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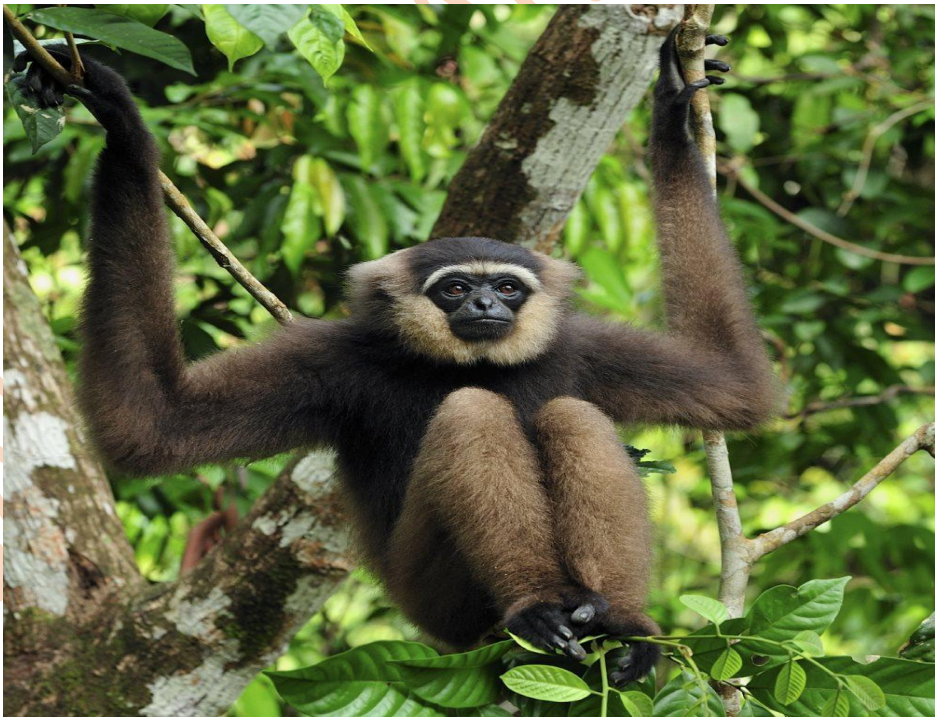
Canopy Bridge for Gibbon

The Northeast Frontier Railway (NFR) has earmarked funds to construct canopy bridges for India's only ape to move across a railway track bifurcating its prime habitat in eastern Assam. The gibbon, known for its vocalisation, spends much of its time on the upper canopy of tall trees, mostly the hollong (Dipterocarpus macrocarpus). The fragmentation of the forest along the track has disturbed the arboreal nature of the ape, putting it at risk while crossing the track.



Gibbon, (family Hylobatidae), any of approximately 20 species of small apes found in the tropical forests of Southeast Asia. Gibbons, like the great apes

(gorillas, orangutans, chimpanzees, and bonobos), have a humanlike build and no tail, but gibbons seem to lack higher cognitive abilities and self-awareness.

They also differ from great apes in having longer arms, dense hair, and a throat sac used for amplifying sound. Gibbon voices are loud, are musical in tone, and carry over long distances. The most characteristic vocalization is the "great call," usually a duet in which the female leads and the male joins in with less complex notes, used as a territorial marker by both sexes. The various species of gibbons can be divided into four genera: *Hoolock*, *Hylobates*, *Nomascus*, and *Symphalangus*.

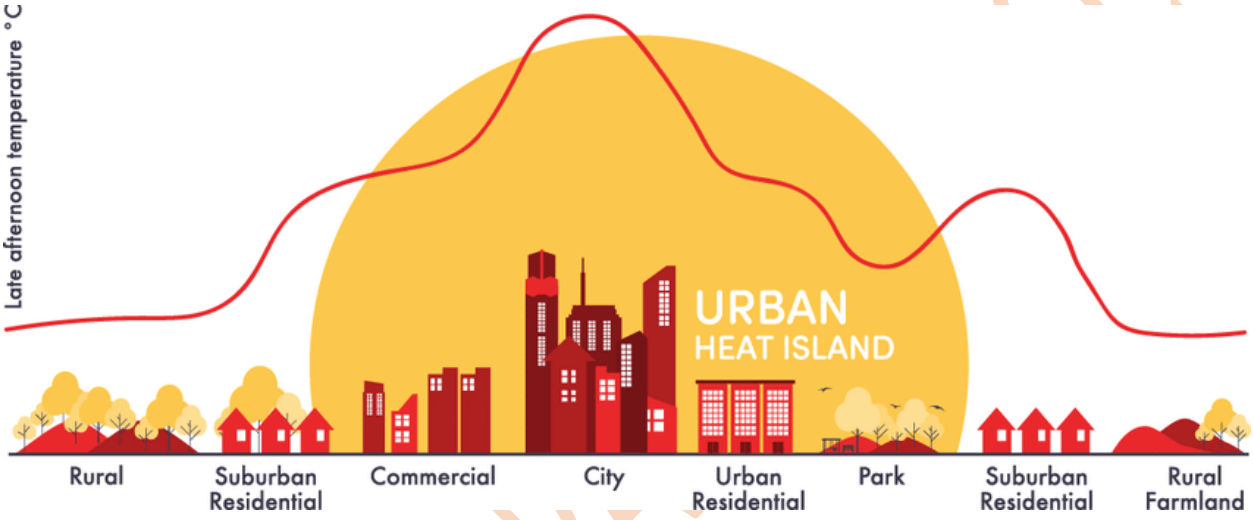
Molecular data indicate that the four groups are as different from one another as chimpanzees are from humans. Gibbons are arboreal and move from branch to branch with speed and great agility by swinging from their arms (brachiating). On the ground, gibbons walk erect with their arms held aloft or behind. They are active during the day and live in small monogamous groups that defend territories in the treetops. They feed mainly on fruit, with varying proportions of leaves and with some insects and bird eggs as well as young birds.

The dark-handed gibbon (*Hylobates agilis*), which lives on Sumatra south of Lake Toba and on the Malay Peninsula between the Perak and Mudah rivers, may be either tan or black and has white facial markings. The white-handed gibbon (*H. lar*), of northern Sumatra and most of the Malay Peninsula northward through Thailand into Yunnan, China, is similar but has white extremities.

The pileated gibbon (*H. pileatus*), of southeastern Thailand and western Cambodia, has white hands and feet; the male is black and the female buff with a black cap and chest patch. The colour difference comes about with age; the juveniles are buff and both sexes darken with age, but the male does so much more rapidly.
Kloss's gibbon (*H. klossii*), from the Mentawai Islands west of Sumatra, is completely black throughout its life.

Heat waves

In cities, this problem is exacerbated by a phenomenon termed the Urban. Heat Island (UHI) effect. Temperatures in large, crowded urban settings can be several degrees higher than in surrounding rural areas, and even hotter at night. Concrete structures and tarmac roads retain heat which stays trapped inside this "urban bubble" along with air pollutants.



A lack of green spaces and waste heat from air conditioners and other machinery add to the UHI. Chennai, a coastal city, is affected by yet another feature which is cause for worry. Humidity reduces the cooling effect of perspiration, leading to a person experiencing an elevated body temperature, debilitating heat stress, exhaustion, and even a potentially fatal heat stroke.

Under high humidity conditions, a wet-bulb temperature (indicating the extent to which evaporation can take place and facilitate cooling) of around 38.5° C is considered by the World Health Organization to be "near the limits of human survivability". In India, a heatwave is officially declared in coastal areas when the maximum temperatures are over 37° C and 4.5° C above normal. Clearly, with an UHI (urban heat island), heatwave conditions are quite easily breached in Chennai.

The effects could be much worse, even dangerous, when compared to inland, rural areas. India has national, State and even some district-level Heat Action

Plans (HAP) to reduce morbidity and mortality, especially among the vulnerable poor, infants and the elderly.
The National Disaster Management Authority (NDMA) Guidelines, which are being upgraded, and those of several States, outline measures to deal with heat waves including early warning bulletins, and staggered work hours at outdoor construction sites, with shaded areas and temporary shelters, and strategic provisioning of drinking water and oral rehydration salts.
The Chennai Climate Action Plan (CCAP) offers several meaningful suggestions including those discussed here, albeit scattered under different sections.
In our view, they underestimate causative factors and, therefore, remedial measures and targets. Increasing green cover tops, the list. Green areas such as urban forests, large greens and parks, avenues and other trees, and even lawns, release moisture that evaporates and cools the environs.

Well-distributed green areas also influence local micro-climate, reduce air pollution, and promote health and wellbeing. Tree-lined and shaded walkways and tracks provide pedestrians, cyclists, and itinerant workers shelter from the blazing sun and also encourage non-motorized transportation.

With such multiple benefits, green areas are considered essential for sustainable urban development by UN-Habitat, which recommends that green spaces be available for all citizens within 400 meters from their residence

The greater the use of air-conditioning, generating even more heat in a nasty feedback loop. It is estimated that moving towards more energy-efficient (EE) air-conditioning, through a combination of mandates for the purchase of five-star or split EE air-conditioners.
Energy savings can also accrue from switching air-conditioners (and other appliances) from the mains rather than by remote control (this leaves appliances on low power-consuming stand-by mode). If buildings are better insulated and ventilated, and constructed using appropriate designs and materials according to "green" building codes, they would require less air-conditioning and generate less waste heat.

Having permeable pavings and walkways using alternative materials, increased shrubbery along sidewalks, berms, and dividers, and reflective paint on roofs, walls, and streets,

Goldfinch

Goldfinch, any of several species of the genus *Carduelis* (some formerly in *Spinus*) of the songbird family Fringillidae; they have short, notched tails and much yellow in the plumage.

All have rather delicate sharp-pointed bills for finches. Flocks of goldfinches feed on weeds in fields and gardens. They have high-lisping calls, often given in flight

- **American goldfinches are granivores, which means they mainly eat seeds. Some of their favorites include sunflower, thistle, and elm seeds. The goldfinch is a diurnal bird, meaning it's most active during the day. It has excellent flying skills, dipping and rising in a wavelike pattern as it soars.**
- **When it's not airborne, or perched on plants, the bird hops along the ground searching for seeds to eat. These animals have six different vocalizations, including their "po-ta-to-chip" call.**

Saying it with flowers

Colours of tradition: People walking past a flower carpet prior to the Corpus Christi procession in Spycimierz, Lodz region in Poland. For over 200 years, local residents here create colourful flower carpets, almost 1-km long, along the Corpus Christi procession route. AFP

LOdZ

- **Lódź is a city in central Poland and a former industrial center. It is the capital of Lódź Voivodeship, and is located 120 km (75 mi) south-west of Warsaw.**

Five Eyes

The 'Five Eyes' is a multilateral intelligence-sharing network shared by over 20 different agencies of five English-speaking countries Australia, Canada, New Zealand, the United Kingdom, and the United States.

It is both surveillance-based and signals intelligence (SIGINT). Intelligence documents shared between the member countries are classified 'SecretAUS/CAN/NZ/UK/US Eyes Only,' which gave the group its title 'Five Eyes.'

How did the alliance come into being?

The alliance between the U.S. and the U.K. evolved around the Second World War to counter the Cold War Soviet threat. The two countries, which had successfully deciphered German and Japanese codes during the World War, forged a collaboration to share intelligence related to signals such as radio, satellite, and internet communications. In the aftermath of the war in 1946, the alliance was formalized through an agreement for cooperation in signals intelligence. The treaty called the British-U.S. Communication Intelligence Agreement, or BRUSA (now known as the UKUSA Agreement), was signed between the State-Army-Navy Communication Intelligence Board (STANCIB) of the U.S. and the London Signal Intelligence Board (SIGINT) of Britain.

Its scope was limited to "communication intelligence matters only" related to "unrestricted" exchange of intelligence products in six areas: collection of traffic; acquisition of communication documents and equipment; traffic analysis; cryptanalysis; decryption and translation; and acquisition of information regarding communication organizations, practices, procedures, and equipment.

The arrangement was later extended to 'second party' countries Canada joined in 1948, while Australia and New Zealand became part of the alliance in 1956.

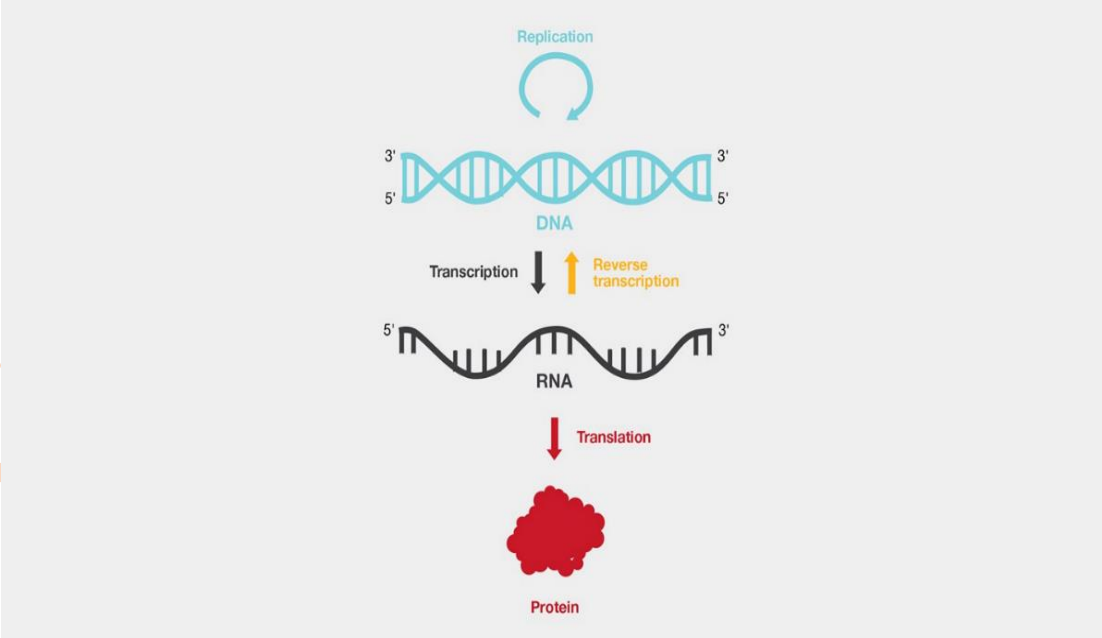
How does the 'Five Eyes' network work?

The five partner countries share a broad range of information and access to their respective intelligence agencies. Initially, the partners are assigned respective SIGINT mandates.

A Canadian intelligence officer writes in a military journal (2020) that the US is responsible for Russia, northern China, most of Asia, and Latin America; Australia covers southern China, Indo-China, and its close neighbours, such as Indonesia; the UK is in charge in Africa and west of the Urals within the former Soviet Union; and New Zealand is responsible for the Western Pacific, while Canada handles the polar regions of Russia

Reverse transcriptase

The ability of cells to create DNA copies from RNA revolutionized research in molecular biology. Researchers could reverse-transcribe messenger RNAs to pieces of DNA, clone that DNA into bacterial vectors, and study the function of the corresponding genes. Reverse transcriptase had a significant effect on management of HIV infections in the 1980s.



- **A generation of antiviral agents targeting the reverse transcriptase enzyme helped convert an otherwise deadly disease to one that could be managed**

Reverse transcriptase has the potential to reveal novel mechanisms of genetic evolution and viral resistance, leading to new therapeutic strategies and biotechnological tools.

Rayleigh scattering

The sky being blue-hued in daytime is the result of Rayleigh scattering the scattering of sunlight by particles in the air that are much smaller than the light's wavelength.

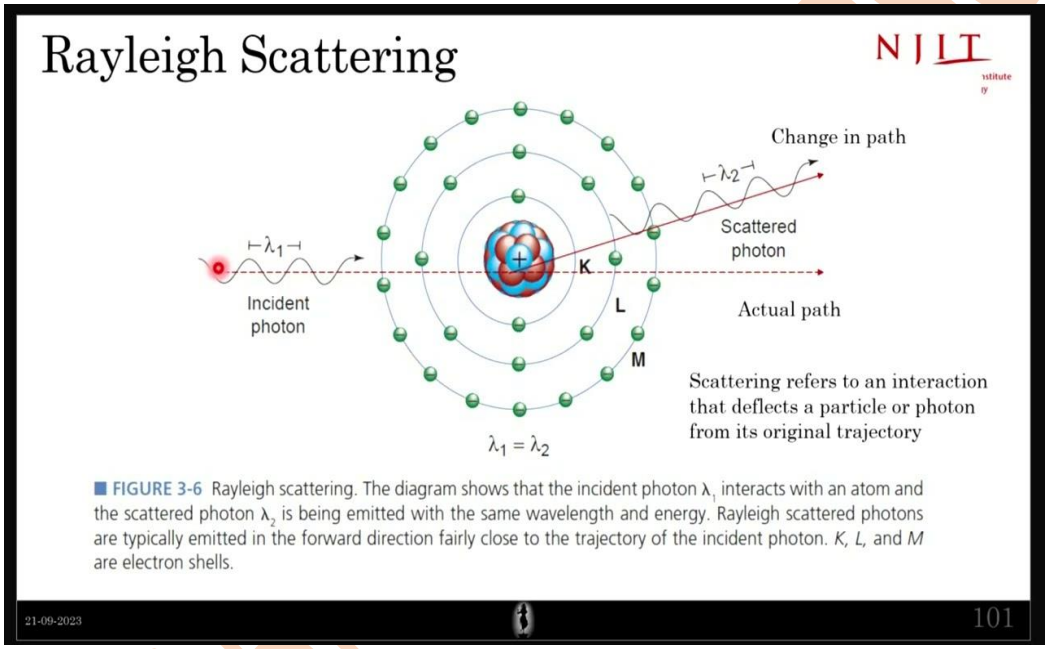
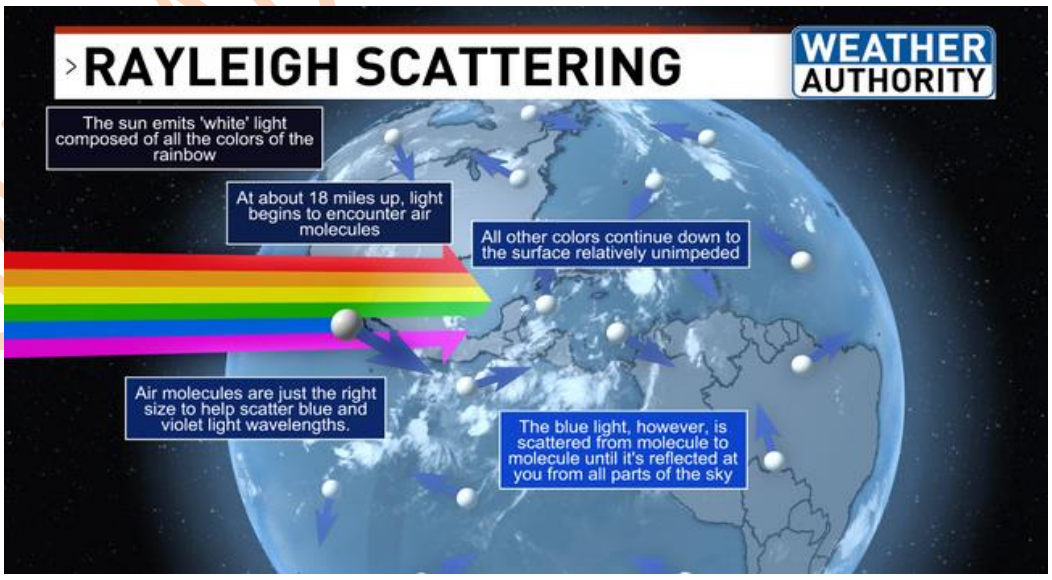
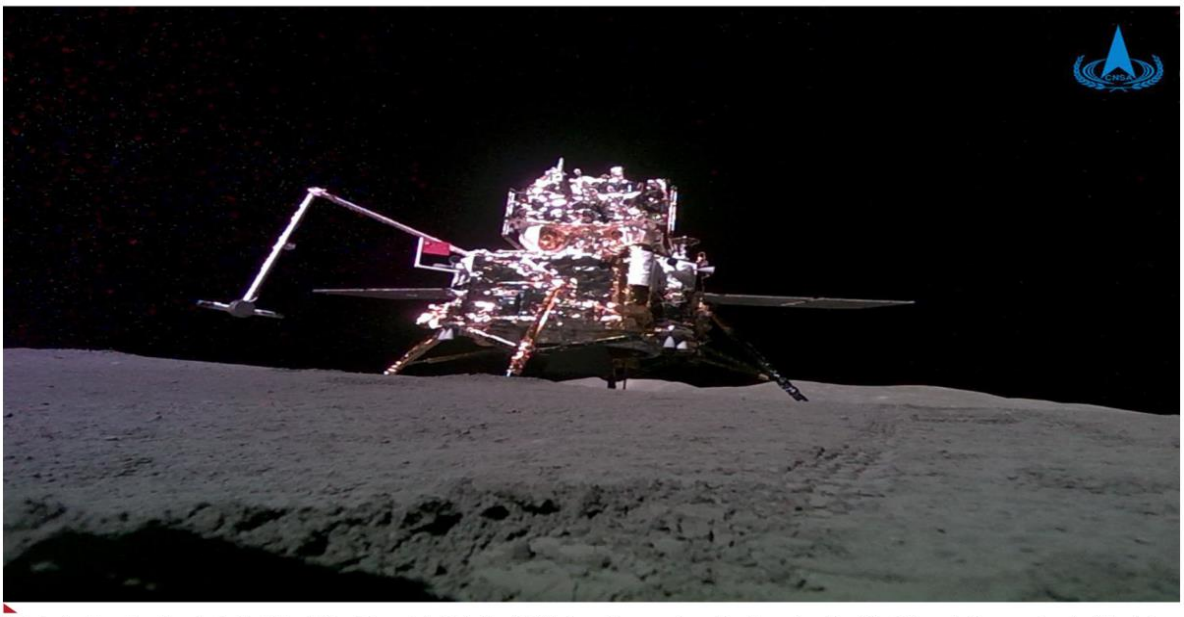


FIGURE 3-6 Rayleigh scattering. The diagram shows that the incident photon λ_1 interacts with an atom and the scattered photon λ_2 is being emitted with the same wavelength and energy. Rayleigh scattered photons are typically emitted in the forward direction fairly close to the trajectory of the incident photon. *K*, *L*, and *M* are electron shells.



Chang'e -6

BIG SHOT



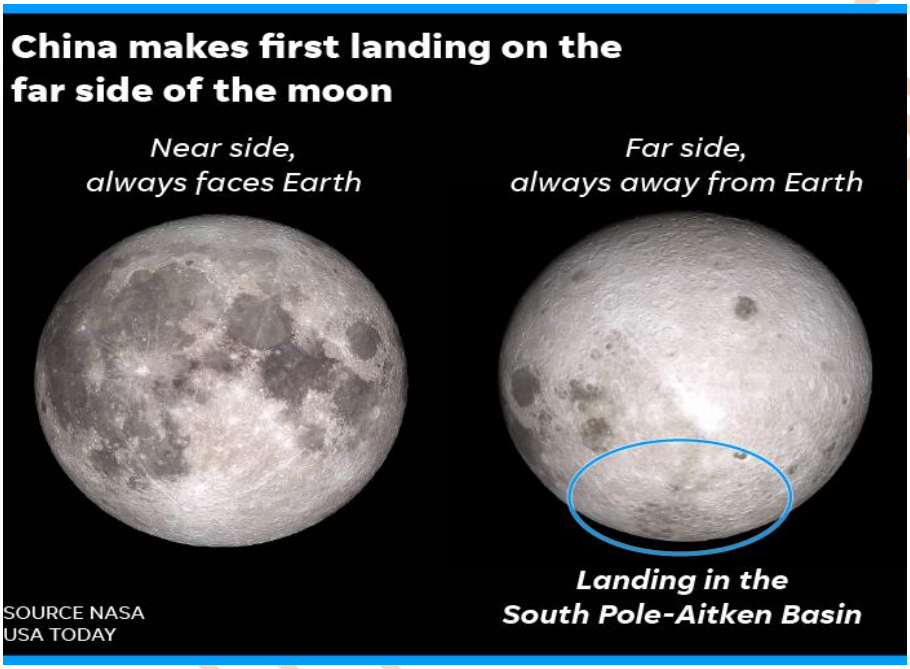
This photo released on Tuesday by the China National Space Administration (CNSA) shows the ascender and lander captured by China's Chang'e-6 lunar probe after it landed on the moon. A module of the Chinese lunar probe successfully took off from the far side of the Moon on Tuesday carrying samples back to Earth, state media reported. AFP

- **The Chang'e-6 probe was launched last month and its lander touched down on the far side of the Moon on Sunday. It used a drill and robotic arm to dig up soil on and below the Moon's surface. After successfully gathering its samples, the Chang'e-6 unfurled China's national flag for the first time on the far side of the Moon.**
- **Probe's landing site was the South Pole-Aitken Basin, an impact crater created more than 4 billion years ago, which is 13km (8 miles) deep and has a diameter of 2,500km (1,500 miles).**
- **China's Moon programme is part of a growing rivalry with the United States still the leader in space exploration and others, including Japan and India.**
- **China has put its own space station the Tiangong into orbit and regularly sends crews there.**
- **The emerging global power aims to put a person on the Moon before 2030, which would make it the second nation after the US to do so.**

Far side of the moon??

The far or "dark" side of the moon - which faces away from Earth - is technically challenging to reach due to its distance, and its difficult terrain of giant, deep craters and few flat surfaces.

Space officials have had to use a satellite to direct and maintain communications with the Chang'e-6 craft.



MOND (for Modified Newtonian Dynamics)

In 1983, the physicist Mordehai Milgrom initiated a new research program in cosmology, called MOND (for Modified Newtonian Dynamics), or Milgromian dynamics. In three papers, Milgrom proposed a set of postulates describing how Newton's laws of gravity and motion should be changed in regimes of very low acceleration.

Milgrom's postulates were designed to explain the asymptotic flatness of galaxy rotation curves, without the necessity of postulating the existence of "dark matter". Milgrom showed that a number of other, novel predictions follow from his three postulates, and proposed these predictions as tests of the theory.

What is Dark Matter?

Dark matter is a mysterious, invisible substance that makes up about 27% of the universe's mass and energy. Unlike ordinary matter, it neither emits, absorbs, nor reflects light, making it undetectable through electromagnetic observations.

Its presence is inferred from gravitational effects on visible matter and cosmic structures. The exact nature of **dark matter** remains unknown, but it is believed to consist of non-baryonic particles.

While it does not interact with electromagnetic forces, its gravitational influence plays a crucial role in shaping the large-scale structure of the cosmos. Research continues to unravel the enigma of **dark matter** and its impact on the universe.

World wealth report

PM stands for particulate matter (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. Some particles,

such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

PM10: inhalable particles, with diameters that are generally 10 micrometers and smaller; and
PM2.5: fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Sources of PM

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires.

Most particles form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries, and automobiles.

What are the Harmful Effects of PM?

Particulate matter contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems. Some particles less than 10 micrometers in diameter can get deep into your lungs and some may even get into your bloodstream. Of these, particles less than 2.5 micrometers in diameter, also known as fine particles or PM2.5, pose the greatest risk to health. Fine particles are also the main cause of reduced visibility (haze) in parts of the United States, including many of our treasured national parks and wilderness areas.

