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Art and Culture

GI Tags Given To Crafts From Rajasthan, Mangoes Grown In Goa

Context: Seven products from across India including four from Rajasthan were given the Geographical Indication (GI) tag by the Geographical Indications Registry in Chennai.

Key Highlights

GI Tags were given to	Facts	Image
The Jalesar Dhatu Shilp (metal craft)	At Jalesar in Etah district in Uttar Pradesh, which was the capital of Magadha King Jarasandha, over 1,200 small units are engaged in making Jalesar Dhatu Shilp. This place is known for making decorative metal craft as well as brassware.	
Goa Mankurad mango	The Portuguese named the mango as Malcorada meaning poor coloured and with time this word transformed to 'Mankurad' aamo. Aamo means mango in Konkani language.	
Goan Bebinca	Bebinca is a type of pudding and a traditional Indo-Portuguese dessert. It is also known as the Queen of Goan desserts.	
Udaipur Koftgari metal craft	The Udaipur Koftgari metal craftsmen practices the ancient art of Koftgari used in making ornamental weaponry. The weapons are exquisitely ornamented by a complicated process of etching of design, heating and then cooling intertwined with the process of embedding gold and silver wire into the metal, pressing and flattening it to a smooth surface using moonstone and finally polishing.	
Bikaner Kashidakari craft	Kashidakari work is done majorly on objects associated with marriage, especially gift items, and makes use of mirror work.	
Jodhpur Bandhej craft	The Jodhpur bandhej craft is the Rajasthani art of tying and dyeing. It is the art of printing varied patterns on fabrics using the tie and dye method.	
Bikaner Usta Kala craft	The Bikaner Usta Kala craft is also known as gold nakashi work or gold manauti work, due to the prominence of golden colour in an actual manner developed by gold in the previous period. Due to this, the craft has longevity.	

18th Century Tamil Manuscripts Found In Monastery In Italy

Context: Palm manuscripts from the 18th Century, titled Gnanamuyarchi, have been discovered in an Armenian monastery in northern Italy.

- It could be a **copy of the first Tamil translation of Spiritual Exercise**, written by **St. Ignatius of Loyola in the 16th century**.
- This translation is most likely by Michele Bertoldi, known in Tamil as **Gnanaprakasasamy**.
- The manuscript was initially misclassified as **‘Indian Papyrus Lamulic Language–XIII Century,’** unaware that they were written in Tamil.
- The monastery authorities think the manuscripts might have been **brought to Italy by Armenians** in Chennai.

What is a Manuscript?

A manuscript is a handwritten or typewritten document, usually historical or literary in nature, before the age of printing. For example, ancient religious Sanskrit texts written on palm or birch leaf.

Kancheepuram Classic

Context: Silk saris from the town are prized for their exquisite craft but weavers worry about job losses, drop in income and diminishing interest in the profession.

- Kancheepuram has become eponymous for its silk saris, both in India and abroad.
- The Kancheepuram silk sari got its Geographical Indication tag in 2005.
- The handloom silk saris are prized attire for weddings and other special occasions: a Kancheepuram silk sari can cost anywhere between ₹10,000 and ₹1,00,000.
- The intricate process of getting the sari ready involves dyeing of the raw silk, drying it under the scorching sun for four to five hours, spinning, warping, and, finally, weaving. The process can take 10-15 days.

What is the Issue?

- Up to the turn of the century (early 2000s), the Kancheepuram silk sari enjoyed tremendous patronage. But now, with shifting fashion trends, competition from the faster power loom and the availability of cheaper artificial silk, there are fewer buyers, the weavers say.
- Earlier, customers and traders were willing to wait for two weeks for the sari to get woven but today they prefer readymade ones.
- This shift has led to job losses and a drop in revenue for the weavers.
- The pandemic also had a significant negative impact on the industry as the number of direct customers visiting Kancheepuram dwindled to nothing.
- Most of the handloom weavers today are of an older age group or middle-aged. They say that the next generation is neither motivated nor interested in learning and continuing the centuries-old craft.

The major concern of the weavers is that their generation may be the last to practise the profession, leaving no one to carry on their legacy.

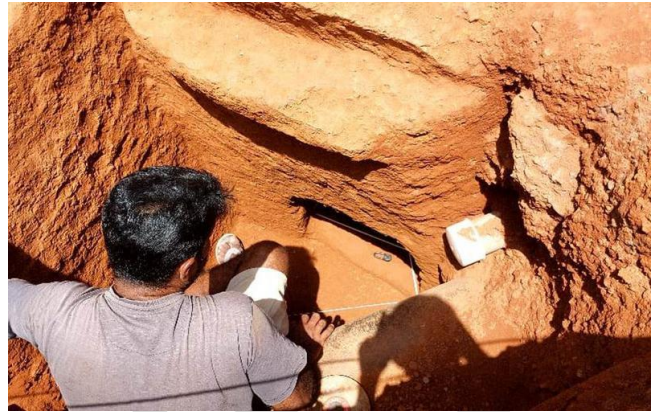
Kanjeevaram Sarees

- ✓ Traditionally, the Kanjeevaram is a sari that is handwoven in **mulberry silk** and **has pure gold or silver zari** that renders it a festive quality.
- ✓ It is identified as the most luxurious and classy fabric in Indian traditional clothing. Originating from the village ‘Kanchipuram’ in Tamil Nadu, Kanjeevaram is considered the queen of silk sarees.
- ✓ The temple architecture of south India especially around Kanchipuram has historically served as the design inspiration for the traditional Kanjeevaram motifs.
- ✓ One can spot motifs such as the mythical creature called the Yali (an elephant-lion fusion), the Ganda Berunda (a two-headed majestic mythical bird) and the ubiquitous temple border called reku.
- ✓ Tracing its long and rich history from the Chola Dynasty, Kanchipuram sarees today are considered as one of the oldest and rich legacies of the Indian textile industry.

Vast Megalithic Site In Kerala

Context: A large number of megalithic hat stones were found from a single site during a recent salvage excavation conducted by the Kerala State Archaeology Department at Nagaparamba in Kuttippuram village, near Tirunavaya, in Malappuram district.

- It all began when a unique rock cut laterite burial chamber was found during the laying of water supply pipelines.
- Hat stones, popularly called **Thoppikkallu** in Malayalam, are hemispherical laterite stones used as lids on burial urns during the megalithic period.
- It could be the largest number of hat stones in an unprotected site in the State.



Key Highlights

- Many hat stones are feared to have been destroyed inadvertently by the local people in recent times.
- People say they had no idea about the archaeological relevance of hat stones and many were destroyed when they cleared their land for house construction.
- A large number of megalithic burial sites and relics were found during the excavation.
- The team salvaged numerous earthen urns and iron implements with unique features, which could throw light on the life and culture of people who lived in those parts over 2,000 years ago.

Seethakali Folk Art

Context: Artists breathe new life into Seethakali folk art; all set to perform outside Kerala.

- Over the years, the staging became sporadic and around three decades ago, the folk art started fading away from public domain.
- A group of folk art aficionados cutting across caste and communal barriers could successfully salvage it in 2017. The Perinad Seethakali Sangham currently has artists from all walks of life and the 20-member group is all set to perform outside Kerala for the first time.
- Since the Seethakali songs were orally passed on from one generation to the next, the tradition came to a standstill at one point.

About Seethakali Folk Art

- Seethakali is a dance drama primarily performed by Dalit artists belonging to the Veda and Pulaya communities.
- It presents minuscule episodes of the Ramayana at every homestead.
- Seethakali was a part of Onam festivities in the past and it's a Dravidian dance form portraying the portions from vanayatra (exile to the forest) to Sita's andardhanam (descend into the earth).
- Key characters include Sita, Ram, Lakshman, Ravan, and Hanuman.
- It's a blend of songs, storytelling and fast movements.
- Instruments used are ganjira, manikatta, chiratta and kaimani.
- Stories are conveyed through folk-style songs influenced by Vallappaattu Kuthirappaattu, and Rakshasappattu.



Agriculture

Is India's Sugar Surplus Leading to a Crisis?

Context: India became the world's top sugar producer in 2021-2022, surpassing Brazil with a record of 359 lakh tonnes. However, the extensive use of resources in sugar production is depleting rapidly, leading to a potential crisis in the future.

- Over-cultivation of sugarcane has caused a sugar surplus and high exports, impacting groundwater negatively.
- To prevent the risk of agricultural collapse, addressing groundwater overuse in the sugar industry is crucial.

Why Is There Excess Sugar Production?

- India is the world's largest consumer of sugar, and thus has to produce enough to meet its huge domestic demand.
- But the excess production stems from policies and measures that make farmers favour sugarcane cultivation.
- The Central government offers a fair and remunerative price (FRP) scheme, which mandates a minimum price that sugar mills have to pay to sugarcane farmers, ensuring that farmers always get fair profits for their crop.
- State governments also offer heavy subsidies to incentivise sugarcane cultivation.

The resulting sugar surplus has led to higher exports, with a record of 110 lakh tonnes exported in 2021-2022.

- In fact, Brazil, Australia, and Guatemala filed a complaint with the World Trade Organization (WTO) against India for violating international trade rules by offering excessive export subsidies and domestic support to farmers to outcompete other countries in the global sugar market. The WTO ruled against India and India also lost its appeal.

What Efforts Have Been Made To Address This Issue?

To deal with the sugar surplus, the Indian government considered diverting it to the production of ethanol, an organic compound made by fermenting sugarcane molasses or sugar.

THE GIST

- India became the world's top sugar producer in 2021-2022, surpassing Brazil, but the extensive use of resources in sugar production is depleting rapidly, leading to a potential crisis in the future.
- The sugar surplus and high exports are a result of policies favouring sugarcane cultivation, such as the fair and remunerative price (FRP) scheme and State government subsidies.
- India's top sugarcane-growing states rely heavily on groundwater for irrigation, leading to concerns over groundwater depletion.

ETHANOL

Ethanol is the active ingredient in alcoholic beverages and is also used in the chemicals and cosmetics industries.

- ✓ In the transport sector, the use of ethanol-blended petrol (EBP) significantly reduces harmful emissions, such as carbon monoxide and various hydrocarbons, from vehicles.
- ✓ The government launched the EBP programme in 2003 to reduce crude oil imports and curtail greenhouse gas emissions from petrol-based vehicles; it has been fairly successful.
- ✓ It started with the modest goal of achieving a blending rate of 5%, but the target set for 2025 is 20%.
- ✓ The government also reduced the Goods and Services Tax on ethanol from 18% to 5% in 2021.
- ✓ In the same year, of the 394 lakh tonnes of total sugar produced, about 350 lakh tonnes were diverted to produce ethanol, while India achieved a blending rate of 10% months ahead of the target.

Excessive Sugarcane Cultivation & Groundwater

Sugarcane cultivation is a water-intensive cultivation.

- Sugarcane requires 3,000 mm of rainfall, but top-growing States get 1,000-1,200 mm, relying heavily on groundwater from confined aquifers, a limited resource.

- 100 kg of sugar needs two lakh litres of groundwater for irrigation, raising concerns as these States are already drought-prone and groundwater-stressed, as per a 2022 CGWB report.

Solutions

- ✓ While the environmental implications of excess sugar production should be clear, surplus production and export have enormous financial gain, amounting to lakhs or crores of rupees a year.
- ✓ A better and more sustainable way would be to assess and then correct incentives that skew in favour of sugarcane over other crops, leading to a consistent surplus.
- ✓ Introducing fair and comprehensive subsidy schemes for a variety of crops can help farmers diversify as well as distribute cultivation evenly, prevent monocultures, and ensure an equitable income.
- ✓ The availability of a wider range of profitable and less resource-intensive crops can lower the strain on vital natural resources.
- ✓ This must be complemented by environmentally responsible sugarcane cultivation practices that prioritise groundwater, such as drip irrigation, to tackle the issue in the long run.
- ✓ In drip irrigation, water is allowed to drip slowly but directly to the roots of sugarcane plants, reducing water consumption by up to 70% relative to the current flood irrigation method.
 - This method has already been made mandatory in many parts of India, and the government has also offered subsidies to farmers for setting up the system. Next, India needs to invest in overall water-saving and management systems.
 - Concerted efforts to adopt cleaner practices such as rainwater harvesting, wastewater treatment, and canal irrigation networks, will help minimise stress on groundwater reservoirs as other water sources become available for irrigation.
 - Although the CGWB conducts significant research and generates valuable data, many aspects of groundwater availability and distribution remain poorly understood and/or mapped. Investment in groundwater research, therefore, needs to be considered seriously.

As India continues to become more of a global frontrunner in the agricultural sector, it must put sustainability at the centre.

Third Phase of Universalisation of Distribution of Fortified Rice

Context: The Union Food Ministry has set a target to procure 521 lakh tonnes of rice this kharif season. It was also decided to complete the third phase of universalisation of distribution of fortified rice ahead of its earlier target of March 2024.

- Union Food Secretary said the target for rice procurement was decided after discussions with all States.
- The Ministry will release additional quota of two lakh tonnes of sugar, over and above the 23.5 lakh tonnes already allocated for August, in view of the “strong demand” for the upcoming festivals of Onam, Raksha Bandhan and Krishna Janamashtami.

Food for thought

Fortification of eatables is aimed at fighting malnutrition

What it means

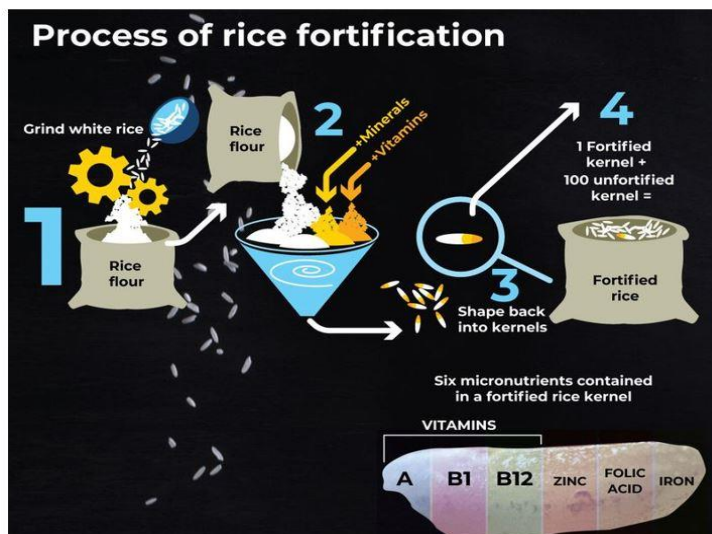
Fortification is the addition of key vitamins and minerals, such as iron, iodine, zinc, Vitamins A & D, to staple foods such as rice, milk and salt to improve their nutritional content



- The nutrients may or may not have been originally present in the food before processing
- It is a simple, proven, cost-effective and complementary strategy in use across the globe
- The draft Food Safety and Standards Regulations, 2016, prescribe the standards for fortification of salt, oil, milk, and rice

About The Programme

- A scheme for the distribution of fortified rice, containing prescribed micronutrients (Iron, Folic Acid, and Vitamin B12) was launched in October 2021 in a phased manner in order to address the problem of anaemia in children and women.
- In April 2022, the Cabinet Committee on Economic Affairs (CCEA) approved the supply of fortified rice throughout the Public Distribution System (PDS), Integrated Child Development Services (ICDS), Pradhan Mantri Poshan Shakti Nirman-PM POSHAN and other welfare schemes in all states and Union Territories by 2024 in a phased manner.
- The entire cost of rice fortification, which is around Rs 2,700 crore per annum, would be borne by the Centre as part of the food subsidy till its full implementation up to June 2024.



It is said that Ministry was on track to achieve the target of 100% distribution of fortified rice across all rice-consuming districts in the country.

- The third phase of the programme was in progress and the entire public distribution system would be covered with fortified rice.
- The scheme will be universalised within some months, adding that of the 250 lakh tonnes with the Food Corporation of India, only 12 lakh tonnes was non-fortified rice.
- The Ministry organised a national seminar on the efficacy of rice fortification.
- The scheme is an evidence-based programme and fortified rice was safe even for those with thalassemia and sickle cell anaemia.
 - It would not cause any toxicity.
 - Five kilograms of fortified rice would be supplied to a person every month, which is 160 grams of fortified rice per day containing 7 mg of iron.

Polity

Jan Vishwas Act, 2022

Context: The controversial Jan Vishwas Act, 2022 which was recently enacted into law by Parliament, has been touted by the government as a landmark piece of legislation aimed at improving “ease of doing business” in India by either decriminalising or making “compoundable” offences across 42 legislations.

- The legislation has mostly replaced criminal imprisonment with penalties, it has transferred the power to impose these monetary penalties from the judiciary to the bureaucracy.

The larger question is whether giving the bureaucracy, rather than the courts, the power to not just adjudicate a factual dispute but also penalise or order compensation, goes against the constitutional scheme of separation of powers.

THE GIST

- The Jan Vishwas (Amendment of Provisions) Bill, 2023 proposes to amend 183 provisions to be decriminalised in 42 Central Acts administered by 19 Ministries/Departments.

- Among these, the changes proposed to the Drugs and Cosmetics Act, 1940 have been the most contentious. The Act regulates the import, manufacture, distribution and sale of drugs and cosmetics in the country.

- Activists fear that the government, under the guise of ease of doing business, have proposed the amendments which seek to dilute the punishment by doing away with prison terms for a lot of offences and converting fines to penalties.

What is the Jan Vishwas Bill about?

The Jan Vishwas (Amendment of Provisions) Bill, 2022 amends 42 laws, across multiple sectors, including agriculture, environment, and media and publication and health.

