AWS (Amazon Web Services)** re/Start, a workforce development program aimed at unemployed and underemployed individuals.

The training covers essential AWS cloud skills

and includes practical guidance on aspects like resume writing and interview preparation.

Through hands-on exercises, labs, and coursework based on real-world scenarios, participants receive training in various technologies, such as Linux, Python, networking, security, and relational databases.

Additionally, the program covers the expenses associated with the AWS Cloud Practitioner Certification exam, a widely recognized credential that validates participants' cloud-related skills and knowledge. Furthermore, it connects program participants with job interview opportunities in the cloud and IT sectors with local employers.

The significance of Project AMBER lies in its ability to introduce entry-level talent into the workforce, assisting individuals in launching successful careers in the cloud industry, aiding organizations in gaining a competitive advantage by acquiring in-demand talent, and benefiting communities at large.

As for the SANKALP Program, **it was initiated in 2018** and is led by the **Ministry of Skill Development and Entrepreneurship (MSDE)**. This program is supported by a World Bank loan and is aligned with the broader objectives of the National Skill Development Mission (NSDM).

The primary focus of SANKALP is to revamp and improve India's skilling ecosystem, encompassing both central and state-level agencies to enhance overall skill development outcomes.

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RED SAND BOA

Why in the News?

A report by the Wildlife Conservation Society (WCS)-India has pointed out 172 incidents of seizures of red sand boa between the years 2016-2021.

About Red Sand Boa

It is commonly called the **Indian Sand Boa** is a **non-venomous species** found throughout the **dry parts of the Indian subcontinent**. It is **ovoviviparous and nocturnal** and spends the majority of its time under the ground.

The species is endemic **to Iran, Pakistan, and India.** It is a primarily **reddish-brown and thick-set snake** that grows upto 75 cm.

Unlike most snakes, the tail is almost as thick as the body and gives the reptile the **appearance of being "double-headed".**

Like other snake species, the Red Sand Boa also plays a significant role in the ecosystem by maintaining a **healthy population between prey and predator.** It feeds on rodents, lizards, and even other snakes.

Conservation Status

IUCN: Near Threatened

Wildlife (Protection) Act, 1972: Schedule IV

CITES: Appendix II

ADDIS ABABA DECLARATION

Why in the News?

Over 50 African countries agree to work on minimising impact of mineral mining.

About

Fifty-four countries acknowledged key environmental challenges faced by the continent — land degradation, desertification and drought – in the Addis Ababa declaration.

The declaration was a key outcome of the 19th African Ministerial Conference on the Environment (AMCEN) 2023 held from August 14 to 18, 2023 at Addis Ababa, Ethiopia.

The declaration prioritises urgent, wide-ranging action on environmental challenges related to climate change, plastics pollution, marine protection, biodiversity conservation and natural capital.

The countries also committed to take appropriate measures to implement the Kunming-Montreal Global Biodiversity Framework through updating or revising national biodiversity strategies and action plans or national targets.

The ultimate aim is to increase the global finance flow to at least $100 billion per year, stated the declaration.

They will work towards closing the biodiversity finance gap of $700 billion per year. The countries have also agreed to work on a priority to implement Africa Blue Economy Strategy of the African Union.

COCOS (KEELING) ISLANDS

An Indian Navy Dornier maritime patrol aircraft and an Indian Air Force C-130 transport aircraft visited Australia's Cocos (Keeling) Islands (CKI).

India and Australia signed a Mutual Logistics Support agreement in 2020, and the two Navies signed the 'Joint Guidance for the India – Australia Navy to Navy Relationship' document in August 2021.

About Cocos Islands

The Cocos (Keeling) Islands are an Australian external territory in the Indian Ocean, comprising a small archipelago approximately midway between Australia and Sri Lanka and relatively close to the Indonesian island of Sumatra.

The territory consists of two atolls made up of 27 coral islands, of which only two – West Island and Home Island – are inhabited.

"PEDICULARIS REVEALIANA" – A NEWLY DISCOVERED PLANT SPECIES

Scientists from the Botanical Survey of India (BSI) Prayagraj Centre have discovered a new plant species in the state of Sikkim named Pedicularis Revealiana.

Sikkim is renowned for its remarkable biodiversity which ***alone accounts for 45% of the total plant diversity in the Indian Himalayan region.***

About Pedicularis Revealiana

Pedicularis Revealiana is a plant belonging to the Pedicularis species group. It is commonly known as a perennial herb.

This plant thrives in remote forests, which remain snow-covered for most of the year.

It is a hemi-parasitic species, meaning, it is partially parasitic, setting it apart from all other known Pedicularis species.

This plant not only produces its own food but also demonstrates the remarkable ability to draw nutrients from the roots of neighbouring trees and plants.

MAHANADI RIVER

Context:

The Odisha government recently alerted the districts in the Mahanadi delta area as it apprehends a "medium" flood in the river system following heavy rains for three consecutive days in the state.

About Mahanadi River:

It is one of the major east-flowing peninsular rivers in India.

Origin: The river originates from the Sihawa range of hills in the Dhamtari district of Chhattisgarh state.

Length: It flows a total of 860 km by distance before it ends up in the Bay of Bengal.

Course:

It flows in a southeastern direction through Chhattisgarh and Odisha.

The catchment area of the basin extends over major parts of Chhattisgarh and Odisha and comparatively smaller portions of Jharkhand, Maharashtra and Madhya Pradesh.

It passes through several major cities and towns, including Raipur, Sambalpur, and Cuttack.

The river is bounded in the north by Central India hills, in the south and east by the Eastern Ghats and in the west by Maikal hill range.

Tributaries: The main tributaries of Mahanadi are Seonath River, Jonk River, Hasdeo River, Mand River, Ib River, Ong River and Telen River.

Hirakud Dam:

The Hirakud Dam, the world's longest earthen dam (26km), is constructed across the Mahanadi River, about 15 km from Sambalpur in Odisha.

The dam is used for irrigation, flood control, and power generation.

Chilika Lake

Chilika, named wetland of international importance under the Ramsar Convention, gets 61% of its inland flow from the Mahanadi river system, mainly from its distributaries - Daya and Bhargabi.

It ranks second to the Godavari River among the peninsular rivers in respect of water potential.

NAWEGAON-NAGZIRA TIGER RESERVE

Context:

A young male tiger recently died in a road hit near Murdoli village in the buffer zone of the Nawegaon-Nagzira Tiger Reserve in Maharashtra.

About Nawegaon-Nagzira Tiger Reserve:

Location: It is situated in Gondia and Shahdara District of Maharashtra. It comprises Nawegaon National Park, Nawegaon Wildlife Sanctuary, Nagzira Wildlife Sanctuary, New Nagzira Wildlife Sanctuary and Koka Wildlife Sanctuary.

It is connected with many surrounding tiger reserves like Pench, Kanha, Tadoba Andhari Tiger Reserve, Indravati Tiger Reserve etc.

Vegetation: Southern Tropical Dry Deciduous Forestwhich includes dry mixed forests to moist forest type.

Flora: There are 364 species of plants and the major trees are: Terminalia tomentosa, Lagerstroemia parviflora, Anogeisus lotifolia, Pterocarpus marsupium, Diospyrus melanoxylon, Ougeinia oogenesis etc.

Fauna: The major wild animals are: Tiger, Panther, Small Indian Civet, Palm Civet, Wolf, Jackal, Wild Dog, Sloth Bear, Ratel, Common Giant Flying Squirrel, Gaur, Sambar, Chital, Four Horned Antelope, Mouse Deer and Pangolin.

INDIAN FLYING FOX BAT

Context:

A new study found that India's largest species of bats, Indian Flying Fox bat spends 7% of its day-roosting time being environmentally vigilant.

About Indian Flying Fox bat:

It is a species of flying fox native to the Indian subcontinent. It is one of the largest bats in the world.

The nectar and fruit-eating flying fox (Pteropus giganteus) is generally considered vermin as they raid orchards.

It is a keystone species causing seed dispersals of many plants in tropical systems.

Appearance: The Indian flying fox is so called due to its unique, fox-like appearance: reddish-brown coat, characteristically long snout as well as large eyes. And indeed, this animal resembles a little fox with wings.

Distribution: These bats are endemic to South Central Asia, found from Pakistan and China to the Maldives Islands.

Habits and Lifestyle:

It is highly social creatures, forming large roosts of several hundred animals.

These bats live in a 'vertical', male-dominated hierarchy system, where higher-ranked individuals occupy higher spots of the tree, while lower-ranked individuals remain on lower spots.

Diet: They maintain a frugivorous diet, supplementing it with insects as well as flowers, containing juice and nectar.

Threat: Being external roosters, the flying fox is exposed to predators and disturbances apart from environmental indicators such as heat and light.

Conservation status

IUCN: **Least concern**

The Wildlife (Protection) Act of 1972: **Schedule II**

KALKA-SHIMLA RAILWAY LINE

Context:

Heavy rain and floods in Himachal Pradesh have battered the 94-km-long Kalka-Shimla railway line, a UNESCO World Heritage Site.

About Kalka-Shimla Railway line:

This railway was declared a UNESCO World Heritage Site on July 8, 2008.

It is located at an elevation of 2,152 ft above sea level in Haryana, to the capital of Himachal Pradesh, at 6,808 ft.

The narrow gauge "toy train" passes through 18 stations, 102 tunnels, and over 988 bridges.

It offers majestic views for most of the route. Passengers see breath-taking valleys, covered with pine, oak, and deodar trees.

Key facts about UNESCO:

UNESCO stands for United Nations Educational, Scientific and Cultural Organization.

It is specialized agency of the United Nations (UN).

The constitution, which entered into force in 1946, called for the promotion of international collaboration in education, science, and culture.

Headquarters: Paris, France.

Parent Organisation: United Nations Economic and Social Council

Goal: The primary goals of UNESCO are to contribute to peace and security by promoting collaboration among nations through education, science, and culture, and to promote sustainable development and intercultural dialogue.

UNESCO believes that these areas are crucial for building a more just, peaceful, and inclusive world.

FLOODWATCH APP

Context:

Recently, the Chairman of Central Water Commission (CWC) launched the mobile application, "FloodWatch.

About Floodwatch App:

This app gives information related to the flood situation and forecasts up to 7 days on a real-time basis to the public.

The in-house developed user-friendly app has readable and audio broadcast and all the information is available in 2 languages, viz. English and Hindi.

Other feature of the app includes real-time flood monitoring where users can check up-to-date flood situation throughout the country.

The app utilizes near real-time river flow data from various sources.

The app also provides flood forecast at nearest location where users can check the flood advisory at the station nearest to them on the Home Page itself.

The app will also provide State-wise/Basin-wise Flood Forecast (up to 24 hours) or Flood Advisory (up to 7 days) which can be accessed by selecting specific stations, state wise or basin wise from the dropdown menu.

This app utilizes advanced technologies such as satellite data analysis, mathematical modelling, and real-time monitoring to deliver accurate and timely flood forecasts.

Key facts about Central Water Commission

It is a premier Technical Organization of India in the field of Water Resources.

It is presently functioning as an attached office of the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation.

Functions

- The Commission is entrusted with the general responsibilities of initiating, coordinating and furthering in consultation of the State Governments concerned, schemes for control, conservation and utilization of water resources throughout the country.
- It also undertakes the investigations, construction and execution of any such schemes as required.
- It is headed by a Chairman, with the status of Ex-Officio Secretary to the Government of India.

LIKARU-MIG LA-FUKCHE ROAD

Context:

Border Roads Organisation (BRO) recently started the construction of the Likaru-Mig La-Fukche road close to Hanle in Eastern Ladakh's Demchok sector.

About Likaru-Mig La-Fukche road:

It is located close to Hanle in Eastern Ladakh.

The 64-km long road will connect Likaru to Fukche, situated 3 km from the Line of Actual Control (LAC).

Once completed, it will be the ***world's highest motorable road at a height of 19,400 ft in Mig La.***

This would also provide an alternate land connectivity route to the Fukche advanced landing pad, which is only 2.5 km away from the LAC.

It is the first project in India to be carried out entirely by an All Woman Road Construction Company. It is led by a five-member All Woman Border Road Task Force.

Umling La Pass:

- Currently, Umling La in Ladakh, at a height of 19,024 ft, holds the record of being the highest motorable road in the world.
- The construction of this road has been achieved by the BRO (Border Road Organization) as part of "Project Himank".
- It is a 52-km road that connects Chishumle to Demchok villages. Both these villages lie in close proximity to the Line of Actual Control (LAC), and a friction point between India and China.

A VISION FOR CLEAN COOKING ACCESS FOR ALL - WORLD ENERGY OUTLOOK SPECIAL REPORT

#mains

Why in news?

The IEA's new special report, A Vision for Clean Cooking Access for All, builds on the Agency's two decades of work on energy access issues, shedding light on the challenges and successes in delivering clean cooking solutions, and laying out a roadmap to achieve universal access.

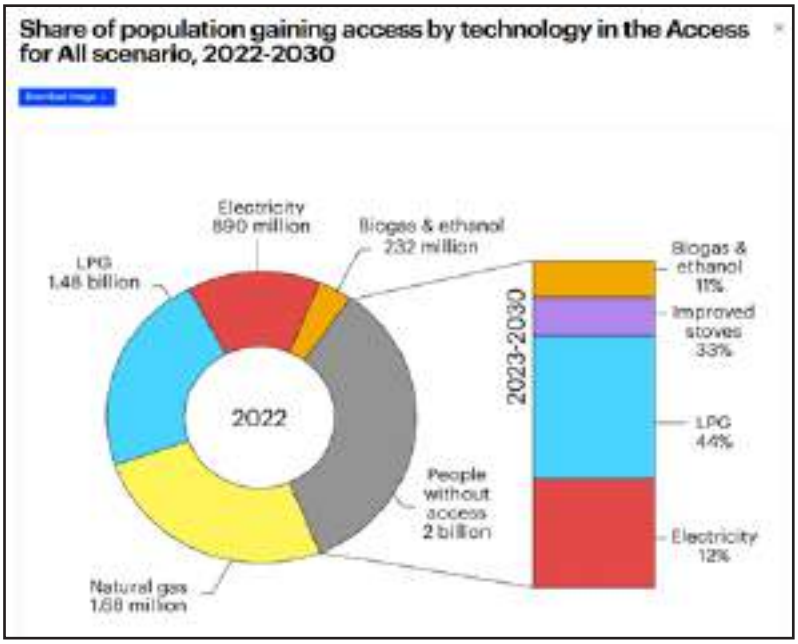
Clean Cooking Access

Clean cooking access is defined as a household that has reliable access to and uses as their primary cooking means, fuels and equipment that significantly limit or avoid the release of pollutants harmful to human health

There are several different clean cooking technologies including stoves using natural gas, liquefied petroleum gas (LPG), electricity, bioethanol, and biogas. Improved biomass cookstoves (ICS) can act as a transitional technology from traditional biomass cookstoves and three-stone fires to the clean-cooking technologies listed above, and play an important role in providing immediate, meaningful health benefits to areas where needed infrastructure is unlikely to reach in the coming years.

Importance of clean cooking access

Providing energy access to the country's poor; reducing health issues and premature deaths, mostly among women and children in rural areas; as well as helping India achieve its net zero targets by reducing carbon emissions. It can also boost the country's GDP by



reducing the economic burden resulting from the use of unsustainable fuels.

Switching from traditional three-stone open fires to clean cookstoves can reduce or remove the pressure on local terrestrial and mangrove forests.