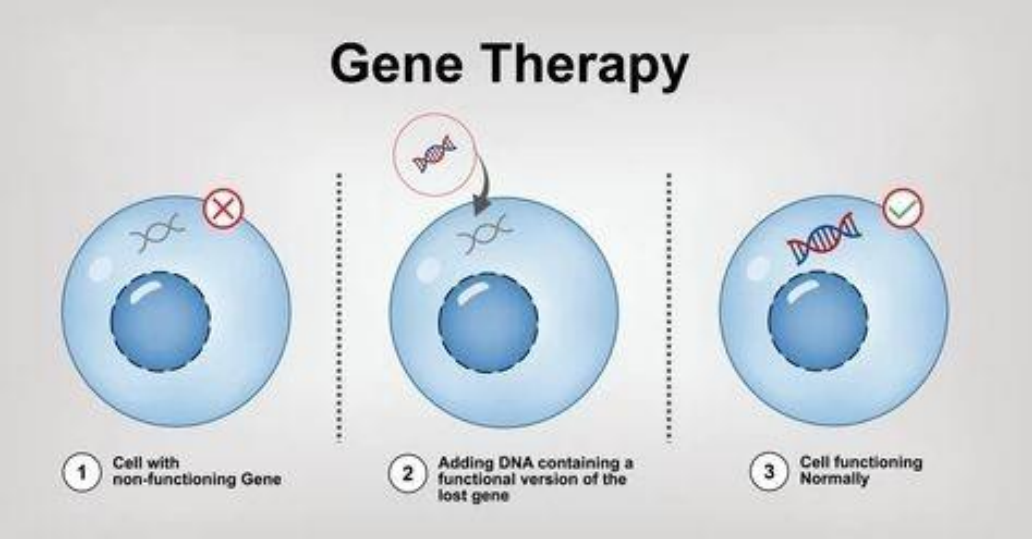
Gene Therapy

Gene therapy is a technique that modifies a person's genes to treat or cure disease. Gene therapies can work by several mechanisms:

- **Replacing a disease-causing gene with a healthy copy of the gene**
- **Inactivating a disease-causing gene that is not functioning properly**

- **Introducing a new or modified gene into the body to help treat a disease**

Gene therapy products are being studied to treat diseases including cancer, genetic diseases, and infectious diseases.



There are a variety of types of gene therapy products, including:

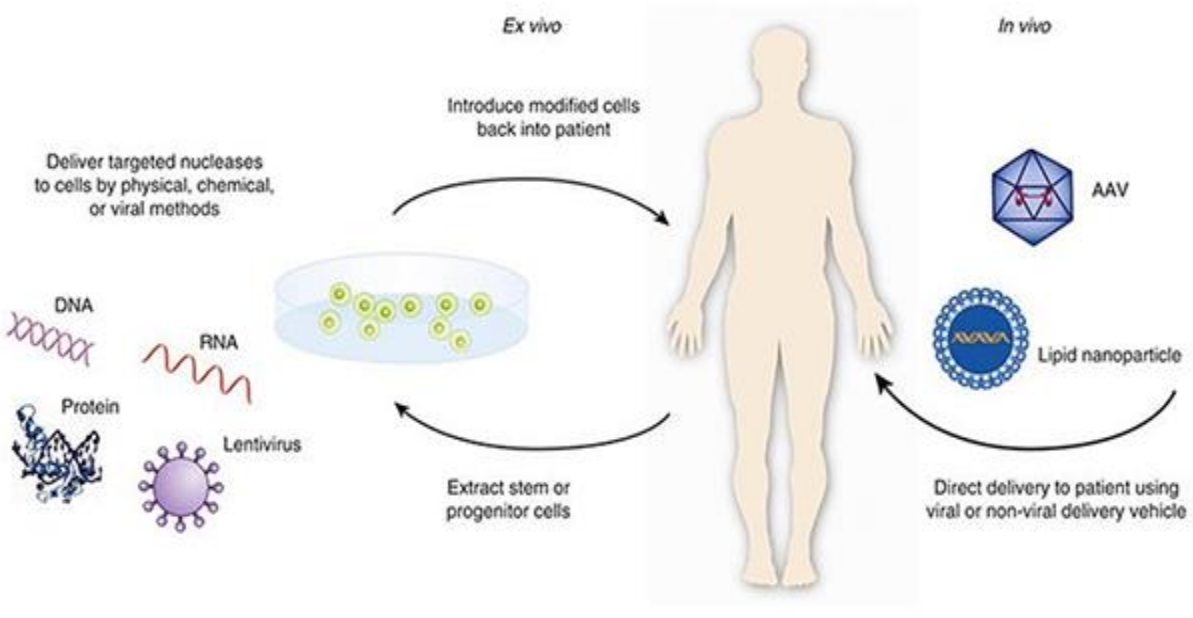
Plasmid DNA: Circular DNA molecules can be genetically engineered to carry therapeutic genes into human cells.

Viral vectors: Viruses have a natural ability to deliver genetic material into cells, and therefore some gene therapy products are derived from viruses. Once viruses have been modified to remove their ability to cause infectious disease, these modified viruses can be used as vectors (vehicles) to carry therapeutic genes into human cells.

Bacterial vectors: Bacteria can be modified to prevent them from causing infectious disease and then used as vectors (vehicles) to carry therapeutic genes into human tissues.

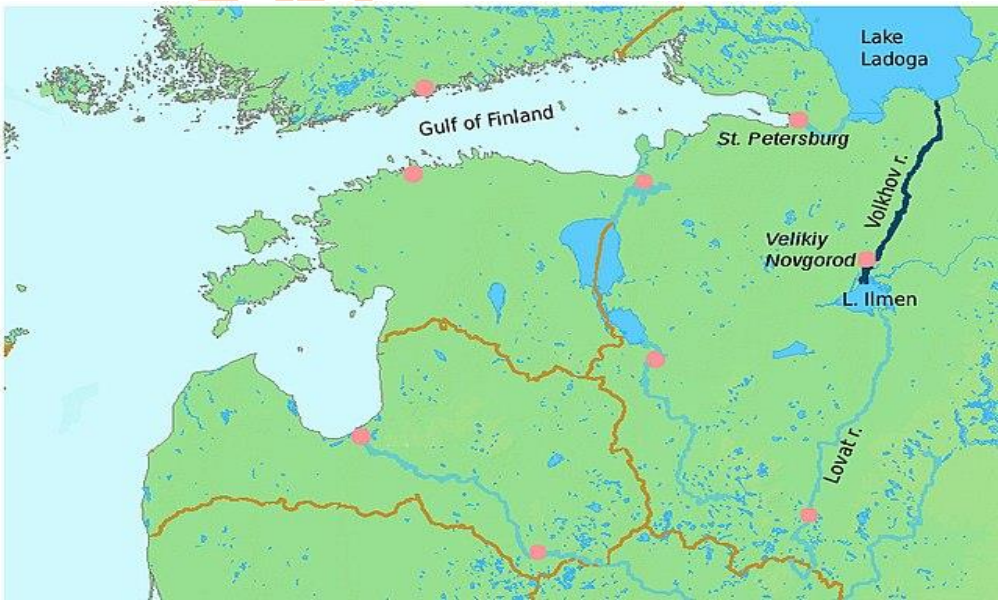
Human gene editing technology: The goals of gene editing are to disrupt harmful genes or to repair mutated genes.

Patient-derived cellular gene therapy products: Cells are removed from the patient, genetically modified (often using a viral vector) and then returned to the patient.



The Volkhov River

- **The Volkhov is a river in northwestern Russia. It connects Lake Ilmen and Lake Ladoga and forms part of the basin of the Neva.**
- **The Volkhov flows out of Lake Ilmen north into Lake Ladoga, the largest lake in Europe. It is the second-largest tributary of Lake Ladoga.**
- **It is navigable over its whole length.**



Nata Pratha

A centuries-old custom "Nata Pratha" is still alive in several Indian states like Rajasthan, Gujarat, and Madhya Pradesh. The custom allows men to live with as many women resulting in children being abandoned by their parents. Nata Pratha is practiced by the Bhil tribe, one of the largest tribes in South Asia. Traditionally, both the man and the woman are supposed to be married or widowed, but the custom has evolved to include single people as well.

The National Human Rights Commission (NHRC) called for the eradication of 'nata pratha' and issued notice to the Centre and the governments of Rajasthan, Madhya Pradesh, Uttar Pradesh, and Gujarat over the evil tradition.

Under 'nata pratha', girls in some communities are allegedly 'sold', either on a stamp paper or otherwise in the name of marriage having no legal sanctity in parts of Rajasthan and the adjoining areas in Madhya Pradesh, Uttar Pradesh, and Gujarat.

About the Organisation

The National Human Rights Commission (NHRC) of India was established on 12 October 1993. The statute under which it is established is the Protection of Human Rights Act (PHRA), 1993 as amended by the Protection of Human Rights (Amendment) Act, 2006.

It is in conformity with the Paris Principles, adopted at the first international workshop on national institutions for the promotion and protection of human rights held in Paris in October 1991, and endorsed by the General Assembly of the United Nations by its Regulations 48/134 of 20 December, 1993.

The NHRC is an embodiment of India's concern for the promotion and protection of human rights.

Section 2(1)(d) of the PHRA defines Human Rights as the rights relating to life, liberty, equality, and dignity of the individual guaranteed by the Constitution or embodied in the International Covenants and enforceable by courts in India.

2.3 Composition of NHRC

NHRC is an autonomous institution consisting of:

1. (a) A Chairperson who has been a Chief Justice of the Supreme Court;
   (b) One Member who is or has been a Judge of the Supreme Court;
   (c) One Member who is or has been the Chief Justice of a High Court;
   (d) Two Members to be appointed from amongst persons having knowledge of, or practical experience in matters relating to Human Rights;
2. The Chairperson of the National Commission for Minorities, National Commission for the Scheduled Castes, National Commission for the Scheduled Tribes and National Commission for Women are deemed Members of the Commission.

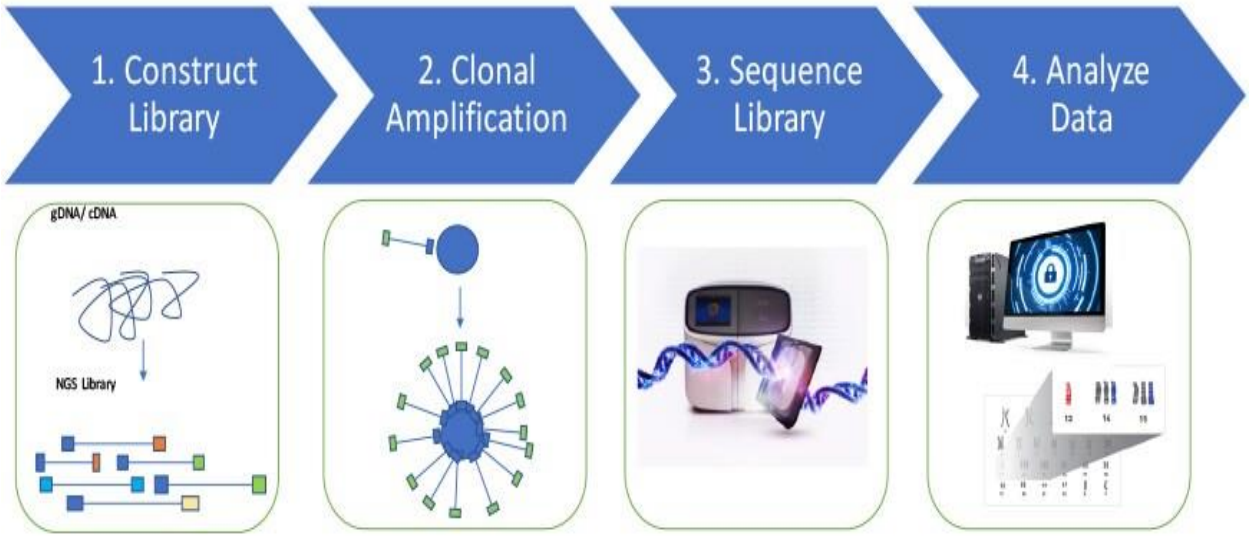
Next-generation sequencing (NGS)

Next-generation sequencing (NGS) is a massively parallel sequencing technology that offers ultra-high throughput, scalability, and speed. The technology is used to determine the order of nucleotides in entire genomes or targeted regions of DNA or RNA.

NGS has revolutionized the biological sciences, allowing labs to perform a wide variety of applications and study biological systems at a level never before possible. Today's complex genomics questions demand a depth of information beyond the capacity of traditional DNA sequencing technologies. NGS has filled that gap and become an everyday tool to address these questions. Next-generation sequencing (NGS) is a technology for determining the sequence of DNA or RNA to study genetic variation associated with diseases or other biological phenomena.

Introduced for commercial use in 2005, this method was initially called "massively-parallel sequencing", because it enabled the sequencing of many

DNA strands at the same time, instead of one at a time as with traditional Sanger sequencing by capillary electrophoresis (CE)



Gene deserts

Gene deserts are regions of the genome that are devoid of protein-coding genes. Gene deserts constitute an estimated 25% of the entire genome, leading to the recent interest in their true functions.

Originally believed to contain inessential and "Junk DNA" due to their inability to create proteins, gene deserts have since been linked to several vital regulatory functions, including distal enhancing and conservatory inheritance.

Thus, an increasing number of risks that lead to several major diseases, including a handful of cancers, have been attributed to irregularities found in gene deserts.

One of the most notable examples is the 8q24 gene region, which, when affected by certain single nucleotide polymorphisms, lead to a myriad of diseases

H5N2

Situation at a glance

On 23 May 2024, the Mexico International Health Regulations (IHR) National Focal Point (NFP) reported to PAHO/WHO a confirmed fatal case of human

infection with avian influenza A(H5N2) virus detected in a resident of the State of Mexico who was hospitalized in Mexico City.
This is the first laboratory-confirmed human case of infection with an influenza A(H5N2) virus reported globally and the first avian H5 virus infection in a person reported in Mexico. Although the source of exposure to the virus in this case is currently unknown, A(H5N2) viruses have been reported in poultry in Mexico.

H5N2 is just one of several kinds of avian influenza viruses.H5 viruses have been circulating among poultry and wild birds in Mexico since the mid-1990s. However, unlike other avian influenza strains that have caused outbreaks in humans such H1 and H3 viruses H5 viruses rarely infect humans.

The viruses are classified based on two types of protein on their surfaces: hemagglutinin, or H, which plays a crucial role in allowing the virus to infect cells, and neuraminidase, or N, which helps the virus spread. Many different combinations of H and N proteins are possible.

H5N2 belongs to a family of bird flu viruses called H5, which primarily infects wild birds. There are a total of nine known subtypes of H5 viruses. H5N1, which was detected in dairy cows in the U.S. in March, also belongs to this family. It is commonly associated with highly contagious strains of H5 viruses called the "Goose Guangdong lineage" that have caused numerous outbreaks in poultry over the last 20 years and sporadic infections in humans

Sanke Mon

The Sanké mon collective fishing rite takes place in San in the Ségou region of Mali every second Thursday of the seventh lunar month to commemorate the founding of the town.
The rite begins with the sacrifice of roosters, goats and offerings made by village residents to the water spirits of the Sanké pond. The collective fishing then takes place over fifteen hours using large and small mesh fishing nets.

It is immediately followed by a masked dance on the public square featuring Buwa dancers from San and neighbouring villages who wear traditional costumes and hats decorated with cowrie shells and feathers and perform specific choreography to the rhythms of a variety of drums. Traditionally, the Sanké mon rite marks the beginning of the rainy season. It is also an expression of local culture through arts and crafts, knowledge, and know-how in the fields of fisheries and water resources.

Bustillos Lagoon

The dry bed of the Bustillos Lagoon. High temperatures have caused an intense drought, in Anahuac, Chihuahua state, Mexico. A form of drought is afflicting nearly 90% of Mexico, the highest rate since 2011, according to government data. Chihuahua state has been hit particularly hard with most of its territory engulfed by the most extreme levels of dryness. "When the amount of water decreases, the pollutants become more concentrated and therefore they also affect the species that live here,

Hydrogen Line

The hydrogen line is an important instrument in modern astronomy from studying distant stars to looking for extraterrestrial intelligence (if it exists). Each hydrogen atom is made of one proton and one electron. Both these particles have a property called spin.

Colloquially, we can say the spin can point up or down at any given time. When the spins of both particles are pointing up (or down), they are said to be aligned. When they are pointing in opposite directions, they are anti-aligned. When the spins are anti-aligned, the atom will have more energy than if they are aligned. The atom will shed this 'excess' energy when the electron flips its spin, emitting electromagnetic radiation of wavelength 21 cm. In some

detectors, this emission shows as a characteristic line, thus the name 'hydrogen line'.

Scientists discovered this emission in 1951 and it transformed radio astronomy. By looking for this emission, they could detect clouds of cold, neutral hydrogen atomic gas in interstellar space.

Litigotiation

Litigotiation means a combination of negotiation and litigation. The term was coined by Professor Marc Galanter to describe the zig-zag course that negotiation often takes in cases that have been filed in court and therefore are punctuated by trips to the courthouse for motion hearings or to depositions for pre-trial discovery, and then back to the bargaining table.

First past the post system?

What is proportional representation?

The Proportional Representation (PR) system ensures representation of all parties based on their vote share. The most commonly used PR system is the 'party list PR' where voters vote for the party (and not individual candidates) and then the parties get seats in proportion to their vote share.
There is usually a minimum threshold of 3-5% vote share for a party to be eligible for a seat. India is a federal country and this principle if implemented should ideally be carried out at each State/Union Territory (UT) level.

What is first past the post system?

We follow the First Past the Post System (FPTP) in our elections to the Lok Sabha and Legislative Assemblies. Under this system, the candidate who polls more than any other in a constituency is declared elected. This is the system that is followed for elections in democracies like the U.S., the U.K., and Canada.
The primary advantage of the FPTP system is that it is simple and the most feasible method in a large country like India.
Secondly, FPTP provides greater stability to the executive in our parliamentary democracy because the ruling party/coalition can enjoy a majority in the Lok

Sabha/Legislative Assembly without obtaining a majority of the votes (more than 50%) across constituencies.

The issue with FPTP is that it may result in over or under representation of political parties when compared to their vote share. The main criticism against the PR system is that it could potentially result in instability as no party/coalition may obtain a majority to form the government in our parliamentary democracy.

Further, it may result in the proliferation of political parties based on regional, caste, religious, and linguistic considerations that may promote casteist or communal voting patterns. However, the second criticism is not well founded since the present FPTP system has also not inhibited the formation of parties based on caste or communal considerations.
This issue can be addressed by specifying a minimum threshold for votes polled to make a party eligible for seats in legislative houses.
To maintain a balance between stability and proportionate representation, the system of Mixed Member Proportional Representation (MMPR) can be considered.
Under this system, there is one candidate who is elected through the FPTP system from each territorial constituency.
There are also additional seats that are filled based on various parties' percentage of votes.

What can be the way forward?

The law commission in its 170th report, 'Reform of the electoral laws' (1999), had recommended the introduction of the MMPR system on an experimental basis.
It had suggested that 25% of seats may be filled through a PR system by increasing the strength of the Lok Sabha.
While it had recommended to consider the entire nation as one unit for PR based on vote share, the appropriate approach would be to consider it at every State/UT level considering our federal polity.

The population explosion that happened in our country during the last five decades has been uneven among various regions.

Determining the number of seats in Lok Sabha solely in proportion to population may go against the federal principles of our country and may lead to a feeling of disenchantment in the States that stand to lose through such representation.

However, in the event of increasing the seats during such the delimitation exercise, the MMPR system may be considered for incremental seats or at least 25% of the total seats to be filled from each State/UT.

Chang'e missions?

What are the Chang'e missions?

China's moon missions are called Chang'e, named for the goddess of the moon in Chinese mythology.

The Chinese National Space Administration (CNSA) launched the Chinese Lunar Exploration Programme (CLEP) in 2003, and the first Chang'e mission happened in 2007.

Chang'e 1 created a map of the moon's surface.

With Chang'e 2, CLEP launched phase I of its moon missions and equipped the orbiter with a better camera. Its images were used to prepare the Chang'e 3 mission's lander and rover for their descent on the moon, which they successfully achieved on December 14, 2013, starting CLEP's phase II missions.

In 2019, Chang'e 4 carried the first lander and the rover to descend on the moon's far side and explore this more mysterious region.

Phase III began with the Chang'e 5 mission. In late 2020, it deployed a lander on the moon near side.

It included a mission component called an ascender, which, after collecting and stowing some lunar soil samples, launched itself into orbit.

There, an orbiter collected the samples and transferred them to a returner, which brought them to the Earth.

Chang'e 6 is attempting to replicate its predecessor's feat but from the moon's far side.

The scientific goal here is to understand why the far side is so different from the near side.

What is the far side?

The moon is tidally locked to the earth: the lunar hemisphere facing the earth will always face the earth, and the hemisphere facing away (far side) will always face away. The far side has rockier terrain and fewer smooth plains.
Thus, it's harder to land a spacecraft on the far side more so since it's impossible to communicate directly from the earth with a spacecraft here: there's no line of sight.

A workaround is to have a second spacecraft in space that relays signals between ground stations on the earth and the surface spacecraft.
This makes the mission more complex.
The far side is expected to be a good place to install large telescopes, which would have a view of the universe unobstructed by the earth.
ISRO and scientists at the Raman Research Institute, Bengaluru, are currently working on such a device, called PRATUSH.

National Health Claim Exchange (NHCX)

The Ministry and IRDAI are launching the National Health Claim Exchange (NHCX), a digital platform that will bring together insurance companies, healthcare sector service providers, and government insurance scheme administrators.

How is the NHCX expected to work?

The NHCX will serve as a gateway for exchanging claims-related information among various stakeholders in the healthcare and health insurance ecosystem.

The integration with NHCX is expected to enable seamless interoperability of health claims processing, enhancing efficiency and transparency in the insurance industry, benefiting policyholders and patients, said the Health Ministry.
The insurance industry is poised to support the implementation of this system by facilitating streamlined interactions between hospitals and insurers, establishing a seamless, paperless, and secure contractual framework.

Acting as a centralized hub for all health claims, the NHCX will significantly alleviate the administrative burden on hospitals, which currently contend with multiple portals for various insurers

What are the challenges?

Health insurance contributes to approximately 29% of the total general insurance premium income in India.
The primary hurdle in health insurance today lies in improving the relationship between hospitals and insurance companies, adding that the push towards digitization requires active involvement from both parties, necessitating upgrades to current IT systems and enhanced workforce training.
"Issues such as discharge delays and miscommunication between hospitals and insurers further complicate matters.

Indian ocean

The Indian Ocean has been getting a lot of attention recently for its rapid warming and the outsized influence it continues to have on its peers.
The warm summer months are characterized by the rapid warming of the Arabian Sea and the Bay of Bengal as well as the southern tropical Indian Ocean. The winds begin to turn around from a land-to-ocean direction during winter to an ocean-to-land direction as summer commences. The northern boundary of the Indian Ocean is closed off by the Asian landmass, minus tiny connections to the Persian Gulf and the Red Sea.

The southern Indian Ocean is also different from the other oceans thanks to two oceanic tunnels that connect it to the Pacific and the Southern Oceans. Through the first tunnel the Indonesian seas the Pacific Ocean dumps up to 20 million cubic meters of water every second into the eastern Indian Ocean. These waters also transport a substantial amount of heat.

They stay mostly in the top 500 m and move through the Indian Ocean towards Madagascar. The Pacific waters, called the Indonesian Through ow, wander around the Indian Ocean and affect the circulation, temperature, and salinities. The other tunnel connects the Indian Ocean to the Southern Ocean

with two-way traffic. Colder, saltier, and thus heavier waters flow into the Indian Ocean from the Southern Ocean below a depth of about 1 km.

Due to the closed northern boundary, the waters slowly mix upward, and with the waters coming from the Pacific. The Indian Ocean is a warm bathtub despite the underwater tunnels because it is heavily influenced by the Pacific Ocean through an atmospheric bridge as well.
The atmospheric circulation, dominated by a massive center of rainfall over the Maritime Continent, creates mostly sinking air over the Indian Ocean. The atmosphere also warms the Indian Ocean year after year.
The Indian Ocean thus gains heat that it must get rid of via the waters moving south. With global warming, the Pacific has been dumping some additional heat in the Indian Ocean. The cold water coming in from the Southern Ocean is also not as cold as before.

The net result: The Indian Ocean is among the fastest warming oceans, with dire consequences for heat waves and extreme rain over the Indian subcontinent.
Marine heat waves are also a major concern now for corals and fisheries.
The warming Indian Ocean is affecting the wind circulation in a way that's also affecting the amount of heat the Pacific is able to take up.
The Pacific Ocean takes up heat in its cold, eastern tropical region, and this is crucial to determining the rate of global warming. The Indian Ocean is thus playing a role in how well the Pacific can control global warming.

Role in human evolution

Until about three million years ago, Australia and New Guinea were well south of the equator and the Indian Ocean was directly connected to the Pacific Ocean. And this Indo-Pacific Ocean was in a warm state known as a 'permanent El Niño' a state that was associated with permanently plentiful rain and lush green forests over East Africa.
Today, this part of Africa is arid. The northward drift of Australia and New Guinea, which is still ongoing, separated the Indian and the Pacific Oceans around three million years ago.

As a result, the eastern Pacific Ocean became cooler and the El Niño went from a permanent state to an episodic one, like the ones we've been seeing.
This transition aridified East Africa, turning its rainforests into grasslands and savannahs. Researchers have also hypothesized that these changes forced our ancestors, such as chimpanzees and gorillas, to move farther and run faster.

Przewalski

Przewalski horses are commonly referred to as one of the world's last breeds of wild horse. The horses are capable of resisting harsh winters like the ones in Kazakhstan where temperatures can drop below minus 30 degrees C and food runs scarce.
The three first specimens Zorro, Ypsilonka, and Zeta II arrived earlier this month. Four more landed in Kazakhstan from Berlin on Thursday morning and were released in the afternoon.

Przewalski's horses are often described as small and stocky. They are heavily built, with a large head, thick neck, and short legs. They are dun-colored with a dark zebra-like erect mane and no forelock. A dark stripe continues from the mane along the backbone to a dark, plumed tail.
They have a yellowish-white belly and dark lower legs and zebra-like stripes behind their knees. There are now 2,000 Przewalski horses around the world,

mainly in China and Mongolia but also in France, and Russia and even living in the wild in the Chernobyl exclusion zone between Belarus and Ukraine.

Following the April 1986 Chernobyl disaster, 30 specimens were introduced there in 1998. In Kazakhstan, the Przewalski horse is not the only endangered species to have received special attention.

The International Tribunal for the Law of the Sea (ITLOS)

The International Tribunal for the Law of the Sea (ITLOS) is an independent judicial body established by the 1982 United Nations Convention on the Law of the Sea. It has jurisdiction over any dispute concerning the interpretation or application of the Convention, and over all matters specifically provided for in any other agreement which confers jurisdiction on the Tribunal.

Disputes relating to the Convention may concern the delimitation of maritime zones, navigation, conservation and management of the living resources of the sea, protection and preservation of the marine environment, and marine scientific research. The Tribunal is composed of 21 independent members, elected from among persons enjoying the highest reputation for fairness and integrity and of recognized competence in the field of the law of the sea.