- The Bill converts several fines to penalties, meaning that court prosecution is not necessary to administer punishments.
- It also removes imprisonment as a punishment for many offences.
- Covered under the Jan Vishwas (Amendment of Provisions) Bill, 2023 are changes in the Drugs and Cosmetics Act, 1940, the Food Safety and Standards Act, 2006 and the Pharmacy Act, 1948.
 - This has evoked heated debate about its pros and cons among health care activists, experts in the field of pharmacy and patient-welfare groups.
 - Among these, the changes proposed to the Drugs and Cosmetics Act, 1940 have been the most contentious. The Act regulates the import, manufacture, distribution and sale of drugs and cosmetics in the country.
 - Currently, the Act defines four categories of offences— adulterated drugs, spurious drugs, mislabelled drugs, and Not of Standard Quality drugs (NSQs) — and lays out degrees of punishment (a combination of prison time and fine) based on the degree of offence.
- The Jan Vishwas Act amends the Environmental (Protection) Act, 1986 and the Air (Prevention and Control of Pollution) Act, 1981 to replace imprisonment as a punishment for certain offences with penalties of up to ₹15 lakh that can be imposed by designated bureaucrats (Joint Secretaries).
- Under amendments to the Indian Forest Act, 1927 forest officers have the power to not just conduct an inquiry to determine the “damage done to the forest” by anybody but also order the offender to pay a hitherto uncapped “compensation” for said damage.

What are the Pros and Cons of the Amendments?

The amendments have brought in sharp criticism from health activists. It is said that the Bill is detrimental to public health on two counts.

- First, it allows manufacturers of Not of Standard Quality Drugs (NSQ) drugs to escape significant penalties despite the fact that these drugs can have an adverse effect on the patient.
- Second, the Bill also reduces penalties for owners of pharmacies who violate the terms of their licence.

Mines and Minerals Bill 2023

Context: On August 2, Parliament passed the Mines and Minerals (Development and Regulation) Amendment Bill, 2023, in a bid to attract private sector investment in the exploration of critical and deep-seated minerals in the country.

- The Bill puts six minerals, including lithium — used in electric vehicle batteries and other energy storage solutions — into a list of “critical and strategic” minerals.
- The exploration and mining of these six minerals, previously classified as atomic minerals, were restricted to government-owned entities.

How Much of India’s Critical Minerals are Imported?

The lack of availability of some minerals or the concentration of their extraction or processing in a few geographical

THE GIST

- The Mines and Minerals (Development and Regulation) Amendment Bill, 2023, passed by India’s Parliament, aims to attract private sector investment in exploring critical and deep-seated minerals in the country.
- Six minerals, including lithium, have been reclassified as “critical and strategic” minerals, making them eligible for exploration and mining by private entities. Previously, these minerals were restricted to government-owned entities.
- India’s dependency on imports for critical and deep-seated minerals has been a concern, leading to supply chain vulnerabilities and import dependencies from countries like China, Russia, and Australia.
- The lack of private sector participation in mineral exploration has hindered India’s ability to discover and develop economically viable reserves.

locations leads to import dependency, supply chain vulnerabilities, and even disruption of their supplies.

- For instance, China has majority ownership of cobalt mines in the Democratic Republic of Congo, where 70% of the world's cobalt is mined.
- China also has by far the largest amount of reserves of REEs of any country in the world, followed by Vietnam, Brazil and Russia.
- India is 100% import-dependent on countries including China, Russia, Australia, South Africa, and the U.S. for the supply of critical minerals like lithium, cobalt, nickel, niobium, beryllium, and tantalum.
- Also for deep-seated minerals like gold, silver, copper, zinc, lead, nickel, cobalt, platinum group elements (PGEs) and diamonds, which are difficult and expensive to explore and mine as compared to surficial or bulk minerals, India depends largely on imports.

- For instance, in 2022-23, India imported close to 12 lakh tonnes of copper (and its concentrates) worth over ₹ 27,000 crore as per official figures.

A variety of minerals, besides those used in creating fuel, are crucial to a country's manufacturing, infrastructure, and advancement.

- ✓ The clean energy transitions of countries including India, seeking to meet their net-zero emission goals, are contingent on the availability of critical minerals such as lithium, which has also been called 'white gold', and others including cobalt, graphite, and rare earth elements (REEs).
- ✓ These are also crucial for the manufacture of semiconductors used in smart electronics; defence and aerospace equipment; telecommunication technologies and so on.

Mineral Exploration

The primary step to discovering mineral resources and eventually finding economically viable reserves is mineral exploration, which comes in various stages before mining. The stages of exploration are divided as per the United Nations Framework for Classification of Resources into G4 (Reconnaissance), G3 (Prospecting), G2 (General Exploration), and G1 (Detailed Exploration).

Why Is Private Sector Vital For Critical Minerals Exploration?

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

- Notably, it is estimated that India has explored just 10% of its Obvious Geological Potential (OGP), less than 2% of which is mined and the country spends less than 1% of the global mineral exploration budget.
- Not many significant mineral discoveries have taken place in the country in the last couple of decades.
- A **majority of exploration** projects have been carried out by the **government agency** Geological Survey of India and other Public Sector Undertakings (PSUs) like Mineral Exploration Corporation Limited (MECL), with **very little private sector participation**.
- India's mining policy had kept Greenfield exploration of minerals out of the purview of private-sector explorers for some years which meant they could only get licences to further prospect and mine resources that had been explored by a government entity.
- Union Minister of Mines pointed out that while Indian PSUs were in a relatively better position to explore surficial and bulk minerals like coal and iron ore, they had not fared well when it came to deep-seated and critical minerals owing to the high expenditure and long duration of risky projects while being under pressure to increase the supply of bulk minerals.

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

Mines and Minerals Bill 2023 & Private Players

- The Bill omits at least six previously mentioned atomic minerals from a list of 12 which cannot be commercially mined.
 - Being on the atomic minerals list, the exploration and mining of these six — lithium, beryllium, niobium, titanium, tantalum and zirconium, was previously reserved for government entities.
- The Act prohibits pitting, trenching, drilling, and sub-surface excavation as part of reconnaissance, which included mapping and surveys. The Bill allows these prohibited activities.
- The Bill also proposes a new type of licence to encourage reconnaissance — level and or prospective stage exploration by the private sector.
 - This exploration licence (EL), for a period of five years (extendable by two years), will be granted by the State government by way of competitive bidding.
 - This licence will be issued for 29 minerals specified in the Seventh Schedule of the amended Act, which would include critical, strategic, and deep-seated minerals.
 - It also specifies the maximum area for exploration; activities in up to 1,000 sq km will be allowed under a single exploration licence.
 - It also states that the licensee will be allowed to retain up to 25% of the originally authorised area after the first three years after submitting a report to the State government stating reasons for retention of the area.
- While most auctions are reserved for State governments in the Act, the Bill also reserves the conduct of auctions for composite licence and mining lease for specified critical and strategic minerals for the central government.

Amendment to New Drugs and Clinical Trial Rules (2023)

Context: India takes first step to remove animals from drug-testing. An amendment to the New Drugs and Clinical Trial Rules (2023), recently passed by the Indian government, aims at avoiding the use of animals in research, especially in drug testing.

- The amendment authorises researchers to instead use non-animal and human-relevant methods, including technologies like 3D organoids, organs-on-chip, and advanced computational methods, to test the safety and efficacy of new drugs.

Current Drug-Development Pipeline

Every drug in the market goes through a long journey of tests, each designed to check whether it can treat the disease for which it was created and whether it has any unintended harmful effects.

- For a long time, the first step of this process has been to test the candidate molecule in at least two animal species: a rodent (mouse or rat) and a non-rodent, such as canines and primates.
- However, humans are more complex creatures, and biological processes and their responses often vary from person to person as well, based on factors such as age, sex, pre-existing diseases, genetics, diet, etc. – and a lab-bred animal species reared in controlled conditions may not fully capture the human response to a drug.

This **'mismatch' between the two species** is reflected in the famously high failure-rate of the drug development process. Despite increasing investment in the pharmaceutical sector, **most drugs that cleared the animal-testing stage fail at the stage of human clinical trials**, which come towards the end of the pipeline.

Alternative Testing Modes

Organoids” Or “Mini-Organ

Organ-on-a-chip

Inkjet Bioprinter

3D Bioprinter

- In the last few decades, several technologies have been developed using human cells or stem cells. These include millimetre-sized three-dimensional cellular structures that mimic specific organs of the body, called “**organoids**” or “**mini-organs**”.
- Another popular technology is the “**organ-on-a-chip**”: they are AA-battery-sized chips lined with human cells connected to microchannels, to mimic blood flow inside the body.
 - These systems capture several aspects of human physiology, including tissue-tissue interactions and physical and chemical signals inside the body.
- Researchers have also used **additive manufacturing techniques** for more than two decades.
 - In 2003, researchers developed the first **inkjet bioprinter** by modifying a standard inkjet printer.
 - Several innovations in the last decade now allow a **3D bioprinter** to ‘print’ biological tissues using human cells and fluids as ‘bio-ink’.

Such technologies, researchers say, are bringing us closer to recreating a human tissue or organ system in the laboratory.

Science Challenges: Is India Ready To Exploit This Technology?

Multidisciplinary knowledge

Training and human-resource building

Centre for excellence’ in india

Resources needed for research

- One problem is that developing an organ-on-a-chip system typically requires **multidisciplinary knowledge**.
 - This means expertise in cell biology to recreate the cellular behaviour in the lab;
 - Materials science to find the right material to ensure that the chip does not interfere with biological processes;
 - Fluid dynamics to mimic blood flow inside the microchannels;
 - Electronics to integrate biosensors that can measure ph, oxygen etc.in the chip;
 - Engineering to design the chip;
 - Pharmacology and toxicology to interpret action of the drugs in the chips.
- It’s a truly interdisciplinary endeavour and needs focused **training and human-resource building**, which is lacking in the country at present.
- To enable this crosstalk between different disciplines, technology developers in academia and industry have proposed creating a ‘**Centre for Excellence**’ in India, akin to the Wyss Institute, to bring together scientists and others with a wide range of expertise to build preclinical human models.
- Another important problem concerns the **resources needed for research**.
 - Most of the reagents, cell-culture related materials and instruments for these technologies are currently imported from the U.S., Europe, and Japan.

Cauvery Water Sharing Issue

Context: On August 14, the Tamil Nadu government sought the Supreme Court’s intervention to make Karnataka immediately release 24,000 cubic feet per second (cusecs) from its reservoirs and ensure the availability of the specified quantity of water at Biligundlu on the inter-State border for the remainder of the month.

- It also urged the Court to direct Karnataka to ensure the release of 36.76 TMC (thousand million cubic feet) stipulated for September 2023 as per the Cauvery Water Disputes Tribunal (CWDT)'s final award of February 2007 that was modified by the SC in 2018.

How is the water being shared?

A monthly schedule is in place for Karnataka, the upper riparian State of the Cauvery basin, to release water to Tamil Nadu.

- As per the schedule, Karnataka is to make available to Tamil Nadu at Biligundlu a total quantity of 177.25 TMC in a "normal" water year (June to May).
- Of this quantity, 123.14 TMC is to be given during the period from June to September, also marking the season of the southwest monsoon.
- Invariably, it is during this period that the Cauvery issue gets flared up, when the monsoon yields lower rainfall than anticipated.

After the SC gave its judgment in February 2018 on the CWDT's 2007 award, the Cauvery Water Management Authority (CWMA) and Cauvery Water Regulation Committee (CWRC) were established four months later to ensure the implementation of the judgment. Since then, the two bodies have been holding meetings to take stock of the situation.

Why has T.N. approached the SC?

- The CWMA, at its meeting on August 11, wanted Karnataka to manage its releases in such a way that 10,000 cusecs of water was realised at Biligundlu for the next 15 days, starting from August 12. In other words, Karnataka would have to provide 0.86 TMC a day or 12.9 TMC totally in the 15 days.
- The Authority also decided that based on future rainfall, there would be a re-evaluation of the quantity to be released.
- But, what apparently irked Tamil Nadu was the refusal of Karnataka during the meeting to abide by the quantity that was agreed upon at the meeting of the CWRC the previous day— which was a figure of 15,000 cusecs for 15 days.
- However, Karnataka, during the Authority's meeting, said it would release only 8,000 cusecs, and that too up to August 22.

How has Karnataka responded?

- Karnataka has contended that lower rainfall in the Cauvery catchment including in Kerala has led to the poor inflow to its own reservoirs. Chief Minister told that whenever additional water flowed into the reservoirs, Karnataka was releasing it to Tamil Nadu. But, this year, Karnataka was not in such a position, he conceded.
- According to data of the Meteorological Department, Kodagu, the district cited for the deficit rainfall (the Cauvery originates from there), received 44% less rainfall during June 1-August 15 than what it was expected to experience.
- Also, Karnataka, at the Authority's meeting, had refused to accept the demand of Tamil Nadu for following a distress-sharing formula, even though its Chief Minister, favoured the idea of sharing distress.

What lies next?

Tamil Nadu, especially its farmers in the Cauvery delta, is eagerly awaiting to see whether Karnataka will go at least by the decision of the Authority.

THE GIST

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The present storage of the Mettur reservoir in Tamil Nadu is precariously low, which will last only few days after giving allowance for dead storage and drinking water requirements, even though water will be required at least for one more month for the standing short-term crop, kuruvai. It remains to be seen how the Supreme Court is going to view the matter. A distress-sharing formula, acceptable to all, seems to be the need of the hour.

Lowering Minimum Age To Contest Polls

Context: A Parliamentary panel has suggested lowering the minimum age for contesting in Assembly elections from 25 years to 18 years.

- Holding that young individuals can be “reliable and responsible” political participants, a Parliamentary Standing Committee has recommended reducing the age for contesting Lok Sabha and Assembly elections to 18 years, which is the minimum age of voting in India.
- This view was, however, contested by the Election Commission of India which said that it was “unrealistic” to expect 18-year-olds to possess the necessary “experience and maturity” for being Members of Parliament and State legislative bodies.
- At present, the minimum age for a person to contest Lok Sabha and Assembly polls is 25 years, while one can become a member of the Rajya Sabha or the State Legislative Council only at 30 years.

The Standing Committee on Personnel, Public Grievance, Law and Justice said that the viewpoint for reducing the age was reinforced by a vast amount of evidence, such as global practices, the increasing political consciousness among young people, and the advantages of youth representation.

- After examining various countries practices, such as Canada, the United Kingdom, and Australia, the Committee observes that the minimum age for candidacy in national elections needs to be 18 years.
 - These nations’ examples demonstrate that young individuals can be reliable and responsible political participants,” it said in the report submitted to Parliament.
- However, the Election Commission of India, in its deposition before the committee, said that it has already considered the issue of aligning the minimum age for voting and contesting elections to Parliament, State Legislature, and local bodies and has found that it is unrealistic to expect 18-year-olds to possess the necessary experience and maturity for these responsibilities.
- Therefore, the minimum age for voting and contesting elections is appropriate. The Commission does not favour reducing the age requirement for membership of Parliament and State Legislatures and still maintains this view, the EC said.
- The legal age for voting in India is 18 years at present.

Benefits of Lowering Minimum Age

Youth Representation

- This allows young individuals to participate actively in the political process and bring fresh perspectives to policy discussions.

Enhanced Political Engagement

- Encourages political awareness and involvement among youth, contributing to a more engaged and informed citizenry.

Diverse Leadership

- Promotes diversity in leadership by allowing representation from different age groups, backgrounds, and experiences.

Adaptation to Modern Challenges

- Acknowledges that young candidates may have insights into contemporary issues like technology, climate change, and social justice.

Drawbacks of Lowering Minimum Age

- **Lack of Experience:** Young candidates might lack the experience and maturity required for effective decision-making and governance.
- **Limited Understanding:** Young candidates may have a limited understanding of the complexities of governance and public policy.
- **Vulnerability to Influence:** Young candidates might be more susceptible to external influence, as they may have less exposure to political dynamics.
- **Inadequate Preparedness:** Lowering the age might lead to unprepared candidates entering the political arena, resulting in ineffective representation.

Governance & Social Justice

National Deep Tech Startup Policy (NDTSP)

Context: The office of the Principal Scientific Adviser to the Government put out a draft National Deep Tech Startup Policy (NDTSP) for public comment, following two versions that were iterated at high levels with other government departments, academia and stakeholder firms.

Key Highlight

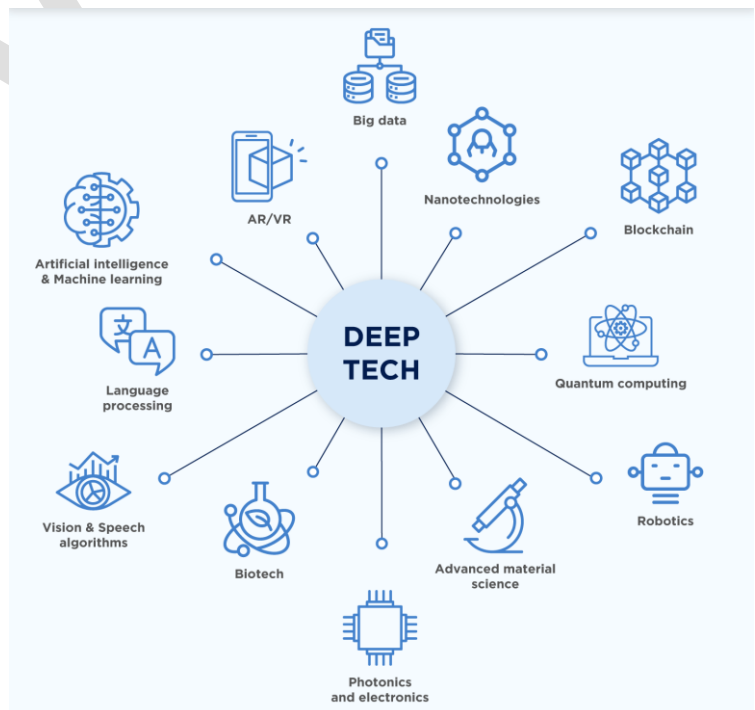
- The policy seeks to “ensure India’s position in the global deep tech value chain,” in areas such as semiconductors, Artificial Intelligence (AI) and space technology.
- The policy seeks to bolster research and development in deep tech start-ups, which work on fundamental and technical problems, unlike firms that monetise technology with distinguished business models, the draft says.
- The policy also seeks to find approaches to provide financing to deep tech start-ups at critical moments, such as before they go to market with their products or ideas.
- The policy also seeks to simplify the intellectual property regime for such start-ups, ease regulatory requirements, and proposes measures to promote these firms.
 - For instance, the NDTSP suggests that an Export Promotion Board be created to ease barriers of entry for Indian deep tech start-ups into foreign markets, and that clauses to ease such market access be included in foreign trade agreements.