Over time, the reduction of forest extraction and reduced pressure have been proven to lead to both an increase in forest biomass and higher levels of diversity and abundance of seedlings of indigenous tree species

A transition to clean cooking solutions can improve food security by reducing land degradation from fuelwood harvest, increasing the amount of time and money available to grow alternative, higher-value, and nutrient-dense foods such as maize, potatoes, and beans, and by improving the nutrient retention of cooked foods

Challenges in delivering Clean cooking access

- Affordability
- Need for Larger Initial Investments
- Regular maintenance
- Supply chain and infrastructure
- Restraint in the transformation of social norms
- Lack of education and awareness in remote areas
- Inadequate policy support
- Issues in addressing equity and inclusivity in delivery of services
- High cost of clean energy alternatives
- India's dependence on imported LPG — the refined commodity has steadily increased to over 64% in FY23 (versus 46% in the pre-PMUY phase)
- Lack of stimulus for the growth of cleaner fuel other than LPG in India

State of Clean cooking access

Today, 2.3 billion people live without access to clean cooking, largely in sub-Saharan Africa and developing Asia

In Asia, access rates are higher with only seven countries, of which five small island countries, having access rates below 20%. However, large countries like China, India, and Indonesia, who have higher access rates, are still home to many people without access

Major progress in providing clean cooking has largely been driven by LPG. In India the number of people primarily cooking with LPG increased by nearly 300 million from 2015 to 2022, thanks to strong measures and schemes as the Pratyaksh Hanstantrit Labh (PAHAL), which has been subsidising LPG refills since 2015 and the Pradhan Mantri Ujjwala Yojana (PMUY), which has provided more than 80 million deposit-free LPG connections to women in poor households since 2016

LPG remains the primary solution to deliver clean cooking access, representing nearly half of the households gaining access to 2030. Electric cooking becomes the main option for one in eight homes gaining access by 2030, while many more homes adopt appliances like rice makers as part of their cooking routines. Electric cooking benefits from reduced imports but faces challenges due to low electricity access rates and unreliable grids in some regions to scale.

Government's Clean Cooking Policies in India

PMUY/ Pradhan Mantri Ujjwala Yojana

This scheme, launched in 2016, has been instrumental in increasing the shift from traditional fuels to LPG.

Under PMUY Phase I, 8 crore women from poor households received deposit-free LPG connections in 2019.

Under PMUY Phase II, the beneficiaries received a stove and free first refill, in addition to depositing free LPG connections.

Over the years, several attempts have been made to increase LPG consumption under this scheme, including

- A subsidy of Rs 200/ 14.2 kg refill
- Up to 12 refills/ year
- 5 kg DBC (Double Bottle

Connection) option

- Swap option from 14.2 kg to 5 kg
- Up to 3 free refills/ beneficiary under PM Garib Kalyan Package in 2020

Surya Nutan

It is a solar cooking stove developed by IOCL (Indian Oil Corporation Limited) and the Union Ministry of Petroleum and Natural Gas.

It works in different modes, making it a reliable solution irrespective of the weather.

The first one isOnlinewhich directly uses solar energy and the second is Hybridthat uses both- solar energy and an auxiliary energy source.

The cost of not having access to clean cooking

Households without clean cooking access spend hours each day gathering biomass, preparing fires, and cooking, with these burdens typically falling on women. Across subSaharan Africa, ***households without clean cooking access typically spend an average of 2 hours per day collecting fuel and an additional 3 hours for cooking and food preparation,*** including tending to the fire. However, in regions facing deforestation and increased urbanisation, collection times are increasing

The need to search for biomass for cooking fuel, can put women at higher risk of genderbased violence. Often, women must wander outside community boundaries to collect firewood leaving women in many cases more exposed to violent attack and other forms of abuse

Outlook under today's policies

Current policies are insufficient to reach universal access to clean cooking. Under today's policies, progress toward universal access to clean cooking remains modest. In the current scenario, the number of people without access to clean cooking declines from 2.3 billion today to 1.8 billion in 2030, owing largely to policy efforts in developing Asia

Development finance plays an important role in today's clean cooking ecosystem, especially where public spending from national sources is limited. However, levels of international support remain far too low and fail to attract sufficient private sector participation.

Total investment in clean cooking access is substantially lower than what is required to deliver on broader climate and energy objectives. Today, clean cooking investments are around USD 2.5 billion annually. In the Access for All scenario, this would need to rise to USD 8 billion annually between now and 2030 – requiring a cumulative investment of around USD 60 billion

Recommendations

Reaching universal access to clean cooking will depend on strong national leadership and programmes reinforced by international financial support.

Key enablers include ***regulatory authority for implementing agencies, public engagement campaigns, and financial backing for consumers*** to manage upfront stove costs and ongoing fuel costs.

Switching to clean cooking relies on widespread changes to social and cultural norms. Grassroots efforts, often woman-led, have proven essential to lasting adoption of clean cooking solutions.

Programmes that amplify peer-to-peer advocacy, including training salespeople and safety technicians, can make the difference between lasting adoption, or stoves going unused

International financial flows have and will play a role in advancing clean cooking, especially in regions without.

New business models are emerging, such as ***Pay-go and on-bill financing*** which can make a difference.

Carbon and climate finance is expected to play a growing role as the number of clean-cooking projects funded via carbon markets has increased significantly in recent years.

WHAT ARE THE CONCERNS ABOUT DRILLING IN THE NORTH SEA?

#mains

Why in News?

U.K. Prime Minister recently backed plans for new fossil fuel drilling off Britain's coast, worrying environment experts even as the world continues its stride towards irreversible climate change.

As the North Sea Transition Authority (NTSA), which is responsible for regulating oil, gas and carbon storage industries, conducts its 33rd offshore oil and gas licensing round, the move will assist Britain in becoming more energy independent.

About the North Sea:

Geographically, the North Sea lies between England and Scotland on its west, the Netherlands, Belgium, and France on its south, and Norway, Denmark, and Germany on its west.

An epeiric sea (an inland sea either completely surrounded by dry land or connected to an ocean by a ***river, strait or "arm of the sea")*** on the European continental shelf.

It connects to the Atlantic Ocean through the English Channel in the south and the Norwegian Sea in the north.

It hosts key north European shipping lanes and is a major fishery. The coast is a popular destination for recreation and tourism in bordering countries, and a rich source of energy resources, including wind and wave power.

It gained significant economic importance in the 1960s as the states around the North Sea began full-scale exploitation of its oil and gas resources.

A Short History of Drilling in the UK North Sea:

The 1958 Geneva Convention on the Continental Shelf was the first international legislation to establish the rights of countries over the continental shelves adjacent to their coastlines.

The treaty came into force in 1964 and paved the way for exploration in the North Sea.

The U.K. Parliament passed the Continental Shelf Act 1964 that provides for exploration and exploitation of the continental shelf based on the 1958 convention.

The first licence for exploration in the U.K. North Sea was awarded to British Petroleum (BP) in 1964.

The following year, BP discovered natural gas in the North Sea, off the east Anglican coast.

In 1970, BP made its first discovery of commercial oil in the large Forties Field east of Aberdeen, Scotland.

In the next 15 years, BP started more than 15 fields in the U.K. North Sea (and four in the Norwegian North Sea).

More British, European, and American companies continued their exploration of the North Sea, and by the 1980s, there were over a hundred installations looking for oil and gas.

According to the U.K. government, production from

the North Sea peaked in 1999 to 1,37,099 thousand tonnes of crude oil and natural gas liquids. By 2022, the total production declined to 38,037 thousand tonnes.

Why is Offshore Drilling Problematic?

The offshore drilling puts workers, waters, and wildlife at risk.

Drilling in seas and oceans for fossil fuels not only aggravates the threat of climate change but also warms oceans and raises sea levels.

Offshore drilling is associated with a direct risk to marine biodiversity, as well as with indirect risks to coral reefs, shellfish and the marine ecosystem from acidic waters because of carbon pollution settling into oceans.

Is the U.K. Honouring its Climate Commitments?

In the U.K., National Adaptation Programmes are statutory programmes that the government must follow to help prepare the country for climate change, as required under the Climate Change Act.

The 2nd National Adaptation Programme covered the period of 2018 - 2023. According to reports, there is very limited evidence of the implementation of adaptation at the scale needed to fully prepare for climate risk.

This means, K.'s climate action is not consistent with the Paris Agreement and its Nationally Determined Contributions (NDCs) and long-term targets do not represent a fair share of the global effort to address climate change.

Licensing new oil and gas extraction plans is incompatible with the 1.5°C limit in the rise in temperature.

SCIENCE & TECHOLOGY

What's Inside?

BAN ON ACECLOFENAC, KETOPROFEN

Why in the News?

Gamechanger for India's vultures: Experts laud Centre's move to ban aceclofenac, ketoprofen.

About

The Union Ministry of Health and Family Welfare banned the **manufacture, sale and distribution of ketoprofen and aceclofenac(Which are toxic for vultures) and their formulations for animal use** under section **26A of the Drugs and Cosmetics Act, 1940** in a notification, with immediate effect.

About **16 years ago,** India had **banned the veterinary use of diclofenac,** as it was found to be toxic for vultures. Conservationists point to **meloxicam and tolfenamic acid as safe alternatives.**

What prompted the Government to Ban usage ?

A recently published study by **Indian Veterinary Research Institute (IVRI)** and collaborators had said that **aceclofenac metabolised into diclofenac in water buffaloes, as it did in cows, threatening the already critically endangered Gyps vultures in South Asia.** They had recommended the immediate ban on the veterinary use of aceclofenac across vulture range countries.

This step will have a very big impact because as soon as aceclofenac is given to any animal, it gets converted to diclofenac. In fact, diclofenac remains longer in the body because of aceclofenac than if diclofenac alone is injected. So, banning aceclofenac is a very good and positive development and will certainly help the vulture population.

Indian Vulture and Diclofenac

- In the 1990s, India's vulture populations plummeted due to diclofenac, a cattle pain reliever causing vultures to die painfully.
- By 2004, 97% of vultures, including Oriental white-backed, long-billed, and slender-billed species, were lost.
- India and agencies devised a **Vulture Recovery Plan in 2004** to combat the decline.
- The plan aimed to ban diclofenac's veterinary use, find alternatives, and establish vulture conservation breeding centres.
- Vultures, slow breeders with long lifespans, faced extinction if mortality rates exceeded 5% annually.
- **The Vulture Recovery Plan was integrated into the 2006 Action Plan for Vulture Conservation.**
- In 2006, India banned diclofenac's veterinary use, and the ban was officially gazetted in 2008.
- The notification recommended **meloxicam** as an alternative veterinary drug to diclofenac.
- To prevent misuse, the Centre limited the vial size of diclofenac for human use to three millilitres.

DIGITAL INDIA RISC-V MICROPROCESSOR (DIR-V) PROGRAM

Why in the News?

Recently, the Union Minister of Electronics & IT addressed the Digital India RISC-V (DIR-V) Symposium organised by IIT Madras in Chennai.

About

The DIR-V Program is a forward-looking initiative that aims to **uplift India's semiconductor ecosystem.**Its primary goal is

to promote indigenous innovation in the field of microprocessors, laying the foundation for self-reliance.

The program emphasizes three key principles: **innovation, functionality, and performance,** shaping its direction for the future.

Aims to enable creation of Microprocessors indigenously for the future in India, for the world and achieve industry-grade silicon & Design wins by December 2023.

The federal government has set a timeline to commercially roll out the first indigenous chipsets – Shakti and Vega – by 2023-24 to meet the surging demand for semiconductors in the automotive, mobility, and computing segments.

This program is a component of the **Semicon India program**, which is aimed at positioning India as a global hub for electronic system design and manufacturing.

The program intends to fortify partnerships between startups, academia, and multinational companies, with the aim of making India a global RISC-V talent hub. Additionally, the DIR-V program also intends to make India a key supplier of RISC-V SoC (system on chips) for servers, mobile devices, automotive, IoT (internet of things), and microcontrollers across the globe.

A Reduced Instruction Set Computer is a type of microprocessor architecture that utilizes a small, highly-optimized set of instructions rather than the highly-specialized set of instructions typically found in other architectures.

DIR-V is positioned at the heart of India's aspirations for high-performance computing. Collaborations with organizations like the Center for Development of Advance Computing (C-DAC) and public-private partnerships will ensure that DIR-V plays a pivotal role in these ambitious goals.

About RISC-V

The term RISC stands for "reduced instruction set computer" which executes few computer instructions whereas 'V' stands for the 5th generation. The RISC was invented by Prof. David Patterson around 1980 at the University of California, Berkeley.

It is an ***open-source hardware ISA*** (instruction set architecture) used for the development of custom processors targeting a variety of end applications.

It also enables designers to create thousands of potential custom processors, facilitating faster time to market. The commonality of the processor IP also saves on software development time.

RISC-V processors find versatile applications in wearables, IoT, smartphones, automotive, aerospace, and more, offering power efficiency, performance customization, and security. They excel in space-constrained designs and complex computational tasks.

DRAFT NATIONAL DEEP TECH STARTUP POLICY (NDTSP)

Why in news?

The office of the Principal Scientific Adviser to the Government put out a draft National Deep Tech Startup Policy (NDTSP) for public comment, following two versions that were iterated at high levels with other government departments, academia and stakeholder firms

About

Deep Technology refers to innovations founded on advanced scientific and technological breakthroughs. Due to their disruptive nature, they have the potential to solve India's most pressing societal issues.

The Draft National Deep Tech Startup Policy (NDTSP) is strategically formulated to stimulate innovation, spur economic growth, and promote societal development through the effective utilization of deep tech research-driven innovations.

This initiative centralizes on ***bolstering deep***

tech startups, thereby solidifying India's financial stability and stimulating the transition towards a knowledge-centric economy, consequently augmenting India's overall productivity.

NDTSP aims to ***harness the transformative potential*** of technological advancement across diverse sectors, serving as a catalyst to stimulate ripple effects throughout the economy and laying the groundwork for new industry creation. This policy aims to significantly ***strengthen India's capabilities and enhance global competitiveness.***

Additionally, the policy seeks to ***simplify the intellectual property regime*** for such start-ups, ease regulatory requirements, and proposes a slew of measures to promote these firms. For instance, the NDTSP suggests that an *Export Promotion Board be created to ease barriers of entry for Indian deep tech start-ups into foreign markets,* and that clauses to ease such market access be included in foreign trade agreements.

The policy also includes ***resource-intensive policy approaches to attract global talent,*** such as offering "networking opportunities to international deep tech startups and experts interested in relocating and contributing to the local ecosystem."

The policy also aims to enable Infrastructure and resource sharing with academic institutions, R&D laboratories, and large manufacturing corporations for faster product development.

CHD1L GENE

Why in news?

Some people of African descent possess this gene variant that likely controls human immunodeficiency virus (HIV), lowering their risk of transmitting the virus and delaying the advancement of their own illness, according to a new study.

About

The gene in question is Chromodomain Helicase DNA Binding Protein 1 Like (CHD1L), which ***contains information to make proteins that allow the body to repair DNA damage.***

A variant of the CHD1L gene, specifically present in the African population, has been linked to the reduced viral load (amount of HIV in the blood) of the most common and virulent type of HIV, called HIV-1 (more common and severe retrovirus compared to HIV-2), the study published in journal Nature on August 2, 2023, noted.

They analysed the DNA of almost 4,000 people of African ancestry living with HIV-1 and found a gene variant CHD1L on chromosome 1.

People carrying this variant had a low viral load. This lowers their risk of spreading the virus and slowing the progress of their own illness.

The researchers said between 4 per cent and 13 per cent of people of African origin could be carrying this particular variant.

Human immunodeficiency virus (HIV)

- Human immunodeficiency virus (HIV) is an infection that attacks the body's immune system.
- Acquired immunodeficiency syndrome (AIDS) is the most advanced stage of the disease.
- HIV targets the body's white blood cells, weakening the immune system.
- This makes it easier to get sick with diseases like tuberculosis, infections and some cancers.
- It is spread from the body fluids of an infected person, including blood, breast milk, semen and vaginal fluids.
- It can be treated and prevented with antiretroviral therapy (ART).

GREEN HYDROGEN STANDARD FOR INDIA

Why in news?

In a significant move for the progress of the National Green Hydrogen Mission, the government has notified the Green Hydrogen Standard for India.

About

The standard issued by the Ministry of New and Renewable Energy (MNRE), Government of India ***outlines the emission thresholds*** that must be met in order for hydrogen produced to be classified as 'Green', i.e., from renewable sources. The scope of the definition encompasses both electrolysis-based and biomass-based hydrogen production methods.

Green hydrogen includes

- Hydrogen produced using renewable energy
- production through electrolysis or
- Production through conversion of biomass
- Produced from electricity generated from renewable sources which is stored in an energy storage system or banked with the grid in accordance with applicable regulations

In the case of use of **electrolysis and biomass**, non-biogenic greenhouse gas emissions arising from the whole processes shall not be greater than **2 kilogram of carbon dioxide equivalent per kilogram of Hydrogen (kg CO2 eq/kg Hydrogen)**, taken as an average over last 12-month period

Bureau of Energy Efficiency shall be the Nodal Authority for accreditation of agencies for the monitoring, verification and certification for Green Hydrogen production project

National Green Hydrogen Mission:

India launched the National Green Hydrogen Mission with the objective of producing 5 million metric tonnes of green hydrogen annually by 2030.