The Tribunal has jurisdiction over any dispute concerning the interpretation or application of the Convention, and over all matters specifically provided for in any other agreement which confers jurisdiction on the Tribunal (Statute, article 21). The Tribunal is open to States Parties to the Convention (i.e. States and international organizations which are parties to the Convention)

UNCLOS

The United Nations Convention on the Law of the Sea was opened for signature at Montego Bay, Jamaica, on 10 December 1982 and entered into force on 28 July 1996. A subsequent Agreement relating to the implementation of Part XI of the Convention was adopted on 28 July 1994 and entered into force on 28

July 1996. This Agreement and Part XI of the Convention are to be interpreted and applied together as a single instrument.

The Convention establishes a comprehensive legal framework to regulate all ocean space, its uses and resources. It contains, among other things, provisions relating to the territorial sea, the contiguous zone, the continental shelf, the exclusive economic zone, and the high seas.

It also provides for the protection and preservation of the marine environment, for marine scientific research, and for the development and transfer of marine technology. One of the most important parts of the Convention concerns the exploration for and exploitation of the resources of the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction (the Area).
The Convention declares the Area and its resources to be "the common heritage of mankind".
The International Seabed Authority, established by the Convention, administers the resources of the Area. Commission of Small Island States on Climate Change and International Law (COSIS)

States who are least responsible for climate change, Small Island Developing States (SIDS), will be the most likely to bear the worst brunt of its effects in the short- as well as the long-term.
Over the coming decades, SIDS will encounter "rising sea levels, extreme weather events, coral bleaching, loss of fisheries and marine biodiversity", as well as the risk of total submersion.
Facing this existential threat, as well as inaction on the international stage, the Prime Ministers of Antigua and Barbuda and Tuvalu signed the Agreement for the Establishment of the Commission of Small Island States on Climate Change and International Law (COSIS) on the eve of COP26. The Agreement was registered with the United Nations in accordance with Article 102 of the Charter of the United Nations.

The Republic of Palau acceded to the Agreement in November 2021, Niue in September 2022, Vanuatu in December 2022, and St. Lucia in December 2022. Membership is open to any member of the Alliance of Small Island States (AOSIS)."The mandate of the Commission shall be to promote and contribute

to the definition, implementation, and progressive development of rules and principles of international law concerning climate change, including, but not limited to, the obligations of States relating to the protection and preservation of the marine environment and their responsibility for injuries arising from internationally wrongful acts in respect of the breach of such obligations."

INDIA –US

The U.S.-India initiative on Critical and Emerging Technology (iCET) is considered a major success for bilateral relations that would set the stage for a whole new phase in ties. With the conclusion of all foundational agreements, a plethora of military exercises, growing inter-operability and coordination on maritime operations, not to mention the considerable purchases in the pipeline of military hardware.

A broader mutual understanding has been sparked by many of the old irritants going away from relations: the de-hyphenation of U.S.-India ties with Pakistan, silence over old concerns on Jammu-Kashmir that once roiled ties, India's increased engagement with the Quad (India, Australia, Japan, and the U.S.) and the U.S.'s Indo-Pacific strategy, and shared concerns over China's aggression have brought Delhi and DC increasingly on the "same page", internationally.

India has chosen a more historical frame that also considers the disruption to other players like the Global South on issues such as food, fertilizer, and energy security. There have been some compromises: The U.S. has withdrawn its objections to India's continued purchase of oil and other Russian exports and held off any talk of sanctions, while India has put over the annual India-Russia summit for two years' now.

China Factor

On the other multilateral front and growing concerns over China's threats against Taiwan, with the latest conflagration over the Philippines in the South China Sea too, India-U.S. cooperation at the Quad Has Flagged somewhat.

- **SPECIAL CATEGORY STATES**

The concept of SCS was first brought into existence through the recommendations made by the Fifth Finance Commission in 1969. It was done to benefit a few States through special grants from the Centre. Five factors stood as the qualifying benchmark for the granting of SCS States that comprise a majority tribal population, low density of population, hilly States close to international borders, States that have socio-economic and industrial backwardness, and lack of adequate State finances.

Ever since the bifurcation of unified Andhra Pradesh, the residual State has been facing a revenue deficit. Additionally, the debts of the State have shot up enormously.

What is special category status?

Special category status is a classification of regions or states by the central government to provide special assistance in the form of tax benefits and financial support for the development of the region. It was first introduced in 1969 based on the recommendations of the Fifth Finance Commission.

What are the criteria for providing special status to a state?

The criteria listed by the government include

(1) Hilly and difficult terrain

(2) Low population density

(3) Strategic location along the borders with neighbouring countries

(4) Economic and infrastructural backwardness and

(5) Non-viable nature of state finances.

Which states have special category status?

In 1969, three states Jammu & Kashmir (now a Union Territory after revocation of Article 370), Assam, and Nagaland were granted the special category status. Subsequently, 8 more states have been granted such a status.
It includes Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Tripura, Himachal Pradesh and Uttarakhand. Telangana was granted the

special category status. Subsequently, 8 more states have been granted such a status.

It includes Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Tripura, Himachal Pradesh and Uttarakhand. Telangana was granted a special status tag after it was carved out of Andhra Pradesh in 2014

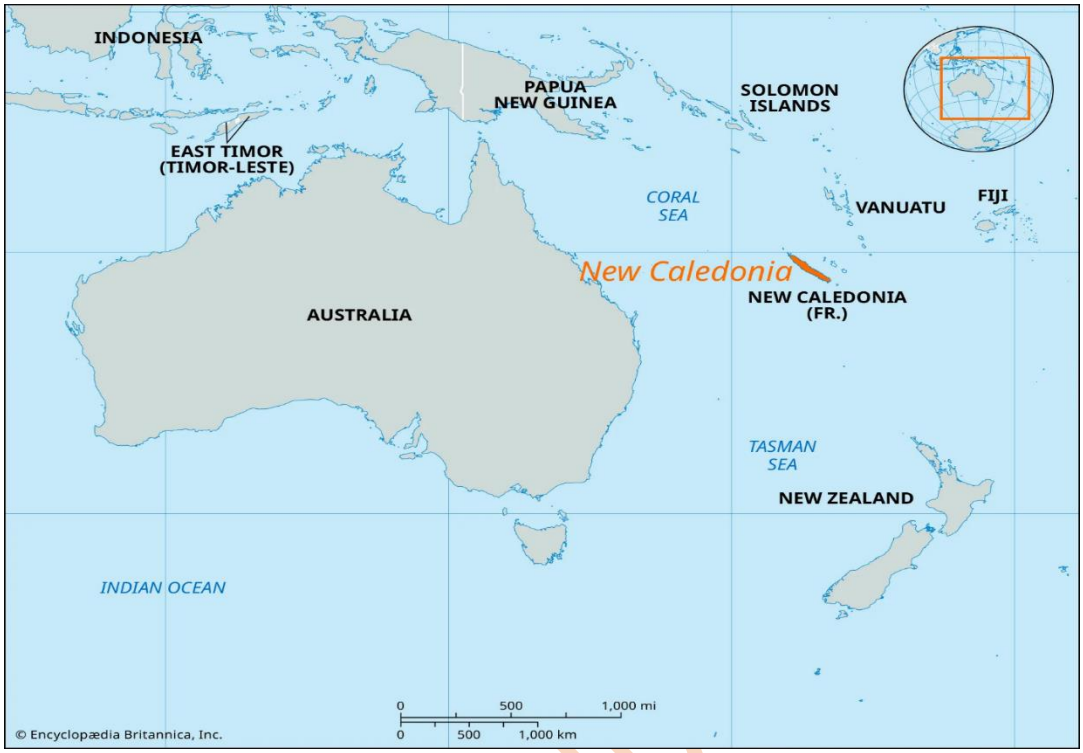
What are the benefits of special category status?

States that come under special category status get preferential treatment in getting central assistance and tax breaks. For the implementation of the centrally-sponsored scheme, the special category status states are required to contribute just 10% while the central government provides 90% of the fund.

For other states the center provides 60%-70% of the fund. Allotted money if not spent, lapse for the normal states, but in the case of special category states it is carried forward. Special category states are provided tax breaks to attract investments. Special category states are provided tax breaks to attract investments. They are also given preferential treatment in allocation of central funds assistance.

New Calodian

Widespread protests and riots erupted in New Caledonia in response to the French parliament's decision to amend the voters' list. The new amendment bill will pave the way for incorporating citizens who were either born or lived in the territory for at least 10 years. Kanaks, the indigenous community of the territory, opposed this on claims that it diluted their electoral power thus marginalizing them. Post World War II, New Caledonia's migration pattern increasingly reflected that, of what the Kanaks call, "settler colonialism."



- ‘Slow-burn’

A view of the eruption site of the volcano near Grindavik in Iceland on Monday. A volcano in southwestern Iceland has been erupting and spewing red lava close to the coastal town of Grindavik. AP

Lava poured from a volcanic fissure near the town of Grindavík, Iceland, in spring 2024. The eruption, which began on March 16 and remained active over two weeks later, was the largest in a string of four volcanic events on the Reykjanes peninsula starting in December 2023.

Iceland experiences frequent volcanic activity, due to its location both on the Mid-Atlantic Ridge, a divergent tectonic plate boundary, and being over a hotspot. Nearly thirty volcanoes are known to have erupted in the Holocene epoch; these include Eldgjá, the source of the largest lava eruption in human history.

Reports on Pollutants

Pollution from man-made emissions and other sources like wildfires have been linked to around 135 million premature deaths worldwide between 1980 and 2020, a Singapore university said on Monday.
Weather phenomena like El Nino and the Indian Ocean Dipole worsened the effects of these pollutants by intensifying their concentration in the air, Singapore's Nanyang Technological University (NTU) said, unveiling the results of a study led by its researchers. The tiny particles called particulate matter 2.5 (PM 2.5), are harmful to human health when inhaled because they are small enough to enter the bloodstream. They come from vehicle and industrial emissions as well as natural sources like fires and dust storms.

The fine particulate matter "was associated with approximately 135 million premature deaths globally" from 1980 to 2020, It found that people were dying younger than the average life expectancy from diseases or conditions that could have been treated or prevented, including stroke, heart and lung disease, and cancer.

Weather patterns increased the deaths by 14%, the study found. Asia had the "highest number of premature deaths attributable to PM 2.5 pollution" with more than 98 million people, mostly in China and India, the university said.
Pakistan, Bangladesh, Indonesia, and Japan also had significant numbers of premature deaths, ranging from 2 to 5 million people, it added.

Atomic clocks

Atomic clocks are the backbone of the Global Positioning System (GPS), the network of satellites above the earth that we use every day to navigate cities, respond to emergencies, and organize military operations, among other things.

Despite being one of the most accurate timekeeping methods, however, there is still room for improvement. Scientists today are pushing the boundaries with a new technology called optical atomic clocks. The working of an atomic clock Atomic clocks work by keeping time using atoms.

One popular design uses atoms of an isotope of caesium, Cs-133. The International Committee for Weights and Measures first used it in 1967 to define the duration of one second. India also uses a Cs-133 atomic clock to define the second for timekeeping within its borders. Cs-133 is a highly stable atom and is found naturally, which is why it is so commonly used in atomic clocks.
Atomic clocks exploit a fundamental property of all atoms: their ability to jump between different energy levels. Energy levels are like the steps of a ladder. An atom climbs up the ladder by absorbing energy, like electromagnetic radiation. In a Cs atomic clock, the energy needed for the atom to jump to a higher energy level matches the frequency of microwave radiation. This frequency is related in some fully understood way to the duration of a second.

Microwaves are electromagnetic waves with frequencies in the range of 300–300000 MHz. Microwave radiation neither possesses ionizing characteristics nor produces changes in the molecular structure; it can be used to measure the movement of molecules a caesium atomic clock loses or gains a second every 1.4 million years.

Optical atomic clocks use lasers

As part of an optical atomic clock, researchers use lasers to stimulate atomic transitions. The lasers' light is highly coherent: the emitted light waves all have the same frequency and their wavelengths are related to each other in a way that doesn't change. The result is light with more precise properties and great stability. Optical atomic clocks use coherent light to achieve higher accuracy in two main ways. The first is the higher operating frequency of atomic clocks.

The second reason is that optical atomic clocks have much narrower linewidths. The linewidth is the range of frequencies over which the transition occurs. The narrower the linewidth, the easier it is to tune the frequency of the

optical light that produces the resonance. When the frequency of an externally applied periodic force a body is equal to the natural frequency of the body

This leads to higher accuracy because it enables more precise changes. The most commonly used atom in optical atomic clocks is strontium (Sr): it has narrow line widths and stable optical transitions.

Pobitora Wildlife Sanctuary

Pobitora Wildlife Sanctuary is a wildlife sanctuary on the southern bank of the Brahmaputra in Morigaon district in Assam, India. It was declared in 1987 and covers 38.85 km^2 (15.00 sq mi), providing grassland and wetland habitat for the Indian rhinoceros. It holds one of the largest Indian rhinoceros' population in Assam. It is known for holding the highest density of Greater One Horned Rhinoceros in the country. Pobitora Wildlife Sanctuary is also known as "Mini Kaziranga" due to its comparable landscape and notable population of the one-horned rhinoceros.

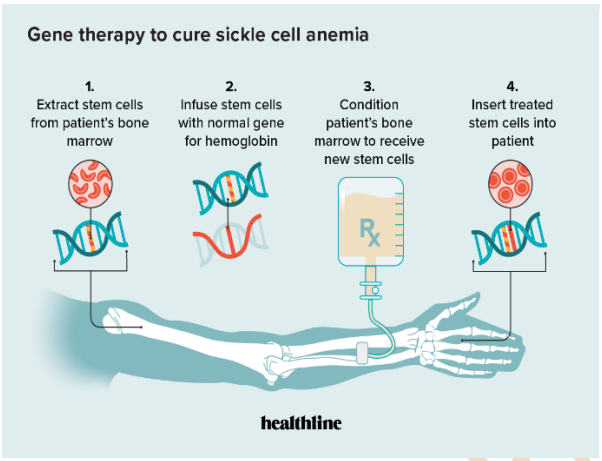
Gene Therapy for sickle cell disease

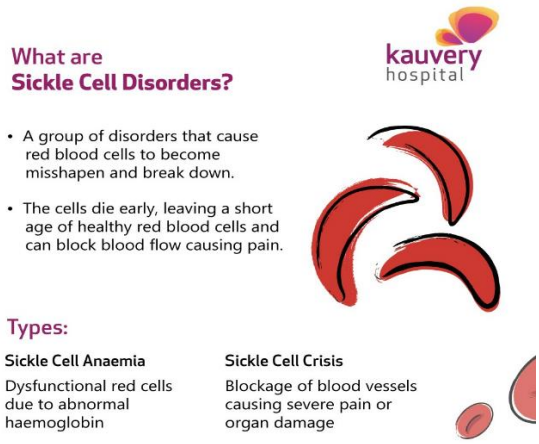
India is getting closer to developing a gene therapy for sickle cell disease, a genetic blood disorder with a high prevalence rate among the Scheduled Tribes. Developing a gene therapy using CRISPR has been part of India's mission to eradicate sickle cell disease by 2047.

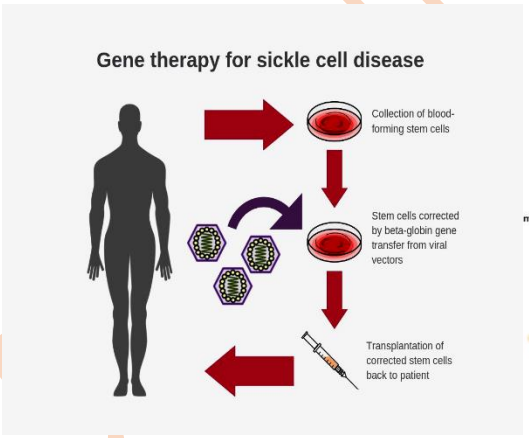
What is Gene Therapy??

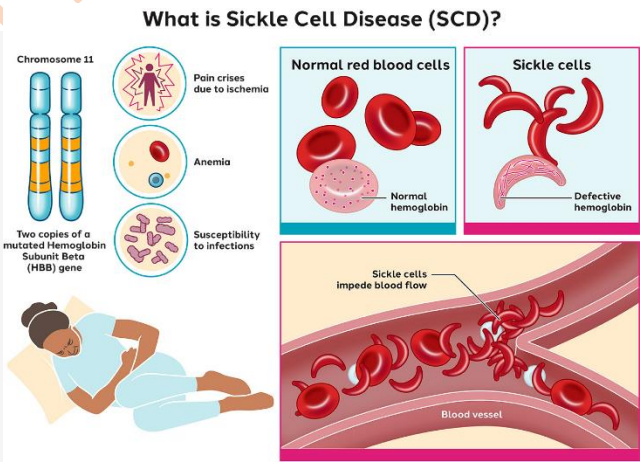
Gene therapy aims to fix a faulty gene or replace it with a healthy gene to try to cure disease or make the body better able to fight disease. It holds promise as a treatment for a wide range of diseases, such as cancer, cystic fibrosis, heart disease, diabetes, hemophilia, and AIDS.

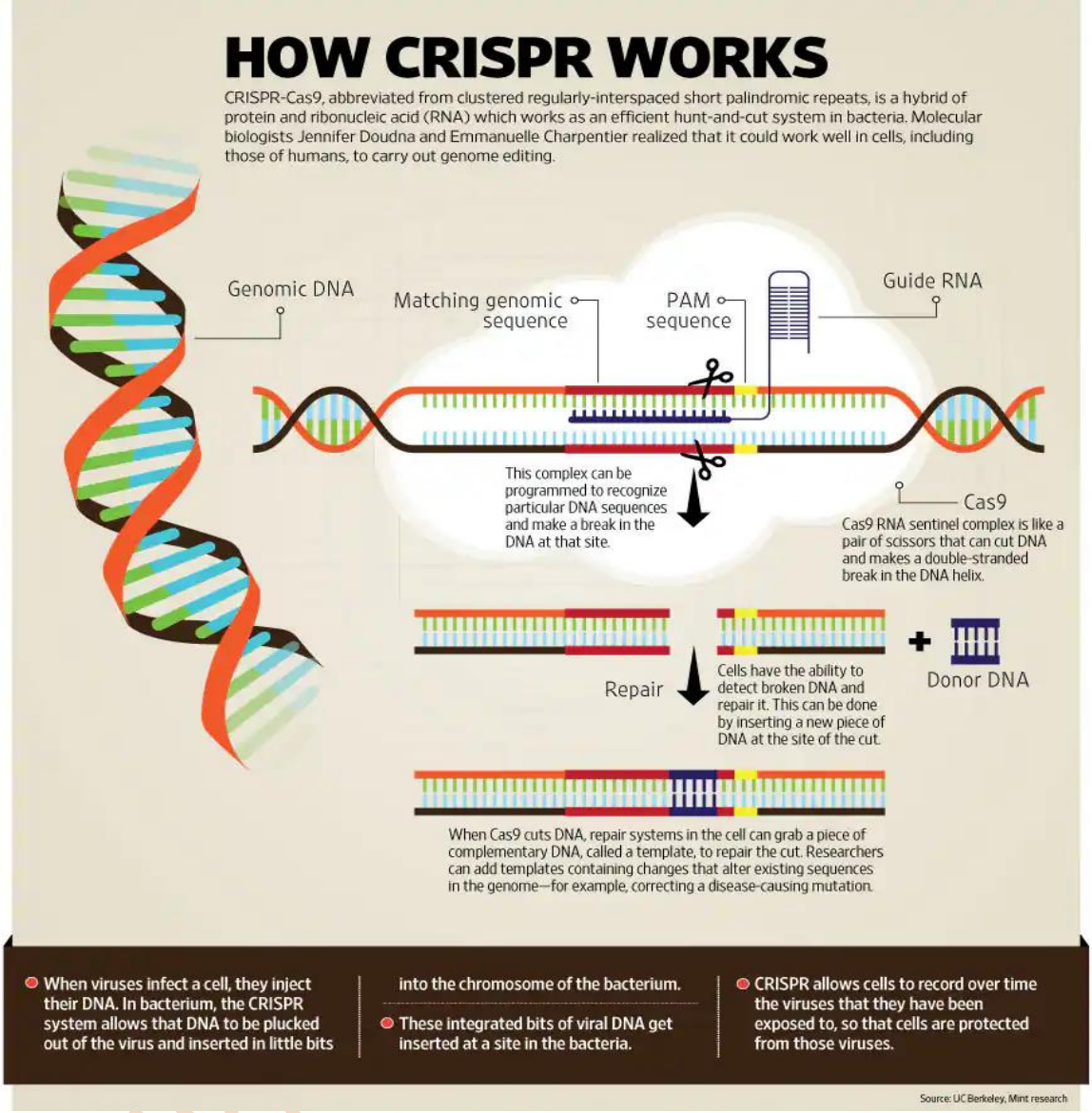

The Principle of Gene Therapy
Nucleus
Therapeutic Transgene
Therapeutic Protein
Target Cell


Gene therapy to cure sickle cell anemia
1. Extract stem cells from patient's bone marrow
2. Infuse stem cells with normal gene for hemoglobin
3. Condition patient's bone marrow to receive new stem cells
4. Insert treated stem cells into patient
Rx
healthline


What are Sickle Cell Disorders?
kauvery hospital
• A group of disorders that cause red blood cells to become misshapen and break down.
• The cells die early, leaving a short age of healthy red blood cells and can block blood flow causing pain.
Types:
Sickle Cell Anaemia
Dysfunctional red cells due to abnormal haemoglobin
Sickle Cell Crisis
Blockage of blood vessels causing severe pain or organ damage


Gene therapy for sickle cell disease
Collection of blood-forming stem cells
Stem cells corrected by beta-globin gene transfer from viral vectors
Transplantation of corrected stem cells back to patient


What is Sickle Cell Disease (SCD)?
Chromosome 11
Two copies of a mutated Hemoglobin Subunit Beta (HBB) gene
Pain crises due to ischemia
Anemia
Susceptibility to infections
Normal red blood cells
Normal hemoglobin
Sickle cells
Defective hemoglobin
Sickle cells impede blood flow
Blood vessel

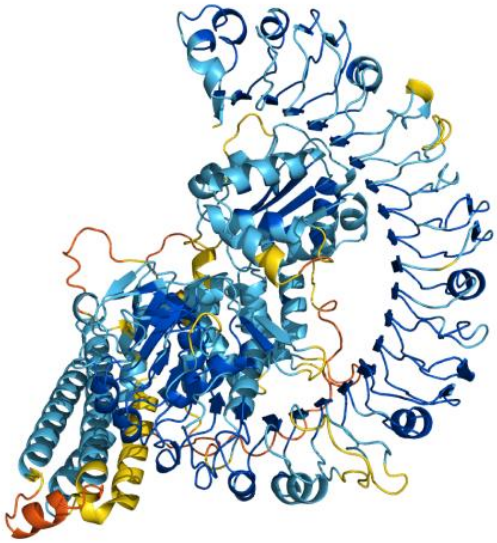


AI for protein structure

Proteins are one of the most important molecules of life, with almost every biological function from birth to death being regulated by them in some way. Each protein is made up of a string of smaller building blocks called amino acids, which contain all the information to transform proteins from a single sequence to a folded, functional 3D structure.

The steps a protein takes to go from its straight form to its final form are too many to count and too hard to follow, leaving the question of how every protein folds the famous protein-folding problem unanswered

Google DeepMind's protein-structure prediction software AlphaFold burst onto the scene in 2020.AlphaFold uses machine learning and artificial intelligence (AI) to accurately predict protein structures from an amino acid sequence, seemingly solving the protein-folding problem without learning any of the deeper physical principles that drive this biological process.



Heat Traps

Indian cities have become "heat traps" due to their unbalanced growth devouring water bodies and increasing greenhouse emissions. Unbalanced urban growth, which has reduced wetlands and water bodies, was another factor. Most Indian states were implementing heat action plans that included provisioning drinking water and better medical facilities, as well as rescheduling outdoor work and school vacations increasing heat insulation of buildings, developing shelters for urban poor and slum dwellers, and investing in cooling water bodies.

The phenomenon of heat being trapped in cities, often referred to as the "urban heat island" (UHI) effect, is a significant environmental issue that affects the climate and air quality of urban areas. This effect causes urban regions to become warmer than their rural surroundings, primarily due to human activities and the physical characteristics of urban environments.