Deep Technology

Deep Technology refers to innovations founded on advanced scientific and technological breakthroughs. It is a classification of organization, or more typically Startup Company, with the expressed objective of providing technology solutions based on substantial scientific or engineering challenges.

Due to their disruptive nature, they have the potential to solve India’s most pressing societal issues.

According to the BCG research, the overall investment in deep tech starting from 2015 increased by 300% to more than \$60 million in 2020.



four pillars



Ensuring the Security of India's Economic Future



Facilitating a Seamless Transition to a Knowledge-Driven Economy



Bolstering National Capability and Sovereignty through the Atmanirbhar Bharat Imperative



Fostering Ethical Innovation.

Objective of NDTSP

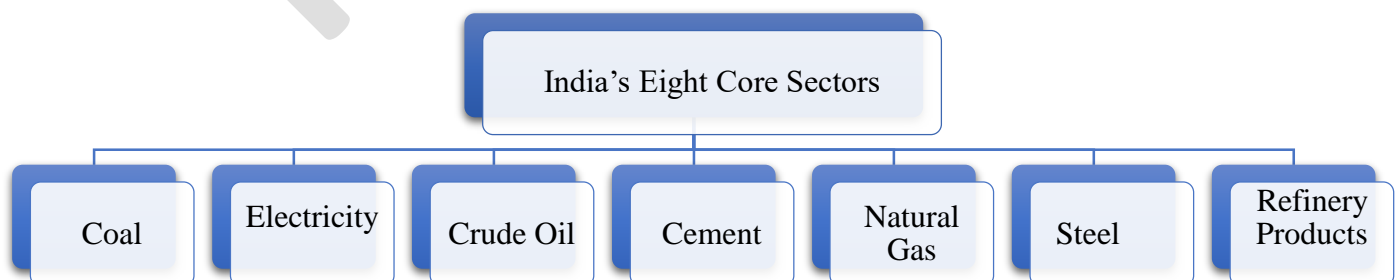
- ✓ To “ensure India’s position in the global deep tech value chain,” in areas such as semiconductors, Artificial Intelligence (AI) and space technology.
- ✓ To bolster R&D in deep tech start-ups working on fundamental and technical problems.
- ✓ To find approaches to provide financing to deep tech start-ups at critical moments.
- ✓ To significantly strengthen India’s capabilities and enhance global competitiveness.
- ✓ To stimulate innovation, spur economic growth, and promote societal development through the effective utilization of deep tech research-driven innovations.
- ✓ To solidify India’s financial stability and stimulating the transition towards a knowledge-centric economy, consequently augmenting India’s overall productivity.
- ✓ To stimulate ripple effects throughout the economy and lay the groundwork for deep tech industry creation.
- ✓ To address the challenges confronting deep tech startups through definitive policy interventions to create a conducive ecosystem.
- ✓ To simplify the intellectual property regime for deep tech start-ups, ease regulatory requirements, and propose measures to promote these firms.

Provisions of Draft NDTSP

- ✓ It proposes an organisation “The Centre for Deep Tech Translation” to assess Indian research (publications, patents, etc.) for potential commercialisation.
- ✓ It suggests creation of Export Promotion Board to ease barriers of entry for Indian deep tech start-ups into foreign markets.
- ✓ It promotes setting up an Open Science and Data Sharing Platform for encouraging collaboration and knowledge sharing among the stakeholders to promote deep tech innovations.
- ✓ It suggests establishing a Single Window Platform that enables a Unified IP Framework, customised for deep tech startups.
- ✓ It suggests creating a thematically focused Fund of Funds (FoF) dedicated to deep tech investments;
- ✓ It suggests the use of Technology Impact Bonds to invite investment from the public and philanthropic entities.
- ✓ The policy insists on expanding skill enhancement grants, and incentivising venture capitalists to invest in female-led deep tech startups.

Government Effort To Boost Infrastructure Is Yielding Results

Context: Output at India’s eight core sectors strengthened hearteningly in June, with the overall year-on-year growth in production estimated to have quickened to a five-month high of 8.2%.



Key Highlights

Seven of the sectors, including steel and cement and electricity, logged appreciable advances.

- **Steel**, which is the third-largest constituent of the index of eight core industries with a weight of just under 18%, was the standout performer, as output of the key alloy surged 21.9% undergirding the wider advance in the index.
- And **cement** posted an almost double-digit increase reflecting the continuing momentum in demand, a slight softening in the pace from the preceding two months on account of the onset of monsoon notwithstanding.
 - Steel and cement led the cross-sectoral advance over the April-June period, growing 15.9% and 12.2%, respectively, in the fiscal first quarter.
 - A key driver of demand for these two construction essentials continues to be the infrastructure sector, where the government's efforts to boost outlays including on affordable housing, urban renewal and transportation networks are providing a palpable tailwind.
 - Total capital expenditure by the Centre in June jumped more than 62% year-on-year and almost 24% from the preceding month to ₹1.10 lakh crore, Controller General of Accounts data showed.
- **Electricity**, which makes up a fifth of the core index, also posted its strongest increase in four months despite a cyclonic storm that impacted highly industrialised Gujarat the most, dampening demand.
- **Coal** output also rose 9.8% in June, lifting the first-quarter's production by 8.7%.
 - And official data showed output in July surged more than 14%, another positive augury given that coal demand extends beyond the electricity sector to other industrial segments including metal making and process industries where it is used in furnaces and boilers.

Areas Of Concern

- For all the talk of Aatmanirbharta, India's efforts to secure a degree of independence in the crucial oil sector are yet to yield meaningful dividends; the country is still heavily reliant on crude imports for its overall fuel needs.
- This is best reflected in the fact that crude oil production remained in the doldrums for a 13th straight month, contracting 0.6%.
- Along with refinery products, which have the heaviest weight of 28% on the index, crude oil also registered a sequential slide underlining the difficulties the oil sector as a whole continues to face because of regulatory inconsistencies.
- Policymakers have their task cut out to ensure the policy environment remains supportive especially at a time when global demand remains particularly uncertain.

Indian Institutes of Management (IIM) Bill

Context: In 2017, Parliament passed the Indian Institutes of Management (IIM) Act. The Act, which hugely expanded the autonomy already enjoyed by the IIMs, contains an important clause. It requires the Board of Governors (BoG) of the IIMs to commission an independent review of the institutes at least once every three years and place the report in the public domain.

- Six years on, very few of the 20 IIMs have done so. Among the top four IIMs, only the review report of IIM Bangalore is available on the website. This act of omission gives us an indication as to why the government thought fit to table the IIM (Amendment) Bill in Parliament last week.
- No government can take kindly to non-compliance with an Act of Parliament. The 2023 Bill seeks to take back from the IIMs the powers that the government ceded in 2017.
- The government seems to have judged that a dangerous governance vacuum has been created in the IIM system in the years since it relinquished control over these institutes.

Why The New Bill Is Required?

- The 2017 legislation was an extraordinary act of self-abnegation by the government. All key appointments — of the chairperson and board members, the director and the chairperson of the Coordination Forum of the IIMs — were left to the BoG. The government reduced the presence of the Central and State governments on the Board from four members to two.

- The 2023 Bill seeks to undo many of the provisions of the earlier Act. It creates the post of Visitor, the President of India.
 - The Visitor will appoint the chairperson of the BoG, one nominee on the selection committee for the director, and the chairperson of the Coordination Forum for the IIMs.
 - He or she will also approve all director appointments.
 - The Visitor can initiate any review of or inquiry into the affairs of an institute and remove the director on his or her own.
- The IIM Act created a situation where there were no meaningful checks and balances on the director.
- The absence of norms on key matters, such as the appointment of dean, had been evident even in the years leading up to the IIM Act as the government increasingly adopted a hands-off approach. The Act served to worsen the situation.
- The director became accountable to a BoG in which the two government nominees played a passive role. Individuals from industry, alumni, etc., who comprise the rest of the Board, have no stakes in their respective institutions and no incentive to exercise the necessary oversight.
- Moreover, the Act left answered the question: to whom are the boards now accountable?
 - Boards in the corporate world are notoriously ineffectual despite the fact that they are subject to company law, regulation, and monitoring by financial markets. To expect a BoG that is accountable to none to be effective is to demand a leap in faith.

Provisions of The Bill

Visitor	<ul style="list-style-type: none">• The Bill designates the President of India as Visitor of every Institute covered by the Act.
Appointment of IIM Directors	<ul style="list-style-type: none">• The Bill mandates the Board of Governors to obtain the prior approval of the Visitor before appointing an Institute Director. The procedure for selecting the Director will be prescribed by the central government.
Removal of IIM Directors	<ul style="list-style-type: none">• The Bill provides that the Board will require prior approval of the Visitor before removing a director. The Bill also grants the Visitor the authority to terminate the services of the Director, as may be prescribed.
Appointment of the Chairperson of the Board of Governors	<ul style="list-style-type: none">• The Bill stipulates that the Chairperson of the Board will be nominated by the Visitor.
Inquiries against IIMs	<ul style="list-style-type: none">• The Bill confers the power of inquiry upon the Visitor. Based on the report of such inquiries, the Visitor may issue directions which will be binding on the Institute. The Board may also recommend such inquiries to the Visitor.
Dissolution of the Board	<ul style="list-style-type: none">• The Bill provides that the central government may prescribe the conditions and procedure for dissolving or suspending an Institute's Board.
Co-ordination Forum	<ul style="list-style-type: none">• The Bill provides that the Chairperson of the Co-ordination Forum for all the Institutes will be nominated by the Visitor. Chairpersons of all Institutes will be ex-officio members of the Forum.

Govt. Imposes Curbs On Import Of Laptops, Tablets

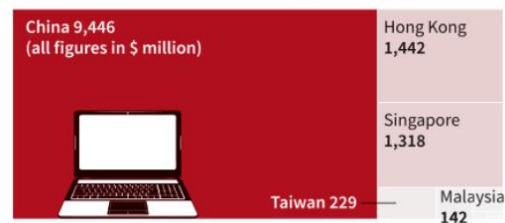
Context: New regulations require import licences with immediate effect; move will hit short-term availability of Dell, HP, Apple laptops, but will be a boost for domestic sector; some devices given exemption.

Key Highlights

- The Union government restricted all imports of laptops, tablets, and all-in-one and small-factor personal computers (PCs), requiring licences for these products to be brought into the country and sold to consumers.
- The move is expected to particularly impact short-term laptop availability from laptop brands that rely on assembly abroad, such as Dell, HP, Lenovo and Apple.
- The notification may entail longer wait times for individual products to be cleared for import and sale in India.
- The said restriction shall not be applicable to imports under Baggage Rules, the Directorate General of Foreign Trade said in its notification announcing the curbs, indicating that travellers may be free to bring one of these products back with them from overseas without attracting penalties.
- Laptops can still be purchased online from overseas, the government clarified; however, when these are imported by individual buyers, the import duty and shipping fees may make this an expensive prospect, as tax may also have to be paid in the country from where the laptop is purchased.
- Devices imported for research and development, and those repaired abroad, are exempt from these restrictions.

China's iron grip

In FY22 and FY23, India imported \$9,446 million worth of laptops from China. Hong Kong was a distant second



PM Announces New Housing Scheme for Urban Poor

Context: Prime Minister Narendra Modi announced a new scheme to help the urban poor build houses in cities. Under this programme, they will receive relief in interest rates and loans taken from banks to construct their houses.

- The initiative will benefit families that live in unauthorised colonies, slums or rented houses in various cities, says Modi; he adds that weaker sections living in cities faced a plethora of problems.

Existing Flagship mission

The government already has a scheme to address the housing shortage for the urban poor called the Pradhan Mantri Awas Yojana Urban (PMAY-U), which was launched in 2015.

- The PMAY-U is a flagship mission of the government which is implemented by the Housing and Urban Affairs Ministry.
- The mission aims to address the urban housing shortage among the economically backward sections, including the slum dwellers by ensuring a pucca house to all eligible urban households by 2022.
- The scheme period though now has been extended up to December 2024 to complete all the houses sanctioned without changing the funding pattern and implementation methodology.
- Uttar Pradesh had the largest number of houses completed at 12,87,307. Gujarat and Andhra Pradesh were other high-performing States with 8,80,209 and 8,08,278 houses completed. The number for Tamil Nadu was 5,30,350.

The parliamentary committee also made well-considered suggestions on the implementation of PMAY-U, and the government would do well to examine them while drawing up the proposed scheme.

- The committee's most significant recommendation is on the need to drop uniform and fixed assistance across the country, as followed in PMAY-U, and adopt a flexible arrangement instead, depending on the topography and other factors.
- Reasons behind the poor quality of the houses and the prevalence of unoccupancy too should be gone into.

- High land costs, floor space index restrictions, and multiple certification from different agencies are factors that determine the success of urban housing.
- This calls for central government-organised discussions with the relevant agencies such as State governments, local bodies, urban planning bodies, urban sector professionals, financial institutions and activists, as there is enough time for the Union government to formulate the new scheme.

Vishwakarma Yojana for Traditional Artisans

Context: Prime Minister Narendra Modi, in his Independence Day address announced a scheme for artisans — Vishwakarma Yojana — with an allocation of up to ₹13,000 crore to help skill development among the youth.

- “Families of weavers, goldsmiths, blacksmiths, laundry workers, barbers, and others will be empowered through the ‘Vishwakarma Yojana’,” he said.
- The scheme, will be available for traditional craftspeople and artisans from 2023-24 to 2027-28.
- The Centre said in a release that the **scheme aims to** strengthen and nurture the “Guru-Shishya parampara” (teacher student tradition) or the family-based practice of traditional skills by artisans and craftspeople working with their hands and tools.
- The scheme also **aims** at improving the quality, as well as the reach of products and services of artisans and craftspeople and to ensure that the Vishwakarmas are integrated with the domestic and global value chains.

Who Will Be Covered Under The Scheme: Eighteen traditional trades such as

Carpenter	Boat maker	Armourer	Blacksmith	Hammer and tool kit maker	Locksmith
Goldsmith	Potter	Sculptor	Stone breaker	Cobbler	Mason
Basket/mat/broom maker/coir weaver	Traditional doll and toy maker	Barber	Garland maker	Washerman	Tailor and fishing net maker

- Artisans and craftspeople will get PM Vishwakarma certificate and ID card, credit support up to ₹1 lakh (first tranche) and ₹2 lakh (second tranche) at a concessional interest rate of 5%.
- There will be two types of skilling programmes — basic and advanced under the scheme and a stipend of ₹500 per day will also be provided to beneficiaries while undergoing skill training.
- 30 lakh families will be covered over five years of the scheme.

Issues Faced By Artisans

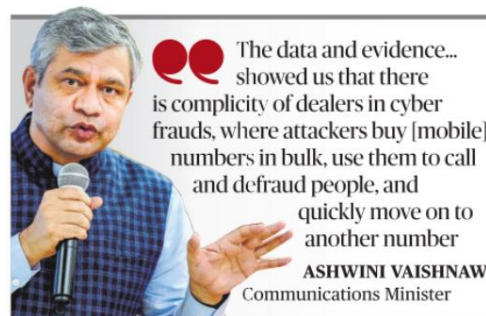
The scheme can help craftspeople and artisans only to the extent of freeing them from the difficulties they now face in accessing affordable credit from the formal banking system. The challenges they face are far deeper than just the availability of cheap credit.

- By far the biggest of these that traditional art and craft professionals face is either the lack of patronage for their goods and services in the wider marketplace, or in the case of other trades, a skewed undervaluation of their economic output.
- They need to overcome the fundamental problem of a lack of economic viability for their output.
- If the scheme fails to open up new markets and simply extends loans to these communities in the name of promoting their welfare, it runs the risk of leaving not only the intended beneficiaries but also their families deeper in debt.

No More Bulk SIM Cards As Govt. Steps In To Curb Fraud

Context: To reduce cyber frauds performed through fraudulently acquired SIM cards, the Department of Telecommunications (DoT) will now mandate registration and “indisputable verification” of SIM dealers.

- Recent efforts to curb fraudulent mobile connections have led to the blacklisting of 67,000 SIM dealers, 52 lakh connections, and the registration of over 300 First Information Reports (FIR).
- The data and evidence... showed us that there is complicity of dealers in cyberfrauds, where attackers buy [mobile] numbers in bulk, use them to call and defraud people, and quickly move on to another number.
- SIM dealers who are found complicit in such schemes will be fined ₹10 lakh.