The mission aligns with a target of about 125 gigawatts of associated renewable energy capacity.

The program offers financial incentives to promote domestic production of electrolysers and green hydrogen.

These incentives are designed to facilitate rapid scale-up, technology development, and cost reduction.

SIGHT programme:

It is a sub component under the National Green Hydrogen Mission.

Aim of the programme:

Component I: It aims at providing **electrolyser manufacturing incentives** with a total outlay of INR 4440 crore

Component II: It focuses on **green hydrogen production** with financial outlay of INR 13050 crore.

Implementing agency: The **Solar Energy Corporation of India (SECI)** would be the implementing agency responsible for the scheme's execution.

AGNIBAAN SUBORBITAL TECHNOLOGICAL DEMONSTRATOR (SORTED) ROCKET

Why in news?

Chennai-based start-up AgniKul Cosmos has initiated the integration of its revolutionary Agnibaan SubOrbital Technological Demonstrator (SOrTeD) rocket at its private launchpad within the Satish Dhawan Space Centre (SDSC) SHAR in Sriharikota.

About

The Agnibaan SOrTeD rocket boasts a unique design, featuring the ***3D-printed Agnilet engine, a single-stage, semi-cryogenic, and customizable launch vehicle***.

Unlike traditional sounding rockets, the Agnibaan SOrTeD ***launches vertically and performs precise maneuvers during flight***. With dimensions of 18 meters in height and a mass of 14,000 kg, the rocket offers various configurations for payloads up to 100 kg, reaching altitudes of 700 km.

It is a customisable launch vehicle that could be launched in one or two stages.

The rocket's first stage could have up to seven Agnilet engines, depending on the mission, which are powered by Liquid Oxygen and Kerosene.

The rocket is also designed for launch from more than 10 different launch ports.

AgniKul Cosmos: A Chennai-based start-up specializing in aerospace technology and known for its innovative rockets.

Agnilet Engine: AgniKul's patented semi-cryogenic engine, uniquely constructed in a single 3D-printed piece, generating 6 kN of thrust.

Launch Pedestal 'Dhanush': A platform developed by AgniKul to facilitate the mobility and compatibility of the Agnibaan rocket across various launch ports.

TRACHOMA

Why in the News?

Recently, the World Health Organization (WHO) announced that Iraq has now joined the league of 17 other countries that have eliminated trachoma.

Iraq becomes the 50th country to be acknowledged by the United Nations health agency for eliminating at least one neglected tropical disease globally.

About Trachoma

It is a disease of the eye caused by infection with the **bacterium Chlamydia trachomatis**. It is a public health problem in 42 countries, and is responsible for the blindness or visual impairment of about 1.9 million people. It is a **neglected tropical disease** and the world's **leading infectious cause of blindness.**

Trachoma starts off as a bacterial infection caused by Chlamydia trachomatis and can be easily treated. Over time, it causes the eyelashes to be pushed inward into the eye. So with every blink, they brush against the eyeball.

The advanced form of trachoma is called trichiasis. Over time, if it's not treated, trichiasis can lead to blindness.Blindness from trachoma is irreversible.

How does it spread?

Infection spreads through personal contact (via hands, clothes, bedding or hard surfaces) and by flies that have been in contact with discharge from the eyes or nose of an infected person.

With repeated episodes of infection over many years, the eyelashes may be drawn in so that they rub on the surface of the eye.This causes pain and may permanently damage the cornea.

To eliminate trachoma as a public health

problem, **WHO recommends the SAFE strategy.** The SAFE strategy includes: **Surgery** to treat the blinding stage (trachomatous trichiasis); **Antibiotics** to clear the infection, particularly the antibiotic azithromycin; **Facial cleanliness and Environmental improvement**, particularly improving access to water and sanitation.

The 17 other countries that have eliminated trachoma are: Benin, Cambodia, China, Gambia, Ghana, Islamic Republic of Iran, Lao People's Democratic Republic, Malawi, Mali, Mexico, Morocco, Myanmar, Nepal, Oman, Saudi Arabia, Togo and Vanuatu.

LACTOSE INTOLERANCE

What is Lactose Intolerance:

Lactose intolerance is the digestive system's reaction to lactose, a sugar found in dairy products. It occurs when the body lacks sufficient lactase, an enzyme needed to digest lactose. Without enough lactase, undigested lactose passes to the colon, causing symptoms like bloating, cramps, and diarrhea.

Causes of Lactose Intolerance:

Enzyme Decline with Age: As people age, the body's production of lactase tends to decrease, leading to lactose intolerance, which might manifest in adulthood.

Ethnic Differences: Lactose intolerance prevalence varies by ethnicity. It's more common in African American and Asian populations compared to Europeans.

Genetic and Family Influence: Lactose intolerance can run in families, with symptoms often becoming evident during childhood or adolescence.

Secondary Lactose Intolerance: Certain conditions like surgeries, chemotherapy, infections, ulcerative colitis, or Crohn's disease affecting the small intestine can trigger temporary lactose intolerance.

Stress and Dietary Changes: Stress, lack of sleep, and dietary changes can exacerbate symptoms of lactose intolerance.

Effects of Lactose Intolerance:

- Lactose intolerance can cause uncomfortable symptoms, including abdominal bloating, continuous belching, pain, and occasional diarrhea.
- Individuals with lactose intolerance often need to exclude or restrict dairy products from their diet to manage symptoms.
- Symptoms of lactose intolerance can overlap with those of irritable bowel syndrome (IBS). For some, dairy products are just one of several triggers for gastric symptoms.
- Lactose intolerance is commonly self-diagnosed and self-managed. Clinical diagnosis based on symptoms and dietary patterns is often sufficient.

AMYOTROPHIC LATERAL SCLEROSIS

Amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's Disease, is a rare neurological disease that affects motor neurons—those nerve cells in the brain and spinal cord that control voluntary muscle movement. Voluntary muscles are those we choose to move to produce movements like chewing, walking, and talking. The disease is progressive, meaning the symptoms get worse over time. ALS has no cure and there is no effective treatment to reverse its progression.

ALS is a type of motor neuron disease. As motor neurons degenerate and die, they stop sending messages to the muscles, which causes the muscles to weaken, start to twitch (fasciculations), and waste away (atrophy). Eventually, the brain loses its ability to initiate and control voluntary movements.

ALS treatment and care are expensive, involving costs for medications, professional

assistance, and equipment modifications. The lack of insurance coverage adds to the financial burden.

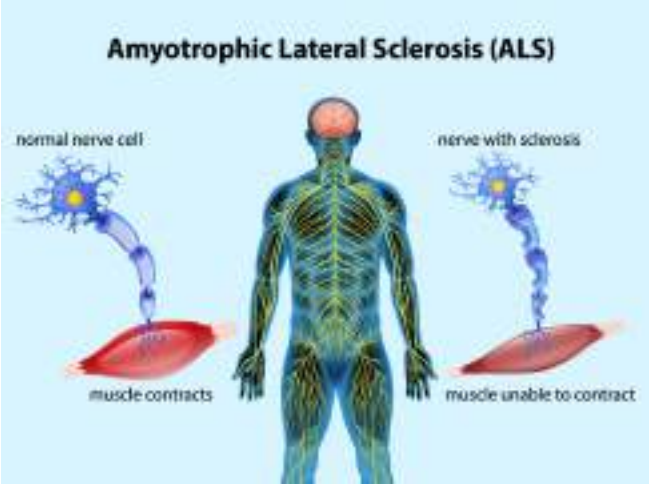
ALS is considered a rare disease, as it affects fewer than 1 in 10,000 people according to the NPRD definition. The passage discusses India's National Policy for Rare Diseases (NPRD) and its provisions for financial assistance to patients with rare diseases, including ALS.

Challenges in Diagnosis: It typically takes 8 to 15 months for a definitive ALS diagnosis due to the lack of specific biomarkers. Diagnosis requires motor cell failure in multiple body regions, such as limbs and the bulbar region controlling swallowing and speaking.

Caregiver Role: Caregivers of ALS patients face significant challenges as they need to provide constant assistance for daily tasks, including feeding, bathing, and communication. Caregivers often experience emotional strain and disruptions to their own lives.

Mental Health Impact: Both ALS patients and caregivers often experience mental health issues, including depression. The challenges of the disease and its effects on quality of life can contribute to psychological distress.

Infrastructural Challenges: Infrastructural inefficiencies, like lack of wheelchair accessibility, can further complicate the lives of ALS patients and caregivers.



JAPAN RELEASES RADIOACTIVE WATER INTO THE PACIFIC OCEAN

Why in news?

Japan started releasing treated radioactive water from the tsunami-hit Fukushima nuclear plant into the Pacific Ocean ,despite opposition from its neighbours. The decision comes weeks after the UN's nuclear watchdog approved the plan.

About

In 2011, a tsunami triggered by a magnitude 9.0 earthquake flooded three reactors of the Fukushima Daiichi Nuclear Power Plant. The event is regarded as the world's worst nuclear disaster since Chernobyl.

Shortly after, authorities set up an exclusion zone which continued to be expanded as radiation leaked from the plant, forcing more than 150,000 people to evacuate from the area.

It was signed off by the UN's nuclear watchdog in July, with authorities concluding the impact on people and the environment would be negligible.

The water that the Japanese government wants to flush from the plant was used to cool the reactors, plus rainwater and groundwater. It contains radioactive isotopes from the damaged reactors and is thus itself radioactive. Japan has said that it will release this water into the Pacific Ocean over the next 30 years.

Can't they just filter the radioactive particles out of the water?

Known as the Advanced Liquid Processing System (or ALPS, for short), it can remove several different radioactive contaminants from the water.

The authorities have used ALPS and other systems to remove some of the most hazardous isotopes, like cesium-137 and strontium-90.

But there's a radioactive isotope that they cannot filter out: tritium. Tritium is an isotope

of hydrogen, and hydrogen is part of the water itself (H20). So it is impossible to create a filter that could remove the tritium.

So how does the Japanese government plan to release this water safely?

There are a couple of parts to the plan. First, they are going to dilute the water with seawater, so that there's a lot less tritium in every drop. The government says they will bring tritium levels well below all safety limits, and below the level released by some operating nuclear plants.

Second, they're taking that diluted water and passing it through a tunnel under the seafloor to a point off the coast of Fukushima in the Pacific Ocean. That will dilute it further.

Finally, they are going to do this slowly. It will take decades to empty all these tanks.

The Pacific Islands Forum, a coalition of nations including the Marshall Islands and Tahiti that are also apprehensive about Japan's decision

STRAITS TIMES GRAPHICS

Pacific Islands Forum (PIF)

The Pacific Islands Forum (PIF) is an inter-governmental organization that aims to enhance cooperation between countries and territories of Oceania, including formation of a trade bloc and regional peacekeeping operations.

It was founded in 1971 as the South Pacific Forum (SPF), and changed its name in 1999 to "Pacific Islands Forum", so as to be more inclusive of the Forum's Oceania-spanning membership of both north and south Pacific island countries, including Australia. It is a United Nations General Assembly observer

ROOM TEMPERATURE SEMI CONDUCTOR

Why in the News?

Skepticism around LK-99, the Korean scientists' room temperature superconducting material.

About

In July 2023, a group of scientists in South Korea uploaded two preprint papers claiming that a **lead apatite** material was an **ambient condition superconductor.**

The novelty of the South Korean group's work was to replace 10% of the lead ions in lead apatite with copper, to produce the supposed wonder material that they had christened LK-99 (after their own last names).

The group's two papers elicited a mixture of surprise and scepticism in the scientific community – surprise because of the apatite, and scepticism because of the history of superconductivity.

Researchers in Australia, China, India, the U.S., and several European countries followed them and tried to replicate the South Korean team's findings – but no one found conclusive evidence of superconductivity in their samples

What is a semiconductor?

A superconducting material lets current pass through it without offering any resistance, which means no **"transmission and distribution losses",** because 'resistance' causes a part of the current

to be converted, wastefully, into heat.

Two Important properties of a superconducting material

1. It must offer **zero resistance to current**;
2. It must display diamagnetism—it should repel magnetic forces.

Good conductors of electricity become superconductors at a certain "critical" temperature, which is extremely low. For example, copper becomes superconducting at near '**absolute zero' temperature, or nearly minus 273 degrees Celsius.**

For well over a century, scientists have been trying to develop a material that does not require to be so cold to be superconducting – preferably, super conduct at room temperature.

Finding such a material means that power transmission, motors, generators, electronics become highly efficient and even transport (super-fast maglev trains) becomes possible. Compact generators mean that offshore wind turbines can be small and hence cost-effective.

Applications of superconductors

1. **Power Transmission and Generation:** Superconducting materials can carry electricity without any loss due to resistance. This makes them highly efficient for transmitting and generating electricity. They are used in high-capacity power cables and generators.
2. **Particle Accelerators:** Superconducting magnets are used in particle accelerators like the Large Hadron Collider (LHC) to generate the necessary magnetic fields for particle acceleration.
3. **Maglev Trains:** Superconducting magnets are used in magnetic levitation (Maglev) train systems to reduce friction and increase efficiency.
4. **Electric Motors and Generators:** Superconducting materials can improve the efficiency and power output of electric motors and generators, particularly in applications where size and weight are critical.
5. **Scientific Research:** Superconductors are used in various scientific experiments and research applications, such as in quantum computing and in studying fundamental properties of matter.
6. **Medical Devices:** Superconducting magnets are essential components in magnetic resonance imaging (MRI) machines. They produce strong, stable magnetic fields, enabling high-resolution imaging of the human body. It is also used in other medical devices like magnetocardiography (MCG) systems for heart diagnostics and magnetoencephalography (MEG) for brain research.

Advantages:

1. **Zero Electrical Resistance:** The most significant advantage of superconductors is their ability to carry electricity without any resistance. This leads to reduced energy loss and increased efficiency in electrical systems.
2. **Strong Magnetic Fields:** Superconducting magnets can generate extremely strong and stable magnetic fields, which is crucial for various applications like MRI machines and particle accelerators.
3. **Energy Efficiency:** Superconducting power transmission lines can significantly reduce energy losses during electricity transmission, making the power grid more efficient.
4. **Miniaturization:** Superconductors allow for the development of compact and powerful electrical devices, which is especially valuable in applications like electronics and medical devices.

Challenges:

1. **Cooling Requirement:** Most superconductors need to be cooled to very low temperatures (usually below -100°C) to maintain their superconducting state.

This cooling requirement can be expensive and challenging to implement in practical applications.

2. **Materials Development:** Finding or creating superconducting materials that can operate at higher temperatures (i.e., above the boiling point of nitrogen) is an ongoing challenge. High-temperature superconductors can make the technology more accessible and cost-effective.
3. **Materials Cost:** Some superconducting materials, especially those with unique properties, can be expensive to manufacture, limiting their widespread adoption.
4. **Maintenance and Reliability:** Superconducting systems can be complex, and maintaining them at low temperatures can be challenging. There are concerns about reliability and the potential for failures.
5. **Magnetic Field Limitations:** In some cases, superconductors may not be suitable for applications involving very high magnetic fields or rapid changes in magnetic fields.

ACTIVE PHARMACEUTICAL INGREDIENTS (APIS)

Context:

Union Health Minister recently said that India has started manufacturing 38 active pharmaceutical ingredients, or APIs, in the last one and a half years.

About Active Pharmaceutical Ingredients (APIs):

APIs are the active components in a pharmaceutical drug that produces the required effect on the body to treat a condition.

APIs are produced by processing chemical compounds.

In a biologic drug, the active ingredient is known as a bulk process intermediate (BPI).

In the context of drug development and manufacturing, APIs are the key active components that interact with specific receptors or target molecules in the body to bring about the desired physiological or therapeutic response

All drugs are made up of two core components: (1) Active Pharmaceutical Ingredient (API), which is the central ingredient, and (2) excipients.

Excipients:

They are substances other than the drug that helps deliver the medication to your system.

Excipients are chemically inactive substances, such as lactose or mineral oil.

Some of these materials are used to help the medication remain stable and to control absorption when you take the drug.

Example: For instance, if you have a headache, acetaminophen is the API, while the liquid in the gel-capsule or the bulk of a pill is the excipient

PARKER SOLAR PROBE

Context:

NASA's Parker Solar Probe recently executed a short maneuver that kept the spacecraft on track to reach the aim point for the mission's sixth Venus flyby.