Causes of Urban Heat Island Effect

1. **Surface Albedo: Urban areas typically have low albedo, meaning they absorb and retain more heat. Materials commonly used in urban areas, such as asphalt and concrete, have much lower albedo compared to natural landscapes like forests and fields.**
2. **Lack of Vegetation: Vegetation plays a key role in cooling the environment through the processes of shading and evapotranspiration. Urban areas often lack sufficient green spaces, contributing to higher temperatures.**
3. **Building Density: High density of buildings and narrow streets can trap heat in small areas, reducing airflow and preventing heat from dissipating during the night.**
4. **Waste Heat: Cities generate a large amount of heat from vehicles, factories, and air conditioning systems, which contributes to higher temperatures.**
5. **Air Pollution: High levels of pollutants in urban areas can also absorb and trap more heat in the atmosphere.**

Impacts of Urban Heat Islands

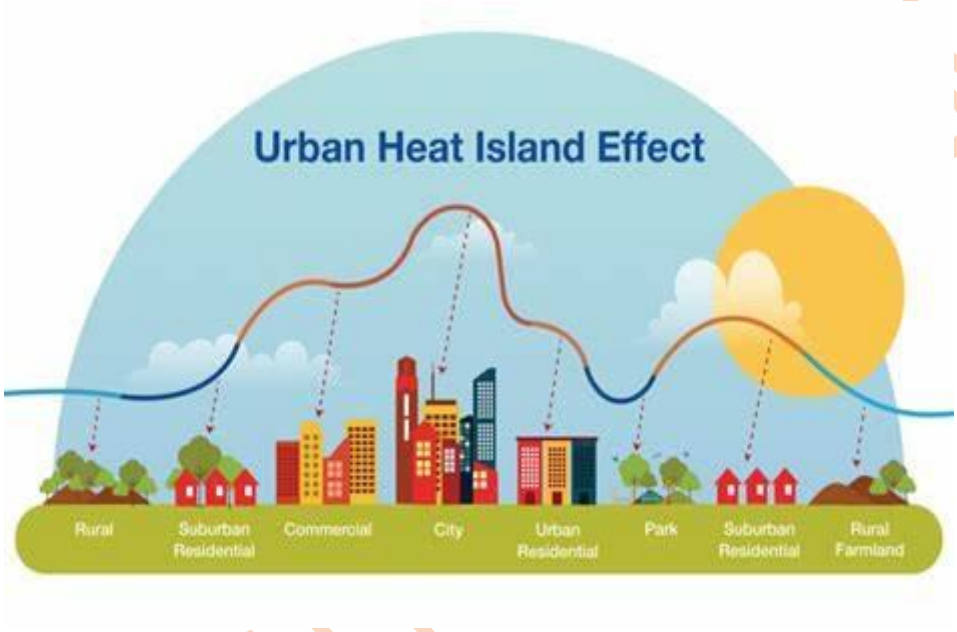
1. **Increased Energy Consumption: Higher temperatures in cities increase the demand for air conditioning, which not only consumes a significant amount of energy but also contributes to higher emissions of greenhouse gases.**
2. **Heat-Related Illnesses: Elevated temperatures can lead to an increase in heat-related illnesses and mortality, particularly among vulnerable populations such as the elderly, children, and those with pre-existing health conditions.**
3. **Reduced Air Quality: Heat can worsen air quality by increasing the formation of ground-level ozone, a key component of smog.**
4. **Water Quality Issues: Increased temperatures can affect water quality by promoting the growth of algae in water bodies, which can be harmful to aquatic life and affect water portability.**

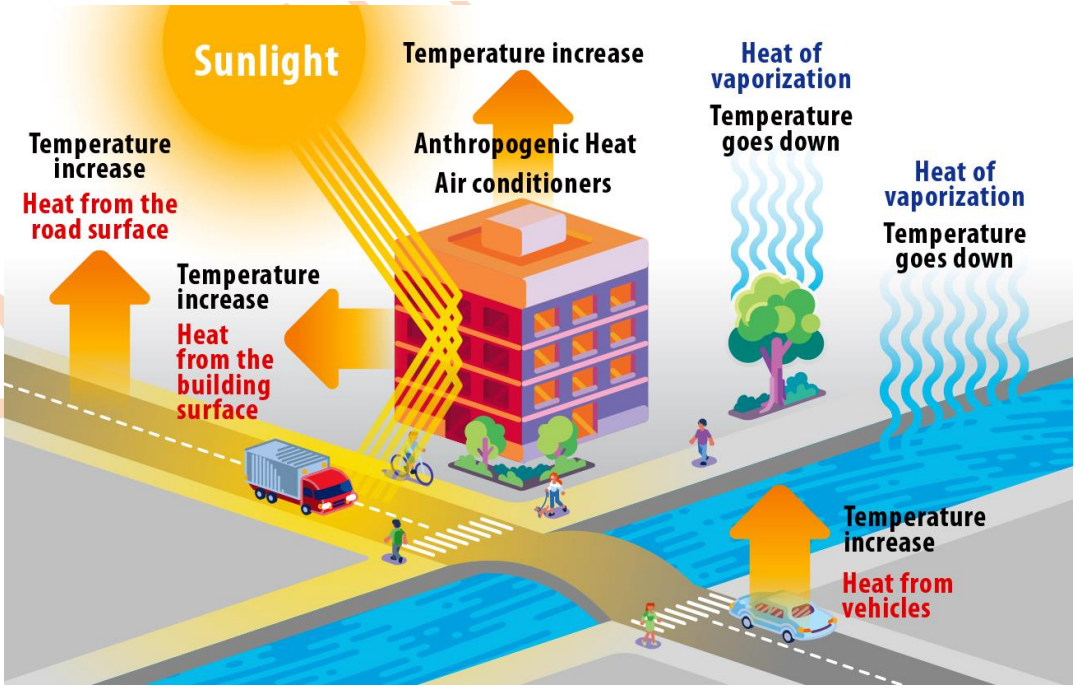
Mitigation and Adaptation Strategies

1. **Increasing Green Spaces: Planting more trees and creating green roofs can help cool the air through shading and evapotranspiration. Trees and other plants also improve air quality and enhance urban aesthetics.**
2. **Cool Roofs and Pavements: Implementing cool roofs and pavements that reflect more sunlight and absorb less heat can significantly reduce the UHI effect.**
3. **Enhanced Building Codes: Promoting better building designs that enhance natural ventilation and use energy-efficient appliances and materials can reduce heat generation and energy consumption.**
4. **Urban Planning: Effective urban planning can mitigate the UHI effect by incorporating open spaces, water bodies, and integrated green infrastructure.**
5. **Community Engagement and Policy: Local governments can develop policies that encourage or mandate the implementation of UHI reduction strategies.**

Public awareness and community participation are crucial for the success of these initiatives.

Overall, addressing the urban heat island effect requires a multifaceted approach involving architectural, environmental, and policy changes. By adopting these strategies, cities can become more livable and sustainable, especially in the face of rising global temperatures.





World Refugee Day

Each year on 20 June, the world celebrates World Refugee Day, the international day to honour people who have been forced to flee. In line with this year's theme, "Solidarity with Refugees", WHO emphasizes the importance of building inclusive health systems and ensuring equitable care for refugees worldwide. WHO highlights solidarity and health, celebrates refugee resilience, advocates for their health rights, and strives to create a world where everyone, regardless of migratory status, enjoys universal access to quality health care.

UNHCR, the UN Refugee Agency, is a global organization dedicated to saving lives, protecting rights, and building a better future for people forced to flee their homes because of conflict and persecution. We lead international action to protect refugees, forcibly displaced communities, and stateless people.

Our vision is a world where every person forced to flee can build a better future. Formally known as the Office of the High Commissioner for Refugees, UNHCR was established by the General Assembly of the United Nations in 1950 in the aftermath of the Second World War to help the millions of people who had lost their homes.

Snow persistence

The Ganga river basin India's largest reached a record low snow persistence in 2024, the Hindu Kush Himalaya snow update of the International Centre for Integrated Mountain Development (ICIMOD) has reported. The Brahmaputra and the Indus basins have suffered similarly, threatening water supply to millions of people.

What is snow persistence?

Snow persistence is the fraction of time snow is on the ground. When this snow melts, it provides water to people and ecosystems. In the river basins of the Hindu Kush Himalaya (HKH), snowmelt is the biggest source of water in the

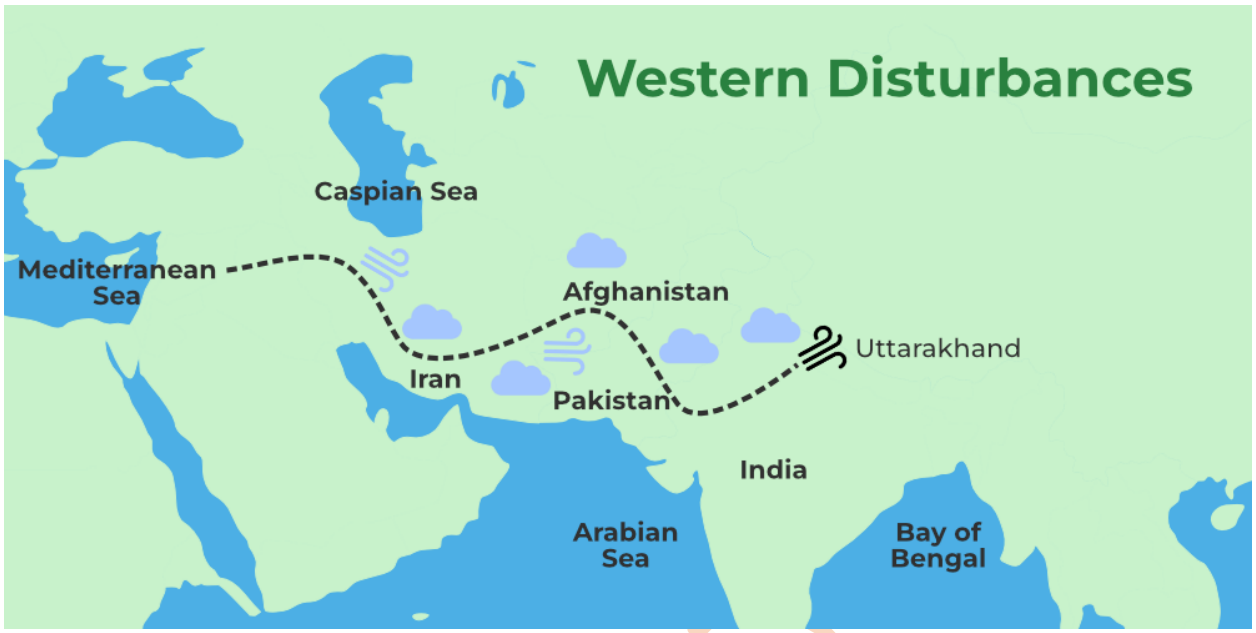
streams. Overall, it contributes 23% of the runoff to the region's 12 major river basins every year. The HKH mountains extend around 3,500 km over eight countries Afghanistan, Bangladesh, Bhutan, China, India, Nepal, Myanmar, and Pakistan. These mountains are also called the "water towers of Asia" because they are the origins of 10 crucial river systems on the continent Amu Darya, Indus, Ganga, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtse, Yellow River, and Tarim.

These river basins provide water to almost one-fourth of the world's population and are a significant freshwater source for 240 million people in the HKH region. In India, snow persistence in the Ganga, the Brahmaputra, and the Indus River basins dropped significantly in 2024.

The Ganga River basin noted its lowest snow persistence in 22 years, 17% below the long-term historical average (also known as 'normal'). Outside India, the basin of the Amu Darya River which flows through Central Asia recorded its lowest snow persistence in 2024: 28.2% below normal.

What explains the lower snow persistence in 2024?

The primary reason for the lower persistence in 2024 was weak western disturbances. "Due to changing climate and global warming, this pattern is becoming increasingly unstable. Although the exact mechanisms are not fully understood, global warming is thought to exacerbate prolonged and intense La Niña–El Niño conditions. These phases of a recurring climate pattern across the tropical Pacific Ocean significantly influence global weather patterns, including western disturbances," he added.

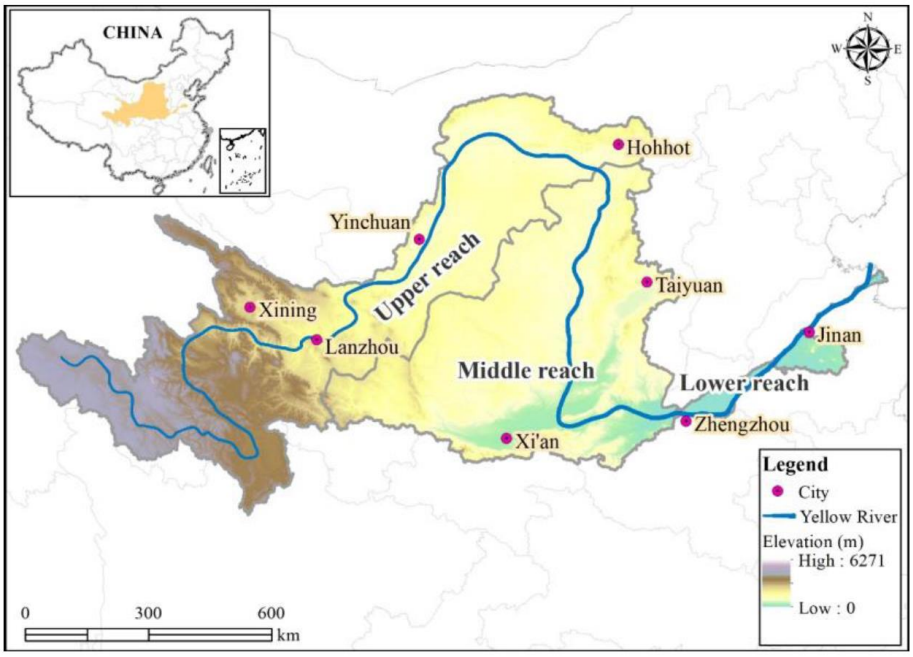


Western disturbances are low-pressure systems that originate over the Mediterranean Sea, the Caspian, and the Black Seas and bring rain and snow to the HKH region in winter. "The region where these storms originate experienced persistently high sea-surface temperatures,". "This disruption weakened and delayed the arrival of the western disturbance, resulting in reduced winter precipitation and snowfall in the HKH region (Himalaya - hindukush region)

What explains higher snow persistence?

The persistence of snow in China's Yellow River basin exceeded the normal value by 20.2% in 2024. "The Yellow river basin is an area where the East Asian winter monsoon brings cold, dry air from Siberia and Mongolia,"

"When this cold air mass interacts with moist air from other regions, particularly the Pacific Ocean, it can result in snowfall over the higher altitudes of the upper Yellow River basin." "When the cold air from the east Asian winter monsoon systems interacts with moist air masses from the Pacific Ocean, it can result in snowfall at higher elevations in the eastern Himalaya,"



What about India?

Snow persisting on the ground is important for the Ganga river basin because its melt contributes to 10.3% of the latter's water, versus 3.1% from glacier melts. In the Brahmaputra and the Indus basins as well, snowmelt brings 13.2% and around 40% of the water, respectively, versus 1.8% and 5% from glaciers. "Lower snow in 2024 may affect water availability, particularly and most importantly in the Indus basin if there is less rainfall in the early season,"."

In the long term, experts say, reforestation with native tree species can help the ground retain more snow. Better weather forecasting and early warning systems can also help local communities prepare for impending water stress.
"Improving water infrastructure and developing policies for protecting areas receiving snowfall is important for long-term change.

Health and economics

The law is quite clear. Article 21 of the Indian Constitution guarantees the right to life and personal liberty, including the right to health, as an integral part of

this fundamental right. Furthermore, the Directive Principles of State Policy (DPSP) under Articles 39(e), 39(f), 41, 42, and 47 mandate the state to work towards improving public health, ensuring social justice, and raising the standard of living. These provisions compel the state to prioritize the health and well-being of its citizens over the economic benefits of tobacco farming.

CRISPR AND TOBACCO

In scientific innovation, the gene editing technique CRISPR (clustered regularly interspaced short palindromic repeats) presents a potential solution to the tobacco epidemic. Researchers are using CRISPR to develop genetically modified tobacco plants that are less harmful or harmless. This technology could potentially alter the nicotine content and other harmful substances in tobacco leaves, providing a safer alternative for consumers. For example, targeting the transcription factor genes ERF199 and ERF189 resulted in an ultra-low-nicotine phenotype. Knocking out the QPT2 gene drastically reduced nicotine production but caused severe growth inhibition, making it unsuitable for agricultural use.

The WHO Framework Convention on Tobacco Control (WHO FCTC) is the first international treaty negotiated under the auspices of WHO. It was adopted by the World Health Assembly on 21 May 2003 and entered into force on 27 February 2005. It has since become one of the most rapidly and widely embraced treaties in United Nations history.

The WHO FCTC was developed in response to the globalization of the tobacco epidemic and is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. The Convention represents a milestone for the promotion of public health and provides new legal dimensions for international health cooperation

Strategic autonomy in foreign policy

A simple definition of the concept is that countries should be able to make decisions that best serve their national interests, irrespective of the pulls and pressures from other parties.

There are two elements to this concept.

The first is the inherent conviction that a nation is capable of taking decisions that serve its interests. The second is that the nation should have the will and the resources to take those decisions even in the face of high pressure. So, if India is not able to make autonomous foreign policy decisions during times of "conflict" and "crisis moments", as Mr. Garcetti has said, it is not exercising its strategic autonomy.

All Indian governments since Independence have followed strategic autonomy in one form or the other, whether it is called non-alignment, multi-alignment, multi-directional foreign policy, or strategic autonomy. From India's point of view, the global order is again changing. The U.S. remains the world's most powerful country but the world order is no longer unipolar. China, already the world's second-largest economy, is rising as a strong competitor to America's global primacy.
Russia is challenging the western security architecture in Europe, militarily. In West Asia, a shadow war between Israel, an American ally, and Iran, a close Russian strategic partner, is heating up. In an anarchic order, India wants to strike a balance between great powers without joining any alliance system.

And for this, maintaining its strategic autonomy is essential. The Russia policy is a case in point. While energy ties with Russia are largely opportunistic and driven by cheap prices (India's crude imports from Russia jumped from $2.4 billion in 2021-22 to $46.5 billion in 2023-24), the defence partnership is structural. Russia is the source of over 40% of India's defence imports, and 86% of the Indian military's equipment is of Russian origin. This cannot be undone overnight.

Russia is also an important partner in continental Asia where India works with Eurasian powers for economic progress, connectivity and tackling security challenges. To be sure, Russia's deepening ties with China alter the essence of India's historical partnership with Moscow. But it is also an opportunity to recast the India-Russian partnership as a more equal bilateral partnership

during the Cold War it was heavily lopsided where both sides would be mindful of each other's sensitivities.

The world is already multipolar, economically, but a similar transition has not taken place in its power dynamics. India wants to improve the system where its voice, and that of the Global South, would be heard with greater interest. For New Delhi, strategic autonomy does not call for isolationism. It calls for greater engagement with different power centers rooted in informed national interest. Theorists of strategic autonomy do not look at foreign policy as a zero-sum game, where Foreign tribunals

How did the FTs come about?

The FTs are quasi-judicial bodies formed through the Foreigners (Tribunals) Order of 1964 under Section 3 of the Foreigners' Act of 1946, to let local authorities in a State refer a person suspected to be a foreigner to tribunals.
The FTs are currently exclusive to Assam as cases of "illegal immigrants" are dealt with according to the Foreigners' Act in other States. Each FT is headed by a member drawn from judges, advocates, and civil servants with judicial experience.

How does an FT function?

According to the 1964 order, an FT has the powers of a civil court in certain matters such as summoning and enforcing the attendance of any person examining him or her on oath and requiring the production of any document.
A tribunal is required to serve a notice in English or the official language of the State to a person alleged to be a foreigner within 10 days of receiving the reference from the authority concerned.

Frozen feast

Cooling off: A tamarin monkey eats frozen fruits to cool off at the Bioparco di Roma zoo during a heat wave in Rome, Italy on Thursday. AFP

Tamarins Monkey

The tamarins are squirrel-sized New World monkeys from the family Callitrichidae in the genus *Saguinus*. They are the first offshoot in the Callitrichidae tree and therefore are the sister group of a clade formed by the lion tamarins, Goeldi's monkeys, and marmosets

Tamarin species vary considerably in appearance, ranging from nearly all black through mixtures of black, brown, and white. Mustache-like facial hairs are typical for many species.

Tamarins range from southern Central America through central South America, where they are found in northwestern Colombia, the Amazon basin, and the Guianas.

The Adyar River

Misson clean-up

Action plan: Workers clearing the Adyar river mouth in Chennai on Tuesday. The Water Resources Department has engaged more machinery to clear silt and complete the project by June-end. B. VELANKANNI RAJ

The Adyar River, originating near the Chembarambakkam Lake in Kanchipuram district, is one of the three rivers which winds through Chennai (Madras), Tamil Nadu, India, and joins the Bay of Bengal at the Adyar estuary. The 42.5-kilometre (26.4 mi) long river contributes to the estuarine ecosystem of Chennai.

Despite the high pollution levels, boating and fishing take place in this river.

Most of the waste from the city is drained into this river and the Cooum. India's First joint doctrine for cyberspace operations. Acknowledging that cyberspace has emerged as a crucial and challenging domain in modern warfare, the Chief of Defence Staff, General Anil Chauhan, released India's First joint doctrine for cyberspace operations.

The joint doctrine is a keystone publication that will guide commanders of the armed forces in conducting cyberspace operations in today's complex military operating environment, the Defence Ministry said in a statement. Unlike territorial limits in the traditional domains of warfare, cyberspace is a "global common and hence has shared sovereignty", the Ministry statement said.

"Operations in cyberspace need to be dovetailed into the national security fabric, to evolve the 'ends,' 'ways' and 'means' to create advantage and influence events in all other operational environments and across all instruments of power,

Kollam port

The Union government has designated the Kollam port in Kerala as an authorised Immigration Check Post (ICP) for entry and exit from India with valid travel documents for all classes of passengers, an order by the Union Ministry of Home Affairs (MHA) said.

The MHA notification was issued under Rule 3 (b) of the Passport (Entry into India) Rules, 1950. The MHA had earlier informed a parliamentary panel that India has 31 authorised seaport ICPs and out of those 10 are under the direct control and management of the Bureau of Immigration, Ministry of Home Affairs.
The remaining Immigration Check Posts are controlled by State police agencies. Kollam Port is one of the oldest ports situated 4 kilometers away from Downtown Kollam It is the second largest port in Kerala by volume of cargo handled and facilities and one of the four Kerala ports having an immigration checkpoint facility.

Kudankulam Nuclear Power Project's (KKNPP)

Russia is all set to ship the first batch of 26 turbine hall pipeline valves, weighing about 27.5 tonnes, for the Kudankulam Nuclear Power Project's (KKNPP) reactors 5 and 6. These specially designed valves can withstand temperatures up to 350 degrees Celsius. Russian State Atomic Energy Corporation, Rosatom's machine-building plant Petrozavodsk mash is shipping the turbine hall pipeline valves to KKNPP. These valves are used in piping systems to monitor and control the flow of fluids or gases. Rosatom has agreed to supply fuel to the power units of the KKNPP throughout their life

Kudankulam Nuclear Power Plant

Kudankulam Nuclear Power Plant is the largest nuclear power station in India, situated in Kudankulam in the Tirunelveli district of the southern Indian state of Tamil Nadu. Construction on the plant began on 31 March 2002, KKNPP is scheduled to have six VVER-1000 reactors built in collaboration with Atomstroyexport, the Russian state company and Nuclear Power Corporation of India Limited (NPCIL), with an installed capacity of 6,000 MW of electricity.

"Spherical super hydrophobic activated carbon catalyst"

A team of scientists from Assam and Odisha in India, China, and the U.K. has developed a water-repellent catalyst that can cut the cost of producing "environmentally benign" biodiesel substantially from the current levels. The process of arriving at the "spherical super hydrophobic activated carbon catalyst" to withstand water byproduct during the production of biodiesel pursued as a substitute for diesel, an exhaustible fossil fuel.

Super-hydrophobic catalysts, imitating the anti-wetting or water-repulsing properties of natural surfaces such as lotus leaves, are deemed crucial for their ability to prevent the poisoning of active sites by water, produced in situ or as a by-product.

"Our novel super hydrophobic catalyst can be a game-changer in the field of biodiesel production. It stands out because of its unmatched robustness; it can

withstand the water byproduct during biodiesel production," catalyst, derived from biomass (cellulose), is ecologically benign, abundant, and highly affordable.
"This breakthrough has the potential to significantly reduce the cost of biodiesel production, making sustainable energy more accessible,"

Chichén Itzá

Chichén Itzá is an ancient Mayan city located in modern-day Mexico. It is known for its grand architecture and iconic ceremonial temples, built around 800-1000 AD. The temples are also infamous for having been the site of human sacrifices made as ritual offerings and have been under constant archaeological investigation for more than a century. The Maya civilization developed in the Maya Region, an area that today comprises southeastern Mexico, all of Guatemala and Belize, and the western portions of Honduras and El Salvador.

It includes the northern lowlands of the Yucatán Peninsula and the Guatemalan Highlands of the Sierra Madre, the Mexican state of Chiapas, southern Guatemala, El Salvador, and the southern lowlands of the Pacific littoral plain.

- **Why do clouds go grey before they rain?**

Scattered water droplets in the clouds are the reason. When the Sun shines over clouds, water droplets in the latter act like prisms, splitting white sunlight into its component colors. They send these rays of light of different colors (frequencies) flying in different directions at haphazard angles.
These rays often manage to recombine because there are several droplets in clouds, all scattering sunlight and creating white light. This is why clouds are white. But just before clouds are going to rain, the water droplets are swollen.

They coalesce to form larger droplets, of a few millimeters or more each. These droplets absorb more light and transmit less to the base of the clouds. As a result, these clouds have a greyish appearance; only their base scatters white light (image) to observers on the ground

Meety rice

This unique type of rice is prepared by embedding cultured beef cells into individual grains of rice. It is considered an eco-friendly, ethical, and sustainable way for people to get their protein. What makes it unique is the faint buttery aroma due to beef muscles and fat cells and the beautiful pink hue.

How do forest fires start in the State?

Fires in the Himalayas occur during the pre-monsoon summer period of moisture stress, due to the resultant depletion of snowmelt water. The moisture conditions of the pre-monsoon season, characterized by rainstorms, play a critical role in determining the nature of forest fires. The less moisture there is the greater the impact of the fires. Human activities such as unattended campfires, discarded cigarettes, etc., are also some of the common causes of forest fires.

These fires are also a major source of pollutants, including black carbon, which significantly contributes to glacier melt in the Himalayas and negatively influences the regional climate. The primary causes of these forest fires are faulty forestry practices, and treating forests from a utilitarian perspective, excluding people's participation.

Himalayan transformation

Early 20th century State-managed forestry led to the gradual replacement of the Banj oak, a source of fuel, fodder, and leaf manure, with the Chir pine, which was more valued commercially as a source of timber and resin. Ecologically, Banj forests absorb a high content of rainwater, leading to better moisture retention and water springs in the mountains.

Currently, more than 17.8% of the total 37,033 square kilometers of forest area is covered with Chir pine trees in H.P. Chir forests are very vulnerable to forest fire

What needs to be done?

Democratization of forests is essential to ensure that people and communities who have lived in and around forests are made part of the forest management

process. The rights of the local community have been periodically curtailed, and as a result, when forest fires start, first responders are nowhere to be found. The traditional forest rights of Himalayan dwellers included the right to extract wood for fuel, timber, fodder, and other activities.

H.P. is under Schedule V of the Indian Constitution, which requires community assent for development activities in the region. However, for large projects like hydro power generation, road widening, and four-lane highways, forests are being diverted with ease. What the Himalayan States now need is to build mixed forestry and remove pine trees; ensure that both scientific and community knowledge converge and forest management is conducted in a participatory manner; implement check dams and other methods to revive water springs; create environmental services at the village level;

Second Thomas Shoal

Second Thomas Shoal, also known as Ayungin Shoal and Rén'ài Jiāo is a submerged reef in the Spratly Islands of the South China Sea, 105 nautical miles (194 km; 121 mi) west of Palawan, Philippines

Buddhavanam

Buddhavanam is a tourism project in Nagarjuna Sagar, Telangana created by the Telangana State Tourism Development Corporation. The project was sanctioned by the Government of India viz., Integrated Development of Nagarjunasagar as part of the Lower Krishna Valley Buddhist circuit to attract large number of domestic and foreign tourists, particularly from the South-East Asian countries.

Artificial Intelligence Act

Ground-breaking law aiming to harmonise rules on artificial intelligence, the so-called artificial intelligence act. The flagship legislation follows a 'risk-

based' approach, which means the higher the risk to cause harm to society, the stricter the rules.

The new law aims to foster the development and uptake of safe and trustworthy AI systems across the EU's single market by both private and public actors. At the same time, it aims to ensure respect for the fundamental rights of EU citizens and stimulate investment and innovation in artificial intelligence in Europe

The AI act applies only to areas within EU law and provides exemptions such as for systems used exclusively for military and defense as well as for research purposes. GPAI models not posing systemic risks will be subject to some limited requirements, for example with regard to transparency, but those with systemic risks will have to comply with stricter rules.