About New System

- The facility to provide SIM connections in bulk to companies is being discontinued, and instead a “business” system is being put in place, where they have to undertake KYC (Know Your Customer) when a SIM is being issued to them.
 - The existing bulk system requires companies to preserve records of individual subscribers.
- A transition period will be provided for bulk subscribers to get themselves verified under the new regime.
- Government, defense and law enforcement bulk subscribers will continue to be exempt from additional verification requirements.

The enforcement move follows the launch of the Sanchar Saathi portal in May this year.

Sanchar Saathi portal

The portal introduces three reforms:

- CEIR for blocking stolen/lost mobiles
- Know Your Mobile Connections for checking registered connections
- ASTR (Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification) for identifying fraudulent subscribers.

Aim: The initiative is designed to prevent frauds such as identity theft and banking fraud by misusing mobile phones.

Achievement of the Portal: Over 40 lakh fraudulent connections have been identified and 36 lakhs disconnected through the portal. Disconnected numbers have been shared with financial institutions and social media platforms for further action.

Sanchar Saathi initiative: It includes modules for IMEI registration, fraud detection, and facial recognition-based verification.

Portal developed by: Department of Telecom

Select Metrics of India @76

Context: India observes its 77th Independence Day on 15 Aug, 2023. This analysis measures India’s relative performance in the past 76 years compared to other countries across four parameters — GDP per capita, Human Development Index (HDI), Infant Mortality Rate (IMR) and women’s participation in Parliament.



- Owing to technological advancement and infrastructural development, India and other countries have made remarkable progress in the past seven and half decades.
- So it becomes imperative to look at where India stood compared to other nations around the time of independence and where it stands now among them.
- India is compared with these countries:

BRICS (Brazil, Russia, China, South Africa)

G-7 countries (Canada, France, Germany, Italy, the United Kingdom, and the United States)

Emerging economies (Argentina, Chile, Colombia, Egypt, Hungary, Indonesia, Iran, Malaysia, Mexico, the Philippines, Poland, Saudi Arabia, Thailand, Turkey, and the United Arab Emirates)

Indian subcontinent (Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka)

Chart 1

- Chart 1 compares GDP per capita (in \$) of 26 countries between the 1960s and 2022.
- India's GDP per capita ranking of 24 out of 26 nations analysed remained unchanged between the 1960s and 2022.
- While Indonesia and Nepal were lagging behind India in the 1960s, Pakistan and Nepal were lagging behind in 2022.

Chart 1 | The chart compares GDP per capita (in \$) of 26 countries between the 1960s and 2022

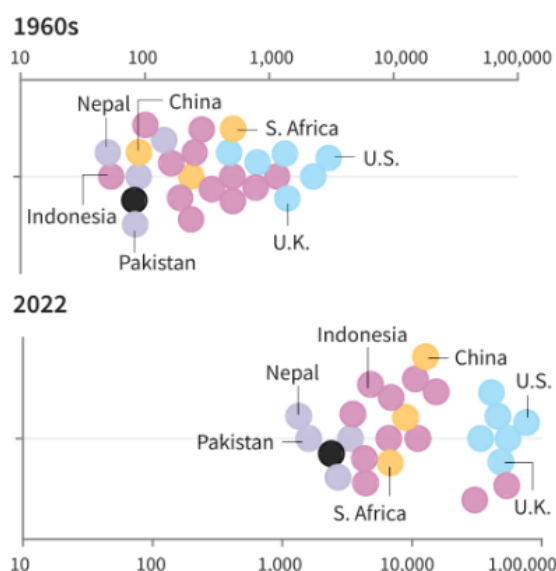


Chart 2 | The chart compares the HDI of 31 countries between 1950 and 2021. It is measured on a scale of 0 to 1

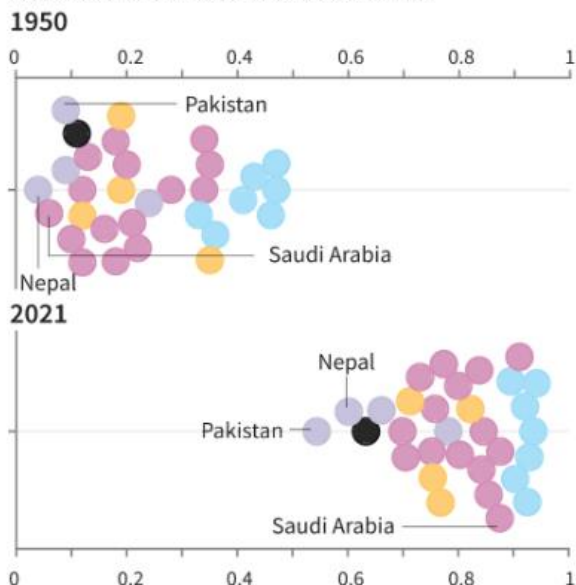


Chart 2

- Chart 2 compares the Human Development Index of 31 countries between 1950 and 2021.
- India's HDI increased by 0.11 points in 1950 to 0.633 in 2021.
- However, India's ranking slipped from 26 in 1950 to 29 by 2021.
- Of the five countries which lagged behind India in 1950, Saudi Arabia, Indonesia and Bangladesh—moved ahead by 2021, with scores of 0.87, 0.7 and 0.66 respectively.

Chart 3

- Chart 3 compares infant mortality rate in 32 countries between 1960-1975 and 2021.
- Between 1960 and 1975, India had the seventh-worst IMR among these 32 nations.
- In 2021, India regressed four spots and became the third-worst.
- Of the six countries which were behind India in 1960-75, five (Turkey, Bangladesh, Bhutan, Egypt and Nepal) surpassed India by 2021. However, South Africa regressed.

Chart 4

- Chart 4 compares the share of women in Parliament in 31 countries between 1997 and 2022.
- Women's participation in India increased from 7% in 1997-98 to 14.9% in 2022.
- Over 10 countries were behind India in this indicator in 1997-98.
- In 2022, only five remain below India.

In case of other indicators like access to electricity and usage of the internet, India has had significant progress.

- Between 1993 and 2000, only 50% of India's population had access to electricity.
- By 2020, this increased to 99% of its population.
- A majority of the 32 countries considered provided electricity to over 99% of their population by 2020, except for Pakistan, South Africa and Nepal where the share remains below 90%.
- In 1990, almost no country considered, except for the U.S., had any access to the Internet.
- But by 2020, India has managed to provide internet access to 43% of its population.
- While India lags behind 27 countries in this indicator, Bhutan (53.5%) is the only country in the subcontinent that is ranked above India.

Chart 3 | The chart compares infant mortality rate in 32 countries between 1960-1975 and 2021

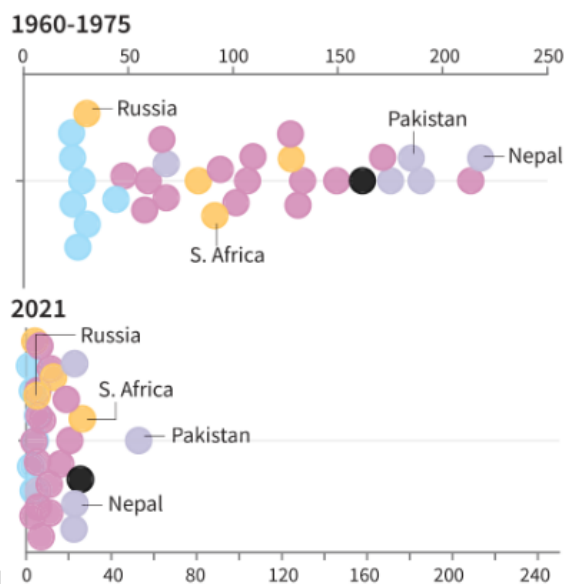


Chart 4 | The chart compares the share of women in Parliament (in %) in 31 countries between 1997 and 2022



In 1960, with a population of 45.05 crore people, India had the second-highest population behind China (66.7 crore). By the end of 2022, India's population stood at 1.417 billion, surpassing China's 1.412 billion, making India the most populous country in the world, according to the World Population Review. India's ranking in Human Development Index has slipped three places among nations compared.

Indianised Research Methodology Tools

Context: ICSSR to develop Indianised research methodology tools. 500 researchers will get funding for the studies based on fieldwork focused on a geographical region.

Key Highlights

- The Indian Council of Social Science Research (ICSSR) will soon announce the results of the research award proposals it had invited to study the impact of various schemes and public policy initiatives of the Union government.
- About 500 researchers will get funding for the studies based on fieldwork focused on a specific geographical region.
- The ICSSR also plans to develop “Indianised research methodology tools” to study the country’s social and economic changes.
 - The schemes and policy initiatives for empirical research include

PM Ujjwala Yojana	PM Awas Yojana	Deendayal Antyodaya Yojana	PM Krishi Sinchai Yojana
PM Fasal Bima Yojana	PM Kisan Samman Nidhi	Year of Millet 2023	Ayushman Bharat
Jan Aushadhi Yojana	Swachh Bharat Abhiyan	Make-in-India	PM Gati Shakti
New Education Policy 2020	Black Money (Undisclosed Foreign Income and Assets)	Imposition of Tax Act, 2015	Benami Transactions (Prohibition) Amendment Act, 2016

- The ICSSR has a mandate to carry out primary data-driven empirical research on the social and economic impact of the policies of the government.
- Under the scheme, we have two types of studies.
 - Collaborative studies with institutions [₹30 lakh for six months] and
 - Individual studies [₹6 lakh for six months] by encouraging researchers from peripheral areas and underprivileged institutions.
 - About 500 proposals will be selected by an expert committee.

When the country moves ahead towards the goal of becoming a developed country in 2047, social science has a crucial role to play.

- ✓ It is in that context that we decided to study public policy initiatives.
- ✓ We have to have an equitable and sustainable development of the people.
- ✓ The specific research outcome is to recommend the government about the direction in which these schemes are moving and to inform the people about these policies.

Bharat NCAP

Context: The Ministry of Road Transport and Highways has rolled out an indigenous star-rating system for crash testing cars under which vehicles will be assigned between one to five stars indicating their safety in a collision. Called the

Bharat New Car Assessment Programme (NCAP), the rating system will be voluntary and will come into effect from October 1, 2023.

Bharat New Car Assessment Programme (Bharat NCAP)

- The Bharat New Car Assessment Programme (Bharat NCAP) is modelled on the Global New Car Assessment Programme (Global NCAP), a project of the Towards Zero Foundation, which is a U.K.-registered charity that promotes the universal adoption of the United Nation's motor vehicle safety standards worldwide.
- The new programme will be applicable to passenger vehicles with not more than eight seats in addition to the driver's seat with a gross vehicle weight not exceeding 3,500 kg.
- It will be based on the soon-to-be published Automotive Industry Standard 197, which lays down testing protocols.
- Officials of the Union Road Transport and Highways Ministry said manufacturers had offered 30 models for testing.
- A rating between one to five stars will be assigned to a vehicle after an evaluation of three parameters — adult occupant protection, child occupant protection, and safety assist technologies present in the car.
 - The first two parameters will be calculated with the help of three tests, which include a frontal offset test in which a vehicle is driven at 64 kmph and with 40% overlap into a deformable barrier which represents an oncoming vehicle. This replicates a crash between two cars of the same weight.
 - The other tests are side impact test at 50 kmph and pole-side impact test (where a car is crashed into a rigid pole sideways) at 29 kmph.
- An original equipment manufacturer must nominate a vehicle model for testing.
- Bharat NCAP representatives will visit the manufacturing facility or a dealer outlet to select the base variant of the model through random sampling and send it to a testing centre, in coordination with the Central Institute of Road Transport (CIRT).
- The test results will be approved by the Bharat NCAP Standing Committee and published on its website. The CIRT will issue a certificate.
- The programme is voluntary except in certain cases such as a base variant of a popular vehicle variant with a minimum clocked sale of 30,000 units, or when the Ministry recommends a model for testing based on market feedback or for public safety.

Objective of the Programme

The **objective of the programme** is to help consumers make an informed decision before purchasing a car, thereby spurring demand for safer cars.

- ✓ India sees nearly 1.5 lakh road fatalities in a year, accounting for 10% of deaths due to road crashes globally with only 1% of the world's vehicles.
- ✓ According to a World Bank study, road crashes are estimated to cost the Indian economy between 5 to 7% of GDP a year.

Bharat- NCAP Norms To Benefit Consumers

- Auto and auto-component makers have responded positively to the Bharat-NCAP norms.
- In addition to empowering consumers, this will also help bring about greater awareness and further transparency by allowing them to know comparative safety aspects of various products on offer.
- This effort will raise safety standards, empower consumers with vital information and make Indian roads safer for all.
- This initiative will not only bolster the auto component industry's value chain but will also stimulate the production of cutting-edge components.

Way Forward

- ✓ India will need to develop its **crash testing capabilities and knowledge expertise** for the Bharat NCAP programme to be implemented meaningfully, such as a software system wired to the dummies placed inside cars to assess the nature and extent of injuries to analyse scores.

- ✓ Over the years, India will also have to **align Bharat NCAP with global standards** by expanding testing parameters.
 - For example, the U.S. NCAP also includes a roll-over test which tests whether a vehicle is vulnerable to tipping up on the road in a severe manoeuvre.
 - Japan's NCAP covers electric shock protection performance after a collision, performance of neck injury protection in a rear end collision, passenger seat belt reminder evaluation, evaluation of pedestrian protection technologies apart from preventive safety performance such as autonomous emergency braking system, lane departure prevention system, rear-view monitoring system and pedal misapplication, among others.

National Curriculum Framework

Context: The NCF was released by NCERT & Union Education Minister. Students of Classes 11 and 12 to study two languages, including one Indian tongue, while students of Classes 9 and 10 to study three; NCF follows the lead of NEP, 2020, and will form the basis for formulating new textbooks from Classes 3 to 12.

Key Highlights

- Currently, students in Classes 9 and 10 study two languages, and students in Class 11 and 12 learn one. The NCF expects students to achieve a **“literary level” of linguistic capacity** in at least one of these Indian languages.
- The NCF has said that all students will be allowed to take **Board exams at least two times in a school year**, with only the best score being retained.
- The NCF, drafted by the National Steering Committee headed by former Chairman of the Indian Space Research Organisation (ISRO) K. Kasturirangan, follows the lead of the National Education Policy (NEP), 2020, and forms the basis for formulating textbooks from Classes 3 to 12 under the Central Board of Secondary Education.
- Textbooks for Classes 1 and 2 have already been released by the NCERT.
- So far, students from Classes 9 to 12 studied five mandatory subjects, with an option of adding one more. Now, the **number of mandatory subjects** for Classes 9 and 10 is **seven**, and it is **six** for Classes 11 and 12.
- **Optional subjects** have been grouped in three parts in the NCF.
 - The **first** includes art education, emphasising both visual and performing arts, with equal emphasis on making, thinking about, and appreciating works of art. It also includes physical education and vocational education.
 - The **second group** includes social science, the Humanities, and interdisciplinary areas. The third group includes science, mathematics, and computational thinking.

Term-Based Systems

- The NCF has recommended that in the long term, all Boards should change to semester or term-based systems, where students can be tested in a subject as soon as they have completed the subject, which would reduce the content load being tested in any one examination.
- For Classes 6 to 8, the NCF states that 20% content would be from the local level for the social science curriculum, 30% content from the regional level, 30% from the national level, and 20% content would be global.
- The “secondary stage” has been significantly redesigned to offer more flexibility and choice for students.
- There is no hard separation between academic and vocational subjects, or between Science, Social Science, Art, and Physical Education. Students can choose interesting combinations of subjects for receiving their school leaving certificates.
- Environmental education is given emphasis across all stages of schooling, culminating in a separate area of study in the secondary stage.
- The textbooks for Classes 3 to 12 are to be aligned with 21st century requirements, making them rooted and futuristic.

Government Imposes Restrictions On Export Of Basmati Rice

Context: The Union government halted the export of Basmati rice valued at less than \$1,200 a tonne to restrict possible “illegal” shipment of plain white rice by wrongly classifying it as Basmati rice.

- The export of non-Basmati white rice was prohibited on July 20, citing the rise in domestic prices.

Key Highlights

- The Union Commerce Ministry said it had directed the Agricultural & Processed Food Products Export Development Authority (APEDA), the agency responsible for regulation of export of Basmati rice, that contracts for Basmati exports with a value of \$1,200 and above should be registered for issue of registration-cum-allocation certificate (RCAC).
- It also asked the APEDA that contracts with a value below \$1,200 a tonne may be kept in abeyance and evaluated by a committee to be set up by the APEDA Chairman for understanding the variation in prices and use of this route for export of non-Basmati white rice.
- It has been noted that there has been large variation in the contract price of Basmati being exported with lowest contract price being \$359 per MT in backdrop of average export price of \$1214 per MT during August,” the Ministry said.
- The Ministry directed the committee to submit its report within one month, and said a decision on lower price exports of Basmati can be taken based on the report.
- The Ministry also directed the APEDA to hold consultations with traders to sensitise them to the matter and work with them to discourage any use of the window for export of non-Basmati white rice.

Understanding Curbs On Rice Exports

Context: In a move to check domestic rice prices and ensure domestic food security, the Indian government has prohibited the export of **white rice**, levied a 20% export duty on **par-boiled rice** till October 15, and permitted the export of **Basmati rice** for contracts with value of \$1,200 a tonne or above.

- The export of broken rice has been prohibited since last September. However, it is allowed on the basis of permission granted by the government to other countries to meet their food security needs and based on the request of their government.

What Is The Rice Production Estimate?

According to the third Advanced Estimate of the Department of Agriculture and Farmers Welfare, during the Rabi season 2022-2023, rice production was 13.8% less, at 158.95 lakh tonnes against 184.71 lakh tonnes during Rabi 2021-2022.