About Parker Solar Probe:

- It is a NASA spacecraft designed to study the Sun and its atmosphere.
- It was launched on August 12, 2018, from Cape Canaveral Air Force Station, Florida, and is currently orbiting the Sun in a highly elliptical orbit that takes it closer to the Sun than any previous spacecraft.
- The mission objectives of the Parker Solar Probe are to study the structure and dynamics of the Sun's corona, the Sun's magnetic field, and the solar wind.

- To achieve this, the probe will make a total of 24 close approaches to the Sun over the course of its mission, getting as close as 3.83 million miles from the Sun's surface, which is about 7 times closer than any previous spacecraft.
- In December 2021, the Parker Probe reached the atmosphere of the sun. Since then, it's been looping around the sun, drawing closer each time, and sending back tons of data about everything it encounters.

Features:

- Mass: 685 kilograms at launch.
- Scientific Instruments: Fields Experiment (FIELDS), Integrated Science Investigation of the Sun (ISIS), Wide Field Imager for Solar Probe (WISPR), Solar Wind Electrons Alphas and Protons (SWEAP).
- Parker Solar Probe and its instruments are protected from the Sun by a 4.5-inch-thick (11.43 cm) carbon-composite shield, which can withstand temperatures reaching nearly 2,500 degrees Fahrenheit (1,377 Celsius).

MARS CURIOSITY ROVER

Context:

NASA's Curiosity Mars rover recently spotted distinctive hexagonal mud cracks on Mars that scientists speculate may offer the first evidence of wet-dry cycles on the planet.

About Mars Curiosity Rover:

- It is a S. robotic vehicle designed to explore the surface of Mars.
- It was launched aboard an Atlas V rocket from Cape Canaveral Air Force Station, Florida on Nov. 26, 2011, and landed on Aug. 5, 2012, after taking eight months and 10 days to reach the Red Planet.
- The rover is currently roaming Mars' landscape looking for signs of life and learning about the Red Planet's unique environment.
- The rover is part of NASA's Mars Science Laboratory mission which tested a novel landing method that saw the spacecraft descend on a parachute before its landing system fired up its rockets and hovered as the rover was lowered down onto the surface.

Features:

It is about 3 metres long and weighs about 900 kg.

It does not rely on solar cells for its energy needs but rather draws its electric power from a thermoelectric power generator, with the heat source being the radioactive decay of plutonium and the heat sink being Mars's atmosphere.

According to NASA, Curiosity has four main science goals in support of the agency's Mars exploration program:

Determine whether life ever arose on Mars.

Characterize the climate of Mars.

Characterize the geology of Mars.

Prepare for human exploration.

What is NASA's Perseverance rover?

It is a robotic explorer to land on Mars as part of NASA's ongoing Mars 2020 Mission.

Main Job: Seek signs of ancient life and collect samples of rock and regolith (broken rock and soil) for possible return to Earth.

The rover will collect samples of rock and soil, encase them in tubes, and leave them on the planet's surface to be returned to Earth at a future date.

Launch: It was launched on July 30, 2020from Cape Canaveral, Florida.

Landing: Successfully landed on the surface of Mar's Jezero Crater on Feb. 18, 2021.

Features:

- It is about 3 metres long, 2.7 metres wide, and 2.2 metres tall.
- It is about the size of a car, but weighs only about 1,025 kilograms with all instruments on board.
- Power source: Multi-Mission Radioisotope Thermoelectric Generator (MMRTG). Converts heat from the radioactive decay of plutonium into electricity.

SAPPHIRE

Context:

In Jammu and Kashmir, Lieutenant Governor said that within the next year, the Sapphire mines will be auctioned in a scientific way to give a boost to the local economy.

About Sapphire:

The name SAPPHIRE is derived from the Latin word 'Saphirus' and the Greek word 'Sapherios' both the words mean blue.

The scientific name of sapphire is called corundum. It is made up of aluminium oxide (Al203) mineral.

Corundum comes in all types of colours like red, pink, yellow, orange and violet.

Distribution:

Sapphire is found all over the world. Sri Lanka is still a top source for natural sapphire.

In India the reserves/resources of corundum are found in association with kyanite and sillimanite in Assam, Meghalaya and Maharashtra.

It occurs in syenites and ultrabasic rocks in Telangana.

The total reserves/resources of sapphire was estimated at 450 kg, all of which is placed under 'Remaining Resources' category and is located in Jammu & Kashmir.

Uses:

Sapphire has emerged as a versatile material useful to a range of industries in many varied applications including LEDs, optical and Radio Frequency Integrated Circuits (RFICS).

Why is Kashmir sapphire famous?

Kashmir sapphires are valued as significantly as they are because they contain only the best specimens.

MELANIN

Context:

An Indian-origin researcher, along with his team recently identified 135 new melanin genes associated with pigmentation.

About Melanin:

Melanin is a substance in your body that produces hair, eye and skin pigmentation. It is present in human and animal skin to varying degrees, and is responsible for your unique eye, hair and skin color.

It also absorbs harmful UV (ultraviolet) rays and protects your cells from sun damage. Melanin is produced within special structures called melanosomes. Melanosomes are found inside melanin-producing pigment cells called melanocytes.

Although all humans have the same number

of melanocytes, the amount of melanin they produce differs and gives rise to the variation in human skin colour.

People with more melanin generally have darker skin, eyes and hair compared to those with little melanin.

Types of melanin: There are three different types of melanin, including:

Eumelanin:

Eumelanin is responsible for dark colors in skin, eyes and hair. There are two types of eumelanin: black and brown.

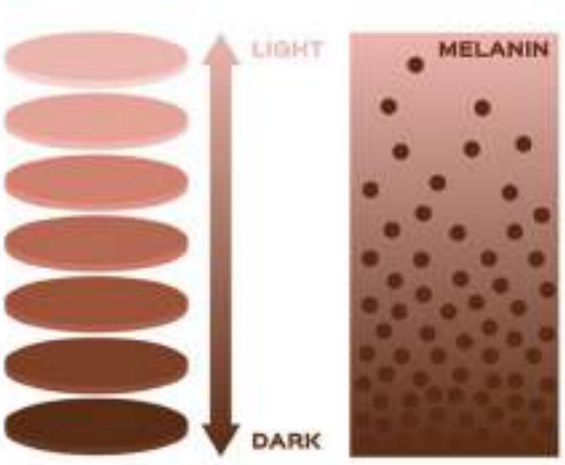
People with brown or black hair have varying amounts of brown and black eumelanin.

It provides protection against UV radiation by absorbing and dispersing it.

Pheomelanin:

It is responsible for lighter colors, such as red and yellow.

It is less effective at protecting against UV radiation compared to eumelanin.



Neuromelanin:

While eumelanin and pheomelanin control the colors of things you see (such as skin, hair and eyes), neuromelanin is responsible for the color of your neurons.

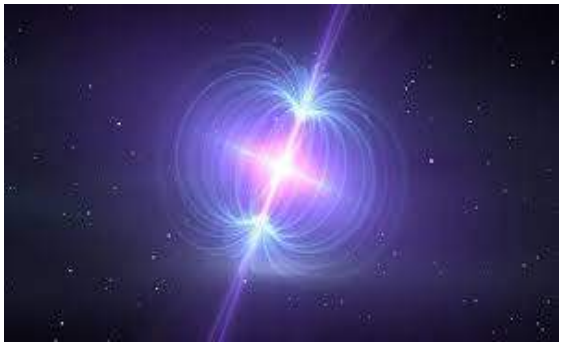
These specimens are noted to have a superior cornflower blue tint with a sleepy quality to them.

MAGNETAR

Context:

According to a new study, observations and stellar evolution models of a hot, helium-rich Wolf-Rayet star indicate that it will produce a magnetar when it explodes as a supernova.

About Magnetar:



A magnetar is an exotic type of neutron star, its defining feature that it has an ultra-powerful magnetic field.

The field is about 1,000 times stronger than a normal neutron star and about a trillion times stronger than the Earth's.

Apart from ultra-powerful magnetic fields, magnetars also release vast amounts of energy in the form of flares, X-rays, and gamma-ray bursts.

They are therefore associated with extreme events in the universe, making them perhaps the most bizarre objects in the cosmos next to black holes.

The magnetic field of a magnetar may be caused by a neutron star's interior – thought to be made up of neutrons, quarks and exotic states of matter such as Bose-Einstein Condensates – becoming a superconducting fluid.

Thus, when the star rotates, it would behave like a huge dynamo, generating an immense magnetic field.

What is a Supernova?

A supernova is the name given to the cataclysmic explosion of a massive star.

They are the largest explosion that takes place in space.

A star can go supernova in one of two ways:

Type I supernova: Star accumulates matter from a nearby neighbour until a runaway nuclear reaction ignites.

Type II supernova: Star runs out of nuclear fuel and collapses under its own gravity.

It can emit more energy in a few seconds than our sun will radiate in its lifetime of billions of years.

They're also the primary source of heavy elements in the universe.

On average, a supernova will occur once every 50 years in a galaxy the size of the Milky Way.

What are Wolf-Rayet stars?

These are massive stars that are near the end of their stellar evolution.

They are typically more than 25 times the mass the Sun and lose this mass at a very high rate.

They are a rare sight and are among the most luminous, most massive, and most briefly-detectable stars known to scientists.

INDIA'S FIRST 3D-PRINTED POST OFFICE

Why in news?

India's first 3D-printed post office was virtually inaugurated by Union Minister Ashwini Vaishnaw in Bengaluru's Cambridge Layout.

Its construction was completed in just 43 days - two days ahead of the deadline.

Multinational company Larsen & Toubro Limited built the post office with technological support from IIT Madras.

Background

Invented in the 1980s, 3D printing burst into the mainstream around the 2010s, when many thought it would take over the world.

The technology, however, at the time was expensive, slow and prone to making errors.

In recent years, some of these flaws have been done away with, making 3D printing more prevalent than ever before.

About

3D printing, also known as additive manufacturing, is a process of creating three-dimensional objects from digital models by adding material layer by layer.

It is an additive process, in which layers of a material like plastic, composites or bio-materials are built up to construct objects that range in shape, size, rigidity and colour.

This process allows for more efficient and customized production compared to traditional subtractive manufacturing methods.

What are some of the notable examples of 3D printing?

3D printing is being used in a host of different industries like healthcare, automobile and aerospace.

In May this year, aerospace manufacturing company Relativity Space launched a test rocket made entirely from 3D-printed parts, measuring 100 feet tall and 7.5 feet wide.

Shortly after it's take off, however, it suffered a failure.

At the peak of the Covid-19 pandemic in 2020, the healthcare industry used 3D printers to make much-needed medical equipment, like swabs, face shields, and masks, as well as the parts to fix their ventilator.

METAGENOMIC SEQUENCING

Context

In a recent study, Scientists from the Nigerian Centre for Disease Control applied metagenomic sequencing for pathogen surveillance and detection in three cohorts of patients. The pandemic led to the development of rapid and unbiased genome sequencing techniques for pathogen surveillance.

The metagenomic approach, used to directly sequence patient samples without prior knowledge of the infectious agent, quickly identified SARS-CoV-2 as the cause of COVID-19.

This genomic approach, termed metagenomics, has revolutionized pathogen identification and surveillance. The widespread adoption of genome sequencing techniques birthed numerous technologies, including the CovidSeq assay, which facilitated national and international genome surveillance efforts.

Genome sequencing has also been employed to track avian influenza, a prime candidate for genomic surveillance due to its potential for rapid spread and impact on both animals and humans.

What is Metagenome sequencing?

Metagenome sequencing is a technique that directly analyzes genetic material from samples without prior knowledge of the organisms present. It's used to identify and study the entire genetic diversity of microbial communities, enabling the detection of known and unknown pathogens in a high-throughput manner.

'High-throughput' refers to sequencing techniques that can parse large quantities of DNA at the same time, including a whole genome at once.

For instance, a single gram of soil consists of 4000 to 5000 different species of microbes, while human intestines consist of 500 different types of bacteria.

It enables us to understand the diversity, abundance, and interaction of microbes in any system.

It is different from conventional sequencing methods, which requires culturing or isolating individual species before sequencing their genomes.

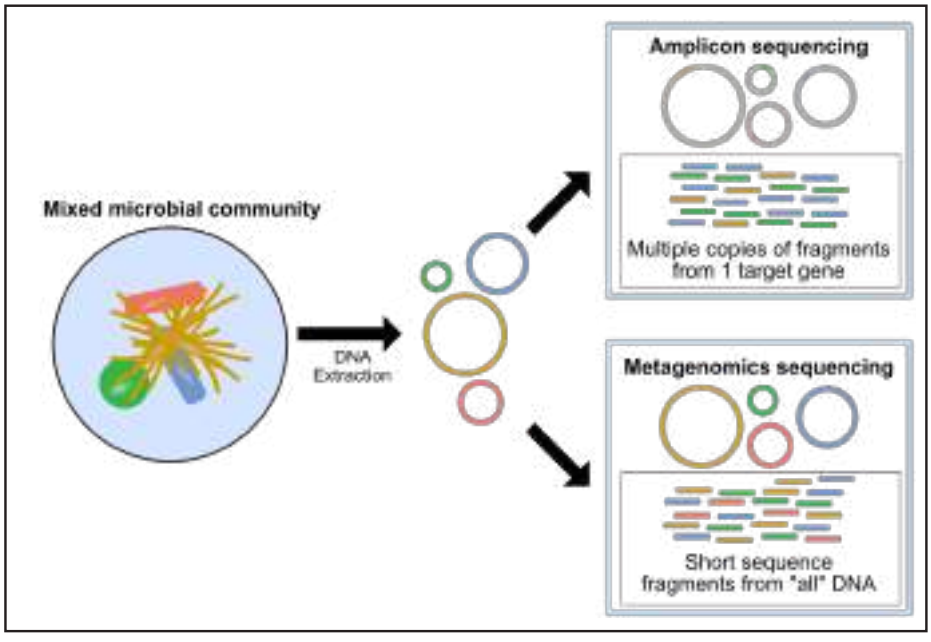
Applications of Metagenomics

Longitudinal metagenome studies can reveal how microbial communities change in response to environmental perturbations or human interventions.

Metagenomics allows researchers to study the diversity of microorganisms in different ecosystems, such as oceans, soil, freshwater, and extreme environments like hot springs.

Metagenomics has revolutionized our understanding of the human gut microbiome and its impact on digestion, metabolism, and overall health.

It can identify microorganisms with the ability



to degrade pollutants and toxic compounds, which can be harnessed for bioremediation purposes.

It can uncover novel genes and pathways responsible for the production of bioactive compounds, potentially leading to the discovery of new drugs and therapeutic agents.

Understanding the microbial communities in agricultural soils can help optimize nutrient cycling and enhance crop productivity.

INDIA'S 'MAYA' - THE ALTERNATIVE TO MICROSOFT OS

Context

In the face of increasing cyber and malware attacks on defence as well as critical infrastructure across the country, the Defence Ministry has decided to replace the Microsoft Operating System (OS) in all computers connected to the Internet with a new OS, Maya, based on open-source Ubuntu developed locally.

What Maya offers?

Maya OS offers a number of features such as cloud storage integration, full disk encryption, digital signature, biometric authentication, and a feature named **"Chakravyuh".**

Chakaravyuh serves as a robust endpoint solution for anti-malware and antivirus protection. It acts as a safeguarding barrier that shields users from online threats by blocking cybercriminals' attempts of breach.

Why India replaced Microsoft OS with Maya?

India's critical infrastructure has seen numerous **cyberattacks and security breache**s in recent years.

Some of the most notable incidents include the cyberattack on Kudankulum Nuclear Power Plant (KKNPP) in 2019, the Mumbai Power Grid outage in 2020, the ransomware attacks on Oil India Limited and Spice Jet servers in 2022, and the Goa Flood Monitoring System hack.

Hence, using an indigenous operating system could not only be a promising step towards securing India's vital computer systems from malicious actors, but also reduce the country's reliance on foreign software and enhance its cyber resilience.

This will help in **IT modernisation efforts** that are underway — like digitizing government services and making them interoperable.

BHARAT NEW CAR ASSESSMENT PROGRAMME (NCAP)

The Ministry of Road Transport and Highways introduced the Bharat New Car Assessment Programme (NCAP), a voluntary star-based system, effective October 1, 2023, to rate car safety through crash tests.