To ensure proper enforcement, several governing bodies are set up:

An AI Office within the Commission to enforce the common rules across the EU

A scientific panel of independent experts to support the enforcement activities

An AI Board with member states' representatives to advise and assist the Commission and member states on consistent and effective application of the AI Act

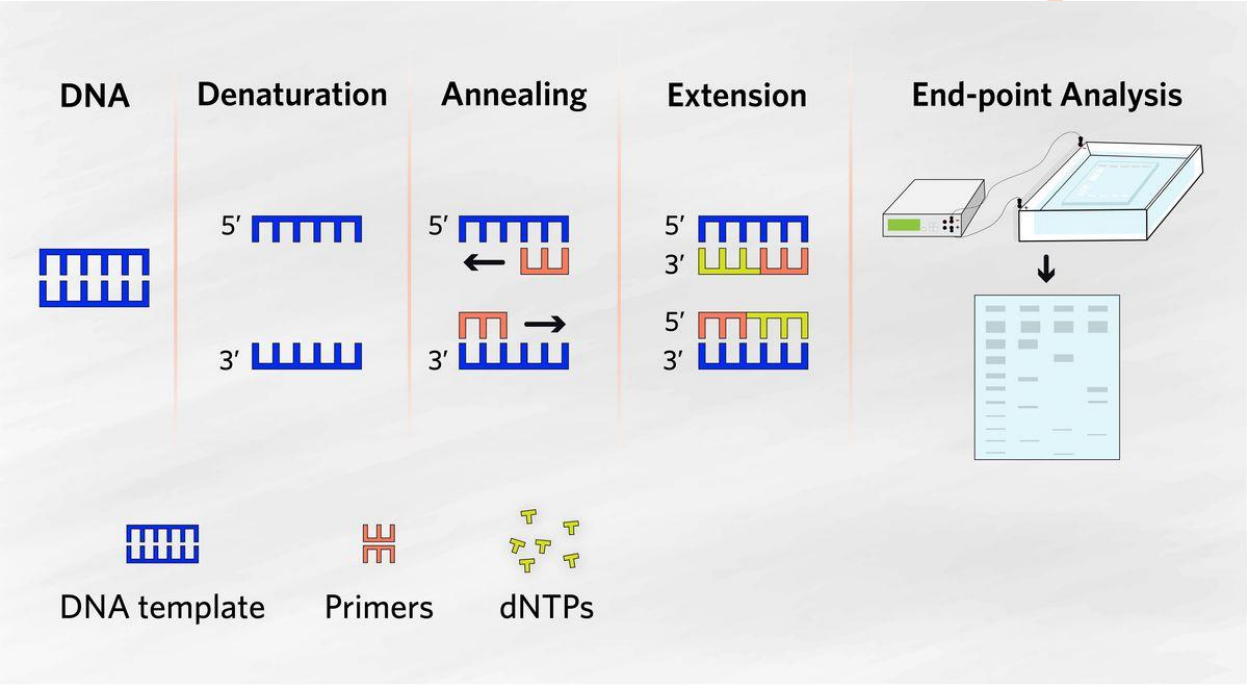
An advisory forum for stakeholders to provide technical expertise to the AI Board and the Commission

But as the industry booms, questions have been raised over how AI companies obtain the data used to train their models, and whether feeding them bestselling books and Hollywood movies without their creators' permission amounts to a breach of copyright

The Truenat platform

The Truenat platform, a rapid molecular test for the diagnosis of pulmonary, extrapulmonary, and rifampicin-resistant tuberculosis, that was developed in India, has been hailed for its role in combating TB and as a possible component of global healthcare solutions at the recently held 77th World Health Assembly in Geneva.

Developed by Goa-based Molbio, a point-of-care molecular diagnostics company, Truenat was first launched in 2017 and is a real-time quantitative micro-PCR system.
It is a portable, battery-operated machine that can be deployed at labs, health centres, and in the field. Truenat delivers results from samples in less than an hour and can test for over 40 diseases.

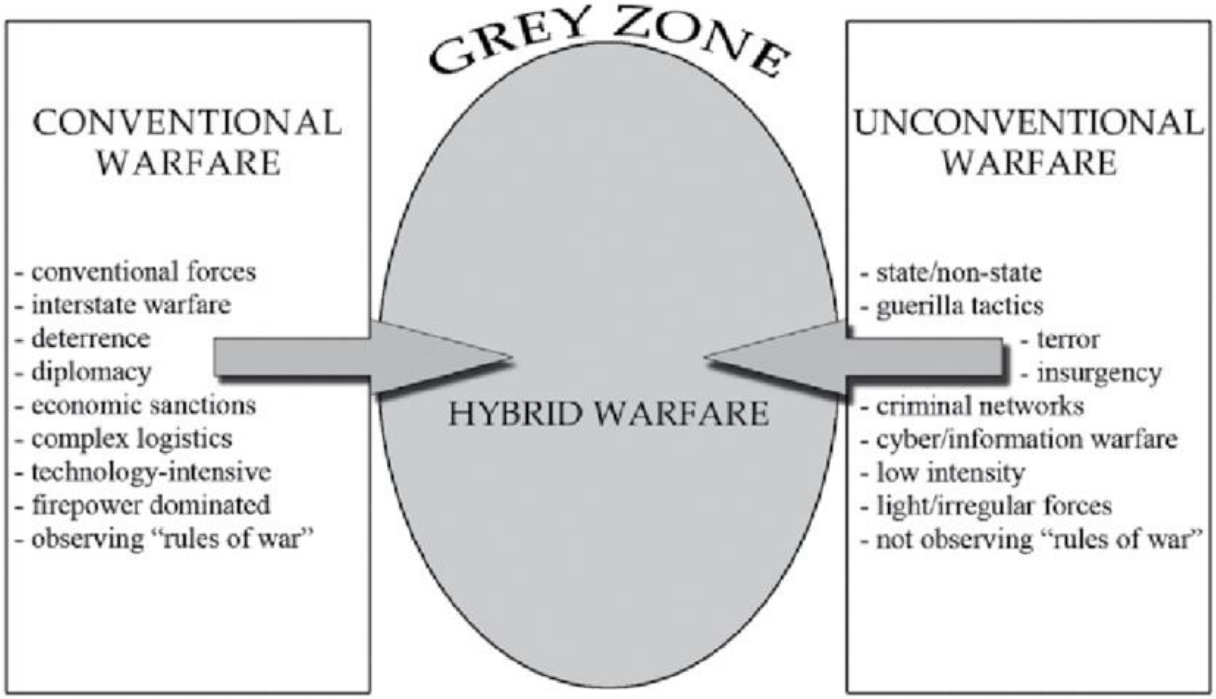


Grey Zone Warfare

Grey zone tactics, confrontation, and conflict relates to the use of non-military means below the threshold of armed conflict – to achieve political objectives.
Grey zone confrontation is the dangerous 'grey' area between peace and war.
Activities can include political and election meddling, cyber threats and attacks, economic coercion, use of proxies, and many other measures including military action.
According to Andrew Dowse and Sascha-Dominik Bachmann, it uses the ambiguity of international law, the ambiguity of actions and attribution, or because the impact of the activities does not justify a response by governments. Left unchecked, grey zone activities can undermine governments. Grey zone activities are generally unseen and insidious.

There are no rules and the front line is everywhere. Miscalculations in the grey zone can also inadvertently lead to armed conflict.

Characteristic	Grey-Zone Conflict	Hybrid Warfare
Level	Tactical, operational, strategic	Tactical and operational
Use of conventional military operations	Used alongside non-conventional operations.	Used alongside non-conventional operations. Usually the dominant element.
Use of non-conventional military operations	May be used standalone or alongside conventional operations.	Used alongside conventional operations as auxiliary tactics.
Protracted engagement	One of the dominant characteristics.	May be protracted or short



Longitude Prize

In 1714, the British government announced the Longitude Prize to solve the longitude problem, literally. In the 18th century, thousands of ships were lost at sea because sailors couldn't determine the position of the ship at sea. If a ship doesn't know where it is, it risks being shipwrecked.
To determine the position of a ship, both latitude and longitude are needed. Latitude was easy to measure by observing the sun, moon, and stars, but longitude was a mystery.

The British government announced the Longitude Prize for an invention that helps calculate longitude. John Harrison, a watchmaker, invented an ingenious device that could calculate longitude perfectly and won the prize. 300 years after the first Longitude Prize, Britain launched a second Longitude Prize. The public was asked to vote for a major challenge that needed an immediate solution, such as global warming, food shortages, and water shortages.

The public voted for Anti-Microbial Resistance. A £ 10 million Longitude Prize was announced in 2014. Of this, £ 2 million was awarded to various innovators to refine their technology. The final winner receives £ 8 million.

The Longitude Prize on AMR intends to incentivize the creation of new diagnostic tests that in a matter of minutes, can identify whether an infection is bacterial and, if so, the right antibiotic to prescribe to slow the spread of antibiotic resistant infections

About PA-100AST

PA-100 AST System from Sysmex Astrego has developed a transformative technology based on a phenotypic test.

This test identifies the bacteria causing the urinary tract infection and performs antibiotic susceptibility testing (AST) to determine the eff antibiotic for the specific patient in under 45 minutes

Craters in mars

The scientists of the Ahmedabad-based Physical Research Laboratory (PRL) have discovered three new craters on Mars. They have been discovered in the Tharsis volcanic region on Mars.

One crater has been named "Lal crater" after Devendra Lal, a renowned Indian geophysicist

The second crater has been named "Mursan crater" after a town in Uttar Pradesh. Mursan is a 10-km wide crater superimposed on the eastern side of the rim of the Lal crater. The third is "Hilsa crater". It is a 10-km wide crater superimposed on the western side of the rim of the Lal crater. It is named after a town in Bihar.

Nitrous Oxide

India is the world's second-largest source of nitrous oxide (N_2O), a greenhouse gas that heats the atmosphere far more than carbon dioxide.

Nearly 11% of such global man-made emissions in 2020 were from India, topped only by China at 16%.

The major source of these emissions comes from fertilizer usage, according to a global assessment of N_2O emissions published in the journal Earth System Science Data on Wednesday. In 2022, the concentration of atmospheric N_2O reached about 25% above the levels seen before the industrial age. In comparison, the concentration of carbon dioxide was 417 parts per million in 2022.

Agricultural production using nitrogen fertilizers, such as ammonia, and animal manure contributed 74% of the total anthropogenic N_2O emissions in the last decade. N_2O emissions from human activities, responsible for 6.4% of the effective radiative forcing of greenhouse gases, have added about 0.1 degree Celsius to current global warming

Vaccine against HIV

Chief among them is that the replication of the human immunodeficiency virus (HIV), which causes AIDS, is an incredibly error-prone process that results in multiple variants of the virus circulating. The sheer number of all the different strains circulating in the world is in fact the biggest challenge to an HIV vaccine

When the immune system encounters a virus, one of its responses is to produce antibodies highly specific to proteins on the virions' surface.

Each antibody is unique to a small piece of a given protein, and the immune system can generate antibodies against any given fragment of any protein. The immune system does this by starting with a pool of specialised cells that produce antibodies, called B-cells.
Each B-cell produces an antibody unique to one protein fragment. When a B-cell encounters a similar protein fragment on a foreign object say, a virus or bacteria it begins to divide and refine the antibody until it binds perfectly to the target.
These antibodies then bind to their corresponding pieces on the viral surface, rendering them incapable of further infection. The body then retains some of these specific antibody-producing cells in case of a future infection.
A vaccine aims to generate these antibodies before viral infection so that whenever a virus enters the body, the antibodies can neutralize the virus and prevent it from initiating an infection.
When multiple variants of the same virus exist, generating antibodies against all the different variants simultaneously becomes very difficult.

Broadly neutralizing antibodies (bNAb) worked by targeting areas of the viral proteins that the virus couldn't afford to change, since doing so would make it lose infectivity. Scientists have since discovered many bNAbs, and they are classified into different groups based on the region of HIV they target.
A body usually takes years to make bNAbs, and by then, the virus has already evolved to escape them. It takes years because the parental B-cell that makes the bNAbs is incredibly rare in the starting pool.

Elephant behaviour

Over the years, researchers who study elephants have noticed an intriguing phenomenon. Sometimes, when an elephant makes a vocalization to a group of other elephants, all of them respond. Yet, sometimes, when that same elephant makes a similar call to the group, only a single individual responds.
The study's findings indicate elephants "address one another with something like a name"

Mapping

Amboseli National Park is in southern Kenya. It's known for its large elephant herds and views of immense Mount Kilimanjaro, across the border in Tanzania.

The Samburu National Reserve is a game reserve on the banks of the Ewaso Ng'iro River in Kenya. On the other side of the river is the Buffalo Springs National Reserve.

IEA Report on oil

The world is likely to have a major surplus of oil by 2030 as production is ramped up while clean energy transition tempers demand, the International Energy Agency said on Wednesday.

Global demand is expected to "level of" at 106 million barrels per day (bpd) towards the end of this decade while overall supply capacity could reach 114 million bpd, the IEA

"As the pandemic rebound loses steam, clean energy transitions advance, and the structure of China's economy shifts, growth in global oil demand is slowing down and set to reach its peak by 2030.

The IEA noted that fast-developing Asian countries like China and India along with the aviation and petrochemical sectors would still drive oil demand, which stood at 102 million bpd in 2023.

But the shift toward electric cars along with fuel efficiency gains for conventional vehicles and the declining use of oil by West Asia for electricity production, would help limit the overall demand increase to around 4% by 2030.

International energy Agency

THE *INTERNATIONAL ENERGY AGENCY* IS AN INTERNATIONAL ENERGY FORUM COMPRISED OF 29 INDUSTRIALIZED COUNTRIES UNDER THE ORGANIZATION FOR ECONOMIC DEVELOPMENT AND COOPERATION (OECD).

The IEA was established in 1974, in the wake of the 1973-1974 oil crisis, to help its members respond to major oil supply disruptions, a role it continues to fulfill

today. IEA's mandate has expanded over time to include tracking and analyzing global key energy trends, promoting sound energy policy, and fostering multinational energy technology cooperation.

Delos

According to Greek mythology, Apollo was born on this tiny island in the Cyclades archipelago. Apollo's sanctuary attracted pilgrims from all over Greece and Delos was a prosperous trading port.
The island bears traces of the succeeding civilizations in the Aegean world, from the 3rd millennium B.C. to the palaeochristian era.
The archaeological site is exceptionally extensive and rich and conveys the image of a great cosmopolitan Mediterranean port. Delos is a Greek island and archaeological site in the Aegean Sea's Cyclades archipelago, near Mykonos.

Reports on Pollutants

Pollution from man-made emissions and other sources like wildfires have been linked to around 135 million premature deaths worldwide between 1980 and 2020, a Singapore university said on Monday.
Weather phenomena like El Nino and the Indian Ocean Dipole worsened the effects of these pollutants by intensifying their concentration in the air, Singapore's Nanyang Technological University (NTU) said, unveiling the results of a study led by its researchers.

The tiny particles called particulate matter 2.5 (PM 2.5), are harmful to human health when inhaled because they are small enough to enter the bloodstream
They come from vehicle and industrial emissions as well as natural sources like fires and dust storms.
The fine particulate matter "was associated with approximately 135 million premature deaths globally" from 1980 to 2020,

It found that people were dying younger than the average life expectancy from diseases or conditions that could have been treated or prevented, including stroke, heart and lung disease, and cancer.

Weather patterns increased the deaths by 14%, the study found. Asia had the "highest number of premature deaths attributable to PM 2.5 pollution" at more than 98 million people, mostly in China and India, the university said.

Pakistan, Bangladesh, Indonesia, and Japan also had significant numbers of premature deaths, ranging from 2 to 5 million people, it added.

Caecilian (Ichthyophis spp)

A limbless amphibian has been added to the fauna in the 1,307.49 sq. km Kaziranga National Park and Tiger Reserve. Assam's wildlife officials said a team of herpetologists recorded the striped caecilian (Ichthyophis spp) in the tiger reserve for the first time during a rapid herpetofauna survey.

Reptiles and amphibians

Reptiles and amphibians, collectively called herpetofauna, are the least studied but most vulnerable to climate change.
"Caecilians are limbless amphibians that spend most of their lives burrowed under the soil.

What is the alcohol in liquor?

Liquor is differentiated by its alcohol content from the 5% or so of beer to the 12% or so of wine to the 40% or so of distilled spirits (all by volume).
In the beverages consumed for recreational purposes, the alcohol in question is almost always ethanol.

In this context, ethanol is technically a psychoactive drug that, in low doses, reduces the level of neurotransmission in the body, leading to its typical intoxicating effects.
Ethanol (C_2H_5OH) is one carbon atom bonded to three hydrogen atoms and one more carbon atom; the second carbon atom is also bonded to two hydrogen atoms and the hydroxyl group, also known as the ion OH.
Inside the body, ethanol is metabolized in the liver and the stomach by alcohol dehydrogenase (ADH) enzymes to acetaldehyde. Then, acetaldehyde is transformed into acetate by aldehyde dehydrogenase (ALDH) enzymes.

Spurious liquor is characterized by a liquid mixture containing methanol as well.

What is methanol?

The methanol molecule (CH3OH) consists of one carbon atom bonded with three hydrogen atoms and one hydroxyl group. The most common way to produce methanol is to combine carbon monoxide and hydrogen in the presence of copper and zinc oxides as catalysts at 50-100 atm of pressure and 250° C.

In the pre-industrial era, going back to ancient Egypt, people made methanol (together with several other byproducts) by heating wood to a very high temperature. Methanol has several industrial applications, including as a precursor to acetic acid, formaldehyde, and aromatic hydrocarbons.

There are two immediate ways to treat methanol poisoning. One is to administer pharmaceutical-grade ethanol. This may sound counter-intuitive but ethanol competes very well with methanol for the ADH enzymes, which metabolise ethanol around 10x faster.
As a result, the methanol is kept from being metabolised to formaldehyde.
The other option is to administer an antidote called fomepizole, which has a similar mechanism: it slows the action of the ADH enzymes, causing the body to produce formaldehyde at a rate the body can quickly excrete, preventing the deadlier effects from kicking in.

Also administer folinic acid, which encourages the formic acid to break up into carbon dioxide and water. Both fomepizole and folinic acid are in the WHO's list of essential medicines.

The alcohol found in liquor is primarily ethanol, also known as ethyl alcohol. This type of alcohol is produced through the fermentation of sugars by yeast. In the context of alcoholic beverages, ethanol is the principal active ingredient that is responsible for the intoxicating effects of drinks such as spirits, wine, and beer.

Here's a breakdown of how ethanol is typically produced and its role in beverages:

1. **Fermentation Process**: Ethanol is produced through a natural chemical process where yeast converts sugars present in various ingredients (like grains, fruits, or vegetables) into alcohol and carbon dioxide. This process is known as fermentation.
2. **Types of Liquors**: Different types of alcoholic beverages are produced based on the source of the sugars and the specific fermentation and distillation processes used. For instance:
   - **Beer** is made from the fermentation of malted barley and other grains.
   - **Wine** is produced from the fermentation of grapes or other fruits.
   - **Spirits** such as vodka, whiskey, and rum involve not only fermentation but also distillation, a process that purifies the alcohol, increasing its concentration.
3. **Distillation**: For spirits, after the initial fermentation, the beverage is distilled. Distillation involves heating the fermented liquid to a temperature that vaporizes the alcohol (which has a lower boiling point than water) and then condensing the vapor back into liquid form. This increases the alcohol content.
4. **Alcohol by Volume (ABV)**: Beverages vary in their alcohol content, typically measured as Alcohol by Volume (ABV). Spirits generally have a higher ABV than beer or wine, typically ranging from about 20% to 50% or more.

Ethanol is not only the active component in alcoholic drinks but also a solvent and preservative, and it has various applications outside of beverages, including in medical and industrial contexts. However, in the context of liquor and other alcoholic beverages, its primary significance is its psychoactive effects and flavor contribution

Strategic Alliance Agreement (SAA)

Riyadh and Washington are on the verge of a new and enhanced relationship, tentatively titled Strategic Alliance Agreement (SAA).
Components: bilateral, regional, and global.
At a bilateral level, it would codify the current implicit bilateral alliance into a strategic defense pact modeled on the U.S.-Japan treaty committing the Pentagon to come to the Kingdom's rescue in case of an attack.
The U.S. would also equip Riyadh with means to defend itself which would include the state-of-art F-35 stealth fighters.

More surprisingly, Washington, a non-proliferation hawk, seems to be agreeable to providing Saudi Arabia with nuclear technology for peaceful use. At a regional level, Riyadh wants a ceasefire in Gaza and some movement toward a two-state solution to the Israel-Palestine problem.

As a quid pro quo for Riyadh's maximalist demands, Washington reportedly has put forth a daunting wish list of its own.
It wants Riyadh to recognize Israel and have full normal diplomatic relations. It also wants the Kingdom to ring-fence its foreign policy to avoid getting too close to Washington's rivals, specifically, Beijing and Moscow.

To U.S. strategists, a decline in the oil-for-security paradigm notwithstanding, Saudi Arabia retains much of its importance.
As the custodian of Islam's two holy shrines, the Kingdom has been the most important determinant of the Ummah, the 1.4 billion Muslims all over the world.
So, if Saudi Arabia agrees to become the fifth Abraham Accord Arab state to recognize Israel's right to exist, this could geopolitically reconfigure not only West Asia but also push much of the Islamic world to follow Riyadh's lead.

Second, Saudi Arabia remains the largest economy in both the Arab and Islamic world, and an ambitious Vision 2030 offered very lucrative pickings.
Last but not least, during his decade at the helm, MbS has not only consolidated power but also taken bold and often controversial reforms

Hurdles

First, the past decade has seen a rise in the bilateral trust deficit. In 1990-91, the U.S. deployed troops to evict Saddam Hussein's forces from Kuwait poised to threaten Saudi Arabia. The second major obstacle that the SAA faces is the ongoing Gaza conflict which has made it politically inopportune for Riyadh to agree to any reconciliation with Israel

India's stake

An SAA would be in India's overall interest as it would hopefully enhance regional stability, create economic opportunities, promote the India-Middle

East-Europe Economic Corridor, and free the U.S. to follow its Indo-Pacific Strategy more vigorously. At the same time, India needs to pursue its own "Act West" policy without waiting for a third iconic image of Israeli and Saudi leaders shaking hands at Camp David.

Ele – fence

The installation of the country's first artificial intelligence-based smart fence, 'Ele-fence', is under way in Kerala's Wayanad to mitigate the burgeoning cases of human-wildlife conflict in the region.

The proposed 70-metre Ele-fence incorporates an effective blend of surveillance, real-time monitoring, and control as well as preventive and protective features,

- **Apart from the loaded AI features, Ele-fence also uses lasher belt technology, which would prevent elephants from physically breaching the fence.**

When the animal reaches within 50 to 60 metres range of the fence, multiple cameras would capture the live visuals and trigger alarm bells, warning local people of the elephant's presence.

It seems like you might be looking for information or making a reference that includes "Ele" and "fence." The phrase as it stands is a bit unclear, but here are a couple of interpretations and responses that might help:

Elephant Fence: If "Ele" is shorthand for "elephant," you could be referring to a fence designed to keep elephants either contained (such as in a wildlife reserve or zoo) or out (such as fences built to protect crops from wild elephants). Elephant fences need to be particularly strong and often electrified to be effective due to the size and strength of elephants.

Ele Fence as a Compound or Concept: If "Ele" and "fence" together are meant to represent a concept or a specific product name, it's not a widely recognized term. It could be a local or specific term not broadly known outside a particular area or field.

Word Play or Error: If this is a form of wordplay or a typographical error, clarification would be needed to provide a more accurate and helpful response.

(RELOS)

India-Russia mutual logistics agreement (Reciprocal Exchange of Logistics Agreement (RELOS)

After being held up for several years, the India-Russia mutual logistics agreement is ready for conclusion, with Russia approving the draft agreement over the past week.

The agreement will simplify military-to-military exchanges for exercises, training, port calls, and Humanitarian Assistance and Disaster Relief (HADR) efforts.

It is similar to a series of such agreements that India has signed with a number of countries, beginning with the U.S. in 2016.

Defence cooperation is a major pillar of the India Russia strategic partnership and is guided by the agreement on military technical cooperation.

Among the three services, the Indian Navy has been the biggest beneficiary of these administrative arrangements signed with several countries, improving its operational turnaround and increasing interoperability on the high seas.

RLV LEX

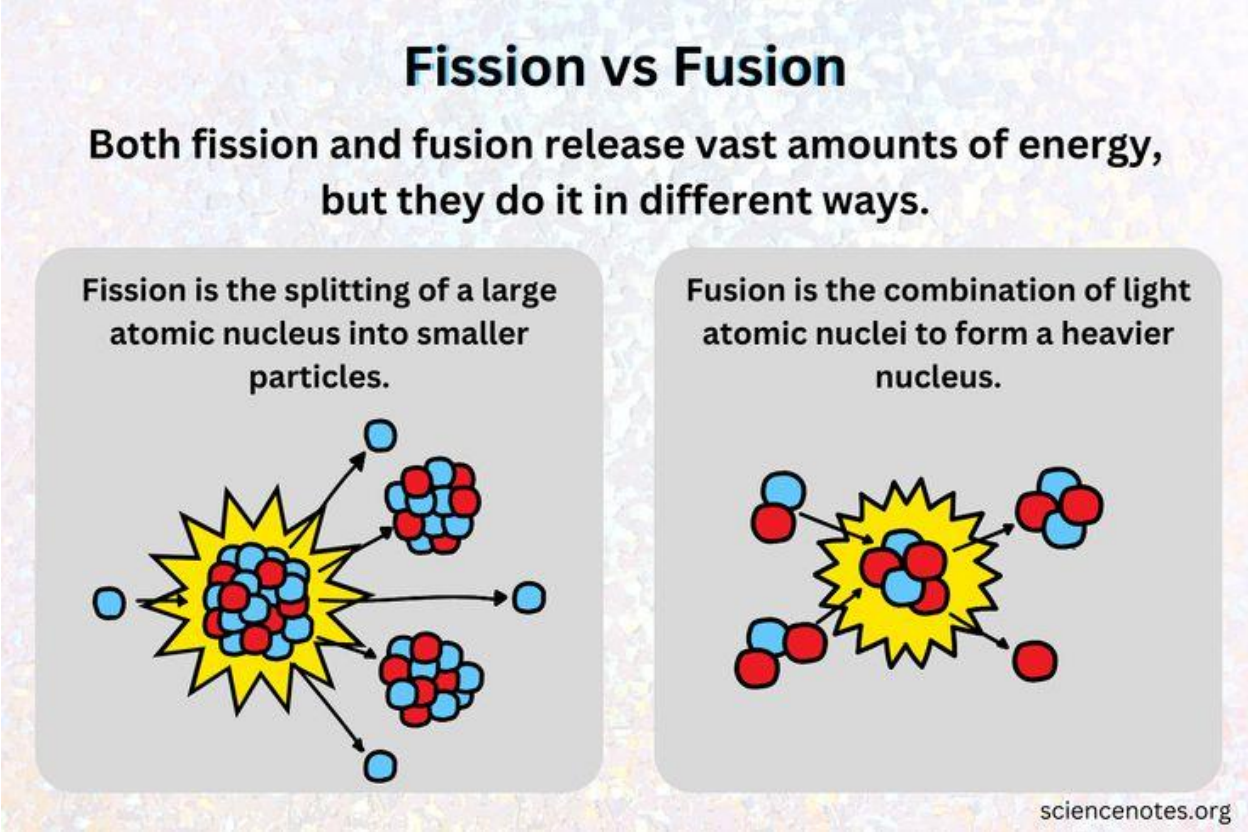
The Indian Space Research Organisation completed the third reusable launch vehicle landing experiment (RLV LEX) at the Aeronautical Test Range in Chitradurga, Karnataka.

"Following the success of RLV LEX-01 and LEX-02 missions, RLV LEX-03 re-demonstrated the autonomous landing capability of the RLV under more challenging release conditions and more severe wind conditions
Pushpak autonomously executed cross-range correction maneuvers, approached the runway, and performed a precise horizontal landing at the runway center line.
LEX used sensors such as an inertial sensor, radar altimeter, flush air data system, and NavIC.
Notably, the LEX-03 mission reused the winged body and flight systems from the LEX-02 mission without any modification, demonstrating the robustness of the ISRO's capability of design to reuse flight systems

Plutonium isotope fission

0nn March 42024, India stepped on the threshold of the second stage of its nuclear power programme when engineers started the core-loading process of the prototype fast breeder reactor (PFBR) at the Madras Atomic Power Station, Kalpakkam.