- ✓ Kharif sowing data show that rice is sown on 384.05 lakh hectares this year as on August 25 compared with 367.83 lakh hectares during the same period last year.
- ✓ In States such as Tamil Nadu where the Samba crop sowing starts usually in August in the Cauvery delta area, a section of farmers says there will be delayed sowing due to a shortfall in the south west monsoon.
- ✓ Trade and rice millers say that new season crop arrivals will start after the first week of September and that El Nino effects are likely to impact arrivals to some extent.

THE GIST

- The Indian government has prohibited the export of white rice, levied a 20% export duty on par-boiled rice till October 15, and permitted the export of Basmati rice for contracts with value of \$1,200 a tonne or above.
- India is the largest rice exporter globally with a 45% share in the world rice market. Overall rice exports in April-May of 2023 were 21.1% higher compared with the same period last financial year.
- For domestic consumers, though there is a slight increase in rice prices, in the long run, availability is secured and prices are not expected to spiral.

About Rice Exports

India is the largest rice exporter globally with a 45% share in the world rice market.

- ✓ Overall rice exports in April-May of 2023 were 21.1% higher compared with the same period last financial year.
- ✓ In May alone, export of Basmati rice was 10.86% higher than its exports in May 2022.
- ✓ Non-Basmati rice shipments were 7.5% more, despite the government introducing a 20% export duty on white rice and prohibiting the export of broken rice last September.
- ✓ The shipment of non-Basmati rice has been on the rise for the last three years and the export of Basmati rice in 2022-2023 was higher than the previous year, according to data available on the website of The All-India Rice Exporters' Association.
- ✓ The data shared by the government says that till August 17 this year, total rice exports (except broken rice) were 15% more at 7.3 million tonnes as against the 6.3 million tonnes during the corresponding period last year.

Trade sources add that Thailand expects nearly 25% lower production in 2023-2024; Myanmar has stopped raw rice exports; and the crop is said to be hit in Iraq and Iran as well.

What Can Indian Farmers Expect?

The government has increased the Minimum Support Price (MSP) for rice, and the paddy procured now by rice millers are at a price higher than the MSP. The prices will not decline for farmers.

The restrictions on exports will ensure that there is no steep climb in rice prices in the market. When the bench mark price set by the government is high, the farmers will realise better prices, say trade sources.

For domestic consumers, though there is a slight increase in rice prices at present, in the long run, availability is secured and prices are not expected to spiral.

A clear situation on the arrivals and government policy will be known by mid-September.

A Survey To Assess The Impact Of Drug Abuse On Society

Context: Parliament Standing Committee on Social Justice and Empowerment in India has recommended conducting a survey to assess the impact of drug abuse on society.

- In 2018, the ministry commissioned a national survey conducted by the National Drug Dependence Treatment Centre (NDDTC) AIIMS, which formed the basis of the National Action Plan for Drug Demand Reduction (NAPDDR) to address drug abuse in the country.

What is Drug Abuse?

Drug abuse refers to the excessive, inappropriate, or harmful use of legal or illegal substances, leading to negative physical, mental, social, and behavioural consequences.

Important Findings

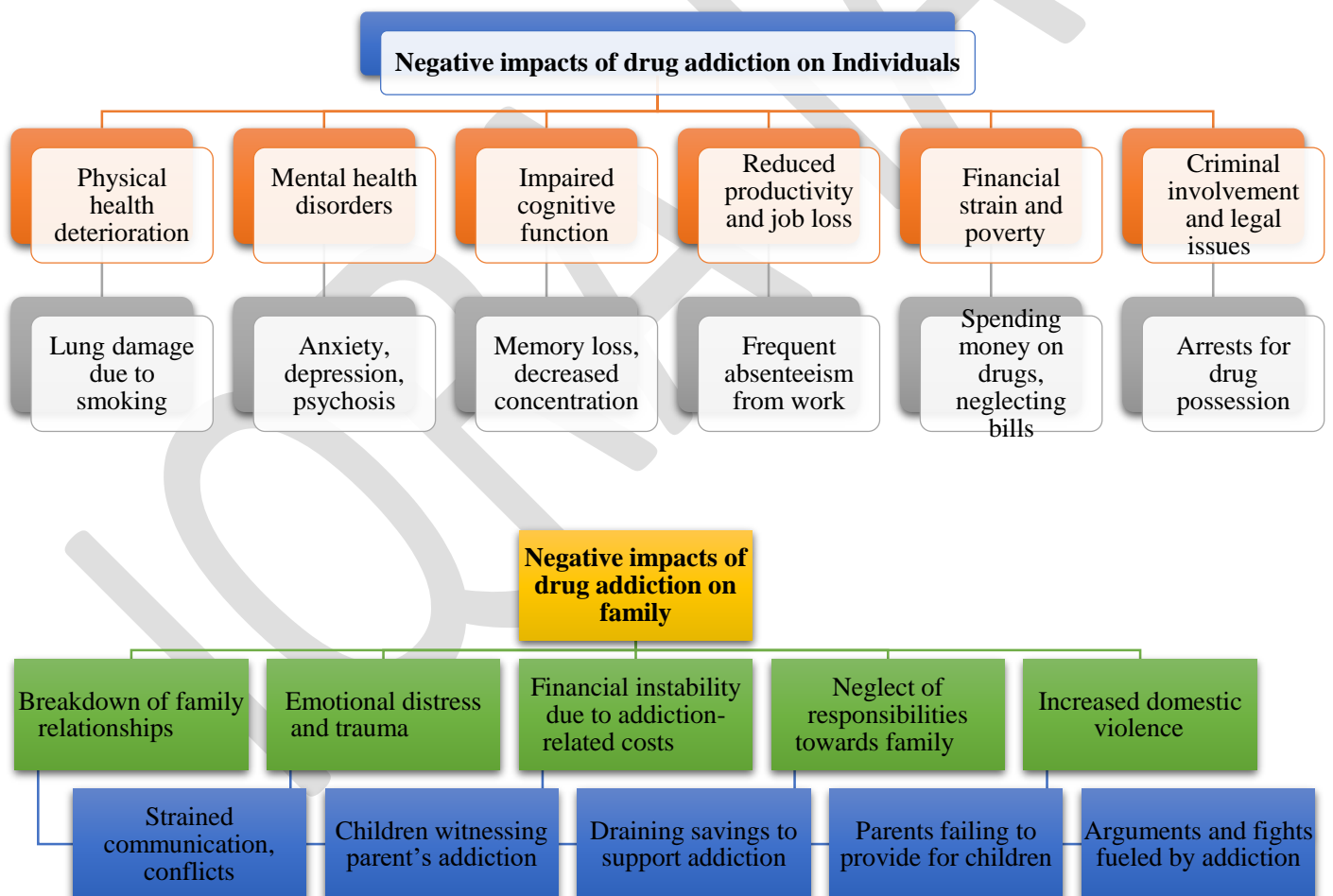
No comprehensive study or survey has been conducted by the Ministry of Social Justice and Empowerment to assess the impact of drug abuse on society.

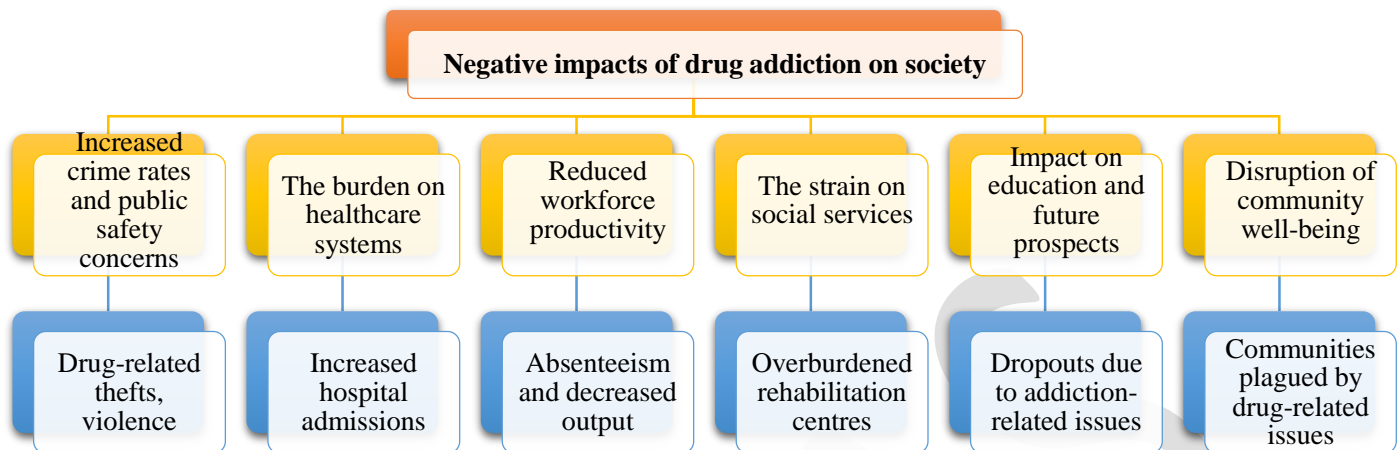
- Around 37 crore people in the age groups of 10-17 years (children) and 18-75 years (adults) are using drugs and alcohol in states like Punjab, Haryana, Delhi, Uttar Pradesh, Odisha, and Maharashtra.
- Penetration of District De-Addiction Centers (DDAC) is inadequate.
- Decrease in financial allocations for preventive education and awareness programs.
- Delay in providing training to Master Trainers under the Navchetna Programme, which focuses on life skills and drug education for school children.

Recommendations

Regular meetings and reviews of the Apex Committee of Narcotics Coordination Centre (set up by the Ministry of Home Affairs in 2016).	Establish an impact assessment mechanism for National Action Plan for Drug Demand Reduction (NAPDDR) .
Incorporate awareness chapters on drug addiction , consequences, and de-addiction measures in the education curriculum.	Foster inter-ministerial coordination to address both supply and demand side issues.
Conduct periodic surveys by National Drug Dependence Treatment Centres (NDDTC) to stay updated on drug abuse situations.	National Institute of Social Defence should undertake the survey to provide a clearer understanding of the issue and aid in better intervention strategies.

India is geographically situated between major drug-producing regions, including the Golden Crescent (Pakistan, Afghanistan, Iran) and Golden Triangle (Thailand, Myanmar, Vietnam, Laos).





Government Measures To Address Drug Abuse

- ✓ ‘Nasha Mukta Bharat Abhiyaan’ (Drugs-Free India Campaign) was launched in August 2020 in 272 vulnerable districts.
- ✓ The Ministry of Social Justice & Empowerment is implementing the National Action Plan for Drug Demand Reduction (NAPDDR) for 2018-2025.
- ✓ The Narco-Coordination Centre (NCCORD) was established in November 2016.
- ✓ The “National Fund for Control of Drug Abuse” was created to support efforts against illicit drug traffic, addiction rehabilitation, and public education.
- ✓ National Drugs & Psychotropic Substance (NDPS) Act, 1985 (Narcotics Control Bureau has been set up under it).
- ✓ National Policy on Narcotic Drugs and Psychotropic Substances 2012.

Cyber Security

Defence Ministry To Switch To Locally Built OS

Context: In the face of increasing cyber and malware attacks on defence as well as critical infrastructure across the country, the Defence Ministry has decided to replace the Microsoft Operating System (OS) in all computers connected to the Internet with a **new OS, Maya, based on open-source Ubuntu developed locally.**

- **Maya** has the interface and all functionality like Windows and users will not feel much difference as they transition to it.
 - Maya OS has been named after the **Sanskrit word Maya which means “illusion.”**
- To begin with, the direction is to install Maya on all computers connected to the Internet in South Block before August 15.
- In addition, an ‘**end point detection and protection system**’, ‘**Chakravayuh**’, is also being installed in these systems.
 - Chakravayuh is derived from the **ancient Indian military formation** that was used to trap enemies in a circular maze.
- Currently, Maya is being installed only in Defence Ministry systems and not on computers connected to the networks of the three Services.



- Maya was developed by government development agencies within six months. Maya would prevent malware attacks and other cyberattacks which had seen a steep increase, the official noted.

International Relations

Two Indian Military Aircraft Visit Australia's Strategic Cocos Islands

Context: The planes were at Cocos Island for a week, which can be an important base for refuelling and operational turnaround for Indian armed forces; India aims to increase its military-to-military engagement, deepening interoperability in the region.

- Expanding the strategic reach of the Indian military and improving interoperability with Australia, an Indian Navy Dornier maritime patrol aircraft and an Indian Air Force (IAF) C-130 transport aircraft visited Australia's Cocos (Keeling) Islands (CKI) in the Southern Indian Ocean, close to Indonesia and strategic maritime choke.

Key Highlights

- Cocos can be an important base for refuelling and operational turnaround for the Indian military, especially once the runway there is expanded to accommodate large aircraft like the P-8 long range maritime patrol aircraft.
- This week's visit by Indian Navy Dornier maritime patrol aircraft and a C-130 Hercules from the IAF effectively elevates the Cocos Islands as a staging point for Australian and Indian air surveillance of the maritime choke points through Southeast Asia and the entire eastern Indian Ocean.
- The visit represents an important step in the bilateral relationship as the two countries increasingly give each other access to their military facilities in the Indian Ocean.
- This is the latest in a series of India's growing military-to-military engagements, deepening interoperability broadly in the region and especially with Australia.
- In February, in another first, an Indian Navy Kilo class conventional submarine, INS SindhuKesari, which was on operational deployment, travelled through the Sunda Strait and docked in Jakarta, Indonesia for operational turnaround.
- Even before the Indian military reached there, Cocos Islands had been a point of cooperation between the space agencies of the two countries for India's Gaganyaan human space flight mission.
- Australia's active support in establishing a temporary ground station at CKI for the Gaganyaan missions, and potential opportunities for cooperation in earth observation, satellite navigation, space situational awareness, weather and climate studies using satellite data, were the highlights of the discussion, an Indian Space Research Organisation (ISRO) statement had said during the visit of Enrico Palermo, head of the Australian Space Agency (ASA) to the ISRO's headquarters in September 2022.
- India's access to CKI and Christmas Island, which is even closer to the strategic choke points, has been under discussion for a while. A turnaround from either of the islands would significantly enhance the on-station time of the Indian Navy's P-8Is to monitor movements into the Indian Ocean, especially by China's People's Liberation Army Navy, whose forays into the region have significantly gone up in recent years.



Why Is BRICS Summit Important For India?

Context: All eyes this week are on Johannesburg, as leaders of the Brazil, Russia, India, China, South Africa (BRICS) grouping are hosted by South African President Cyril Ramaphosa. BRICS is essentially a movement of “emerging economies”, and thus gives a salience to economic issues, but given the geopolitical flux especially after the war in Ukraine, this BRICS summit takes on a new importance. It is, therefore, no surprise that many Western capitals are watching the summit closely.

Why Is The 15th BRICS Summit Important?

This BRICS meet comes at an important geopolitical and geoeconomic moment — this is the first in-person summit since 2019 and the COVID-19 pandemic.

Even in 2022, when COVID had receded, the remnants of the pandemic remained in China, and the summit was hosted via videoconference.

This is also the first in-person meeting since the Russian invasion of Ukraine in 2022, an event that has cast a long shadow not only over global stability, but food, fertilizer and fuel (energy) security.

Given its composition, BRICS deliberations are perceived to carry a “counter-western” slant, and will be of importance as the U.S. and EU still hope to try and “isolate” Russia over the conflict.

This is also the first summit since Luiz Inácio Lula da Silva returned to power in Brazil, who represents a more socialist, anti-western politics than his predecessor President Bolsonaro.

What Is In It For India?

For India, this BRICS summit carries special importance. This is the first in-person summit since the military standoff with China at the Line of Actual Control began in 2020.

- At the BRICS summit both PMs will be in a very small group of four (with President Putin attending virtually), and will have many opportunities to hold bilateral talks.
 - This meeting would be significant in terms of resolving the LAC situation.
- Just over two weeks after the BRICS summit, India will host the G20 summit, and Prime Minister Modi will want to ensure full attendance by the leaders, which include all BRICS members.
- In addition, India wants more cooperation from China and Russia that are blocking discussions on a common language for the Leader’s declaration to be released at the summit on September 9-10.
- Mr. Modi might use the forum for talks on the issues over the paragraphs on Ukraine, climate change, debt financing and others that are being held up by their objections.

What’s The Big Item On The Agenda?

During the summit, the leaders of BRICS will confer among themselves, and also take part in the BRICS-Africa Outreach and BRICS Plus Dialogue. A major item on the agenda is on **the expansion of BRICS**.

What Else Is Expected To Be Discussed?

- BRICS leaders are also expected to take forward earlier talks on intra-BRICS trading in national currencies, although a much-touted plan pushing for a “BRICS currency” to challenge the dollar does not appear to be on the agenda.
- The Johannesburg Declaration will include language acceptable to all the countries on a number of global developments.

- In addition, South Africa which has chosen the theme “BRICS and Africa: Partnership for Mutually Accelerated Growth, Sustainable Development, and Inclusive Multilateralism” for the year, seeks to introduce initiatives in its priority areas, including
 - An equitable and just transition on climate change issues
 - Unlocking opportunities through the African Continental Free Trade Area
 - Strengthening the meaningful participation of women in peace processes
- Indian officials will also look out for language proposed by China, to promote Beijing’s key initiatives like the Belt and Road Initiative, and the new Global Development Initiative (GDI) as part of an economy roadmap for BRICS.
 - India had refused to sign onto an Economy Roadmap at the SCO meeting chaired by India in July 2023 for the same reasons.