About Bharat NCAP

- Under this program, car manufacturers can voluntarily nominate vehicles to undergo crash testing based on protocols outlined in the forthcoming Automotive Industry Standard 197.
- The program applies to passenger vehicles with up to eight seats (including the driver's seat) and a gross vehicle weight not exceeding 3,500 kg. Only the base model of each variant will be tested.
- Cars will be assigned a safety rating of one to five stars based on three parameters: adult occupant protection, child occupant protection, and the presence of safety

assist technologies in the vehicle.

- While the program is voluntary, certain scenarios may require mandatory testing, such as for popular variants (with at least 30,000 units sold) or if recommended by the Ministry of Road Transport and Highways based on market feedback or safety concerns.
- The main goal of Bharat NCAP is to enable consumers to make informed decisions when purchasing cars, thereby increasing the demand for safer vehicles.

TETHERED DRONES

The Army has signed contracts for the procurement of 130 tethered drones and 19 tank-driving simulators under Emergency Procurement (EP) and they will be delivered in 12 months. The armed forces are currently executing the fourth tranche of EPs sanctioned by the Defence Ministry.

About Tethered Drones

A tethered drone is an unmanned aerial vehicle tethered to the ground.

It consists of a base station on the ground and the drone, which is connected to the station through the tether (cable).

The drone can be operated remotely to perform specific tasks.

Advantages:

Tethered UAVs are perfect for data capture and telemetry due to the reliability of tethered connections.

Tethered drones dramatically reduce technical and human error crashes in flight.

Tethered drones provide a secure line of communication between the ground station and the aircraft.

It also does not require GPS navigation.

Many tethered drones have longer flight times compared to free-flying, battery-operated drones.

Due to the restricted movement of a tethered drone, the operator does not need piloting skills and can mainly focus on their tasks.

'CLEAN-ROOM FACILITY' OF ISRO

ISRO has one of the most sophisticated and largest `clean room' facilities in the country for the assembly, integration and testing of communication, navigation and earth observation satellites.

The clean-room will be housed in a 21-metre-high building with enough space for the simultaneous assembly and integration of as many as 10 communication satellites.

Significance

Dust is an enemy of electronic equipment, especially of delicate and precise parts used in space technology.

While developing sensitive electronic instrumentation, tiny specks of dust can be a major source of contamination.

Dust can degrade electronic instruments when exposed to humidity. A clean room maintains a constant temperature and humidity, eliminates dust, and protects the satellite during its development, construction and testing.

INDEPENDENT VERIFICATION IS CRUCIAL ON CLAIMS ABOUT MATERIAL LK-99

Recently, South Korean scientists revealed their discovery that the substance they termed LK-99 is a superconductor at room temperature and atmospheric pressure in two preprint paper uploaded to the arXiv repository

What is LK99?

LK99 is a material developed by South Korean scientists.

It is a copper-doped lead apatite, a type of phosphate mineral.

The scientists claim that LK99 shows superconducting properties at room temperature and under normal pressure conditions.

However, the claim is yet to be peer-reviewed and independently validated by other researchers.

What is Apatites?

Apatites are minerals with a phosphate scaffold in a tetrahedral or pyramidal motif (one phosphorus atom is surrounded by four oxygen atoms).

The scientists started with lead apatite and substituted some of the lead atoms with copper, resulting in copper-substituted lead apatite, which they named LK-99.

What is room temperature superconductivity?

Room temperature superconductivity occurs at typical room temperature (20-25 degrees Celsius).

It allows materials to conduct electricity with

zero resistance.

No extreme cooling is required for this phenomenon.

The discovery of room temperature superconductivity has the potential to revolutionize various industries and technologies.

How LK99 is different from earlier superconductors?

LK99 claims to be a room-temperature superconductor, unlike earlier discoveries that required extremely low temperatures.

It operates under normal pressure conditions, setting it apart from previous superconductors that needed high-pressure environments.

What is the significance of discovering a room-temperature superconductor?

A large amount of electric current is lost during transmission from power plants to consumption points. A room-temperature superconductor could drastically reduce these losses.

Such a material would ***benefit heavy industrial processes***. For instance, it could enhance the design and efficiency of nuclear reactors.

Particle colliders, used in cutting-edge physics research, would see improvements in their design and operation.

Medical Devices like MRI machines could become more efficient, potentially leading to clearer images and faster diagnostics.

Current superconductors need to be cooled to very low temperatures, which can be costly and challenging. For example, some superconductors require cooling with liquid helium, which is harder than using liquid nitrogen. Room-temperature superconductors eliminate this need.

There was a significant jump in superconducting capabilities in the late 1980s with the discovery of copper-oxide superconductors, showing the transformative nature of such breakthroughs.

The discovery carries both material benefits and significant scientific honor, ***making it a sought-after achievement in the physics community.***

What are the limitations for discovering a room-temperature superconductor?

Verifying superconductivity is complex. It requires sophisticated equipment and knowledge to ensure the material truly exhibits zero resistance.

Some materials, like LaH10, show superconductivity near room temperature, but only under extreme pressures, making them impractical for most applications.

The allure of prestige and potential benefits can cause researchers to hasten publications before thorough verification, risking inaccuracies.

Past claims of room-temperature superconductors often faced retractions after independent scrutiny. For instance, the German physicist Jan Hendrik Schön's claims were later retracted, casting doubt on new claims.

Creating the exact conditions for superconductivity, like with the South Korean LK-99, can be intricate and hard to replicate.

Why there is skepticism about LK99?

It claims to be a room-temperature superconductor, which has been an elusive goal in the scientific community.

Previous claims of room-temperature superconductivity have faced controversies and were not validated upon further scrutiny.

The claim of LK99 is yet to undergo peer review and independent verification by other researchers.

Some experts raise concerns about potential technical errors or incomplete data in the published work.

What should be done?

Independent Verification: Any new claim, like the South Korean group's discovery of LK-99, needs thorough independent testing to confirm its properties.

Avoid Rushed Publications: Given past

retractions, like that of Ranga P. Dias in 2020, researchers should avoid premature publications before comprehensive data verification.

Maintain Skepticism: Both the scientific community and the public should approach new claims cautiously, awaiting multiple confirmations before acceptance.

Increase Transparency: Open access to research, as seen with the South Korean group's preprint papers, fosters trust and facilitates wider scrutiny.

Collaborative Efforts: Engage multiple labs and experts for a combined effort, ensuring diverse perspectives and minimizing biases or errors.

AKIRA RANSOM WARE: WHY HAS THE GOVERNMENT ISSUED A WARNING AGAINST IT?

The Computer Emergency Response Team of India issued an alert for the ransom ware dubbed "Akira." The ransom ware, found to target both Windows and Linux devices, steals and encrypts data, forcing victims to pay double ransom for decryption and recovery.

What is Akira?

Akira is a type of ransom ware. It gets its name due to its ability to modify filenames of all encrypted files by appending them with the "akira" extension.

How does it work?

- The ransom ware is designed to close ***processes or shut down Windows services*** that may keep it from encrypting files on the affected system.
- ***It uses VPN services,*** especially when users have not enabled two-factor authentication, to trick users into downloading malicious files.
- VSS services facilitate communication between different components without the need to take them offline; thereby ensuring data is backed up while it is also available for other functions.
- Once the ransom ware deletes the VSS files it proceeds to encrypt files with the pre-defined the ".akira" extension.

How does Akira infect devices?

- Ransom ware typically spreads through spear phishing emails that contain malicious attachments in the form of archived content (zip/rar) files.
- Other methods used to infect devices include drive-by-download, a cyber-attack that unintentionally downloads malicious code onto a device and specially crafted web links in emails, clicking on which downloads malicious code.

What does Akira do after infecting devices?

Once it infects the device, Akira ransom ware deletes Windows Shadow Volume copies. These files are instrumental in ensuring that organizations can back up data used in their applications for day-to-day functioning.

It then steals the sensitive data and leaves a note (akira_readme.txt) with attack details and a link to the negotiation site.

The attackers then demand a ransom, threatening to publish the data on their dark web blog if the demands are not met.

Protecting against the ransom ware:

CERT-In has advised users to follow basic internet hygiene and protection protocols to ensure their security against ransom ware.

These include maintaining up to date offline backups of critical data, to prevent data loss in the event of an attack.

Additionally, users are advised to ensure all operating systems and networks are updated regularly, with virtual patching for legacy systems and networks.

Companies must also establish ***Domain-based Message Authentication, Reporting, and***

Conformance, Domain Keys Identified Mail (DKIM), and Sender policy for organizational email validation, which prevents spam by detecting email spoofing.

Strong password policies and multi-factor authentication (MFA) must be enforced.

The agency has also advised periodic security audits of critical networks/systems, especially database servers.

Conclusion:

Continuous efforts are needed to Secure (National Cyberspace), Strengthen (Structures, People, Processes, and Capabilities), and Synergize (Resources including Cooperation and Collaboration) in the field of cyberspace in India

NEUTRON STARS

Recently, scientists from the Inter-University Center for Astronomy and Astrophysics (IUCAA) and Aryabhatta Research Institute of Observational Sciences (ARIES) ***have investigated the inflow of matter onto neutron stars.***

What are Neutron stars?

These are the remains of the cores of massive stars that have reached the end of their lives.

Key points:

Neutron stars can harbour extreme magnetic fields, and this work, for the first time, found a methodology to obtain unique solutions for accretion onto a neutron star.

It could help in understanding of underlying physical processes around Neutron stars (NS).

Because of the extreme compactness (mass-to-radius ratio) of NS, they have large surface gravitational potentials, which make them an efficient accretor of surrounding matter.

It may be noted ***accretion is the process of inflow of matter onto a compact star.***

The accretion dynamics, however, are strongly dictated by the magnetic fields.

The strong magnetic field of the star restricts the infalling matter from flowing along these field lines until they reach the poles of the star.

It is near the poles where the matter emits most of its kinetic energy in the form of radiation. This enables the flow to slow down, finally settling down onto the NS surface.

Accretion flow around NS is composed of ionised plasma, which is a soup of protons and electrons.

Because electrons are almost two thousand times lighter than the protons, they are prone to different radiative emission processes, and hence, these species are expected to exhibit a different temperature distribution than that of the protons.

Working in this two-temperature regime is not trivial since they suffer from a very basic problem of degeneracy, which arises because of the presence of more variables than the number of equations of motions available.

Degeneracy implies that the equations of motions, when solved, produces multiple accretion solutions and hence different observable spectrum even for a given set of constants of motion.

SODIUM ION BATTERY

Recently, AR4 Tech has partnered Sodion Energy of Singapore to make sodium-ion battery packs for domestic and export markets.

About Sodium-Ion Battery:

These types of batteries generate electricity through a chemical reaction.

These are made up of an anode, cathode, separator and electrolyte.

In a sodium-ion battery, ***lithium ions are replaced with sodium ions in the battery's cathode, and lithium salts are swapped for sodium salts in the electrolyte.***

Operating principle:

When the battery is being charged, Na atoms in the cathode release electrons to the external circuit and become ions, which migrate through the electrolyte toward the anode, where they combine with electrons from the external circuit while reacting with the layered anode material.

This process is reversed during discharge.

Benefits of sodium batteries

Readily available: One of the most interesting aspects of this technology is the wide availability in nature of its constituent raw materials.

Safety: Sodium batteries also ensure high standards of safety because cells based on this chemical element are neither flammable nor susceptible to explosions or short circuits

Low-cost: The raw materials are readily available in nature and can be extracted at low costs and with low energy use, making sodium a material with a low impact on the environment.

Low-temperature resistance..

ACOUSTIC SIDE CHANNEL ATTACKS

Context

A research paper titled "A Practical Deep Learning-Based Acoustic Side Channel Attack on Keyboards" revealed that Artificial Intelligence (AI) can be used to decode passwords by analysing the sound produced by keystrokes. The study highlighted the accuracy of Acoustic Side Channel Attacks (ASCA) when state-of-the-art deep learning models were used to classify laptop keystrokes and their mitigation. While ASCA is not new, the development of AI and deep learning has increased the risks posed by side channel attacks.

What are Acoustic Side Channel Attacks (ASCA)?

To understand Acoustic Side Channel Attacks, one should know Side Channel Attacks (SCAs). SCAs are a method of hacking a cryptographic algorithm based on the analysis of auxiliary systems used in the encryption method.

These can be performed using a collection of signals emitted by devices, including electromagnetic waves, power consumption, mobile sensors as well as sound from keyboards and printers to target devices. Once collected, these signals are used to interpret signals that can be then used to compromise the security of a device.

In an ASCA, the sound of clicks generated by a keyboard is used to analyse keystrokes and interpret what is being typed to leak sensitive information. These attacks are particularly dangerous as the acoustic sounds from a keyboard are not only readily available but also because their misuse is underestimated by users.

While most users hide their screens when typing sensitive information, no precautionary steps are taken to hide the sound of the keystrokes. And though over time, the sound of keyboard clicks has become less profound with devices making use of non-mechanical keyboards, the technology with which the acoustics can be accessed and processed has also improved drastically.

Additionally, the use of laptops has increased the scope of ASCAs as laptop models have the same keyboard making it easier for AI-enabled deep learning models to pick up and interpret the acoustics.

How accurate are Acoustic Side Channel Attacks?

The study found that when trained on keystrokes by a nearby phone, the classifier achieved an accuracy of 95%, the highest accuracy seen without the use of a language model.

ASCA attacks are not new and have been around since 1950 when acoustic emanations of encryption devices were used to crack their security. Additionally, the United States National Security Agency (NSA) declassified documents listed acoustic emanations as a source of compromise in 1982. Over the past decades, researchers have published papers talking about the threats from ASCA attacks with the advent of modern

technology that brought more microphones in close proximity to keyboards, making it easier to collect and interpret acoustic data.

How can users protect against ASCAs?

While there is no explicit means of defence against ASCAs, simple changes to typing could reduce the chances of attacks. Using touch-based typing can also reduce the chances of successful keystroke recognition from 64% to 40%, making it more difficult for threat actors to leak sensitive information.

Additionally, changes in typing style and creating stronger passwords that use a combination of upper- and lower-case alphabets can make it more difficult for criminals to launch successful ASCA attacks; the study found that even deep learning models had a difficult time recognising the use of shift key to change the case of alphabets when typing. Users should also avoid the use of easily recognisable phrases which can make it easier for AI models to predict the text.

SOMATIC GENETIC VARIANTS

Context

Recent researches in genome sequencing unveil the impact of somatic genetic variants on human health, from cancer development to immune disorders, driving innovation in disease detection and treatment strategies.

As the cells divide, the DNA is copied with extremely high accuracy thanks to proteins that proofread and correct errors in the DNA. But despite this mechanism, various studies have estimated that there is still an error rate of 0.64-0.78 mutations per billion base pairs per division. But this rate is also minuscule given the large size of the human genome.

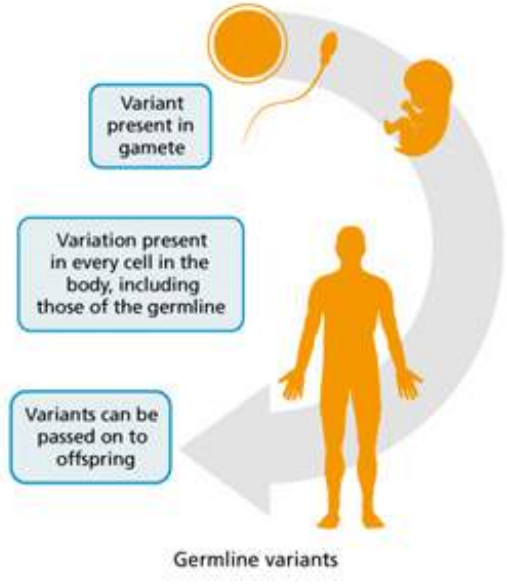
Somatic Genetic Variants

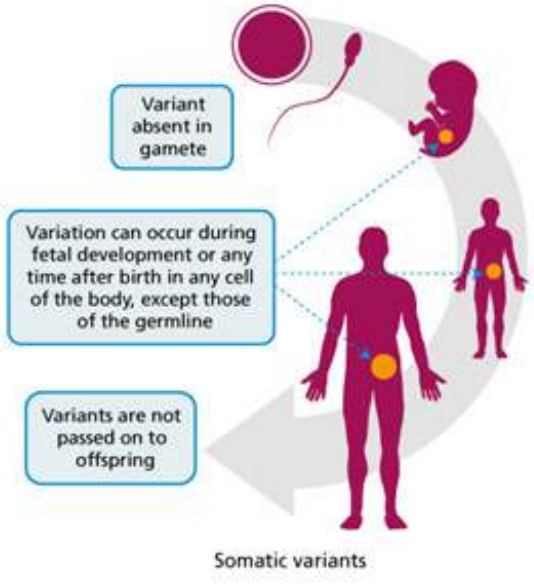
Somatic genetic variants also known as somatic mutations refer to alterations in the DNA sequence that occur specifically within the cells of an individual's body (somatic cells), excluding the germline cells (sperm and egg cells).