While the first stage used uranium isotopes as nuclear fuel in pressurized heavy-water reactors to produce plutonium-239 (Pu-239) and energy, the second stage is more concerned with plutonium fission.



When a Pu-239 nucleus captures a neutron, it has a 27-38% chance of becoming Pu-240 instead of undergoing fission. It is thus present in many nuclear reactors and in the fallout of nuclear weapon tests. When Pu-240 captures a neutron, it most often turns into Pu-241. On the of chance it does undergo fission, however, there is a significant amount of uncertainty about the energy carried away by its fission products.

Researchers currently use models that incorporate several complicated calculations based on theory to estimate the output. A part of the fission energy carried away by neutrons is called the prompt fission neutron spectrum. 'Prompt' stands for neutrons Pu-240 might emit right after it has captured a neutron with the energy to destabilize it

Pu-240 undergoes spontaneous fission and emits alpha particles. The isotope is considered a contaminant of weapons-grade plutonium, where its composition by weight is restricted to under 7% Researchers also reported a higher-than-expected rate of second-chance fission of Pu-240.

They also reported finding signs of 'a smaller contribution from third-chance fission' but added that this 'was difficult to observe in the data directly

Post-traumatic stress disorder

Around 4% of the world's population has suffered post-traumatic stress disorder (PTSD) at some point, according to the World Health Organisation (WHO).

PTSD is often associated with war veterans, survivors of sexual violence, and typically anybody who has lived through a life-threatening situation. They often experience anxiety, flashbacks, and nightmares. But health workers have also recorded PTSD symptoms among people who have suffered repeated bullying, emotional abuse, and/or neglect.

These individuals include children bullied or gaslighted since a young age and someone who has suffered domestic abuse for many years. They are said to have complex PTSD, or cPTSD.

SVOM

BIG SHOT

A Long March-2C rocket carrying the Space Variable Objects Monitor (SVOM), a satellite developed by China and France, takes off in Sichuan province of China on Saturday. SVOM will study gamma-ray bursts. Shortly after launch, a booster from the rocket dropped over a populated area in Guizhou province as people ran for cover. VIA REUTERS

The SVOM mission (Space-based multi-band astronomical Variable Objects Monitor) is a Franco-Chinese mission dedicated to the study of the most distant explosions of stars, the gamma-ray bursts. It is to be launched end 2023 by the Chinese Long March 2C rocket from the Xichang launch base.

It is the result of a collaboration between the two national space agencies, CNSA (China National Space Administration) and CNES (Centre national d'études spatiales), with the main contributions of the Institute of Research into the Fundamental Laws of the Universe (Irfu) and the Research Institute of Astrophysics and Planetology (IRAP) for France and the National Astronomical Observatory (NAO) and the Beijing High Energy Institute (IHEP) for China.

Ethanol, methanol

Ethanol is legal liquor for consumption. It is produced biologically whereas methanol is produced from fuels such as coal in India. Molasses, which are a by-product of the sugar-making process, form the starting material of distilleries that are often located close to sugar factories.
They produce rectified spirit which is distilled further to produce edible extra-neutral alcohol that in turn goes into making Indian Made Foreign Liquor, a lucrative cash cow for State governments.

During ethanol production in responsible distilleries, methanol is also produced but is carefully removed since the processes are highly controlled. Methanol is produced from coal and other fossil fuels. While ethanol can be made edible, methanol is poison. Even very low concentrations of methanol can be toxic, and often fatal. However, it is needed to produce a range of highly useful products. Paints, for instance, can't be produced without methanol.

What needs to be done?

The periodic occurrence of methanol poisoning suggests the need for strong central legislation that can work with State legislation. Various laws such as the Poisons Act that involve State governments can tighten the methanol supply chain.

The implementation of laws holds the key, especially when there are plans to ramp up the production of both ethanol and methanol for use as cheaper, eco-friendly alternatives to petrol and diesel for transportation

"Chat Control"

The European Union's proposed 'chat control' law has become a bone of contention between members of the bloc. First proposed by the European Commissioner for Home Affairs Ylva Johansson in May 2022 as part of the bloc's push to combat child sexual abuse online, the framework of the bill has now come under fire, earning itself a derisive term "Chat Control".
France, Germany and Poland have particularly refused to accept a clause that allows for mass scanning of private messages by breaking end-to-end encryption.

Are heatwaves a natural disaster?

The National Disaster Management Act (NDMA) is the key piece of legislation governing the roles of the Centre and States in responding to a natural disaster. The Ministry of Home Affairs is the nodal body that governs the execution of this Act. Several disaster management authorities draw their powers from this legislation and they define which natural calamities qualify for state-backed compensation.

The legislation is also the genesis of special funds at the state level and the Centre that can be drawn upon for a disaster. As of now, 12 disasters are notified in the Guidelines on Constitution and Administration of the State Disaster Response Fund (SDRF) and National Disaster Response Fund (NDRF), namely cyclone, drought, earthquake, flood, tsunami, hailstorm, landslide, avalanche, cloudburst, pest attack, frost, and cold waves. Heatwaves are yet to be included and this has to do with a government body that is unconnected to institutions under the NDMA.

Which is this body?

The 15th Finance Commission, the constitutional body that decides upon the revenue sharing between the Centre and States, had in its report "observed" that the list of notified disasters eligible for funding from SDRF and NDRF

covers the needs of the State to a large extent and thus did not and merit in the request to expand its scope.

States have appealed to the Finance Commission to expand the scope of natural calamities that can be considered a disaster as this makes them eligible for more funds.

However, in terms of the aforesaid guidelines, a State Government can use up to 10% of the annual fund allocation of the SDRF, with certain caveats, for providing immediate relief to the victims of natural disasters, other than the aforesaid 12 disasters, that they consider to be 'disasters' within a local context in the State.
Thus, compensation awarded to those confirmed by State authorities as having succumbed to heatwaves comes from this tranche

Why Can Railways do not stop accidents?

During signal failure, trains can be operated under caution. The station master issues a TA-912 notice, which authorises loco pilots to cross a signal in red during signal failures, and a 'line clear' ticket, under the G&SR.

The combination empowers the loco pilot to move forward. In this situation, the rule book says that the "driver shall proceed cautiously, so as to stop short [at] any obstruction."

But the much-touted anti-collision device, Kavach, was not installed on this route. Kavach would have slowed down the freight train (it was moving at 45 kmph at the time of the accident) as the automatic braking system would have become operational.
However, progress on the implementation of Kavach has been slow because of lack of vendors. Human failure is a major reason for accidents. One of the most important recommendations of the Kakodkar Committee is related to the division of responsibilities: "Three vital functions (rule-making, operations and regulation) are all vested in the Railway Board.

There is a need for an independent mechanism for safety regulation. The Committee recommends the creation of a statutory Railway Safety Authority with enough powers to have a safety oversight on the operational mode of Railways."

At a macro-level, Ramesh Subramanian (Evolution and Diffusion of ICTs in Indian Railways: A Historical Analysis, 2022) argues that since "Indian Railways' fortunes are vastly dictated by political needs rather than profitability," capital available to be invested in newer technologies is limited. The Indian passenger cannot afford massive expenses for modernizing the system

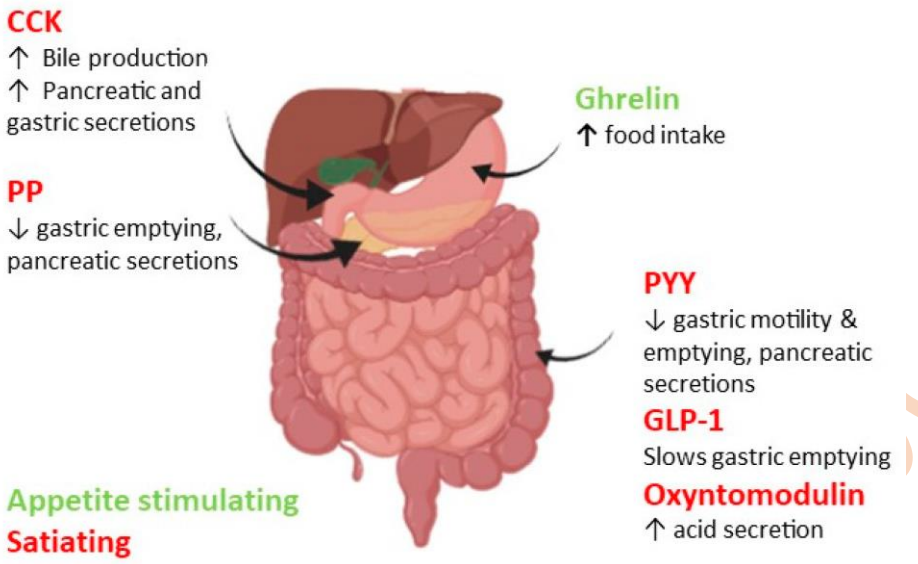
Nalanda University

In March 2006, while addressing a joint session of the Bihar State Legislative Assembly, the late former President, Dr. A.P.J. Abdul Kalam, proposed the revival of the ancient Nalanda University

Parliament of India passed the Nalanda University Act, 2010, and in September 2014, the first batch of students was enrolled Built at an initial cost of ₹1,800 crores and spread over 485 acres. It is a large carbon footprint-free Net-zero campus, whose design elements are inspired by the original monasteries and buildings at the ancient Mahavihara.

Hormone named PYY

Researchers have delineated how diets either low or high in fiber can shape the metabolic landscape of the small intestines, according to their study involving 10 volunteers fed various diets. The findings demystify the complex digestive processes that break down fiber-rich foods as they travel through the gut and show those foods support the release of a gut hormone named PYY that suppresses appetite.



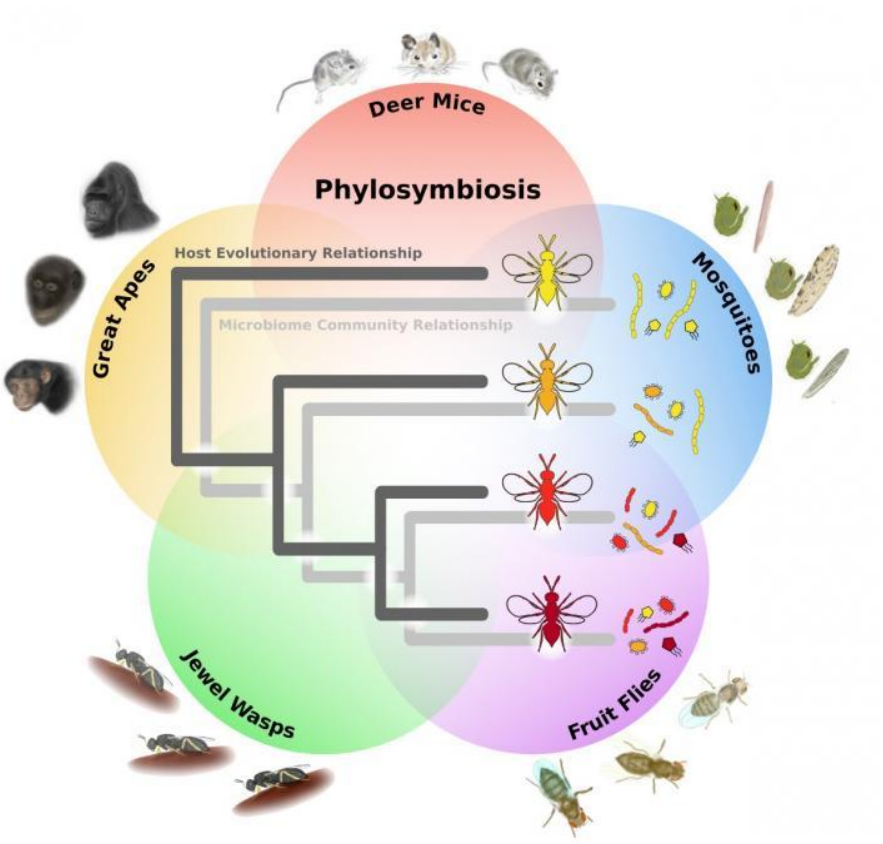
Phylosymbiosis

Cold-blooded Antarctic marine worms depend on two genera of bacteria to produce cryoprotective proteins that act like biological antifreeze to help them survive the harsh polar waters.

Proteomic examinations showed that bacterially-derived cold-shock proteins and ice-binding proteins were present at nearly the same level as the worms' own self-made proteins, supporting the hypothesis of a phylosymbiotic relationship.

Phylosymbiosis is first and foremost a significant association between host phylogenetic relationships and host-associated microbial community relationships wherein 'phylo' refers to the host clade and 'symbiosis' refers to the microbial community in or on the host.

A clade, in biology, is a group of organisms that consists of a common ancestor and all of its descendants.



Chimpanzees

A new study has found that chimpanzees appear to consume plants with medicinal properties to treat their ailments. The researchers observed a male Chimpanzee with an injured hand seek out and eat fern leaves, which may have helped reduce pain and swelling.

Himalayan region vs development

In the State of Telangana and Others vs Mohd. Abdul Qasim (Died) Per Lrs, the Court had said that the need of the hour is to adopt an ecocentric view of the environment, where nature is at the core.

The Court said, "Man being an enlightened species, is expected to act as a trustee of the Earth...The time has come for mankind to live sustainably and respect the rights of rivers, lakes, beaches, estuaries, ridges, trees, mountains, seas and air

A model of destruction

According to this approach, nature is not an object of protection but a subject with fundamental rights, such as the right to exist, to survive, and to persist and regenerate vital cycles.

The current development model being pursued in the IHR is in total contravention of this approach. We are witnessing a 'bumper crop' of hydroelectric power stations on the rivers and streams in the IHR, without any care for the rights of these rivers and streams. There is a reckless widening of existing hill roads to four lanes in the name of development.

The Teesta dam breach in Sikkim and the monsoon floods and landslides in Himachal Pradesh both events in 2023 are a stark reminder of the havoc our development model is causing to the environment, ecology and communities, especially in the mountains.

In the case of the Great Indian Bustard, the Court has recognised the right of the people of this country to be free from the adverse impacts of climate change.

Articles 14 and 21, specifically, human rights which include the right to development and the newly minted right to be able to adapt to climate change.

The top court went on to say: "without a clean environment which is stable and unimpacted by the vagaries of climate change, the right to life is not fully realized... The inability of underserved communities to adapt to climate change or cope with its effects violates the right to life as well as the right to equality

The right to equality under Article 14 and the right to life under Article 21 must be appreciated in the context of the decisions of this Court, the actions and

commitments of the state on the national and international level, and scientific consensus on climate change and its adverse effects".

It is a given that unless infrastructure is sustainable and dependable, it cannot become the foundation for people's pursuit of their developmental goals. Sustainability of infrastructure necessarily means that it is resilient to the adverse impacts of climate change and consequent disasters.

This is essential to ensure equality, equity, and equal access to people, to various opportunities all across the country as is the mandate of Articles 14 and 21 of the Constitution. Disasters are also known to amplify social inequality as the poor are the worst hit and the most inadequately equipped to deal with the consequences.
Our actions in the name of development, in total disregard of nature in most cases, is to be blamed for these unnatural disasters resulting from natural hazards.
The development plans, policies and laws that underpin them too play a pivotal role in the making of these disasters. There is an urgent need for planning stage convergence of different authorities so that when there is a plan for any development, all concerns about disaster and climate resilience are also factored in, and the project reaches the implementation stage only after the green signal in these areas.

The island of Great Nicobar vs development project

The island of Great Nicobar is the southernmost tip of India and a part of the Andaman and Nicobar archipelago that comprises 600-odd islands. The island is home to two tribal communities the Shompen and the Nicobarese. The Shompen, around 250 in total, mostly live in the interior forests and are relatively isolated from the rest of the population.

They are predominantly hunter-gatherers and are classified as a Particularly Vulnerable Tribal Group within the list of Scheduled Tribes. The Nicobarese community practices farming and fishing. It has two groups: The Great

Nicobarese and the Little Nicobarese. They use different dialects of the Nicobarese language (the Shompen have their unique language).

What is the NITI Aayog project?

- **In March 2021, NITI Aayog unveiled a ₹72,000 crore plan called 'Holistic Development of Great Nicobar Island at Andaman and Nicobar Islands'.**
- **It includes the construction of an international transshipment terminal, an international airport, a power plant, and a township.**
- **The project is to be implemented by a government undertaking called the Andaman and Nicobar Islands Integrated Development Corporation (ANIIDCO).**
- **The plan states: "The proposed port will allow Great Nicobar to participate in the regional and global maritime economy by becoming a major player in cargo transshipment.**
- **In January 2021 the Indian government denotified two wildlife sanctuaries the Galathea Bay wildlife sanctuary and the Megapode wildlife sanctuary to make way for the project. In the same month, the government released a 'National Marine Turtle Action Plan' that lists Galathea Bay as a marine turtle habitat in India.**
- **The transshipment terminal is expected to be developed at Galathea Bay, one of the world's largest nesting sites for the giant leatherback turtle.**
- **Both this species and the Nicobar megapode are listed in Schedule I of the Wildlife (Protection Act), 1972 the highest level of protection for wild animals under Indian law (numerous species, especially endemic ones, are likely yet to be documented in Great Nicobar given the limited number of surveys conducted so far).**
- **As for the Shompen, one of the biggest threats is disease. Since the Shompen have had little contact with the outside world, they haven't yet developed immunity to infectious diseases that affect India's general population.**
- **Some Shompen settlements also overlap with the areas the NITI Aayog has proposed to be used for the transshipment terminal.**

- **Earlier this month, the local panchayat of Campbell Bay raised concerns over the social impact assessment process for land acquisition for the airport.**

- **Researchers who work on disaster management have also raised concerns that proponents of the mega project have failed to adequately assess earthquake risk.**
- **The Andaman and Nicobar archipelago is located in the "ring of fire": a seismically active region that experiences several earthquakes throughout the year.**

Religious practices

Justice G.R. Swaminathan reinstated the practice by invoking Article 25(1) of the Constitution that guarantees the right to freely profess, practice, and propagate religion.
The judge linked the belief of the devotees, who claim to derive spiritual benefit from such practice, to the right to privacy, a fundamental right under the Constitution.
He argued that if the right to privacy includes "gender and sexual orientation", it also includes "spiritual orientation". "It should not affect the rights and freedoms belonging to others customary practice is protected as a fundamental right under Articles 14, 19(1)(a), 19(1)(d), 21 and 25(1) of the Constitution.

PESA

The Panchayat (Extension to Scheduled Areas) Act (PESA). Passed in 1996, PESA extends local government councils to Scheduled Areas. Under the Fifth Schedule of the Constitution, regions with predominantly tribal populations are categorized as 'Scheduled Areas', a territorial designation that recognizes the customary rights of the Scheduled Tribes (ST).

Though the 73rd Amendment, passed in 1992, formalized local self-government through the three-tier Panchayati Raj Institutions (PRI) in the non-Scheduled Areas, it did so without "mandated representation for STs". PESA, however, took it a step further. It "introduced an electoral quota that requires all

chairperson positions, as well as at least half the seats on each local government councils to be reserved for ST individuals."

Incidentally, in States where PESA has not been implemented well, as in Gujarat, for instance, the most common failure has been the absence of mandated ST representation in gram sabha committees. This variegated governance landscape has one virtue.

It offers comparable data sets of local self-governance and forest cover that differ in geography and over time for villages: with local self-government in Scheduled Areas (with mandated ST representation); for villages with local self-government without mandated ST representation; and also, villages which adopted PESA earlier, and those that did so later .If mandated political representation for marginalised communities is one institutional mechanism that can yield better results in conservation.

Killing of wild animals

The Tamil Nadu government has decided to allow culling of wild boars that cause distress to farmers in farmland close to forest areas.

Rule

Section 11 of the Wildlife Protection Act 1972 regulates the killing of wild animals. As per clause (1)(A) of the section, the Chief Wildlife Warden (CWLW) of a state may if satisfied that a wild animal specified in Schedule I (mammals) has become dangerous to human life or disabled or diseased beyond recovery permit hunting or killing of such animal

eSakshya

The Union Ministry of Home Affairs (MHA) is testing eSakshya (e-evidence), a mobile phone application to help police record scene of crime, search and seizure in a criminal case, and upload the file on the cloud-based platform.
The police official will have to upload a selfie after the procedure is complete.

Each recording could be a maximum of four minutes long and several such • les could be uploaded for each First Information Report (FIR)

iDEX

The iDEX initiative was launched by the Hon'ble PM in April 2018. iDEX aims to achieve self - reliance and foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups, individual innovators, R&D institutes, and academia.

iDEX has partnered with leading incubators in the country to provide handholding, technical support, and guidance to the winners of iDEX challenges.

Defence India Start-up Challenge (DISC) is launched with Problem Statements (PS) from the Armed Forces and OFB/DPSUs for resolution by innovators.

The Pradhan Mantri Awas Yojana (Urban)

The Pradhan Mantri Awas Yojana (Urban), a scheme to enable affordable housing for the urban poor, would be revamped with new features based on learning from the past nine years since when it was operational.
The PMAY (Urban), launched in 2015, has been given an extension till December 2024.

The mission aims to address the urban housing shortage among the poor and middle-income groups, including slum dwellers, by ensuring a pucca house to all eligible urban households. PM Modi had started the Pradhan Mantri Awas Yojana.
Under the Pradhan Mantri Awas Yojana, all homeless citizens of India are given housing by the central government.
Prime Minister Narendra Modi inaugurated the Pradhan Mantri Awas Yojana (PMAY) on 25 June 2015.
Then the main goal of the Pradhan Mantri Awas Yojana was that every family living below the poverty line should have their own house by the year 2023 so that they do not have to take a house on rent.
The government claims that this goal has almost been achieved.

Who can apply under the PM Awas Yojana?

Eligibility criteria have been set by the Government of India to apply under the Pradhan Mantri Awas Yojana (PM Awas Yojana Apply Online 2024). According to this, the age of the applicant should be less than 70 years.

There should not be any house or flat in the name of the applicant or any member of his family. The applicant should not have taken any kind of government exemption to buy a house, the ownership of the house should be either in the name of a woman, or there should be only men in that family.

Apart from this, the maximum annual income of the applicant's family should not exceed Rs 18 lakh. For this, the applicant has been divided into four different parts economically. These include the Economically Weaker Section (EWS) - those with an annual total income of less than three lakh rupees.

Low Income Group (LIG) - those with Rs 3 lakh to 6 lakhs annually, Middle Income Group-1 (MIG-I) - those with Rs 6 lakh to 12 lakhs annually, and Middle Income Group-2 (MIG-II) - those with Rs 12 lakh to 18 lakh annually. However, government assistance for the repair or improvement of the house is available only to the EWS or LIG category.

Potassium cyanide

Potassium cyanide when consumed causes death by gradually arresting the supply of oxygen to our body's cells by forming complexes with haemoglobin and cytochrome (a protein that helps in the respiration of cells), depriving them of their capacity to transport or exchange oxygen.

Normally, oxygen is carried to different parts of the body from the lungs by the blood using haemoglobin the iron-containing, oxygen-carrying molecule of the red blood cells. Haemoglobin is made up of a globular protein and four heme groups. The iron (in a ferrous state) present in these heme complexes can bond to either an oxygen molecule or a water molecule or exchange one for the other without much difficulty.
It is because of this ability that haemoglobin can pick up oxygen from the lungs, carry it to the cells, and bring water in return. Cells respire oxygen with the help of myoglobin (haemoglobin-like proteins present in the cells) and

cytochrome, which carries electrons. Specific forms of cytochrome and haemoglobin also cause sudden death when poisoned by cyanide.

When potassium cyanide is consumed, it splits into a potassium ion and a cyanide ion. The cyanide ion has a greater affinity for the ferrous ion than. As a result, it occupies the site meant for oxygen in hemoglobin. This process is irreversible and prevents the transfer of oxygen.

One form of cytochrome, designated cytochrome-a, also binds with the cyanide ion and stabilizes the iron to such an extent that it does not take part in the electron transfer to the cell. This prevents oxygen intake by the cell.

National Security Strategy (NSS)

A regular and well-crafted NSS would give India +ve critical benefits that it currently lacks. First and logically foremost, it would force the government to undertake a comprehensive strategic assessment a review of the country's threats and opportunities, and a stocktake of global security trends.

Such a periodic review would force New Delhi to spotlight evolving challenges, such as the growth of the Chinese navy, even though it does not pose an urgent and lethal threat today.

Second, an NSS would provide a coherent framework for long-term planning. Strategic competition requires intense work in peacetime, to conceptualize how best to secure India's expanding interests and deter its adversaries, and then to develop the requisite military capabilities and international partnerships

Highlights

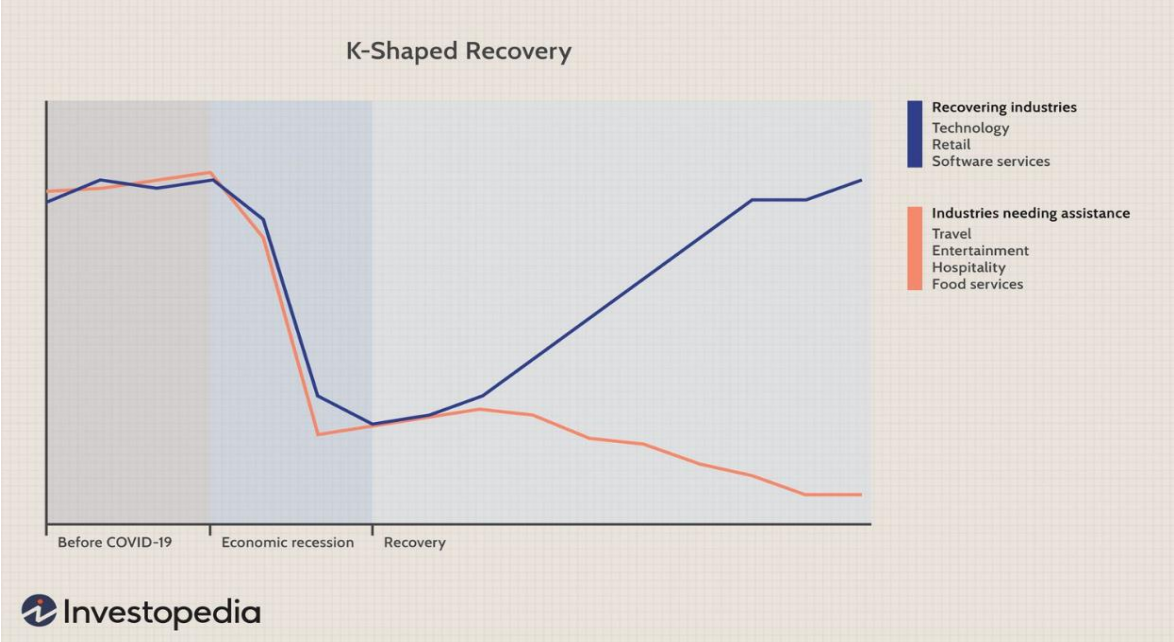
1. **Coherent Framework**: A National Security Strategy (NSS) provides a structured approach for long-term planning.
2. **Strategic Competition**: Intense peacetime work is crucial for addressing strategic competition.
3. **Securing Interests**: The NSS focuses on securing India's expanding national interests.