India, ASEAN Agree to Review Goods Trade Pact by 2025

Context: India and the ASEAN countries reached an agreement to review their free trade pact for goods and set a 2025 goalpost for concluding the review aimed at addressing the “asymmetry” in bilateral trade.

Key Highlights

- A Joint Committee of the ASEAN-India Trade in Goods Agreement (AITIGA), signed in 2009, deliberated on the roadmap for the review of the pact and finalised the terms of reference for the fresh negotiations, ahead of an ASEAN-India Economic Ministers’ meeting held in Indonesia.
- The AITIGA review will now be taken up at the India-ASEAN Leaders’ Summit scheduled in early September for further guidance.
- The review of the AITIGA was a long-standing demand of Indian businesses and the early commencement of the review would help in making trade facilitative and mutually beneficial.
- The Ministers agreed to follow a quarterly schedule of negotiations and conclude the review in 2025.
- The review of AITIGA is expected to enhance and diversify trade while addressing the current asymmetry in the bilateral trade.

India and the Northern Sea Route

Context: Murmansk, popularly called the capital of the Arctic region and the beginning point of the Northern Sea Route (NSR), is witnessing the rising trend of Indian involvement in cargo traffic.

- In the first seven months of 2023, India got the lion’s share with 35% of eight million tonnes of cargo handled by the Murmansk port, which is about 2,000 km northwest of Moscow.
- India has been showing greater interest regarding the NSR for a variety of reasons.

Do You Know

- ? What are the significances of the arctic region for India's interests?
- ? Why is India involved in Murmansk's Cargo Traffic?
- ? How long has India been engaged with the Arctic region?
- ? What is the NSR?
- ? How does Russia ensure the navigability of the NSR?
- ? How does the Chennai-Vladivostok Maritime Corridor impact NSR?

THE GIST

- India's involvement in Murmansk's cargo traffic has increased significantly, with the country handling 35% of cargo at the Murmansk port in 2023.
- The Arctic region's vulnerability due to climate change could impact India's economic and water security, as well as sustainability.
- India's engagement in the Arctic dates back to the 1920 signing of the Svalbard Treaty and includes various scientific studies and research activities.
- The Northern Sea Route (NSR) is a key focus for India, as it offers the shortest shipping route between Europe and the Asia-Pacific region.

Why Is The Arctic Region Significant To India?

- The vulnerability of the Arctic region, which is above the Arctic Circle and includes the Arctic Ocean with the North Pole at its centre, to unprecedented changes in the climate may have an impact on India in terms of economic security, water security and sustainability.
- The region also constitutes the largest unexplored prospective area for hydrocarbons remaining on the Earth.
- It is estimated that the region may hold over 40 per cent of the current global reserves of oil and gas. There may also be significant reserves of coal, zinc and silver.
- However, the government’s Arctic Policy of 2022 mentions that the country’s approach to economic development of the region is guided by UN Sustainable Development Goals.

How Old Is India’s Engagement With The Arctic?



- India’s engagement with the Arctic can be traced to the signing of the Svalbard Treaty in February 1920 in Paris and India is undertaking several scientific studies and research in the Arctic region.
- This encompasses atmospheric, biological, marine, hydrological and glaciological studies.
- Apart from setting up a research station, Himadri, at Ny-Ålesund, Svalbard, in 2008, the country launched its inaugural multi-sensor moored observatory and northernmost atmospheric laboratory in 2014 and 2016 respectively.
- Till last year, thirteen expeditions to the Arctic were successfully conducted.
- In May 2013, India became an observer-State of the Arctic Council along with five others including China.

What is NSR?

The Northern Sea Route (NSR), the shortest shipping route for freight transportation between Europe and countries of the Asia-Pacific region, straddles four seas of the Arctic Ocean.

- Running to 5,600 km, the route begins at the boundary between the Barents and the Kara seas (Kara Strait) and ends in the Bering Strait (Provideniya Bay).



- A paper published on the website of the Arctic Institute in September 2011 states that “in theory, distance savings along the NSR can be as high as 50% compared to the currently used shipping lanes via Suez or Panama.”
- The 2021 blockage of the Suez Canal, which forms part of the widely-used maritime route involving Europe and Asia, has led to greater attention on the NSR.

How Is Russia Making The NSR Navigable?

As the seas of the Arctic Ocean remain icebound during most of the year, the icebreaking assistance is organised to ensure safe navigation along the NSR.

- Russia is the only country in the world with a nuclear-powered icebreaker fleet, according to Rosatom State Nuclear Energy Corporation, the NSR infrastructure operator.
 - In December 1959, the world’s first nuclear icebreaker, “Lenin,” was put into operation, unveiling the new chapter in the NSR development. It was decommissioned 30 years later.
- Today, FSUE Atomflot, a subsidiary of Rosatom, acts as the fleet operator of nuclear-powered icebreakers.
 - The fleet comprises seven nuclear-powered icebreakers, apart from one nuclear container ship.
 - Three more are expected to be commissioned between 2024 and 2027.

What Are The Driving Factors For India To Participate In The NSR Development?

Primarily, the growth in cargo traffic along the NSR is on the constant rise and during 2018-2022, the growth rate was around 73%.

- Last year, the volume of cargo traffic was 34.117 million tonnes.
- With India increasingly importing crude oil and coal from Russia in recent years, Rosatom says that “the record supplies of energy resources for the Indian economy are possible due to such a reliable and safe transport artery as the NSR.”

Secondly, the NSR assumes importance, given India’s geographical position and the major share of its trade associated with sea transportation.

Thirdly, the Chennai-Vladivostok Maritime Corridor (CVMC) project, an outcome of signing of the memorandum of intent between the two countries in September 2019, is being examined as one linking with another organise international container transit through the NSR.

- The 10,500 km-long CVMC, passing through the Sea of Japan, the South China Sea and Malacca Strait, will bring down transport time to 12 days, almost a third of what is taken under the existing St. Petersburg-Mumbai route of 16,000 km.
- A study commissioned by Chennai Port Trust reveals that coking coal [used by steel companies], crude oil, Liquefied Natural Gas (LNG) and fertilizers are some of the cargo that can be imported from Russia to India through CVMC.

Fourthly, experts are discussing the possibility of China and Russia gaining collective influence over the NSR.

What Lies Forward?

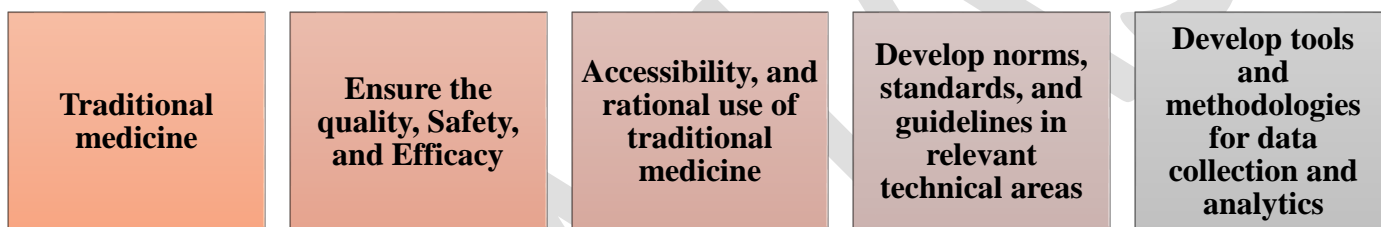
The NSR development plan until 2035, as approved by the Russian government last year, sets the cargo traffic target as 80 million tonnes and 150 million tonnes for 2024 and 2030. The plan approval took place amid economic sanctions imposed by the West against Russia.

In March, a Russian delegation held meetings with the Indian business community in New Delhi and Mumbai on the NSR development, according to media reports. The delegation had promised to provide the availability of key components for the year-round operation of the route. Rosatom seeks the participation of Indian companies in projects related to the NSR.

Asian Development Bank: Climate Change & Health Centre In Delhi

Context: Having bagged the first WHO Centre for Global Traditional Medicine, to be set up in Gujarat, India is now all set to open a climate change and health hub in New Delhi in partnership with the Asian Development Bank (ADB).

- The World Health Organization (WHO) outpost in Jamnagar will aim to provide leadership on global health matters pertaining to



Key Highlights: Need to Pool Resources

- Climate change affects all of us and this centre will give us the opportunity to have different partners discussing this important issue and learning from each other.
- The world is facing new challenges, and we must pool in our resources, learning and innovations to tackle the fall-out of this change in a timely manner.
- In its recently released G-20 outcome document, India also noted that climate change will continue to drive health emergencies, including the emergence and re-emergence of infectious diseases, and by increasing the severity and frequency of natural disasters, thereby threatening to overwhelm health systems' ability to deliver essential services.
- As such, we recognise the need to enhance the resilience of health systems against the impact of climate change. We commit to prioritising climate-resilient health systems development, building sustainable and low-carbon/low greenhouse gas (GHG) emission health systems and healthcare supply chains that deliver high-quality healthcare, mobilise resources for resilient, low-carbon sustainable health systems, and facilitate collaboration, including initiatives such as the WHO-led Alliance for Transformative Action on Climate and Health (ATACH)," the document noted.

India, Kenya Sign MoU For Shipbuilding Collaboration

Context: Goa Shipyard Ltd. and Kenya Shipyard Ltd. signed a memorandum of understanding (MoU) for capacity building and collaboration in ship design and construction.

Key Highlights

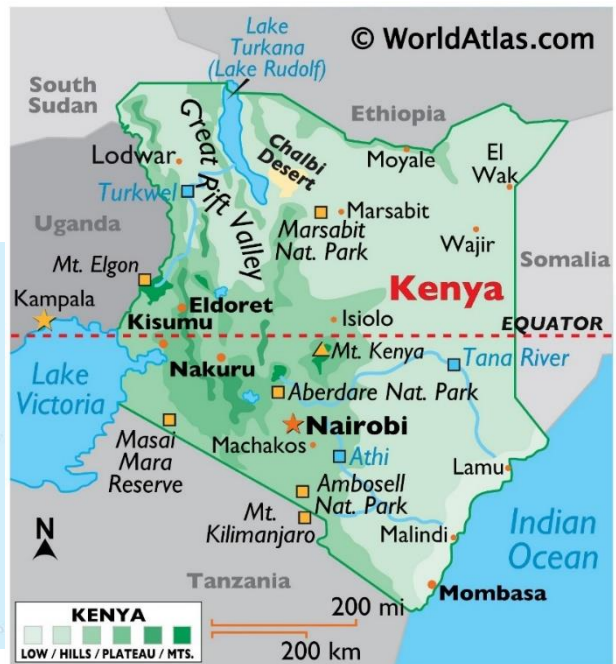
- The MoU was signed as Defence Minister Rajnath Singh and Kenyan Cabinet Secretary for Defence Aden Bare Duale discussed defence industry cooperation during talks.
- Both the Ministers agreed that the defence relationship between the two countries has evolved from being training-centric to include more strategic aspects.

- The two Ministers also concurred on the need for deeper cooperation in maritime security of the Indian Ocean region.
- As a token of friendship, Mr. Singh presented 15 pairs of parachutes (main and reserve) manufactured by Gliders India Ltd. to the Kenyan Cabinet Secretary for Defence for use by the Kenyan forces.
- India also extended support towards setting up of an advanced CT scan facility in Kenya.

Note: Kenya is bordered by the Indian Ocean to the southeast.

Its neighbouring countries are

- ✓ Ethiopia
- ✓ Somalia
- ✓ South Sudan
- ✓ Tanzania
- ✓ Uganda



Military Exercises, Defence & Security

Malabar Multilateral Exercise

Context: The 31st edition of the Malabar multilateral exercise comprising India, Australia, Japan and the U.S. will be held off Sydney from August 11 to 21, as Australia hosts the war games for the first time this year. Australia has also invited India for the Sea Power conference that it is hosting from November 7 to 9.

- The exercise will take place in a large designated area, the East Australian exercise area, spread over a couple of hundred miles off Sydney and will have a harbour and sea phase.
- Exercise Malabar will be followed by AUSINDEX, the India-Australia bilateral naval exercise. In the past, officials have termed Malabar as the most complicated naval exercise that India does.

Malabar Exercise

The exercise started in 1992 along the Malabar Coast as a bilateral exercise between India and the United States. It was expanded in 2007 with the participation of Japan, Singapore and Australia. Japan became a permanent partner in 2015.

- The aim of the exercise is to increase interoperability between the naval forces.
- The exercise is also designed to deepen the partnership for the Indo-Pacific, for shared aspiration, for a free, open and resilient Indo-Pacific.

Warship Vindhyagiri

Context: President Murmu launches warship Vindhyagiri.

- Vindhyagiri is the last in the series of three Project 17A (Alpha) frigates built by the Indian Navy at the Kolkata-based Garden Reach Shipbuilders and Engineers (GRSE).
- Describing the development as a move forward in **enhancing India's maritime capabilities**, the President said that the launch was also a **step towards achieving the goal of Atmanirbhar Bharat** through indigenous shipbuilding.

- Project 17A, under which Vindhyagiri was developed, reflects the country's commitment to self-reliance and technological advancement.

About INS Vindhyagiri

- INS Vindhyagiri is the sixth ship of the Project 17A Frigates series. After INS Nilgiri, Udaygiri, Himgiri, Taragiri, and Dunagiri, INS Vindhyagiri derives its name from a mountain range in Karnataka.
- These frigates are a follow-on class of the Project 17 (Shivalik Class) Frigates, integrating improved stealth, advanced weapons, and cutting-edge sensors.
- It employs a cutting-edge propulsion system enabling speeds of over 28 knots, ensuring rapid response and agility in various operational scenarios.
- Equipped with state-of-the-art stealth features, enhancing its ability to operate discreetly and minimize detection.
- Over 75% of the equipment and systems used are sourced from indigenous firms, including Micro, Small, and Medium Enterprises (MSMEs).



Environment

Hybrid EV imperative

Context: With their higher fuel economy and reduced carbon emissions, hybrid EVs offer an opportunity for economically developing countries to kick start the shift towards sustainable transportation while addressing infrastructure and cost challenges associated with full EV adoption.

- A crucial element of the world's transition to becoming net-zero is electric vehicles (EVs).
- In this milieu, hybrid EVs present a big opportunity for economically developing countries: while their power generation and grid capacity and reliability, the fraction of renewable sources in the power generation mix, and availability of fast-charging infrastructure are still less than ideal, hybrid EVs offer a way to begin the transition instead of waiting.

What is net-zero for a vehicle?

Net-zero for a vehicle includes emissions at both the tailpipe of the vehicle and at the power plant.

Making vehicles net-zero requires cutting emissions from both new and existing vehicles

What are the different types of EVs?

Any vehicle propelled by an electric drivetrain, taking electric power from a portable, electrical energy source, is called an Electric vehicle (EV).

- In a hybrid EV, an internal combustion engine (ICE) is used to produce electricity with an electrical generator.
- A small battery, typically 1-5kWh, is used in a hybrid EV as an energy buffer to store the electricity. The battery can't be charged from the grid.

THE GIST

- Hybrid electric vehicles (EVs) is a crucial element in the world's transition to a net-zero future.
- By combining the benefits of internal combustion engines with electric drivetrains, these vehicles offer an effective short-term solution to lower emissions and fuel costs while paving the way for a more sustainable future.
- These vehicles offer a realistic approach for nations facing grid limitations and challenges in building fast-charging infrastructure.

What is the fuel economy of hybrid and fully electric EVs?

Full EV

- A **full EV** – a.k.a. a battery EV or a plug-in EV – has no ICE and hence no tailpipe emissions.
- The battery typically is much larger at 20-120 kWh. And it can only be charged from the grid.

Plug-in hybrid EV

- A **plug-in hybrid EV** is still a hybrid EV with a much larger battery, typically 5-15 kWh.
- This larger battery can also be charged from the grid.
- This means a plug-in hybrid operates like a fully electric vehicle as long as there is energy in the battery.

Fuel-cell EV

- A **fuel-cell EV** uses a fuel cell to produce electricity for the drivetrain together with a small battery buffer to manage variations.

- The use of an ICE in combination with a generator and battery in a hybrid EV results in the fuel economy of these vehicles being 1.5-2x times higher than in conventional ICE vehicles for city driving and 1-1.5x times higher for highway driving.
- A plug-in hybrid EV combines the best of both hybrid and full EVs. It can cover 80-90% of all short, day-to-day commutes in a fully electric mode with 3-4x higher fuel economy than conventional vehicles. A driver on intercity trips can switch to the hybrid mode.

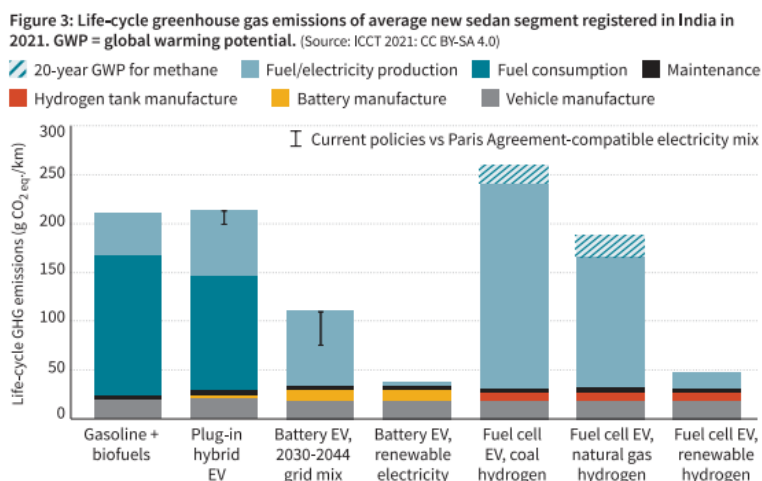
What are the net emissions of hybrid EVs?