Somatic genetic mutations occur after birth during development and are not inherited from parents.

Somatic Mutation Progression

The human genome consists of 23 pairs of chromosomes, inherited from each parent, forming the blueprint of our genetic identity. Following the fertilization of an egg cell by a sperm cell, the





resultant single cell amalgamates genetic material from both parents.

Through subsequent rounds of division, this initial cell proliferates extensively, ultimately generating the countless trillions of cells constituting the human body. During the process of DNA replication, the incorporation of errors is notably minimized by error-correcting proteins. Nevertheless, a minute error rate persists and occurs at different times, contributing to the emergence of somatic genetic mutations.

As cells continue to renew and replace old ones throughout life, errors keep occurring, leading to the gradual accumulation of somatic mutations over time.

This is why differences in genetic makeup are observed between different tissues in the body as people get older.

Somatic genetic variants in Human health advancements

Somatic variants can serve as diagnostic and prognostic markers for diseases.

Detecting specific mutations can aid in early disease detection and predicting disease progression.

Knowledge of an individual's somatic mutations allows personalized treatment plans.

Tailoring therapies to a patient's unique genetic makeup can enhance treatment outcomes.

Studying somatic mutations associated with aging can shed light on the aging process and age-related diseases, potentially leading to interventions for healthier aging.

In some instances, somatic mutation brings a deleterious change to a normal one, a phenomenon known as revertant mosaicism.

E.g., Around 10% of cases of Wiskott-Aldrich syndrome, a rare genetic immunodeficiency, have been found to have revertant mosaicism, as a result alleviating the severity of the disease in many individuals.

THE HYBRID EV IMPERATIVE

Context

Recently, the importance of hybrid electric vehicles (HEVs) has been increased in the world's transition to a net-zero future, especially in economically developing countries. In recent months, automakers Maruti Suzuki, Toyota and Honda have launched hybrid electric vehicles in India, offering car buyers more choices in the nascent electric vehicle market. This emphasis how ***hybrid EVs are a crucial element in the global effort to achieve a net-zero future by providing a bridge between conventional internal combustion engine vehicles and fully electric vehicles***

About hybrid electric vehicle (HEV):

A hybrid electric vehicle (HEV) uses an ICE (a petrol/ diesel engine) and one or more electric motors to run. It is powered by the electric motor alone, which uses energy stored in batteries, by the ICE, or both

The efficiency of HEVs will be determined by their ability to recover as much energy as possible while braking, with a higher degree of energy recovery lowering fuel consumption. A regenerative braking system (RBS) while enhancing fuel economy also helps in energy optimisation resulting in minimum energy wastage.

The HEVs can be categorised into micro, mild and full hybrid vehicles, based on the degree of hybridisation.

What is net-zero for a vehicle?

Net-zero for a vehicle includes emissions at both the tailpipe of the vehicle and at the power plant.

Making vehicles net-zero requires cutting emissions from both new and existing vehicles.

What are the different types of EVs?

Any vehicle propelled by an electric drivetrain, taking electric power from a portable, electrical energy source, is called an Electric vehicle (EV).

Hybrid EV - internal combustion engine (ICE) is used to produce electricity with an electrical generator. A small battery, typically 1-5kWh, is used in a hybrid EV as an energy buffer to store the electricity. The battery can't be charged from the grid.

A full EV or a battery EV or a plug-in EV – it has no ICE and hence no tailpipe emissions. The battery typically is much larger at 20-120 kWh. And it can only be charged from the grid.

A plug-in hybrid EV is still a hybrid EV with a much larger battery, typically 5-15 kWh. This larger battery can also be charged from the grid. This means a plug-in hybrid operates like a fully electric vehicle as long as there is energy in the battery.

A fuel-cell EV uses a fuel cell to produce electricity for the drivetrain together with a small battery buffer to manage variations.

What is the fuel economy of hybrid and fully electric EVs?

The use of an ICE in combination with a generator and battery in a hybrid EV results in the fuel economy of these vehicles being 1.5-2x times higher than in conventional ICE vehicles for city driving and 1-1.5x times higher for highway driving.

A plug-in hybrid EV combines the best of both hybrid and full EVs. Using a small battery (5-15kWh) that can be charged from the grid, it can cover 80-90% of all short, day-to-day commutes in a fully electric mode with 3-4x higher fuel economy than conventional vehicles. A driver on intercity trips can switch to the hybrid mode.

Net emissions of hybrid EVs:

Importance of Net Emissions:

Net emissions take into account both tailpipe emissions and emissions from fuel production (electricity or fossil fuels) throughout the vehicle's life cycle.

It includes emissions from vehicle and battery production, maintenance, and end-of-life recycling, providing a more comprehensive assessment of the vehicle's environmental footprint.

Impact of Power Production on EV Emissions:

The grids of different countries vary in their degree of de-carbonization. In the case of fully electric vehicles (FEVs), the emissions from power production significantly influence the vehicle's overall well-to-wheel and life-cycle emissions.

Lower emissions from power production (e.g., from renewable energy sources) result in lower overall emissions for FEVs, further supporting the importance of transitioning to cleaner power generation methods.

What are the challenges to transitioning to electric mobility?

A successful transition to full EVs requires fast-charging infrastructure along highways. The lack of a fast-charging infrastructure will discourage people from buying full EVs. Fast-charging means power levels of 50-350 kW for cars and up to 1,000 kW for heavy-duty vehicles. The high cost and wide variation are due to the high-capacity power connections required, the cost of making and installing a new transformer and cables; service-level agreements; DC charger plug options and quantities; customization costs; labour costs; and permits.

Many parts of the world, especially economically developing nations, don't yet have access to a grid or the grid isn't 100% reliable. The relatively high charging power for slow-charging (<22kW) and fast-charging (<350kW) make the problem more prominent vis-à-vis generation and transmission capacities. This in turn could retard the transition to EVs.

Mass-market price points of cars in the economically developing world are much lower, ~$12,000 – whereas EVs with a range of 300-400 km will reach parity with conventional vehicles in the richest countries at a price of $25,000-35,000 in the short term. This is due to the high battery costs, between $130-200/kWh at the pack level. EVs with higher range will need larger battery packs and thus be more expensive.

How can hybrid or plug-in hybrid EVs help us de-carbonize?

Lower Emissions:

Hybrid and plug-in hybrid EVs have lower emissions compared to conventional internal combustion engine (ICE) vehicles.

Their ability to operate in electric mode during short trips which reduces the overall greenhouse gas emissions and air pollutants.

Fuel Economy:

Hybrid and plug-in hybrid EVs offer improved fuel economy, especially in stop-and-go city driving conditions.

The use of electric power for propulsion and regenerative braking helps optimize energy use and reduce fuel consumption.

Reduced Oil Dependence:

Hybrid and plug-in hybrid EVs rely on electricity and have the option to operate without using gasoline for shorter distances.

This reduces the overall consumption of fossil fuels and helps decrease dependence on oil imports.

Transitioning Step:

Hybrid and plug-in hybrid EVs serve as an important transitional step towards a future of full electric vehicles powered by renewable energy sources.

They provide a more immediate solution to reduce emissions while the infrastructure and technology for full EVs continue to develop.

Flexibility:

Plug-in hybrid EVs offer the flexibility of operating in electric mode for short distances and switching to hybrid mode for longer trips, addressing the range limitations associated with full EVs.

This makes them suitable for a wider range of use cases, such as in areas where charging infrastructure is still developing

or for certain commercial applications like taxis.

Regenerative Braking and Engine Start-Stop:

Hybrid EVs' regenerative braking system allows them to capture and reuse energy that would otherwise be lost as heat during braking.

This improves fuel economy, especially in urban driving with frequent stop-and-go conditions.

Additionally, the engine start-stop mechanism saves fuel by automatically shutting off the engine at traffic junctions and in heavy traffic.

Price and Market Penetration:

Hybrid vehicles are often priced only slightly higher than their conventional counterparts, making them more accessible to consumers.

This affordability factor can encourage more people to adopt greener transportation options and contribute to de-carbonization efforts.

Conclusion

Overcoming these challenges requires concerted efforts from various stakeholders, including governments, private companies, and international organizations. Addressing the fast-charging infrastructure, expanding access to reliable grids, and promoting research and development to reduce battery costs are crucial steps towards enabling a successful transition to electric mobility worldwide. Additionally, supportive policies, incentives, and public awareness campaigns can further facilitate the adoption of EVs and accelerate the shift towards a more sustainable and eco-friendly transportation system.

SECURITY

What's Inside?

AUSINDEX-23

Why in the News?

Recently, the fifth edition of the biennial AUSINDEX maritime exercise between the Indian Navy and the Royal Australian Navy (RAN) was conducted from 22-25 August 23 in Sydney.

About

- It is a major **biennial maritime exercise**, being conducted since 2015.
- The exercise will provide an opportunity for both Navies to further bolster inter-operability, gain from best practices and develop a common understanding of procedures for Maritime Security Operations.
- **INS Sahyadri** and **INS Kolkata** participated in the exercise along with HMAS Choules and HMAS Brisbane from RAN.
- Besides ships and their integral helicopters, the exercise also witnessed the participation of fighter aircraft and maritime patrol aircraft.

Other Exercises conducted between Australia and India

- **Ex AUSTRA HIND** (Bilateral Exercise with Army)
- **EX PITCH BLACK** (Australia's multilateral air combat training exercise)
- **Malabar Naval Exercise**
- **Quad** (Multilateral Naval Exercise)

NEERAKSHI

Context:

India recently launched 'Neerakshi'- Autonomous Underwater Vehicle for mine detection.

About Neerakshi:

It is an autonomous underwater vehicle (AUV) designed to detect mines.

Named "Neerakshi" meaning "Eyes in the Water" is first of its kind in the country and is expected to undergo user trials by the Indian Navy, Coast Guard, and Army before a commercial launch.

It is a collaboration of Kolkata-based warship maker Garden Reach Shipbuilders and Engineers (GRSE) Ltd and MSME entity Aerospace Engineering Private Ltd (AEPL).

The AUV, currently capable of mine detection, is part of GRSE's broader ambitions to create autonomous sea surface vehicles, sea-based drones, and explore green propulsion technologies.

Features:

It can be used for a variety of functions ranging from mine detection to mine disposal to underwater survey,

It is a 2.1-metre long cylindrical unmanned vehicle about a foot in diameter and weighing around 45 kg.

It has an endurance of nearly 4 hours, and is **capable of operating up to a depth of 300m.**

SANCHAR SAATHI PORTAL

Context:

In order to reduce cyber frauds performed through fraudulently acquired SIM cards, the Department of Telecommunications (DoT) will now require police verification for SIM dealers, the enforcement move follows the launch of the Sanchar Saathi portal.

About Sanchar Saathi portal:

- The portal aims to provide various reforms and services related to mobile connections and telecommunications.
- It has been developed by C-DoT under the Department of Tele-communications (DoT) to prevent frauds such as identity theft, forged KYC, banking frauds etc.
- The portal allows mobile phone users to:
- Check the connections registered on their names.
- Report fraudulent or unrequired connections.
- Block the mobile phones which are stolen/lost
- Check IMEI genuineness before buying a mobile phone.
- The three reforms are being introduced as part of the portal's framework:
- CEIR (Central Equipment Identity Register): It enables the tracking and blocking of lost or stolen phones anywhere in the country.
- Know your mobile connections: It allows users to check the number of mobile connections issued in their name by logging in using their mobile number.
- This feature helps identify any unauthorized or unwanted connections, which can be blocked immediately.
- ASTR (Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification): This AI-based technology facilitates mobile connection analysis and includes features such as IMEI-based phone theft information messaging to law enforcement agencies and the owner.
- It also enables blocking of any number associated with a particular IMEI and the tracking of stolen mobile devices.
- The portal and its reforms aim to enhance transparency, security, and accountability in the telecom sector.

NATIONAL AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM (NAFIS)

Context:

Union Home Minister recently congratulated the team of the NAFIS of NCRB for winning the Gold Award under the Excellence in Government Process Reengineering for Digital Transformation from the of Department of Administrative Reforms and Public Grievances.

About National Automated Fingerprint Identification System (NAFIS):

- The NAFIS is a pan-India searchable database of crime and criminal-related fingerprints.
- It is managed by the National Crime Records Bureau (NCRB) at the Central fingerprint bureau, based in New Delhi.
- The main objective of the web-based application is to collect fingerprint data of all the criminals from all the states and the Union Territories.
- It will enable law enforcement agencies to upload, trace and retrieve information from the database 24x7 in real-time.

The Working Process of NAFIS:

- NCRB enables law enforcement agencies to upload, trace, and retrieve data from the database.
- Within 24 hours, NAFIS provides a unique 10-digit National Fingerprint Number (NFN) to each criminal who is arrested for the crime.

- The unique ID will be used for a lifetime of an offender. Different crimes registered under different FIRs will be logged as incidents belonging to the same NFN.
- The first two digits of the ID will be the state code of the state where the criminal is registered, followed by a sequence number. The state partition will have IDs belonging to a state.
- Apart from this, a digital record will be added as storage to match the fingerprints in the future.

With NAFIS, it is possible to locate a person of interest in a matter of minutes and connect that individual's name to any active warrants, warnings, or information about related criminal conduct stored in other police information reference systems.\

NON-STATE ACTORS IN CYBERSPACE: MOTIVES, IMPLICATIONS, AND THE SHIFTING LANDSCAPE

In our interconnected world, cyberspace plays a critical role in various domains, including healthcare, commerce, finance, and security. It offers a global platform with minimal entry barriers and high anonymity, making it an ideal arena for nation-states and non-state actors to engage in acts of aggression, hostility, and warfare, often with little consequence.

Cyber Non-State Actors

These entities, ***devoid of territorial sovereignty, operate exclusively in cyberspace,*** encompassing individuals, groups, or organizations that work independently or in collaboration.

The Motives Behind Utilizing Non-State Actors

Protection and Plausible Deniability: States engage non-state actors primarily to shield themselves. Cyberspace inherently provides a high level of anonymity, complicating attribution. Non-state actors offer an additional layer of protection during cyberattacks, allowing states to claim plausible deniability and evade international law repercussions. For instance, North Korea employs Bureau 121, a hacking group, to carry out cyberattacks with a degree of separation from their consequences.

Augmenting Cyber Capabilities: States often lack the necessary resources and talent pool for advanced hacking. Training individuals for high-level cyber operations is time and resource-intensive. Contracting non-state actors enables states to bridge capacity gaps without incurring startup costs. Iran, for example, hires cyber mercenary groups like MuddyWater to target government and commercial websites globally.

Leveling the Playing Field: Non-state actors execute specialized, rapid attacks that redefine power dynamics between states. In traditional warfare, superiority in military, financial resources, or technology provides an advantage. However, cyberspace and non-state actors have narrowed this gap. Smaller countries like Georgia can hire cyber mercenaries, leveling the playing field against more powerful nations, as demonstrated during their 2008 conflict with Russia.

Types of Non-State Actors Utilized by States for Cyberattacks

State-Sponsored Groups: These actors maintain a direct link to the state apparatus, advancing political, military, and commercial objectives. Often state-funded, they operate beyond monetary motives and can be employed for espionage, propaganda, disruption, sabotage, and retaliation against adversaries. State-sponsored attacks, if detected, can lead to serious diplomatic confrontations.

Cyber Mercenaries: A novel breed of non-state actors, cyber mercenaries,

operate in cyberspace to fulfill specific missions for monetary rewards. They lack political or ideological affiliations with their clients and pose a unique danger due to their autonomy from state control.

Enhancing Cybersecurity Through Non-State Actors

Non-state actors are not solely used for aggression. States also engage them to strengthen cybersecurity capabilities and infrastructure. Protecting national interests in cyberspace is paramount, given the ease with which cyber weapons can be developed, the irrelevance of distance, and the physical and psychological removal from actions.