4. **Deterrence**: Essential to deter adversaries through strategic foresight.
5. **Military Capabilities**: Developing necessary military capabilities is a key component.
6. **International Partnerships: Building global alliances is vital for strengthening security.**
7. **Long-Term Vision: Emphasizes the importance of a long-term strategic vision.**
8. **Fourth, an NSS would create a mechanism to force various arms of the government to synchronise their efforts.**
9. **Within the military, an NSS would give the Integrated Defence Staff and future joint organizations a clearer top-down mandate to better align the work of the Indian Army, Indian Air Force, and Indian Navy.**
10. **Beyond the military, an NSS would provide common goals and plans so that various national security agencies, including the Ministries of Defence, External Affairs, and Home Affairs, and the intelligence agencies, could better coordinate daily**
11. **Finally, an NSS would introduce a novel accountability tool, to ensure that the bureaucracy adheres to the political leadership's intent, and that the government's policies are as transparent as possible to Parliament and the people.**

What Is a K-Shaped Recovery?

A K-shaped recovery occurs when, following a recession, different parts of the economy recover at different rates, times, or magnitudes. This is in contrast to an even, uniform recovery across sectors, industries, or groups of people. A K-shaped recovery leads to changes in the structure of the economy or the broader society as economic outcomes and relations are fundamentally changed before and after the recession.

This type of recovery is called K-shaped because the path of different parts of the economy when charted together may diverge, resembling the two arms of the Roman letter "K."



Trouble in cocoa land

Harvesting woes: Recently extracted cocoa beans at a farm in Asikasu. Despite government efforts to stabilise the sector and recent soaring global cocoa prices, many Ghana farmers say they feel abandoned and have turned to illicit trade to survive in the world's number two producer. Ghana is emerging from one of it worst economic crisis in years after securing a $3 billion credit from the International Monetary Fund and restructuring most of its debt. AFP

Cocoa Producer

Cocoa beans are grown on cacao trees and have been consumed for thousands of years. Today, dried and fermented seeds can be used to create chocolate, while the fat of the beans or cocoa butter can also be extracted and used for a

variety of purposes, from moisturizing the skin and hair to cooking. Cocoa was first harvested in what is today Central America.

Soon, though, it became popular around the world, and it is now produced in many regions worldwide. While many nations produce cocoa beans, there are a few that stand out from the pack. One of those is Cote d'Ivoire. This nation is responsible for 30% of the world's cocoa. Familiar brands like Cadbury and Nestle mostly source their cocoa from this country. Ghana is another top producer of cocoa. The production of cocoa contributes significantly to the nation's GDP.

Unfortunately, operational costs have become a problem in recent years, leading to cocoa smuggling to the Ivory Coast.
Indonesia is relatively new to the cocoa industry, only ramping up production during the 1980s. Today, the nation is one of the top producers in the world. Other nations that are top producers of cocoa include Brazil, Cameroon, Dominican Republic, Ecuador, Mexico, Nigeria, and Peru.

Melting of Antarctica

Scientists have discovered a new tipping point toward "runaway melting" of Antarctic ice sheets, caused by warm ocean water intruding between the ice and the land it sits on. As temperatures rise due to human-caused global warming, Antarctic ice sheets are melting, threatening a rise in global sea levels and putting coastal communities at risk.

"Increases in ocean temperature can lead to a tipping point being passed, beyond which ocean water intrudes in an unbounded manner beneath the ice sheet, via a process of runaway melting,"
Antarctic ice sheets sit atop the bedrock and extend beyond the coast to float on the sea. Previous studies have shown that warm seawater is seeping into the "grounding zone" where land and ice meet and further inland.
As the water warms, even by a fraction, the intrusion accelerates from short distances of 100 meters to tens of kilometers, melting ice along the way by heating it from below,

Indigen

In October 2020, the Council for Scientific and Industrial Research (CSIR) had reportedly sequenced the entire genomes of 1,008 individuals in India representing diverse ethnic groups in six months.

This effort was part of a mission called 'IndiGen' to create a pilot dataset with which researchers could analyze the epidemiology of genetic diseases and help develop affordable screening approaches, optimize treatment, and minimize adverse events for them.

(PRaGeD)

India has also launched a pan-country mission for Paediatric Rare Genetic Disorders (PRaGeD), which, despite their rarity, have become a common public health concern. Mission PRaGeD is planning to create awareness, perform genetic diagnosis, discover and characterize new genes or variants, provide counseling, and develop new therapies for rare genetic diseases that afflict India's children.

The mission will incorporate IndiGen data in its in-house bioinformatic pipelines it will use to analyze the parts of a genome that code for proteins (exome). The CSIR-Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad, in collaboration with 15 centers across India, plans to recruit patients and their families with rare genetic disorders.

What is NGS?

Next-generation sequencing (NGS) is a massively parallel sequencing technology that offers ultra-high throughput, scalability, and speed. The technology is used to determine the order of nucleotides in entire genomes or targeted regions of DNA or RNA.NGS has revolutionized the biological sciences, allowing labs to perform a wide variety of applications and study biological systems at a level never before possible.

Today's complex genomics questions demand a depth of information beyond the capacity of traditional DNA sequencing technologies. NGS has filled that

gap and become an everyday tool to address these questions. Next-generation sequencing (NGS) is a powerful technology that allows for the rapid sequencing of entire genomes or targeted regions of DNA and RNA. It has revolutionized genomic research and clinical diagnostics by providing high-throughput, scalable, and cost-effective sequencing solutions. Here's an overview of NGS, including its principles, applications, and tools.

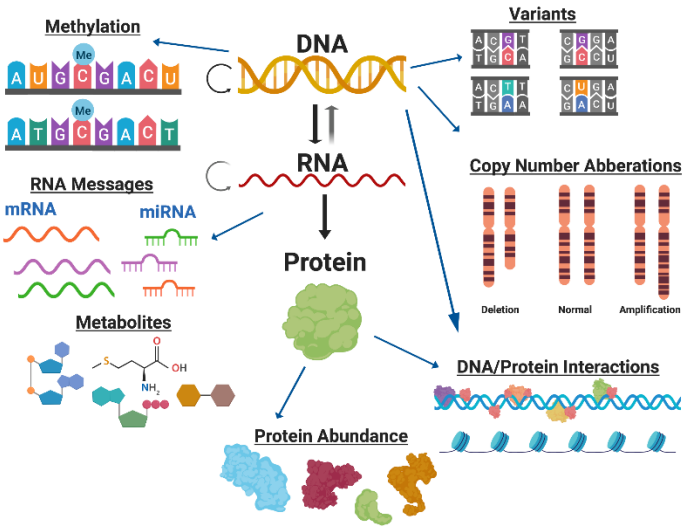
Principles of NGS

NGS technologies share several common steps:

1. **Library Preparation:**
   - **DNA or RNA samples are fragmented into smaller pieces.**
   - **Adaptors are attached to the fragments to enable their amplification and sequencing.**
2. **Amplification:**
   - **The library is amplified using polymerase chain reaction (PCR) to generate a sufficient quantity of material for sequencing.**
3. **Sequencing:**
   - **The amplified library is loaded onto a sequencing platform, where each fragment is sequenced in parallel.**
   - **Various sequencing chemistries are used, such as sequencing-by-synthesis (SBS), sequencing-by-ligation, and ion semiconductor sequencing.**
4. **Data Analysis:**
   - **Raw sequencing data is processed to generate reads, which are then aligned to a reference genome or assembled de novo.**
   - **Bioinformatics tools are used to analyze the data, identify variants, and interpret results.**

What is multiomics?

Multiomics (multiple omics) provides an integrated approach to power discovery across multiple levels of biology. By combining data from genomics, transcriptomics, epigenetics, and proteomics, researchers can achieve a more comprehensive understanding of molecular changes contributing to normal development, cellular response, and disease. Multiomics can also combine separate omic data from past experiments, known as in-silico multiomics, to efficiently analyze novel biological relationships.



Rhisotope

South African scientists injected radioactive material into live rhinoceros' horns to make them easier to detect at border posts in a pioneering project aimed at curbing poaching. Twenty live rhinos in total are part of the pilot 'Rhisotope' project, whereby they will be administered a dose "strong enough to set off detectors installed globally" at international border posts, originally "to prevent nuclear terrorism

The Resolve Tibet Act

The Resolve Tibet Act enhances U.S. support for Tibet empowering State Department officials to actively and directly counter disinformation about Tibet from the Chinese government, rejecting false claims that Tibet has been part of China since "ancient times," pushing for negotiations without preconditions between the Chinese government and the Dalai Lama or his representatives or the democratically elected leaders of the Tibetan community and affirming the State Department's responsibility to coordinate with other governments in multilateral efforts toward the goal of a negotiated agreement on Tibet.

No formal dialogue between Tibetan and Chinese authorities has happened since 2010, and Chinese officials continue to make unreasonable demands of the Dalai Lama as a condition for further dialogue.

What is the RTS (rooftop solar) programme?

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What is the RTS (rooftop solar) programme?

India launched the Jawaharlal Nehru National Solar Mission in January 2010. Its main objective was to produce 20 GW of solar energy (including RTS) in three phases: 2010-2013, 2013-2017, and 2017-2022. In 2015, the government revised this target to 100 GW by 2022, including a 40-GW RTS component, with yearly targets for each State and Union Territory.

In December 2022, India had an installed RTS capacity of 7.5 GW and extended the deadline for the 40-GW target to 2026. While financial incentives, technological advances, awareness, and training have improved RTS installation numbers, there is a long way to go.
India's overall RTS potential is approximately 796 GW. To meet India's target of installing 500 GW of renewable energy capacity, with a solar component of 280 GW, by 2030, RTS alone needs to contribute about 100 GW by 2030.

How can we ensure RTS growth?

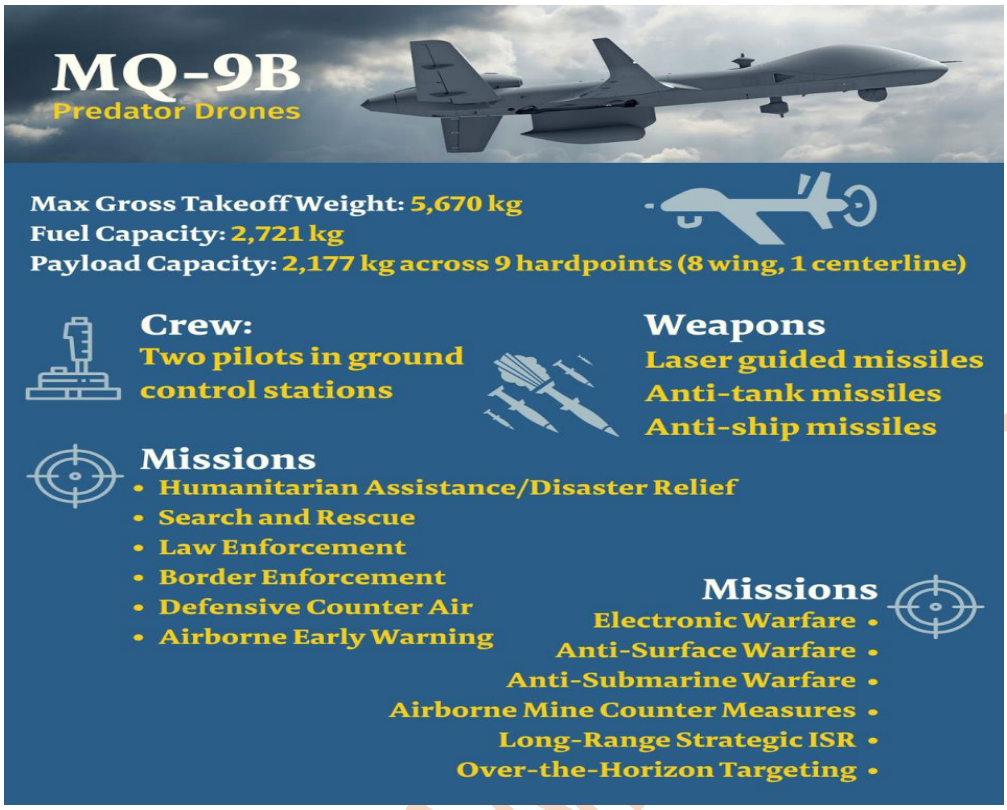
Creating awareness is key to getting consumers on board. In addition, RTS needs to be economically viable for households. While government subsidies are helping, multiple low-cost financing options are required. The number of banks and non-bank financial companies providing RTS loans has increased of late.

Access to low-cost RTS loans should be as easy as getting a bike or car loan. Promoting R&D in solar technology, energy storage solutions, and smart-grid infrastructure can lower costs, improve performance, and enhance the reliability of RTS systems.
Investments in training programs, (like the 'Suryamitra' solar PV technician programme initiated in 2015), vocational courses, and skill development initiatives will help build a skilled workforce.

Stryker

The Stryker is a family of eight-wheeled armored fighting vehicles derived from the Canadian LAV III, itself derived from the Swiss Mowag Piranha. The **General Atomics MQ-9 Reaper** (sometimes called **Predator B) is an unmanned aerial vehicle (UAV, one component of an unmanned aircraft system (UAS)) capable of remotely controlled or autonomous flight operations, developed by General Atomics Aeronautical Systems (GA-ASI) primarily for the United States Air Force (USAF).**

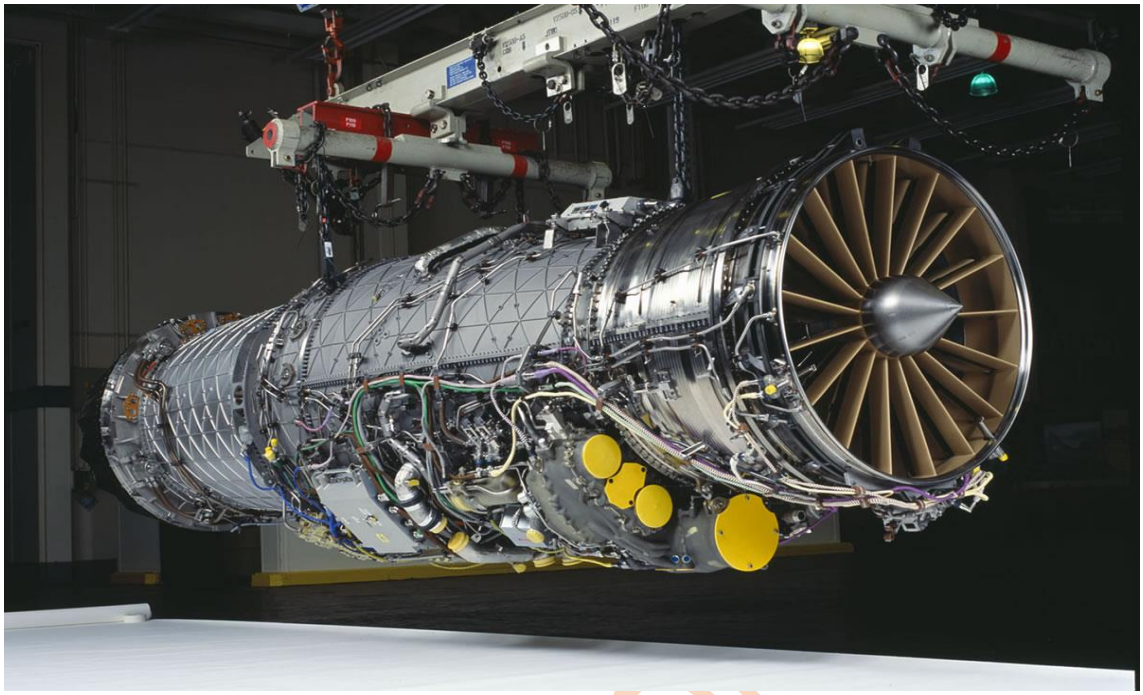
The MQ-9 and other UAVs are referred to as Remotely Piloted Vehicles/Aircraft (RPV/RPA) by the USAF to indicate ground control by humans. The MQ-9 is a larger, heavier, more capable aircraft

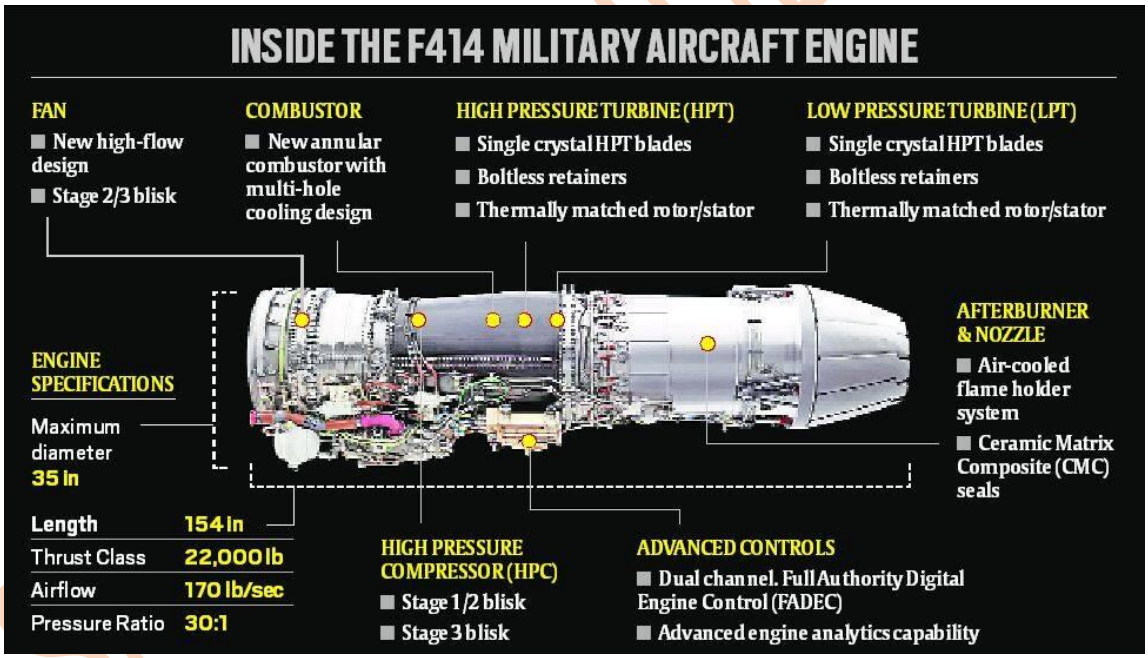


GE-414 jet

General Electric (GE) Aerospace announced that it has signed a Memorandum of Understanding (MOU) with Hindustan Aeronautics Limited (HAL) to co-produce "F414 engines" in India. The General Electric F414 is an American afterburning turbofan engine in the 22,000-pound thrust class produced by GE Aerospace. The F414 originated from GE's widely used F404 turbofan, enlarged and improved for use in the Boeing F/A-18E/F Super Hornet

GE's F414 engines utilize advanced technologies to enhance engine performance, and durability, and reduce Life Cycle Costs (LCC) for next-generation combat aircraft. The F414 provides unrestricted engine performance with rapid throttle response and no throttle restrictions, ensuring power is readily available when needed.





The engine offers good afterburner light and stability, enabling additional thrust to be quickly accessed when required. The F414 is designed to maximize time-on-wing, simplify maintenance, and keep Life Cycle Costs low. The engine's six-module design makes it reliable, and easy to maintain, and allows for interchangeability with no scheduled overhauls and on-condition maintenance, the F414 maximizes engine availability

The mainland serow

The mainland serow, a mammal that looks like a cross between a goat and an antelope, has been recorded at the lowest elevation beyond Bhutan, its natural home, in Assam. A team of scientists recorded a lone mainland serow (Capricornis sumatraensis thar) at 96 meters above the mean sea level at the Raimona National Park in western Assam. Also, the elusive animal has been found for the first time within a radius of 1 km from a human habitation

According to the International Union for Conservation of Nature, the mainland serow inhabits areas at altitudes of 200 meters to 3,000 meters. Its habitat is across the border in the Phibsoo Wildlife Sanctuary and the Royal Manas National Park in Bhutan

Currency swap arrangement

The Reserve Bank of India has put in place a revised framework on currency swap arrangements for countries within the South Asian Association of Regional Cooperation (SAARC) grouping for the period 2024 to 2027. Under the Framework for 2024-27, a separate INR Swap Window has been introduced with various concessions for swap support in Indian Rupee.

The total corpus of the Rupee support is ₹250 billion (Rs 25,000 crore),” the RBI said. The central bank will continue offering swap arrangements in US

dollars and euros under a separate dollar/euro swap window with an overall corpus of $2 billion. Under the currency swap framework, the RBI would strike bilateral swap agreements with central banks of SAARC countries.

The SAARC currency swap facility, which was first operationalized in November 2012, is intended to provide a backstop line of funding for short-term foreign exchange liquidity requirements or balance of payments crises suffered by SAARC countries till longer-term arrangements are made

EU ON CRITICAL RARE EARTHS

EU firms are gearing up to take advantage of the huge potential for recycling to supply critical rare earths for the bloc's green transition, but it will take time before there is enough supply of old EVs and wind turbines to process.

Under the Critical Raw Materials Act that entered into force l, the bloc has set a target that recycling should meet 25% of EU demand for critical minerals by 2030, including rare earths. Today, less than 1% of rare earths consumed in EU are recycled

The Firm is collecting old magnets to be ready when its plant is due to go into production in 2026. Initially, it plans to process 2,000 tonnes a year of old, permanent magnets and make rare earth oxides. It will also process mine concentrate until enough old EVs and wind turbines are scrapped to boost the supply of old magnets. Another key input will be 'swarfs', leftovers when blocks of new permanent magnets are cut into specific shapes, which can total up to a Fifth of magnet production.

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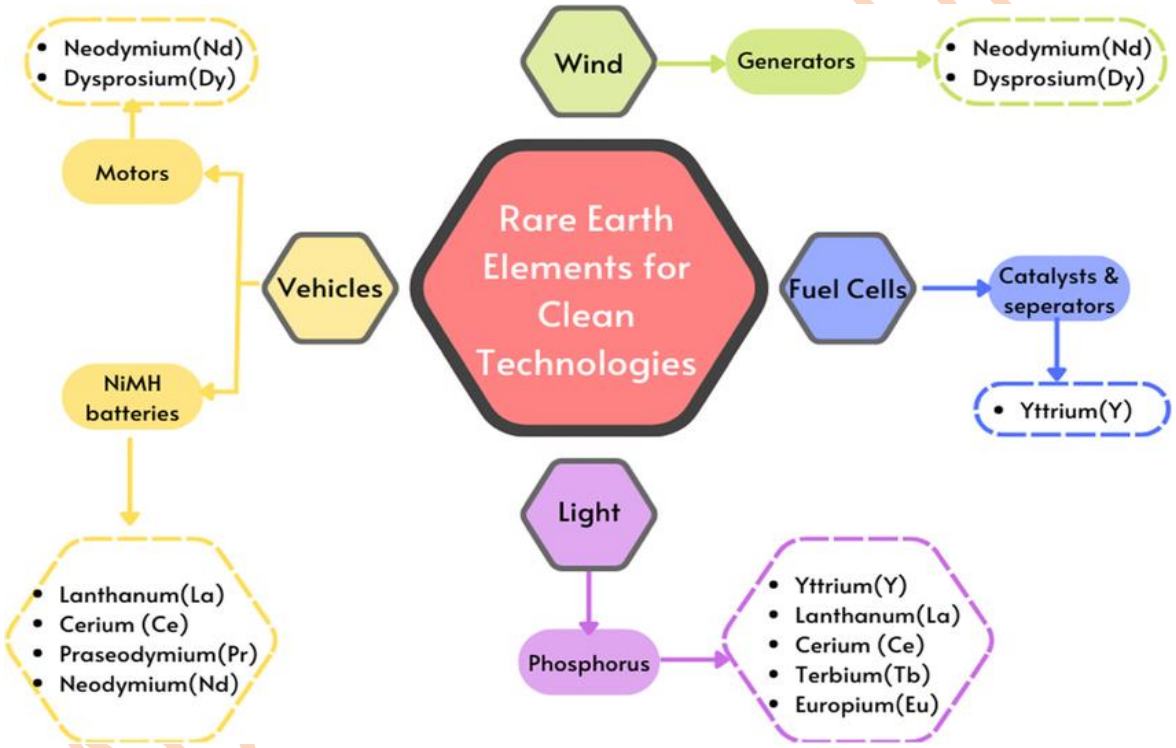
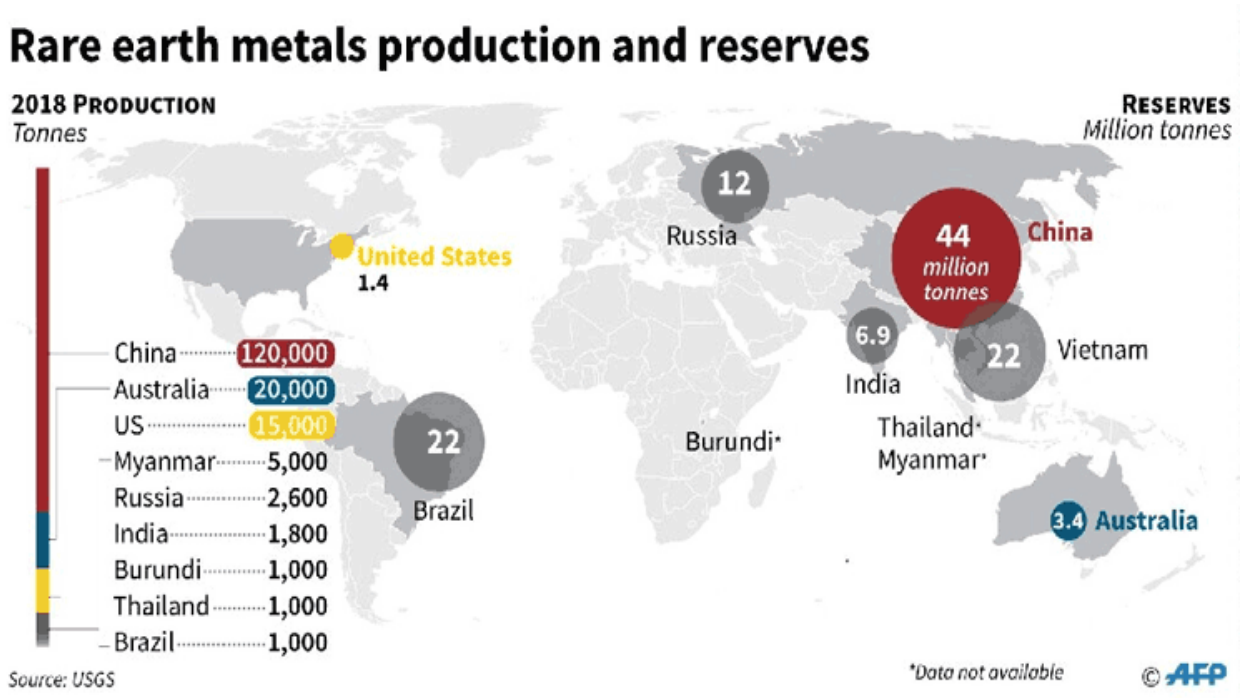
SWARF

Swarf, also known as chips or by other process-specific names, are pieces of metal, wood, or plastic that are the debris or waste resulting from machining, woodworking, or similar subtractive manufacturing processes. Swarf can be small particles; long, stringy tendrils; slag-like waste; or stone fragments and dust

Critical minerals

Critical minerals such as copper, lithium, nickel, cobalt and rare earth elements are essential components in many of today's rapidly growing clean energy technologies from wind turbines and electricity networks to electric vehicles.