- Well-to-wheel emissions include both tailpipe emissions and emissions due to fuel production – electricity or fossil fuels.
- The life-cycle emissions is a more comprehensive index that includes well-to-wheel emissions and emissions due to vehicle and battery production, maintenance, and end-of-life recycling.
- The grids of different countries are decarbonised to different extents at present. In the case of full EVs: the lower the emissions from power production, the lower the vehicle's well-to-wheel and life-cycle emissions.



How do EVs' life-cycle emissions compare to ICE vehicles?

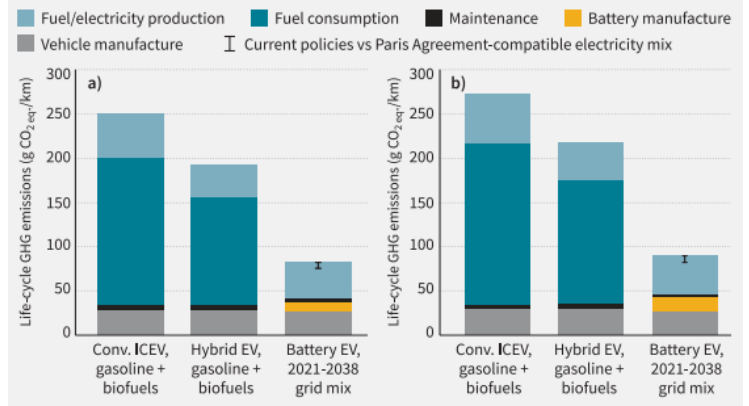
- According to an analysis by the International Council on Clean Transportation of life-cycle emissions of various vehicles in the U.S., Europe, China, and India, switching to full EVs will result in 19-34% lower emissions by sedans and 38-49% by SUVs – even with the fossil-fuel-dominated energy mix in India.
- By 2030, when renewables account for a greater share in the grid, emissions are expected to be 30-56% lower.
- The same report also compared the life-cycle emissions of hybrid EVs with that of conventional EVs in Europe and found 20-23% lower emissions.



Challenges to transitioning to electric mobility

- First fast-charging infrastructure along highways:
 - This is vital because people generally want to own one affordable car serving both short and long-distance travel needs over 5-15 years, and want to drive without range anxiety.
 - The lack of a fast-charging infrastructure will discourage people from buying full EVs. Fast-charging means power levels of 50-350 kW for cars and up to 1,000 kW for heavy-duty vehicles. To compare, our smartphones charge at 10-25 W.
 - Fast-charging will enable drivers to make long-distance trips using their EVs with 10-20-minute stops to gain ranges of 300-400 km.
 - The indicative prices for EV fast-chargers are: capital cost of \$500-1,000/kW, service and maintenance at 5% per year; and an installation cost of around 50% of the charger cost.
 - The high cost and wide variation are due to the high-capacity power connections required, the cost of making and installing a new transformer and cables; service-level agreements; DC charger plug options and quantities; customisation costs; labour costs; and permits.
- Second, many parts of the world, especially economically developing nations, don't yet have access to a grid or the grid isn't 100% reliable.
 - The relatively high charging power for slow-charging (<22kW) and fast-charging (<350kW) make the problem more prominent vis-à-vis generation and transmission capacities. This in turn could retard the transition to EVs.
- Third, mass-market price points of cars in the economically developing world are much lower, ~\$12,000 – whereas EVs with a range of 300-400 km will reach parity with conventional vehicles in the richest countries at a price of \$25,000-35,000 in the short term.
 - This is due to the high battery costs, between \$130-200/kWh at the pack level.
 - EVs with higher range will need larger battery packs and thus be more expensive.

Figure 4: Life-cycle greenhouse-gas emissions of a) lower medium and b) SUV segment conventional gasoline ICE vehicles, gasoline hybrid EVs, and average electricity-powered full-EVs registered in Europe in 2021. (Source: Global comparison of the life-cycle GHG emissions of combustion engine and electric passenger cars, ICCT 2021)



How can hybrid or plug-in hybrid EVs help us decarbonise?

Hybrid EVs – either full or plug-in hybrids – present a big opportunity to lower emissions in the interim, i.e. from today, with ICE vehicles, until we have full EVs powered 100% by renewable energy.

- The 1.5-2x higher fuel economy of hybrids and 3-4x higher fuel economy of plug-in hybrids in electric mode drastically reduces fuel costs, emissions, and oil imports.
 - Plug-in hybrids in particular can match several (but not all) of the benefits of full EVs vis-à-vis emissions and performance without requiring large batteries. With a limited all-electric range, this may not cater to all use cases, such as taxis.
- Regenerative braking in hybrid EVs – i.e. recovering the kinetic energy of the vehicle while slowing down instead of dissipating it as heat in the braking system – can improve fuel economy esp. in urban areas with frequent stop-go conditions and in hilly conditions. An engine start-stop mechanism can also save fuel at traffic junctions and in heavy traffic.
- Finally, the purchase price of hybrid cars is only 5-15% higher than conventional vehicles and is independent of the vehicle range.
 - In an ideal future, all our electricity comes from renewable sources and we power our EVs using solar energy during the day and with wind energy at night.



For countries that can already work towards this goal now, our priority must be to realise this vision. In places where transitioning to renewables for power and building fast-charging infrastructure will take a decade or more, we need to switch to hybrid EVs as a short-term solution due to the fuel-economy and emissions benefits.

Climate Finance Adds Another Layer Of Inequity To Climate Change

Context: Many countries in Sub-Saharan Africa are in debt distress and are also among the nations that are most vulnerable to climate change.

Key Highlights

- In the last few years, climate justice activists have been campaigning for the world’s economically developed countries to raise their investments in climate adaptation and mitigation, including paying for other countries’ abilities to deal with the effects of climate change.
- Countries in Sub-Saharan Africa, Latin America, and South Asia have historically contributed the least to global warming; yet, they are bearing the bigger brunt of climate disasters – both in the form of extreme natural phenomena and debt distress.
- On the other hand, countries in North America and Europe have contributed and continue to contribute the most, and are also the creditors of the debt crisis.

Chart 1 shows

- The carbon dioxide emissions per capita emitted in 1980-2021 by various geographical regions, including Africa, Asia (excluding China and India), and South America, and by some countries.
- It also shows (as a fixed black line) a baseline target of carbon dioxide emissions (2.3 tonnes per capita) needed to limit global warming to 1.5° Celsius, as determined by the Institute for European Environmental Policy.
- The global average emissions per capita is currently double this target, and has stayed above 4.7 tonnes per capita since 2010, whereas Africa and India have both been consistently under.
- China crossed the global average in 2004. It steadily climbed to 8 tonnes per capita in 2021 and joined Europe and Oceania.
- Notably, while the the overall emissions of the UAE and the U.S. have declined, as of 2021 these countries still had the highest emissions per capita (21.8 tonnes and 14.9 tonnes, respectively).

Chart 1 | CO₂ emissions per capita emitted in 1980-2021 by various geographical regions (in tonnes per capita)

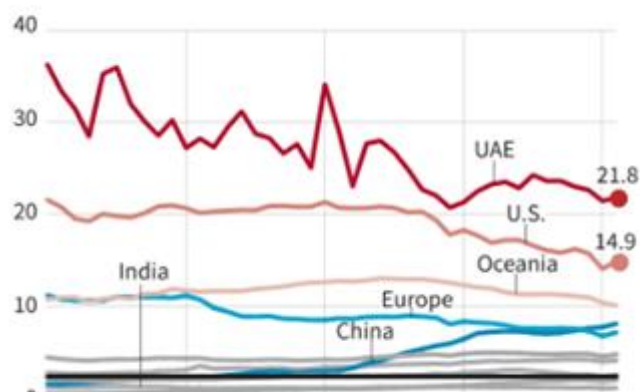


Chart 2 | Total climate investment by each World Bank region as a fraction of that region’s total GDP in 2019 and 2020

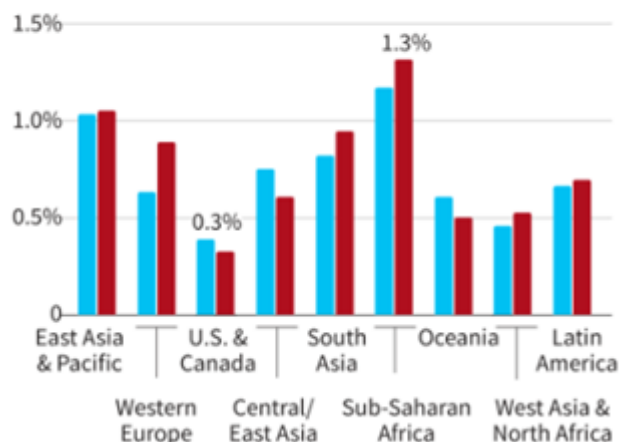


Chart 2 shows

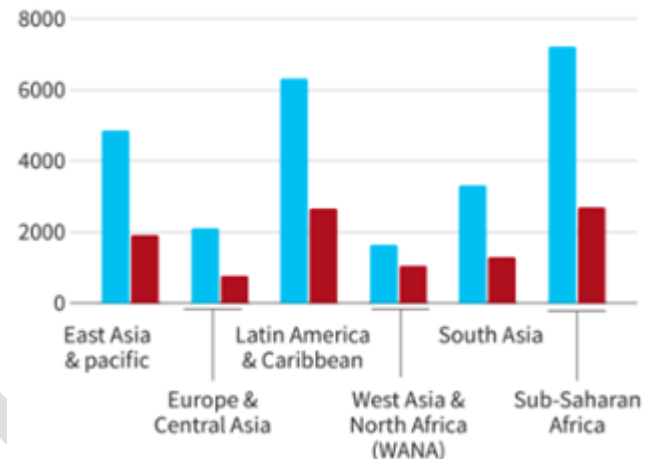
- The total investment in climate-related activities by each World Bank region as a fraction of that region’s total GDP in 2019 and 2020.
- This includes public and private investment in, among others, climate mitigation and adaptation activities, reduction of fossil-fuel use, and reforestation.

- In both years, Sub-Saharan Africa had the highest investment fraction in climate finance (1.3% of its GDP), followed by East Asia and the Pacific (1%) and South Asia (0.9%).
- The U.S. and Canada had the lowest proportionate investment, at only 0.3% of their GDP.
- A large fraction of the funds for climate mitigation and adaptation in the Global South comes from international multilateral climate funds, such as the Green Climate Fund and the Clean Technology Fund. The sources for the Global South are usually economically developed countries.

Chart 3 shows

- The total approved funds and the actual funds disbursed towards each region.
- Since 2003, for example, \$3.3 billion was approved to be disbursed to South Asia, but only \$1.3 billion was actually disbursed. Most regions received only 40% of the approved funding for that region, on average.

Chart 3 | The chart shows the total approved climate funds and the actual funds disbursed towards each region. The figures are in \$ million



Anushka Kataruka is interning with The Hindu Data Team

Chart 4 shows

- The climate vulnerability index by country and the risk of debt distress by region.
- This index, calculated annually by the Notre-Dame Global Adaptation Initiative, combines a country's exposure, sensitivity, and capacity to adapt to climate change.
- The risk of debt distress is based on the International Monetary Fund's Debt Sustainability Framework reports.
- As most reports are limited to the Global South, several high-income countries had to be excluded from the analysis.
- The chart shows that most countries in debt distress or facing a high risk are in Sub-Saharan Africa, which is also the most vulnerable to climate change.
- Overall, countries at high risk or in debt distress are also more vulnerable to climate change. Three of the eight countries in South Asia are in this group.

Chart 4 | Climate vulnerability index (vertical axis) for each country and the risk of debt distress by region



Endangered Himalayan Vulture

Context: Researchers have recorded the first instance of captive breeding of the Himalayan vulture (*Gyps himalayensis*) in India at the Assam State Zoo, Guwahati.

Key Highlights

- Categorized as 'near threatened' on the International Union for Conservation of Nature (IUCN) Red List of threatened species, the Himalayan vulture is a common winter migrant to the Indian plains, and a resident of the high Himalayas.

- Details of the successful breeding were recently published in a paper titled “Breeding of Himalayan Vulture *Gyps himalayensis* Hume, 1869 (Aves: Accipitriformes: Accipitridae) in the Assam State Zoo, Guwahati, Assam, India” in the Journal of Threatened Taxa.
 - During first month, the nestling was kept in the brooder made up of a plastic box (1 x 1 x ½ f) with a mat for the grip. The temperature was maintained around 30-35 C with a lamp, a water bowl and it was monitored with a thermo-hygrometer. The nestling was provided with sufficient space to move towards and away from the heat source.
 - Along with the housing for nestling, the paper says, the food, frequency of feed, and the growth and colouration of the nestling were observed.
- The Himalayan vulture at the Guwahati Zoo is the second such instance in the world, after France, where the species has been bred in captivity.
- Four VCBCs (Vulture Conservation Breeding Centre) established by Bombay Natural History Society (BNHS) at Pinjore in Haryana, Bhopal in Madhya Pradesh, Rani in Assam, and Rajabhatkhawa in West Bengal are involved in conservation breeding of the white-rumped vulture (*Gyps bengalensis*), slender-billed vulture (*Gyps tenuirostris*), and the Indian vulture (*Gyps indicus*).
- The unprecedented scale and speed of declines in vulture populations has left all the three resident *Gyps* vulture species categorised ‘Critically Endangered’.



Clouded Leopards

Context: New study reveals endangered species does not follow any specific pattern of operating in a space, unlike other carnivores.

- Two scientists from the Wildlife Institute of India (WII) have found that the clouded leopard in western Assam’s Manas National Park and Tiger Reserve seems to play a mysterious game of hide-and-seek in the tropical canopy forests.

About Clouded Leopards

- The mainland clouded leopard (*Neofelis nebulosa*) is often likened to the Ice Age sabretooth because it has the largest canines in proportion to its skull size among all cat species.
- It also has rotating rear ankles that enable it to climb down head first from trees, unlike the other felines.
 - Carnivore ecologist observed that the cat with cloud-like spots on its hide does not follow any specific pattern of operating in a certain space, unlike other carnivores.
 - They seemed to go wherever they pleased without worrying about other predators, primarily because of their ability to climb trees, even hang upside down from large branches.



- ✓ The clouded leopard is categorised into two species:
 - The mainland clouded leopard distributed from central Nepal to peninsular Malaysia, and
 - The Sunda clouded leopard (*Neofelis diardi*) native to Borneo and Sumatra.
- ✓ The mainland clouded leopard is tagged vulnerable on the International Union for Conservation of Nature(IUCN) Red List and is considered at high risk of extinction in the wild due to deforestation and poaching.
- ✓ Despite this, knowledge of the animal’s ecology and population status remains limited.

Indian eagle-owl

Context: The Indian eagle-owl was classified as a species only in recent years, thus distinguishing it from the Eurasian eagle-owl.

- ✓ The Indian species is an imposing bird.
- ✓ The slightly larger female can reach a total length of two and a half feet, with a wingspan of six feet.
- ✓ Prominent ear tufts that look like horns are seen to project from its head.
- ✓ Its nocturnal habits have meant that very little is known about this bird.
- ✓ The widespread range — the entire Indian peninsula — would seem to indicate that it is a stable population. But nobody knows for sure, as it is not a very common bird. Their total numbers have never been estimated.
- ✓ The Indian eagle-owl does not have a dependency on forests. The regular items on their menu, such as rats, bandicoots, and even bats and doves are best hunted over open scrubland and agricultural tracts. Nearby rocky perches and crags provide ideal settings for its nests.



Benefits To Agriculture

- Research done by the Ela Foundation and the Zoological Survey of India has shown that Indian eagle-owls nesting near agricultural lands had more, and healthier, owlets than scrubland nesters.
- The former benefited from the abundant populations of rodents near farms.

Great Nicobar Project

Context: Over nine lakh trees likely to be axed for Great Nicobar Project.

- The Centre's ambitious ₹72,000-crore Great Nicobar Project may see 9.64 lakh, and not 8.5 lakh, trees felled to enable the construction of a trans-shipment port, an international airport, a township, and a 450-MVA gas- and solar-based power plant on the Great Nicobar island, according to a response by Minister of State (Environment) Ashwini Kumar Choubey in the Rajya Sabha
- There is also a possibility that fewer trees may be axed, he indicated.

Key Highlights

- The Great Nicobar Project, which is likely to come up over 130 square km of pristine forest, has been accorded environmental clearance by an expert committee.
- However, this was challenged in the National Green Tribunal (NGT), following which it set up an expert committee in April to investigate aspects of the clearance.

Strategic importance

- Though details of a project being appraised for environmental clearance are usually made available on a public portal maintained by the Environment Ministry, details on the Great Nicobar Project have not been put up, it is learnt, following instructions from the Union Home Ministry that has classified the project as one of "strategic importance".
- However, the Environment Ministry on its own had estimated that close to 8.5 lakh trees were expected to be cut for the project.
- These are evergreen tropical forests with high biological diversity and the island itself is home to nearly 650 species of flora and 330 species of fauna.
- "The estimated number of trees to be felled in forest area earmarked for development in Great Nicobar Project is 9.64 lakh.
- Further, it is expected that about 15% of development area will remain as green and open spaces.

- Thus, potential tree felling would be less than 9.64 lakh. Moreover, this tree felling will be done in a phased manner.
- In lieu of the trees being chopped, compensatory afforestation would be carried out in Haryana as “the scope of plantation in Andaman and Nicobar Islands is very limited.