Balancing Non-State Actors and Cyberspace Management

The implications of non-state actors in cyberspace are profound. Their disruptive and destabilizing nature necessitates vigilant attention. They bolster states' capabilities, increasing the threat to their adversaries, particularly in the absence of a legal framework.

To curtail these activities, legislation is imperative. ***Some states have responded by enacting cybercrime legislation to combat malicious cyber activities, such as the European Union's Network and Information Security Directive.*** However, it is important to acknowledge that many countries themselves employ non-state actors due to the limited drawbacks and the deepening of geopolitical rivalries, suggesting that the use of non-state actors in cyberspace is poised to grow.

HISTORY

ART & CULTURE

What's Inside?

PM VISHWAKARMA SCHEME

Why in news?

Union Cabinet approves new Central Sector Scheme 'PM Vishwakarma' to support traditional artisans and craftspeople of rural and urban India

About

Under PM Vishwakarma scheme, **the artisans and craftspeople** will be provided recognition through **PM Vishwakarma certificate and ID card, Credit Support upto Rs.1 lakh (First Tranche) and Rs.2 lakh (Second Tranche)** with a concessional interest rate of 5%. The Scheme will further provide Skill Upgradation, Toolkit Incentive, Incentive for Digital Transactions and Marketing Support.

The scheme will provide support to artisans and craftspeople of rural and urban areas across India. Eighteen traditional trades will be covered in the first instance under PM Vishwakarma. These trades include (i) Carpenter (Suthar); (ii) Boat Maker; (iii) Armourer; (iv) Blacksmith (Lohar); (v) Hammer and Tool Kit Maker; (vi) Locksmith; (vii) Goldsmith (Sonar); (viii) Potter (Kumhaar); (ix) Sculptor (Moortikar, stone carver), Stone breaker; (x) Cobbler(Charmkar)/ Shoesmith/ Footwear artisan; (xi) Mason (Rajmistri); (xii) Basket/Mat/Broom Maker/Coir Weaver; (xiii) Doll & Toy Maker (Traditional); (xiv) Barber (Naai); (xv) Garland maker (Malakaar); (xvi) Washerman (Dhobi); (xvii) Tailor (Darzi); and (xviii) Fishing Net Maker.

The scheme also aims to strengthen and nurture the **"Guru-Shishya parampara"** (teacher student tradition) or the **family-based practice of traditional skills** by artisans and craftspeople working with their hands and tools.

The scheme also aims at improving the quality, as well as the reach of products and services of artisans and craftspeople and to ensure that the Vishwakarmas are integrated with the domestic and global value chains,"

An examination

Available data on the crafts landscape is outdated. The last census of crafts was carried out during the Seventh Plan period, which ended in 2012. According to that, there were more than 68.8 lakh craftspersons in the country, with women (56.13%) and socially and economically disadvantaged sections like SC, ST and OBC (which together make up more than 72%) accounting for a majority of the pool.

So from both a gender justice and social justice perspective, the scheme cannot be faulted for its intended target audience.

Finance, specifically lack of working capital and access to the formal financial system, is of course one of the biggest handicaps that India's traditional artisans labour under.

This is a good move and addresses a known need. However, that is only the first step. Lack of market access, lack of financial inclusion, and the absence of modern technology and tools to improve quality and productivity are equally big impediments to India's traditional craftspersons and artisans realizing the true value of their output.

To be a true game changer, apart from financial assistance, the scheme should be dovetailed with skill development programmes. Sector skills councils should work on training and skill standards and testing and certification of traditional apprentices, currently training under the age old 'ustaad' (master) system which prevails in . this sector. Senior 'ustaads' should be also trained in modern skills, tools and methods so that standardization of trade skills can be achieved. Their role as trainers should also be formally recognised and incentivised so they can train and skill more apprentices beyond their own immediate family/need.

GI TAG FOR RAJASTHAN'S CRAFTS AND GOAN BEBINCA

Why in News?

Seven products from across India, including four from Rajasthan, were given the Geographical Indication (GI) tag by the Geographical Indications Registry in Chennai. The GI tags were secured by **'Jalesar Dhatu Shilp' (a metal craft), 'Goa Mankurad Mango', 'Goan Bebinca', 'Udaipur Koftgari Metal Craft', 'Bikaner Kashidakari Craft', 'Jodhpur Bandhej Craft', and 'Bikaner Usta Kala Craft'.**

This variety of mango is also known as malcorada, cardozo mankurad, corado, and Goa mankur. The Portuguese named the fruit malcorada, which means 'poor coloured', and with time, it became mankurad aamo (mango) in Konkani.

The application for the Goan bebinca was filed by the All Goa Bakers and Confectioners Association. Bebinca, also known as the 'queen of Goan desserts', is a traditional Indo-Portuguese pudding.

At Jalesar in Uttar Pradesh's Etah district, once the capital of Magadha king Jarasandha, over 1,200 small units are engaged in making 'Jalesar Dhatu Shilp', including ghungrus (anklets), ghantis (bells) and other decorative metal craft and brassware. The Thatheras community, which resides in a mohalla (locality) named Hathuras, makes these products.

Rajathan's crafts

Among the four different crafts from Rajasthan given GI tags is 'Udaipur Koftgari Metal Craft'. According to the documents submitted to the GI Registry, weapons are exquisitely ornamented by a complicated process of etching designs, heating, and then cooling, intertwined with embedding gold and silver wire into the metal, pressing and flattening it to a smooth surface with moonstone, and finally polishing it.

The GI tag has also been secured by the 'Bikaner Kashidakari Craft' traditionally created on cotton, silk or velvet with a variety of fine stitches and mirror-work, mainly for objects associated with marriage, especially gift items. The mirrors are believed to repel the 'evil eye' with their reflective surfaces. The weaving of fabrics by hand used to be done by the Meghwal community in Bikaner and nearby districts.

The 'Jodhpur Bandhej Craft' is the Rajasthani art of tying and dyeing. Bandhej is one of the most famous textile art forms of Rajasthan. The fabrics used for Bandhej are muslin, silk and voile. Cotton thread is used for tying the fabric.

The 'Bikaner Usta Kala Craft' is also known as gold nakashi or gold manauti work due to the prominence of its long-lasting golden colour. Untreated raw camel hide is processed and moulded by the Dapgar community of leather craftspeople for the requirements of the Usta.

UNESCO HERITAGE DANGER LIST

Context:

Recently, experts from the United Nations Educational, Scientific and Cultural Organization (UNESCO) have stated in a new report that the Italian city of Venice should be added to a list of world heritage sites in danger.

About UNESCO heritage danger list:

The list highlights a number of UNESCO World Heritage Sites which are threatened due to factors like armed conflict and war, earthquakes and other natural disasters, pollution, poaching, uncontrolled urbanisation and unchecked tourist development.

The UNESCO also sets certain guidelines and criteria under the 1972 World Heritage Convention, which decide, whether or not, a property is faced with specific and proven

imminent danger or threat.

Key facts about UNESCO:

- UNESCO stands for United Nations Educational, Scientific and Cultural Organization.
- It is specialized agency of the United Nations (UN).
- The constitution, which entered into force in 1946, called for the promotion of international collaboration in education, science, and culture.
- The agency's permanent headquarters are in Paris, France.
- Parent Organisation - United Nations Economic and Social Council

Goal:

The primary goals of UNESCO are to contribute to peace and security by promoting collaboration among nations through education, science, and culture, and to promote sustainable development and intercultural dialogue.

UNESCO believes that these areas are crucial for building a more just, peaceful, and inclusive world.

MEGALITHIC SITE

Context:

A large number of megalithic hat stones were found from a single site during a recent archaeological salvage excavation conducted by the Kerala State Archaeology Department at Nagaparamba in Kuttippuram village, near Tirunavaya.

Key findings:

Hat stones, popularly called Thoppikkallu in Malayalam, are hemispherical laterite stones used as lid on burial urns during the megalithic period are fond here.

The findings may throw light on the life and culture of people who lived in those parts more than 2,000 years ago.

What are Megaliths?

These were constructed either as burial sites or commemorative(non-sepulchral) memorials

The former are sites with actual burial remains, such as dolmenoid cists (box-shaped stone burial chambers), cairn circles (stone circles with defined peripheries) and capstones (distinctive mushroom-shaped burial chambers found mainly in Kerala).

Non-sepulchral megaliths include memorial sites such as menhirs.

In India, archaeologists trace the majority of the megaliths to the Iron Age (1500 BC to 500 BC).

In India, these are concentrated in the states of Maharashtra (mainly in Vidarbha), Karnataka, Tamil Nadu, Kerala, Andhra Pradesh and Telangana.

Tirunavaya

It is the land of ancient Mamankam.

It is situated on the banks of Bharathapuzha river; it is a place of historical importance.

In olden days, Mamankam a grand assembly of rulers was held once in 12 years here.

BIDRIWARE

Indian Prime Minister recently gifted Bidri work pair of 'Surahi' from Telangana to South African President Cyril Ramaphosa.

About Bidriware:

It is a form of metal handicraft that has Persian influences and has been made for centuries by artisans from Karnataka's Bidar district.

It is renowned for its intricate, handcrafted designs.

Origin:

The origin of Bidriware as a craft is attributed mostly to the Bahamani Sultans who ruled the region during the 14th and 15th centuries.

It was first brought to India by the noted Sufi Khwaja Moinuddin Hasan Chisti in the form of utensils.

The art form developed in the kingdom was a mix of Turkish, Persian and Arabic influences, which were intermingled with the local styles, and thus a unique style of its own was born.

This native art form has obtained a Geographical Indications (GI) registry.

Bidar in Karnataka and Hyderabad in Telangana are the most vibrant centers of Bidriware.

How is Bidriware made?

Bidri Ware is manufactured from an alloy of copper and zinc (in the ratio 1:16) by casting.

The zinc content gives the alloy a deep black colour.

The craftsman uses small chisels to engrave the design over the freehand etching.

Fine wire or flattened strips of pure silver are then carefully hammered into these grooves.

A special variety of soil, which is available only in the unlit portions of the Bidar fort, is used for the final blackening process. It is mixed with ammonium chloride and water to produce a paste, which is then rubbed onto a heated Bidri surface. The paste selectively darkens the body while it has no effect on the silver inlay.

The product then undergoes a process called buffing to smoothen the surface.

SEETHAKALI

The Perinad Seethakali Sangham member group is all set to perform outside Kerala for the first time.

About Seethakali:

- It is a unique centuries-old folk-art form that is believed to have originated at Perinad in the Kollam district of Kerala.
- This art form was first performed some 150 years back by the people of Vedar and Pulayar communities.

Themes

- It is based on certain episodes taken from the Indian epic Ramayana.
- Mythic characters such as Rama, Seetha, Ravana and Hanuman come alive in Seethakali performances that portray the tale of Seetha's journey, from the time she accompanied Rama to the woods till her ascent to the heavens.
- In the early times, Seethakali was performed as part of the harvest festival Onam.
- From Atham star till the 28th day after Onam, the performers who belong to the subaltern communities go from one house to another performing this art.
- The props and instruments used during performances are all made of natural materials like bamboo and palm leaves.
- The costumes and the make-up are loud and eye-catching.
- The characters of Rama and Laxmana appear in green since the colour is used to represent gods and goddesses in Kathakali.
- Currently, in Kerala, there is only one registered Seethakali performing group – Perinad Seethakali Sangham.

GOND PAINTING

Recently, during the BRICS meeting, the Prime Minister of India gifted a Gond painting to the Brazilian president Lula da Silva.

About Gond Painting:

- It is a famous folk art of the Gond tribal community of central India.
- It is done to preserve and communicate the culture of the Gond tribal community.
- Themes: Gond tribes are highly interlinked with nature, and this appears in their paintings too. They include animals, the mahua tree, mythological stories, Hindu gods, local deities and folktales, etc.
- The artist uses his distinctive pattern and style to fill the images. These style signatures are used in collages to make a complete picture, such as dots, fine lines, curved lines, dashes, fish scales, etc.

Key facts about the Gond Tribe

- The Gonds are the largest Adivasi Community in India and can be traced to the pre-Aryan era.
- The word Gond comes from Kond, which means green mountains.
- They are a heterogeneous group spreading over large areas from the Godavari gorges in the south to the Vindhya Mountains in the north.
- They live in the states of Madhya Pradesh, Maharashtra, Telangana, Andhra Pradesh, Bihar, and Odisha.
- The majority speak various mutually unintelligible dialects of Gondi.

GRAND CROSS OF THE ORDER OF HONOUR

The Indian Prime minister was recently conferred with the Grand Cross of the Order of Honour by the Greek President in Athens.

About Grand Cross of the Order of Honour:

- It is the second-highest civilian honour in Greece.
- It is conferred to "eminent personalities who, by reason of their distinguished position, have contributed to enhancing the stature of Greece".
- The Order of Honour was established in 1975.
- The head of the goddess Athena is depicted on the front side of the Star with the inscription "ONLY THE RIGHTEOUS SHOULD BE HONOURED".

Key Facts about Greece:

Location: It is located in southeastern Europe, on the southern tip of the Balkan Peninsula.

Official Name: Hellenic Republic

Bordering Countries:

The country is bordered by Albania, Bulgaria, Turkey, and North Macedonia.

Greece shares maritime borders with Cyprus, Egypt, Italy, and Libya.

Geography:

The mainland has rugged mountains, forests, and lakes.

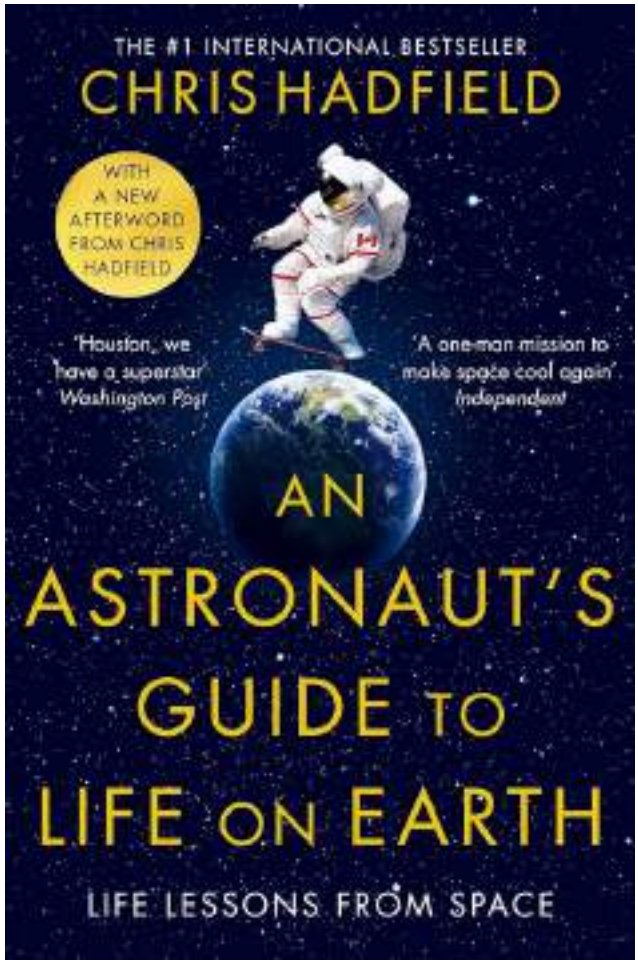
The country is well known for the thousands of islands dotting the blue Aegean Sea to the east, the Mediterranean Sea to the south, and the Ionian Sea to the west.

The largest Greek island is Crete.

Capital: Athens

"AN ASTRONAUT'S GUIDE TO LIFE ON EARTH"

- CHRIS HADFIELD



What I do each day determines the kind of person I'll become".

"I should do things that keep me moving in the right direction. Whatever happens then, I'm happy'."

"As I have discovered again and again, things are never as bad (or as good) as they seem at the time".

"An astronaut is someone who's able to make good decisions quickly, with incomplete information, when the consequences really matter".

"It sounds strange, probably, but having a pessimistic view of my own prospects helped me love my job".

"However, success, to me, never was and still isn't about lifting off in a rocket (though that sure felt like a great achievement). Success is feeling good about the work you do throughout the long, unheralded journey that may or may not wind up at the launch pad".