UNESCO SITE IN KARNATAKA

Bringing to light

Smart move: The Tourism Department in Karnataka is planning to promote the UNESCO World Heritage Site of Somanathapur as part of Mysuru tourism circuit before Dasara this year. This will be through cross-promotion of the 13th-century heritage site at popular places of tourist interest such as the Mysuru Palace, zoo and the Chamundi Hills so that visitors can plan a visit. M.A. SRIRAM

UNESCO SITE IN KARNATAKA

The Hoysala temples at Belur, Halebid, and Somanathapur in Karnataka were declared as UNESCO World Heritage Sites in a move that will bring global recognition with prospects of an increase in international tourism to these places.

The Chennakeshava temple at Belur and the Hoysaleshwara temple at Halebidu both in Hassan district have been on the UNESCO's tentative list since 2014. The Keshava temple at Somanathapur in Mysuru district was appended to the other two monuments under the tentative list and all three were officially nominated by the Centre as India's entry for 2022-23 in February 2022.

Maurya and Davana (Dayana) species

Lucknow-based National Botanical Research Institute (NBRI), a Council of Scientific and Industrial Research (CSIR) institution, has set out to revive endangered flower species used in the 12th century Shree Jagannath Temple in Puri, Odisha. A year after NBRI signed a Memorandum of Understanding with the Shree Jagannath Temple Administration (SJTA), to cater to the needs of flowers, the country's premier botanical research institute (NBRI) has supplied Maurya and Davana (Dayana) species flowers for the temple.

Namoh 108 variety of lotus, released by CSIR-NBRI, was also introduced in the Koili Baikuntha garden of the temple.

All these aromatic flower and foliage plants are in much demand in the temple as these plants are in use in daily rituals,

Asteroid Belt

Mars is bombarded with basketball-sized meteorites on a nearly daily basis, five times more often than previously estimated, seismic recordings from a NASA spacecraft have revealed. Mars is roughly twice as big as the Moon and is much closer to our solar system's main asteroid belt, making it a prime target for large rocks hurtling through space. Most meteorites taking a shot at Earth break apart in our atmosphere. But the Martian atmosphere is 100 times thinner than Earth's, giving it little protection.

Insight mission

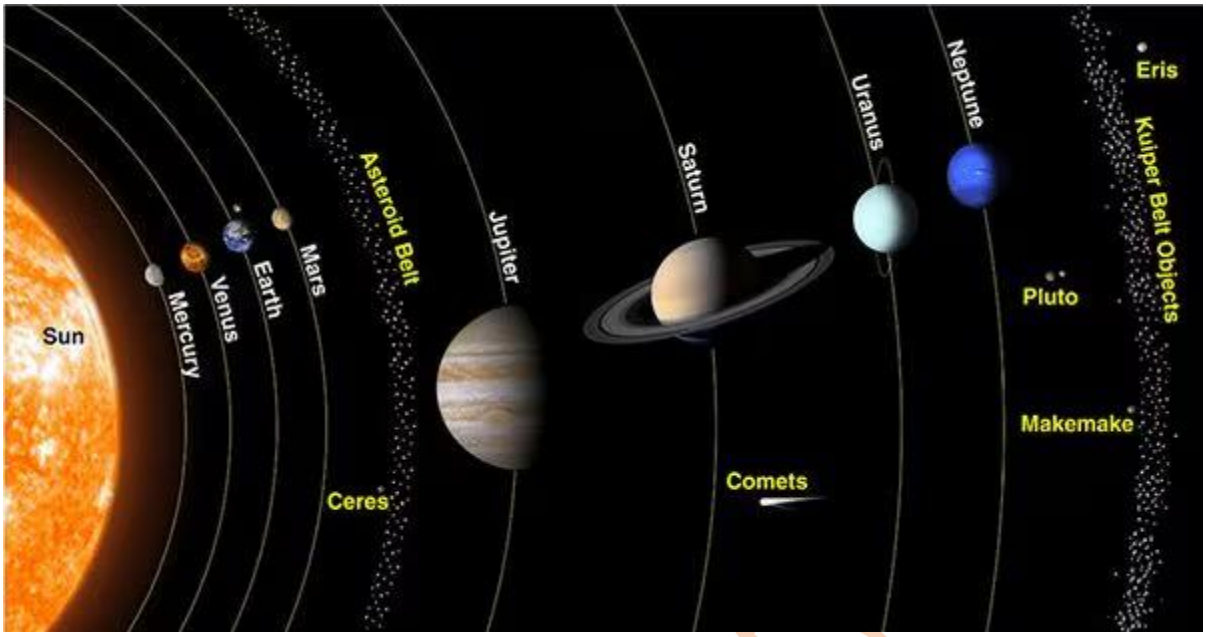
The Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (InSight) was a NASA Discovery Program mission that placed a single geophysical lander on Mars to study its deep interior.

But InSight was more than a Mars mission. It addressed one of the most fundamental issues of planetary science: understanding the processes that shaped the rocky planets of the inner solar system (including Earth) more than four billion years ago. The mission ended in December 2022 after more than four years of collecting unique science on Mars.

- **Launched: May 5, 2018 (4:05 a.m. PT/7:05 a.m. ET)**
- **Launch Vehicle: Atlas V-401**
- **Launch Location: Vandenberg Air Force Base, California**
- **Landed: Nov. 26, 2018, at 11:52:59 a.m. PT (2:52:59 p.m. ET)**
- **Landing Site: Elysium Planitia, Mars**
- **End of Mission: Dec. 15, 2022**

Asteroid Belt

The majority of known asteroids orbit within the asteroid belt between Mars and Jupiter, generally with not very elongated orbits. The belt is estimated to contain between 1.1 and 1.9 million asteroids larger than 1 kilometer (0.6 miles) in diameter, and millions of smaller ones.



Trojans

These asteroids share an orbit with a larger planet but do not collide with it because they gather around two special places in the orbit (called the L4 and L5 Lagrangian points). There, the gravitational pull from the Sun and the planet is balanced by a trojan's tendency to otherwise fly out of orbit. The Jupiter trojans form the most significant population of Trojan asteroids. It is thought that they are as numerous as the asteroids in the asteroid belt. There are Mars and Neptune trojans, and NASA announced the discovery of an Earth trojan in 2011.

Near-Earth Asteroids: These objects have orbits that pass close by that of Earth. Asteroids that actually cross Earth's orbital path are known as Earth-crossers

Mount Bombo

The Bromo, or Mount Bromo is an active somma volcano and part of the Tengger mountains, in East Java, Indonesia.

At 2,329 meters it is not the highest peak of the massif, but is the most active and famous. The name Bromo comes from the Javanese pronunciation of Brahma, the Hindu god of creation.

At the mouth of the crater, there is an idol of Ganesha, the Hindu god of wisdom which is being worshipped by the Javanese Hindus. Mount Bromo is located in

the middle of a plain called "Sea of Sand", a nature reserve that has been protected since 1919.

Spiritual climb

Tenggerese Hindu worshippers and villagers climb Mount Bromo and gather at its top during the Yadnya Kasada festival in Probolinggo, East Java, Indonesia. The festival is held to express their devotion and gratitude to their ancestors and gods. REUTERS

Meningoencephalitis

Unhygienic and stagnant water resources and high temperatures could be the factors contributing to the recent unusual rise in the rare, but fatal primary amoebic meningoencephalitis cases in the State. The meninges are the layers of thin tissue that cover your brain. Meningitis is when these tissues become inflamed or infected. The problem is called encephalitis when your brain becomes inflamed or infected. If both the meninges and the brain are infected, the condition is called meningoencephalitis

Causes

Infectious diseases, like viruses, bacteria, fungi, and the amoeba Naegleria fowleri, are the main causes of meningoencephalitis. These infections can spread through air, water, food, or close contact with somebody else who has them. Not everyone who gets these infections develops meningoencephalitis.

Meningoencephalitis is a medical condition that involves inflammation of both the brain (encephalitis) and the membranes surrounding the brain and spinal cord (meningitis). This condition can be caused by a variety of infectious agents, including viruses, bacteria, fungi, and parasites, or it can be a result of autoimmune diseases. The dual nature of the condition impacting both the meninges and the brain tissue makes it particularly severe and necessitates prompt diagnosis and treatment.

Causes

1. **Viral Infections**: Common causes include enteroviruses, herpes simplex virus, and arboviruses (such as West Nile virus).
2. **Bacterial Infections**: Bacteria like Neisseria meningitidis, Streptococcus pneumoniae, and Listeria monocytogenes can cause meningoencephalitis, especially in cases where bacterial meningitis spreads to the brain tissue.
3. **Fungal Infections**: These are less common and typically occur in individuals with weakened immune systems. Examples include Cryptococcus neoformans.
4. **Parasitic Infections**: Certain parasites, such as Toxoplasma gondii, can also lead to meningoencephalitis.
5. **Autoimmune Conditions**: Sometimes, the immune system may mistakenly attack healthy brain tissue, leading to inflammation.

Symptoms

Symptoms of meningoencephalitis can vary but generally include:

- **Headache**
- **Fever**
- **Stiff neck**
- **Confusion or altered mental status**
- **Sensitivity to light (photophobia)**
- **Seizures**
- **Weakness or numbness in parts of the body**
- **Sleepiness or difficulty waking up**

Diagnosis

Diagnosing meningoencephalitis involves several steps

- **Medical History and Physical Examination**: Initial assessment to check for signs of infection and neurological impairment.

- **Lumbar Puncture (Spinal Tap)**: A key diagnostic procedure where cerebrospinal fluid (CSF) is extracted from the spinal canal for testing. This can show increased white blood cells, elevated protein, and decreased glucose, indicative of infection or inflammation.
- **Imaging**: MRI or CT scans can be used to assess for inflammation and other abnormalities in the brain and surrounding tissues.
- **Laboratory Tests**: Blood tests, and specific tests on CSF to identify viruses, bacteria, or other infectious agents.

Treatment:

Treatment depends on the underlying cause:

- **Antibiotics**: Used aggressively if a bacterial infection is suspected or confirmed.
- **Antiviral Medications**: Used for viral infections, though the effectiveness can vary depending on the virus.
- **Antifungal or Antiparasitic Treatment**: Appropriate if infection is due to fungi or parasites.
- **Supportive Care**: Managing symptoms such as fever, and seizures, and maintaining hydration and nutrition.
- **Corticosteroids**: Sometimes used to reduce inflammation.
- **Immunotherapy**: For cases related to autoimmune reactions.

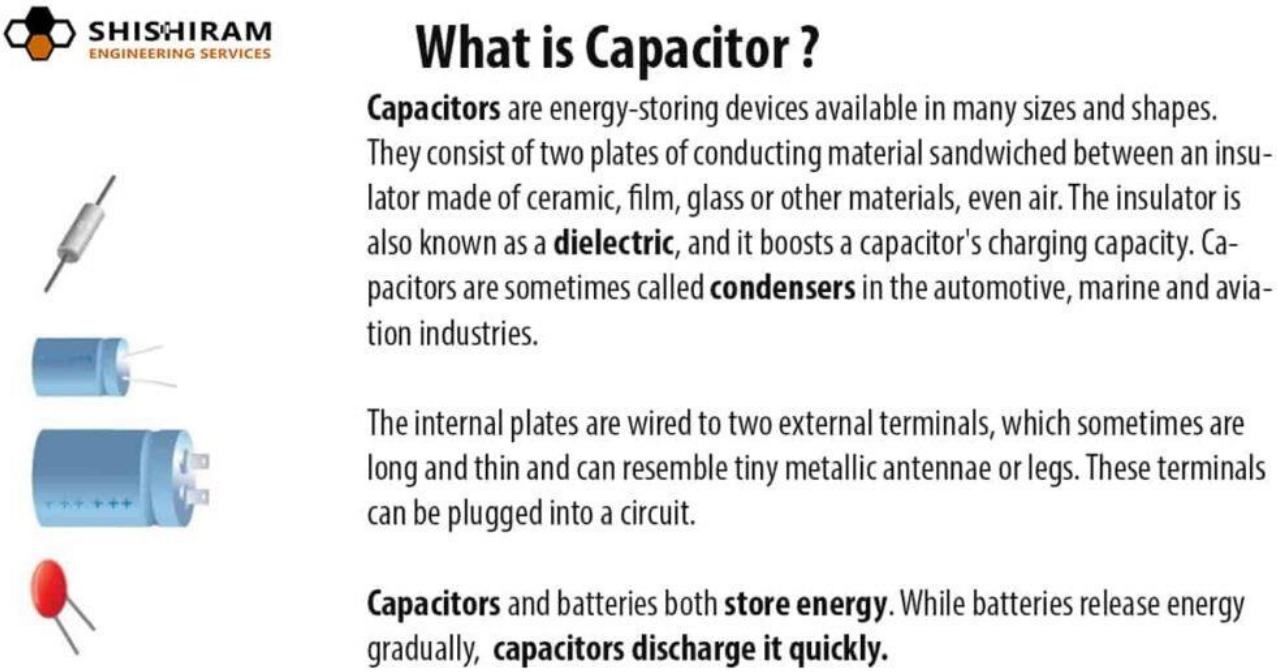
Prognosis:

The prognosis for meningoencephalitis can vary widely depending on the cause, the speed of diagnosis, and the initiation of treatment. Early intervention can significantly improve outcomes, but the condition can be life-threatening and may result in long-term neurological deficits. Prompt medical attention is crucial if meningoencephalitis is suspected, due to its potentially severe complications and rapid progression.

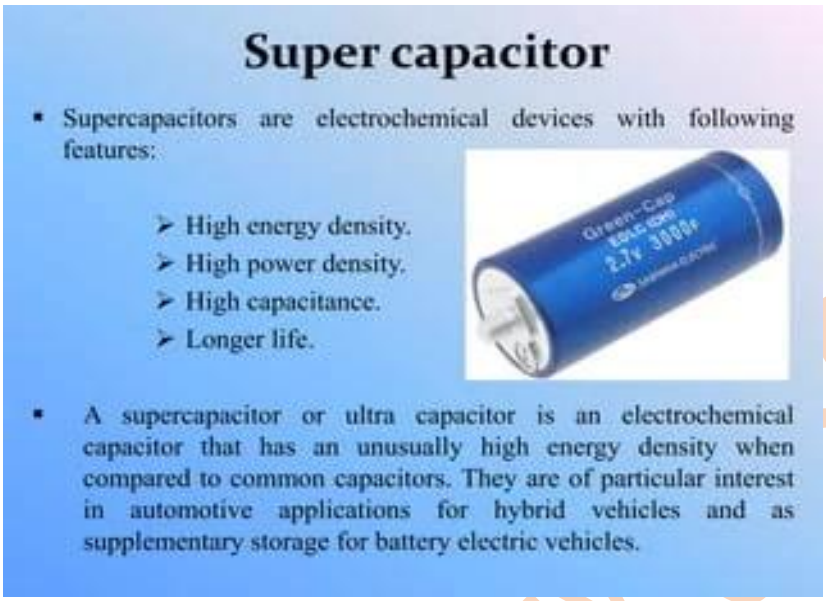
Coconut husk for super capacitor

Researchers at the Government College for Women, Thiruvananthapuram, have devised a method to produce activated carbon, suitable for super capacitor fabrication, from coconut husks, which are a major agricultural residue in Kerala.

The coconut husk biowaste-derived activated carbon holds immense promise for sustainable and efficient green solutions for high-performance super capacitors owing to its availability, low cost, and eco-friendly nature.
Super capacitors, with significantly higher capacitance and energy storage capacity than conventional capacitors, have emerged as a vital component in the quest for sustainable energy storage solutions.
But, the search for an ideal super capacitor electrode material has been a challenge.



GES reporter



Prosopagnosia

Mutation of the MCTP2 causes prosopagnosia, or face blindness. Its prevalence worldwide is estimated to be 1.8-2.9%. Prosopagnosia is one form of visual agnosia, or inability to identify everyday items just by looking at them

Researchers demonstrated that unrelated individuals who performed poorly in face recognition tests were more likely to carry independent mutations in the MCTP2 gene. Their first-degree relatives who shared their mutation also shared the impairment. In the brain, the right middle fusiform gyrus is activated during facial recognition.

When researchers used functional magnetic resonance imaging to study individuals carrying different MCTP2 mutations, they found abnormal responses in the gyrus

Perpetual motion: cheating nature's laws

Nothing lasts forever. This is good life advice, and it also happens to be an important feature of our physical universe. Natural philosophers considered and discarded the idea of "perpetual motion" a long time ago. The basic premise of perpetual motion is that it should be possible to operate a system without supplying power to it. We know from daily experience that this can't be true: for example, your phone's battery will drop to zero if you use it without charging. In physicists' parlance, perpetual motion violates the law of conservation of energy.

The first and second laws of thermodynamics also stipulate that anything that offers power must also liberate heat. If there was an infinite power supply, there would also have to be an infinite heat liberator

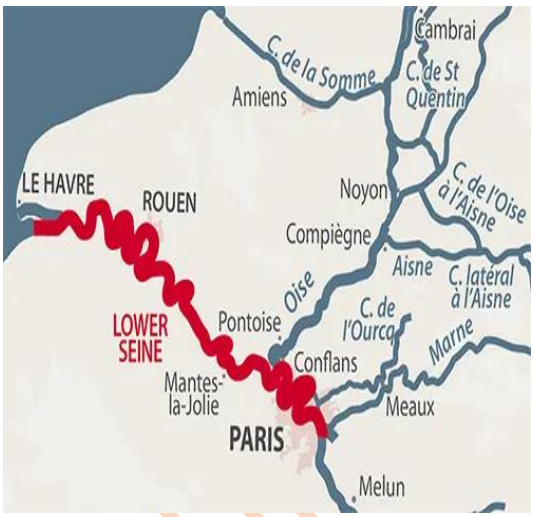
BIG SHOT

Water pollution levels in Paris's Seine river remain much higher than the level allowed for swimming, data showed on Friday. The numbers arrived just one month before the start of the Olympics, in which the capital's landmark waterway is meant to be one of the swimming venues. REUTERS

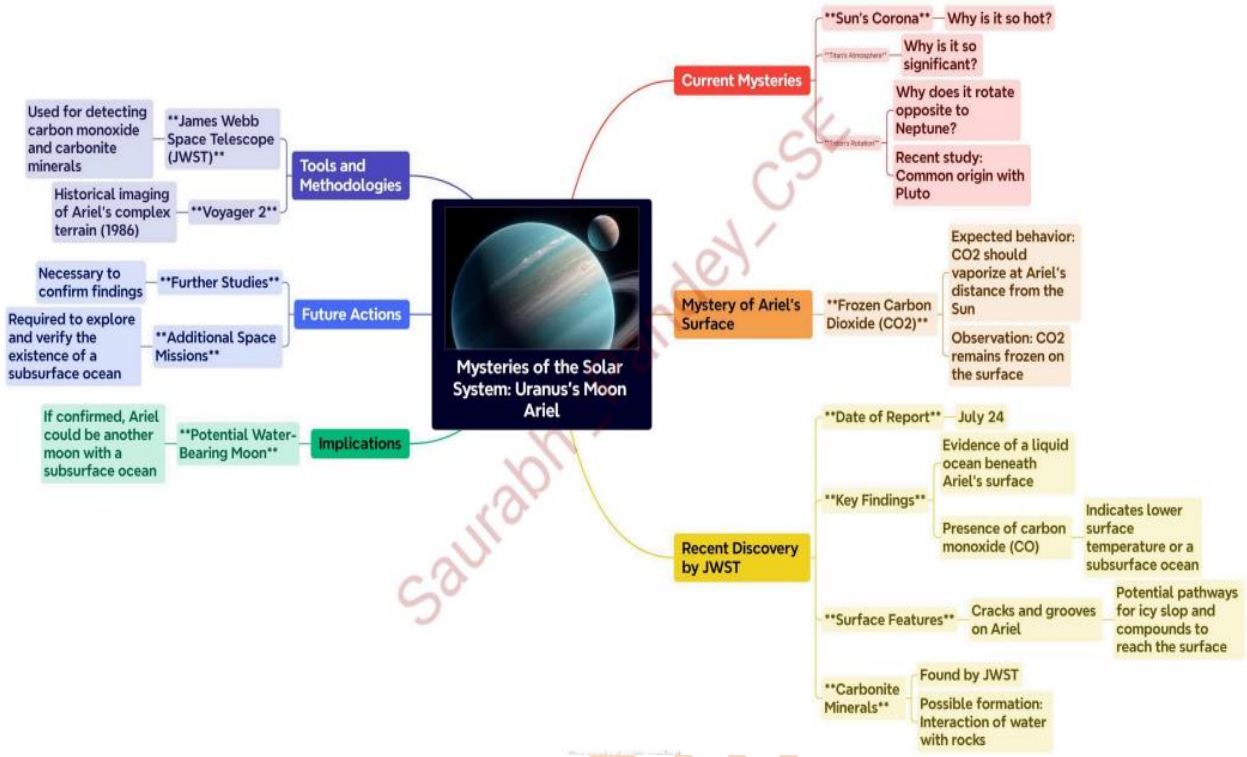
Seine River

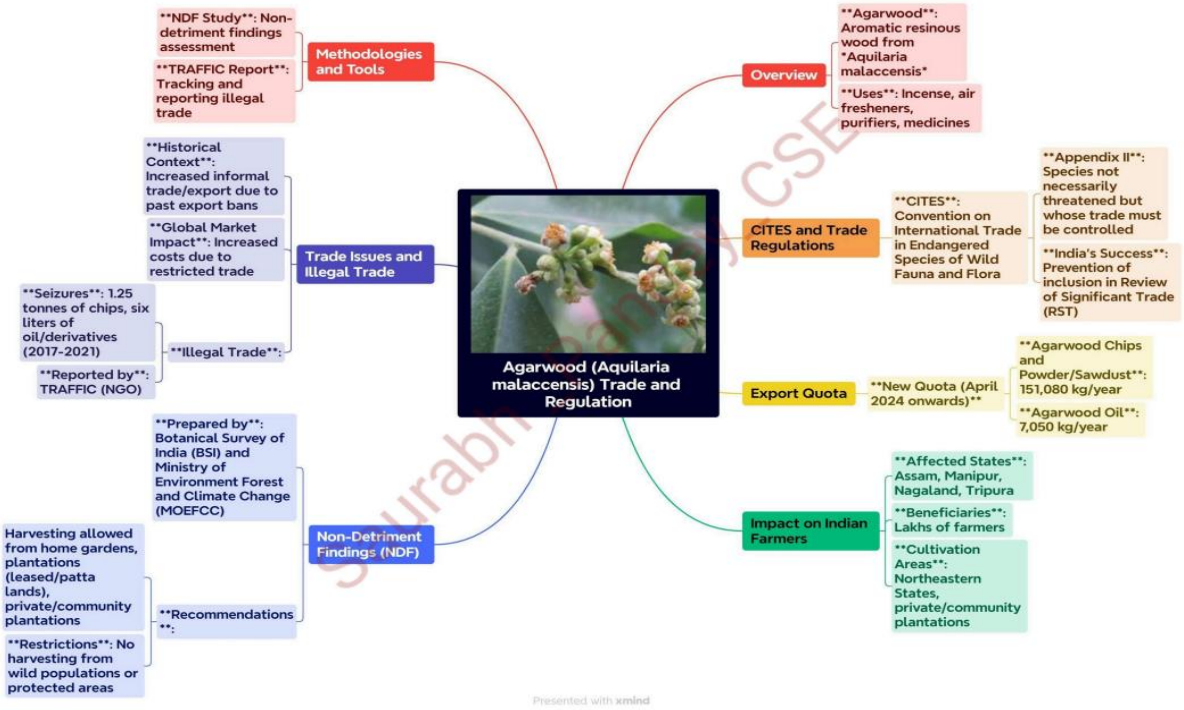
Seine River, ancient Sequana, Second longest river in France. It rises on the Langres plateau, 18 mi (30 km) northwest of Dijon, and flows through Paris before emptying into the English Channel at Le Havre after a course of 485 mi (780 km). Its tributaries include the Marne and Oise rivers.


PARIS
NANTES
BORDEAUX
LYON
TOULOUSE
AVIGNON


Cambrai
C. de la Somme
C. de St Quentin
Amiens
LE HAVRE
ROUEN
Noyon
C. de l'Oise à l'Aisne
Compiègne
Aisne
C. latéral à l'Aisne
Oise
LOWER SEINE
Pontoise
C. de l'Ourcq
Marne
Conflans
Mantes-la-Jolie
Meaux
PARIS
Melun


ENGLAND
London
Bruges
Lille
BELGIUM
Juno Beach
Gold Beach
Omaha Beach
Rouen
Paris
Les Andelys
Vernon
Le Pecq
SEINE
FRANCE
N
Cruise
High-Speed Train
Overnight


Mysteries of the Solar System: Uranus's Moon Ariel
Current Mysteries
Sun's Corona
Why is it so hot?
Why is it so significant?
Why does it rotate opposite to Neptune?
Recent study: Common origin with Pluto
Mystery of Ariel's Surface
Frozen Carbon Dioxide (CO2)
Expected behavior: CO2 should vaporize at Ariel's distance from the Sun
Observation: CO2 remains frozen on the surface
Recent Discovery by JWST
Date of Report
July 24
Key Findings
Evidence of a liquid ocean beneath Ariel's surface
Presence of carbon monoxide (CO)
Indicates lower surface temperature or a subsurface ocean
Surface Features
Cracks and grooves on Ariel
Potential pathways for icy slop and compounds to reach the surface
Carbonite Minerals
Found by JWST
Possible formation: Interaction of water with rocks
Tools and Methodologies
James Webb Space Telescope (JWST)
Used for detecting carbon monoxide and carbonite minerals
Voyager 2
Historical imaging of Ariel's complex terrain (1986)
Future Actions
Further Studies
Necessary to confirm findings
Additional Space Missions
Required to explore and verify the existence of a subsurface ocean
Implications
Potential Water-Bearing Moon
If confirmed, Ariel could be another moon with a subsurface ocean


Agarwood (Aquilaria malaccensis) Trade and Regulation
Overview
Agarwood: Aromatic resinous wood from *Aquilaria malaccensis*
Uses: Incense, air fresheners, purifiers, medicines
CITES and Trade Regulations
CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
Appendix II: Species not necessarily threatened but whose trade must be controlled
India's Success: Prevention of inclusion in Review of Significant Trade (RST)
Export Quota
New Quota (April 2024 onwards)
Agarwood Chips and Powder/Sawdust: 151,080 kg/year
Agarwood Oil: 7,050 kg/year
Impact on Indian Farmers
Affected States: Assam, Manipur, Nagaland, Tripura
Beneficiaries: Lakhs of farmers
Cultivation Areas: Northeastern States, private/community plantations
Methodologies and Tools
NDF Study: Non-detriment findings assessment
TRAFFIC Report: Tracking and reporting illegal trade
Trade Issues and Illegal Trade
Historical Context: Increased informal trade/export due to past export bans
Global Market Impact: Increased costs due to restricted trade
Illegal Trade:
Seizures: 1.25 tonnes of chips, six liters of oil/derivatives (2017-2021)
Reported by: TRAFFIC (NGO)
Non-Detriment Findings (NDF)
Prepared by: Botanical Survey of India (BSI) and Ministry of Environment Forest and Climate Change (MOEFCC)
Recommendations:
Harvesting allowed from home gardens, plantations (leased/patta lands), private/community plantations
Restrictions: No harvesting from wild populations or protected areas