"Ultimately, too many variables are out of my control. There's really just one thing I can control: my attitude during the journey, which is what keeps me feeling steady and stable, and what keeps me headed in the right direction. So, I consciously monitor and correct, if necessary, because losing attitude would be far worse than not achieving my goal".

"'Be ready. Work. Hard. Enjoy it!' It fits every situation".

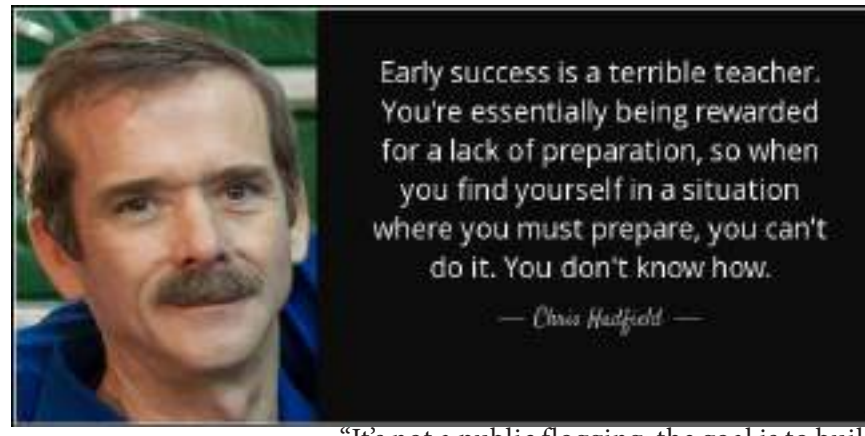
"When you feel helpless, you're far more afraid than you would be if you knew the facts. If you're not sure what to be alarmed about, everything is alarming".

"Knowledge and experience have made it possible for me to be relatively comfortable with heights, whether I'm flying a biplane or doing a spacewalk or jumping into a mountain of corn. In each case, I fully understand the challenge, the physics, the mechanics, and I know from personal experience that I'm not helpless. I do have some control".

"But in order to stay calm in a high-stress, high-stakes situation, all you really need is knowledge. I never stopped getting ready. Just in case".

"Feeling ready to do something doesn't mean feeling certain you'll succeed, though of course that's what you're hoping to do. Truly being ready means understanding what could go wrong—and having a plan to deal with it".

"To drive that message home, we have what we euphemistically refer to as "contingency sims"—death sims, actually—which force us to think through our own demise in granular detail: not only how we'd die, but what would happen afterward to our families, colleagues and the space program itself".



"Rehearsing for catastrophe has made me positive that I have the problem-solving skills to deal with tough situations and come out the other side smiling".

"Anticipating problems and figuring out how to solve them is actually the opposite of worrying: it's productive".

"My optimism and confidence come not from feeling I'm luckier than other mortals or visualizing the victory. They're the result of a lifetime spent visualizing defeat and figuring out how to prevent it".

"Like most astronauts, I'm pretty sure that I can deal with what life throws at me because I've thought about what to do if things go wrong, as well as right. That's the power of negative thinking".

"I couldn't afford to be unprepared in any situation where I was going to be evaluated, formally or not. I had to be ready, always".

"If you're striving for excellence—whether it's in playing the guitar or flying a jet—there's no such thing as over-preparation. It's your best chance of improving your odds".

"In any field, it's a plus if you view criticism as potentially helpful advice rather than as a personal attack".

"It's not a public flogging: the goal is to build up collective wisdom".

"This is why, we have the patience to sweat the small stuff when pursuing major goals. We've learned the hardest way possible just how much little things matter".

"Good leadership means leading the way, not hectoring other people to do things your way".

"When you have some skills but don't fully understand your environment, there is no way you can be a plus one".

"If you start thinking that only your biggest and shiniest moments count, you're setting yourself up to feel like a failure most of the time".

"Life is just a lot better if you feel you're having 10 wins a day rather than a win every 10 years or so".

FACT SHEET

GENERAL STUDIES – II

POLITY

Judiciary

Over 2,000 cases were pending trials for more than 10 years as of December 31, 2022, according to the latest annual report of the Central Vigilance Commission (CVC).

Social Issues

Poverty

- NITI Aayog report reveals a decline in India's poverty rate from 25% (2015-16) to 15% (2019-21).
- UNDP-OPHI Global Multidimensional Poverty Index report indicates a drop in multidimensional poverty from 27.5% (2015-16) to 16.2% (2019-21).

Education

Ministry of Education has released the State of Elementary Education in Rural India – 2023 report, highlighting the Prevalence of Smartphone Usage among students. The survey gathered responses from 6,229 parents of schoolchildren aged 6–16 in rural communities across 21 States.

- 49.3% have access to smartphones. 76.7% of parents indicated that their children primarily use smartphones for playing video games, indicating a preference for entertainment over educational activities.
- Only 34% of students use smartphones for study-related downloads, and a mere 18% access online learning via tutorials.

Health

The new WHO report on tobacco control highlights global progress, including the implementation of MPOWER measures.

- MPOWER measures are tobacco control strategies developed by the World Health Organization (WHO) in 2008.
- Global Smoking Decline Worldwide, with 300 million fewer smokers today, the prevalence of smoking declined from 22.8% (2007) to 17% (2021)
- Over 5 billion people (71% of the global population) are protected by at least one MPOWER measure
- The number of countries implementing at least one MPOWER measure increased from 44 (2008) to 151 (2022).
- Second-hand smoke exposure is linked to over 1 million non-smoker deaths annually, various health issues

UNICEF said that since 2017, a spike in conflict and displacement in the eastern Democratic Republic of the Congo (DRC) is pushing children into the worst cholera crisis.

- Cholera is an acute diarrhoeal infection caused by ingestion of food or water contaminated with the bacterium Vibrio cholerae.

International Relations

Debt-Fossil Fuel Trap report highlights that poor countries burdened with heavy debts are compelled to rely on fossil fuels to generate revenue for repaying loans from richer nations.

- The Debt-Fossil Fuel Trap report has been released by the anti-debt campaigner's Debt Justice and partners in affected countries.
- Fossil fuel extraction is seen as a means to generate revenue and alleviate debt for countries in the global south

GENERAL STUDIES – II

ECONOMY

- According to the Union Finance Ministry, the government has saved Rs 2.73 lakh crore of taxpayers' money from 2014 to 2023 by adopting Direct Benefit Transfer (DBT) to send money directly to the targeted beneficiaries.
- Presently, Fossil Fuel Vehicles (FFVs) are levied with a GST rate of 28% while the GST is 5% on electric vehicles (EVs).
- The National Coal Index (NCI) fell a significant 33.8% year-on-year to 157.7 points in 2023. It indicates a strong supply of coal in the market, with sufficient availability to meet the growing demands.
- Indian railways rank the 4th largest rail network in the world.

Infrastructure

Comptroller and Auditor General (CAG) reported that in the fiscal year 2021-22, the financial health of Indian Railways entered a "concern zone."

- The railway operator spent ₹107 to earn ₹100 due to increased pension funding
- Indian Railways couldn't generate a net surplus in 2021-22
- Total Expenditure increased over 35% more than the previous year.
- Over 75% of total working expenses are spent on staff costs, pension payments, and rolling stock lease charges

Growth Projection

IMF has projected the Indian economy to grow at 6.1% in 2023 in its World Economic Outlook report.

- Global growth is projected to fall from an estimated 5% in 2022 to 3% in both 2023 and 2024.
- Global headline inflation is expected to fall from 8.7% in 2022 to 6.8% in 2023 and 5.2% in 2024.

- Underlying (core) inflation is projected to decline more gradually, and forecasts for inflation in 2024 have been revised upward.

Environment

On the 108th foundation day of the Zoological Survey of India (ZSI), the publication called "75 Endemic Birds of India" was unveiled.

- India is home to 1,353 bird species, representing approximately 12.4% of the global bird diversity.
- Out of these, 78 (5%) are endemic to the country, meaning they are not reported in other parts of the world.
- Waste Management
- With global waste generation touching 2.24 billion tonnes in 2020 and projected to peak at 11 million tonnes a day by 2100, the environmental and socio-economic implications are profound.
- India's construction sector is likely to touch $1.4 trillion in market value by 2025, playing a crucial role in waste generation, as per a GPL note.

Disaster Management

- World Meteorological Organisation (WMO) has come up with its 2022 State of the Climate in Asia report, indicating that in 2022, Asia experienced extreme climate events, including high temperatures, droughts, floods, and cyclones, leading to significant socioeconomic impacts.
- The annual mean near-surface temperature in 2022 was 1.15 °C above pre-industrial average
- Floods were India's worst natural disaster in 2022
- Floods in Pakistan, China, and India caused economic losses exceeding the average observed over 20 years
- Severe floods in Pakistan displaced 14% of the population, causing deaths and displacements.

GENERAL STUDIES – IV

- An audit conducted by the Comptroller and Auditor General of India (CAG) has revealed that approximately Rs 79 crore was improperly transferred to ineligible beneficiaries under the National Social Assistance Programme (NSAP) of the Ministry of Rural Development between 2017 and 2021.

1. The GST Council has decided to impose a 28% levy on bets in online gaming, casinos, and horse racing, aiming for implementation from October 1, 2023. Despite concerns from certain states, the decision stands, and the industry has received clarification on tax calculations.
2. OpenAI CEO has formally re-introduced the Worldcoin Project. It is an iris biometric cryptocurrency project. It aims to create a digital network in which everyone can claim some kind of stake, and join the digital economy. Worldcoin volunteers known as "Orb operators" scan a person's iris pattern with a device called "Orb" to collect their biometric data and issue them with a World ID through an app.
3. The U.K. and India forge economic ties, fuelled by £36 billion bilateral trade. The launch of the £1.5 million "Alive with Opportunity" campaign further catalyses this thriving relationship. It serves as a platform to illuminate the interplay of people, ideas, culture, and investment, fostering greater understanding and collaboration. Aligned with the strategic objective of doubling trade with India by 2030, the campaign aims to ignite interest and demand for U.K. products and services.
4. The National Curriculum Framework 2023 proposes that school boards hold board exams twice a year instead of once a year. This will allow students to take the exam twice and retain their best score. The NCF believes that this will reduce the pressure on students and give them a chance to improve their performance.
5. Tejas, Light Combat Aircraft (LCA) LSP-7 successfully fired the ASTRA indigenous Beyond Visual Range (BVR) air-to-air missile off the coast of Goa. All the objectives of the test were met and it was a perfect textbook launch. Astra is a BVR air-to-air missile to engage and destroy highly manoeuvring supersonic aerial targets.
6. North India's first River Rejuvenation Project, named Devika, which was inaugurated by the Prime Minister is almost finished now. This project modelled after the 'Namami Ganga' initiative, is aimed at restoring the health of the Devika River (in Udhampur, Jammu & Kashmir).
7. Shiv Khanna, an 11th-grade student from Delhi, stands out in the world of tennis for his dedication to promoting wheelchair tennis in India. He was inspired after witnessing wheelchair tennis at Wimbledon, leading him to successfully host a wheelchair tournament in Delhi. Alongside his father, they have established the "Aces on Wheels" foundation to bolster wheelchair tennis.
8. To boost rail infrastructure and enhance rail connectivity in tribal-dominated regions, the "Janjatiya Gaurav Corridor" initiative has been launched with a budget of ₹70,000 Crore for the fiscal year 2023-24. This effort addresses connectivity gaps, supports tribal communities, and contributes to overall regional development.
9. China's recent devastating floods have raised questions about the effectiveness of its "sponge city" initiative launched in 2015 to reduce urban flood risks. Rapid urbanization and concrete development have compromised natural water absorption, leading to waterlogging and floods. The sponge city infrastructure is unable to handle extreme rainfall events. So, many cities remain vulnerable to flooding.

VALUE ADDITION

10. "Niveshak Sarathi" ("Investor Guide" or "Investor Mentor") Vans are launched in Delhi-NCR as part of the Azadi ka Amrit Mahotsav celebrations. It aims to enhance financial literacy and awareness about fraudulent schemes in the region. The vans are equipped with a TV screen showcasing investor awareness movies, a public address system, and informative brochures.
11. 'Operation Kavach', Delhi Police's drive against drugs launched. A string of successful raids has forced the smugglers to move smaller quantities of the contraband through cars.
12. Recently, the Election Commission of India has decided to issue digital time vouchers to National and State political parties for campaigning on Doordarshan & All India Radio during elections.
13. The Supreme Court's "The Handbook on Combating Gender Stereotypes" is a significant step towards recognizing and addressing the biases of the legal system. The handbook provides guidelines for judges and lawyers to recognize and avoid gender stereotypes in their decision-making process. It also challenges the patriarchal notions of language in the legal system and provides alternate words and phrases.
14. The RBI's pilot program introduces the 'Public Tech Platform for Frictionless Credit,' aiming to streamline digital credit delivery by integrating data from various entities. The platform reduces costs, expedites disbursement, and promotes data-driven lending.
15. India will open a climate change and health hub in New Delhi in partnership with the Asian Development Bank (ADB). The hub will aim to provide leadership on global health matters pertaining to climate change and to enhance the resilience of health systems against the impact of climate change.

TERMS IN NEWS:

1. Zero FIR => When a police station receives a complaint regarding an alleged offence that has been committed in the jurisdiction of another police station, it registers an FIR and then transfers it to the relevant police station for further investigation. This is called a Zero FIR.
2. Sunrise industry => It is a new business or sector with the potential for rapid growth. They often have high growth rates, multiple start-ups, and high levels of venture capital funding. A sunrise industry commonly moves to a maturity stage and then to the sunset stage when its growth subsides.
3. Cell-free DNA (cfDNA) => In the human body, most of the DNA in a genome is neatly packed inside cells with the help of specific proteins, protecting it from being degraded. In a variety of scenarios, some fragments of DNA are 'released' from their containers and are present outside the cell, in body fluids. These small fragments of nucleic acids are widely known as cell-free DNA (cfDNA).

RELEVANT QUOTES

1. Hunger: "There are people in the world so hungry, that God cannot appear to them except in the form of bread" - Mahatma Gandhi.

2. Justice: "Where there is adherence to right action, there [alone] lies victory!" ("Yato Dharmastato Jaya") - Supreme Court Motto.
3. Science & Religion: "Science without religion is lame, religion without science is blind" - Albert Einstein.
4. Poverty: "In a country well governed, poverty is something to be ashamed of. In a country badly governed, wealth is something to be ashamed of" – Confucius.
5. Ethical Governance: "If Ethics is poor at the top, the behaviour is copied down the organisation" - Robert Noyce.

FIDE CHESS WORLD CUP

Context

In the FIDE World Cup finals, Magnus Carlsen secured his first-ever title, defeating Indian chess prodigy R. Praggnanandhaa in Baku, Azerbaijan. Praggnanandhaa has become the second Indian after Viswanathan Anand to reach a World Cup final. Praggnanandhaa's spirited performance earned him a spot in the prestigious Candidates Tournament, despite his loss.

FIDE World Cup

The FIDE World Cup, established in 2000 by the International Chess Federation (FIDE), encompasses various iterations. Since 2005, it's been a 128-player single-elimination chess tournament, a vital part of the World Chess Championship qualification.

Candidates Tournament

It has been organized by FIDE since 1950 and determines the challenger for the World Chess Championship. The winner faces the reigning World Champion. Historically held triennially until 1992, since 2013, it follows a 2-year cycle.

World ChessChampionship

It determines the world champion in chess. Ding Liren (China) won the 2023 championship, defeating Ian Nepomniachtchi, while Magnus Carlsen opted not to defend his title.

GALLANTRY AWARDS

Context

President Droupadi Murmu approves 76 gallantry awards for armed forces and Central Armed Police Forces (CAPF) personnel. The approval comes on the eve of the 77th Independence Day.

Gallantry Awards in India:

Gallantry Awards instituted by the Government of India to honor acts of bravery and sacrifice by Armed Forces personnel, lawfully constituted forces and civilians.

Awards are announced twice a year: Republic Day and Independence Day.

Kirti Chakras and Shaurya Chakras

Among these, the Kirti Chakra, the second-highest peacetime gallantry award, will be presented to four Central Reserve Police Force (CRPF) members who lost their lives during an anti-Naxal operation in Chhattisgarh in April 2021.

Additionally, eleven individuals will receive the Shaurya Chakra, the third-highest peacetime gallantry award, including personnel from the Army, Jammu and Kashmir Police, and CRPF.

Five of these awardees will be posthumously honoured.