5% of Birds in India are Endemic, says Zoological Survey of India

Context: A recent publication by the Zoological Survey of India (ZSI) points out that about 5% of the birds found in the country are endemic and not reported in other parts of the world.

- The publication, **75 Endemic Birds of India**, was recently released on the **108th foundation day of the ZSI**.

Key Highlights

- India is home to 1,353 bird species, which represents approximately 12.4% of the global bird diversity. Of these, 78 (5%) are endemic to the country.
- Three of the 78 species have not been recorded in the past few decades.
- They are
 - The **Manipur bush quail** (*Perdica manipurensis*), listed as “**endangered**” by the International Union for Conservation of Nature (IUCN) Red List of Threatened Species with its last recorded sighting in 1907.
 - The **Himalayan quail** (*Ophrysia superciliosa*), listed as “**critically endangered**” with its last recorded sighting in 1876.
 - The **Jerdon’s courser** (*Rhinoptilus bitorquatus*), listed as “**critically endangered**” with its last confirmed sighting in 2009.
- The publication highlighted the importance of endemic bird species in the country.
- Since endemic species are restrictive in nature, it is important that their habitats are conserved so that they don’t dwindle out.

Endemic Birds & Western Ghats

- The highest number of endemic species have been recorded in the Western Ghats, with 28 bird species.
- Some of the species recorded in the country’s bio-geographic hotspot are

Malabar grey hornbill (*Ocyrocus griseus*)

Malabar parakeet (*Psittacula columboides*)

Ashambu laughingthrush (*Montecincla meridionalis*)

White-bellied sholakili (*Sholicola albiventris*)

Asian Elephant Population and Demography Estimates, 2023

Context: Asian Elephant (largest living land animal in Asia) Population and Demography Estimates, 2023 was released recently.

- The report was released by Karnataka Minister for Forests Eshwar Khandre, ahead of the World Elephant Day being observed on August 12 to create awareness about the importance of preserving and protecting these animals that are classified as endangered species.

Key Highlights

- The number of elephants in Karnataka has increased by 346, from an estimated 6,049 in 2017 to 6,395 now, which is the highest in the country, according to an interim report.
- Their population range is estimated to be between 5,914 and 6,877.



Synchronised Census

- The report has been prepared after a synchronised elephant census was conducted from May 17 to 19 by the Forest Department in collaboration with neighbouring Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, and Goa.
- The number of elephants in Karnataka that had risen from 5,740 in 2010 to 6,072 in 2012 had decreased to 6,049 in 2017.
- However, this time the number of pachyderms has increased by 346. With this, the elephant numbers have increased by 655 in the State since 2010.
- The census, which was taken up in 23 forest divisions, shows that the State has an average elephant density of 0.34 per sq. km. Bandipur Tiger Reserve with 1,116 elephants accounted for the highest density of 0.96 per sq. km followed by Nagarahole Tiger Reserve that has 831 elephants with a density of 0.93.

About Asian Elephant	
Habitat	Indian Subcontinent and Southeast Asia. <ul style="list-style-type: none"> ✓ The habitat varies from wet tropical evergreen forests to semi-arid coniferous and scrub forests. ✓ However, the largest population of elephants is found in tropical deciduous forests. ✓ Elephants are “mega herbivores” that require vast forests and grasslands with plenty of food and water.
Subspecies	<ul style="list-style-type: none"> ✓ The Sri Lankan ✓ The Indian Elephant ✓ The Sumatran Elephant
Appearance	<ul style="list-style-type: none"> ✓ Smaller than their African counterparts, Asian elephants are easily recognized by their “small” rounded ears. ✓ They often have a hump on their back, a double-domed head with two humps, and a single “finger” on their body for grasping.
Distribution In India	<ul style="list-style-type: none"> ✓ The Asian elephant was once widespread throughout the country, including states such as Punjab and Gujarat. ✓ They currently exist in four fragmented populations in South, North, Central and Northeast India.
IUCN Status	Endangered
Threats	<ul style="list-style-type: none"> ✓ Loss of habitat ✓ Human-animal conflict ✓ Illegal wildlife trade

Can SMRs Help India Achieve Net Zero?

Context: The world’s quest to decarbonise itself is guided, among other things, by the UN Sustainable Development Goal 7: “to ensure access to affordable, reliable, sustainable and modern energy for all”.

- Since the world still depends on fossil fuels for 82% of its energy supply, decarbonising the power sector is critical; the share of electricity in final energy consumption will also increase by 80%-150% by 2050.
- The recent uptick in coal consumption in Europe, despite the increase in solar and wind power, suggests that reliable, 24/7 low-carbon electricity resources are critical to ensure the deep decarbonisation of power generation, along with grid stability and energy security.
- Small modular reactors — a type of nuclear reactor — can be helpful to India in this regard.

What Are The Challenges Of Decarbonisation?

- The **transition from coal-fired power generation to clean energy** poses major challenges, and there is a widespread consensus among policymakers in several countries that solar and wind energy alone will not suffice to provide affordable energy for everyone.

- In decarbonised electricity systems with a significant share of renewable energy, the addition of at least one firm power-generating technology can improve grid reliability and reduce costs.
- According to the International Energy Agency, the demand for critical minerals like lithium, nickel, cobalt, and rare earth elements, required for clean-energy production technologies, is likely to increase by up to 3.5 times by 2030.
 - This jump poses several global challenges, including the **large capital investments** to develop new mines and processing facilities.
- The **environmental and social impacts** of developing several new mines and plants in China, Indonesia, Africa, and South America within a short time span, coupled with the fact that the top three mineral-producing and mineral-processing nations control 50-100% of the current global extraction and processing capacities, pose **geopolitical and other risks**.

THE GIST

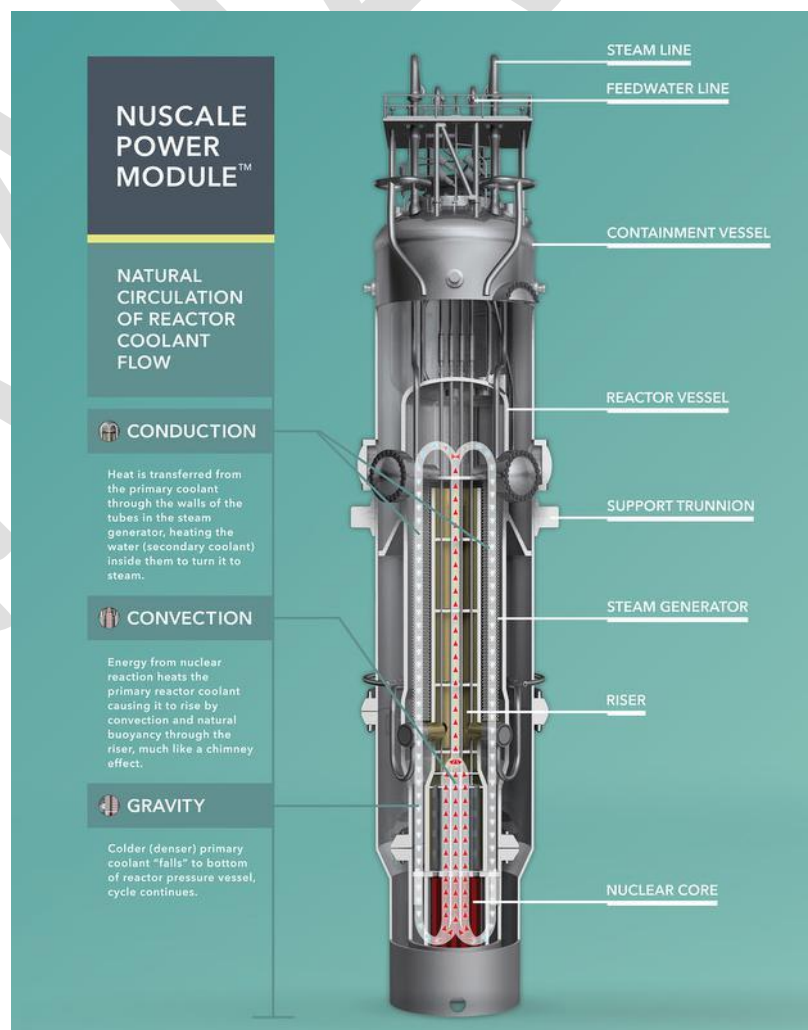
- Conventional nuclear power plants often suffer from time and cost overruns. As an alternative, several countries are developing small modular reactors (SMRs) — nuclear reactors with a maximum capacity of 300 MW — to complement conventional NPPs.
- Studies have found that SMRs can be safely installed and operated at several brownfield sites that may not meet the more stringent zoning requirements for conventional NPPs.
- Most land-based SMR designs require low-enriched uranium, which can be supplied by all countries that possess uranium mines and facilities for such enrichment if the recipient facility is operating according to international standards. Since SMRs are mostly manufactured in a factory and assembled on site, the potential for time and cost overruns is also lower.

Nuclear Power Plants

- Nuclear power plants (NPPs) generate 10% of the world’s electricity and help it avoid 180 billion cubic metres of natural gas demand and 1.5 billion tonnes of CO2 emissions every year.
 - Any less nuclear power could make the world’s journey towards net-zero more challenging and more expensive.
- NPPs are efficient users of land and their grid integration costs are lower than those associated with variable renewable energy (VRE) sources because NPPs generate power 24x7 in all kinds of weather.
- Nuclear power also provides valuable co-benefits like high-skill jobs in technology, manufacturing, and operations.

This said, conventional NPPs have generally **suffered from time and cost overruns**. As an alternative, several countries are developing small modular reactors (SMRs) — nuclear reactors with a maximum capacity of 300 MW — to complement conventional NPPs.

- SMRs can be installed in decommissioned thermal power plant



sites by repurposing existing infrastructure, thus sparing the host country from having to acquire more land and/or displace people beyond the existing site boundary.

What Are The Advantages Of SMRs?

SMRs are designed with a smaller core damage frequency (the likelihood that an accident will damage the nuclear fuel) and source term (a measure of radioactive contamination) compared to conventional NPPs.

They also include enhanced seismic isolation for more safety.

SMR designs are also simpler than those of conventional NPPs and include several passive safety features, resulting in a lower potential for the uncontrolled release of radioactive materials into the environment.

The amount of spent nuclear fuel stored in an SMR project will also be lower than that in a conventional NPP.

Studies have found that SMRs can be safely installed and operated at several brownfield sites that may not meet the more stringent zoning requirements for conventional NPPs.

The power-plant organisation can also undertake community work, as the Nuclear Power Corporation did in Kudankulam, Tamil Nadu, before the first unit was built.

Accelerating the deployment of SMRs under international safeguards, by implementing a coal-to-nuclear transition at existing thermal power-plant sites, will take India closer to net-zero and **improve energy security because uranium resources are not as concentrated as reserves of critical minerals.**

- Most land-based SMR designs require low-enriched uranium, which can be supplied by all countries that possess uranium mines and facilities for such enrichment if the recipient facility is operating according to international standards.
- Since SMRs are mostly manufactured in a factory and assembled on site, the potential for time and cost overruns is also lower.
- Further, serial manufacture of SMRs can reduce costs by simplifying plant design to facilitate more efficient regulatory approvals and experiential learning with serial manufacturing.
- Since SMRs are designed to operate for more than 40 years, the levelised cost of electricity is \$60-90 per MWh.
 - The figure is expected to drop rapidly after 2035, by when the SMRs ordered by a number of east-European countries from NuScale and GE Hitachi are expected to come online.
 - The costs will decline steepest for India when reputed companies manufacture SMRs.
 - This at least was the reason SMRs were included in the U.S.-India joint statement after Prime Minister Narendra Modi met U.S. President Joe Biden in June 2023.

What Are The Legal And Regulatory Changes Required?

- The Atomic Energy Act will need to be amended to allow the private sector to set up SMRs.
- To ensure safety, security, and safeguards, control of nuclear fuel and radioactive waste must continue to lie with the Government of India.
- The government will also have to enact a law to create an independent, empowered regulatory board with the expertise and capacity to oversee every stage of the nuclear power generation cycle.
- The security around SMRs must remain under government control, while the Nuclear Power Corporation can operate privately-owned SMRs during the hand-holding process.
- Finally, the Department of Atomic Energy must improve the public perception of nuclear power in India by better disseminating comprehensive environmental and public health data of the civilian reactors, which are operating under international safeguards, in India.

Flying Fox Bats

Context: India's largest species of bats, named after a canine fabled to be sly, spends 7% of its day-roosting time being environmentally vigilant, a new study has said.

Key Highlights of Study

The study, focussing on the environmental and social vigilance of one of two subspecies of the Indian flying fox, found space in Behavioral Ecology and Sociobiology, a peer-reviewed international journal.

- ✓ The study describes vigilance behaviour as an individual scanning its surroundings for both competition and predation risk.
- ✓ Vigilance is social if an individual looks directly at another close-by individual approaching or likely to fight while vigilance of the environmental kind is gazing elsewhere, primarily watching for any signs of danger.
- ✓ The Indian flying fox roost gregariously and externally in tree canopies.
 - In such conditions, hierarchy and competition for preferred roosting positions may result in the social structuring of animal aggregation.
 - Vigilance is a manifestation of competition in canopy roosting bats, which can vary temporally.
- ✓ Most bats forage at night and spend more than half of their lives roosting during the day in camps or colonies.
- ✓ The flying foxes studied spent 82% of their roosting time sleeping but remain alert to their surroundings. Dependence on auditory perception gives the added advantage of not sacrificing sleep entirely.



About Flying Fox	
Important facts	<ul style="list-style-type: none"> ✓ The nectar and fruit-eating flying fox (<i>Pteropus giganteus</i>) is generally considered a vermin as they raid orchards. ✓ It is a keystone species causing seed dispersals of many plants in tropical systems.
Wildlife (Protection) Act of 1972 Status	Schedule II list
IUCN Status	Least concern
Appearance	Reddish-brown coat, characteristically long snout as well as large eyes. It also resembles a little fox with wings.
Distribution	It is native to the Indian subcontinent. These bats are endemic to South Central Asia, found from Pakistan and China to the Maldives Islands.

Lifestyle	<ul style="list-style-type: none"> ✓ It is highly social creatures, forming large roosts of several hundred animals. ✓ These bats live in a 'vertical', male-dominated hierarchy system, where higher-ranked individuals occupy higher spots of the tree, while lower-ranked individuals remain on lower spots.
Threat	<ul style="list-style-type: none"> ✓ Being external roosters, the flying fox is exposed to predators and disturbances apart from environmental indicators such as heat and light. <ul style="list-style-type: none"> • The biggest threat to the flying fox is from humans. Hunting for meat and medicine and probable threats like the felling of roost trees have contributed to the dramatic decrease in the population of the species.

Haphazard Development Is Increasing The Impact Of Weather Events

Context: Being an El Niño year, the expectation was that north India would see a sparse monsoon. However, the pendulum has swung the other way.

- July saw record rainfall in many parts of Himachal Pradesh, Punjab and Uttarakhand and the rare sight of the Yamuna nearly spilling into the Red Fort in Delhi.
- Multiple floods in Himachal Pradesh and Uttarakhand that have claimed many lives. A series of landslides has crumbled buildings and blocked highways.

What Is The Reason?

Western Disturbances

- The immediate explanation for the landslides is the unexpectedly copious rainfall that these States have received and that these in turn are due to a surfeit of **Western Disturbances (WD)**.
 - These are tropical storms that originate in the Mediterranean region and normally bring winter rainfall to north India.
- Right from the beginning of this year, the WD have been erratic. There were too few of them in December and January and their absence was cause for the hottest February recorded in India in at least a century.
- The WD appear to be overcompensating for their absence, with several of them incident over north India in the last two months — a time when they normally should not be around.
- While a combination of WD and monsoon can be dismissed as **'freak' weather**, climate scientists have been warning of the increasing probability of such high-risk events.
- The awry WD are in part due to a warming Arctic that causes the polar jet stream, which carries moisture, to deviate from its regular path and bring the disturbances to north India during the monsoon.

Constructions

- It is in the context of these altered weather patterns that warnings by scientists and environmentalists of the perils of wanton construction in the Himalayas must be factored in.
- The ongoing Char Dham road building project has led to large-scale altering of the mountains with significant chunks carved away, rendering them vulnerable to upheaval.
- As recent fears of land subsidence in Joshimath, Uttarakhand demonstrated, ill-thought construction and haphazard building practices have magnified the risk to residents who live in these regions.

While State governments tend to search for **short-term solutions** such as demanding compensation from the Centre for **'disaster relief'**, it is time that more serious thought is given to the **nature of infrastructure development** and, if need be, **restrictions imposed** in the larger interest of **minimising hazards and maintaining stability**.

White-Bellied Sea Eagles

Context: Study finds that white-bellied sea eagles make nests on powerline towers in Tamil Nadu; authors say this poses risk to the species, and also points to the lack of suitable nesting sites near the sea.

Key Highlights

- White-bellied sea eagles in India are beginning to emulate their counterparts in Australia and Thailand by making their homes on power towers holding high-tension wires.
- The use of man-made structures as nesting sites can be **both risky and beneficial** to these coastal raptors and humans in the vicinity, but the development points to a lack of trees and other natural nesting alternatives.
- The nests of the white-bellied sea eagles were found on powerline towers about 2 km away from the sea.
 - The nesting sites were strategic for the birds to conveniently scan the marine area for food, the study said.



About White-Bellied Sea Eagle

- The white-bellied sea eagle (*Haliaeetus leucogaster*) is a resident raptor.
- It belongs to the family Accipitridae.
- It has a wide distribution range on the sea coast of India from Mumbai to the eastern coast of Bangladesh, and Sri Lanka in southern Asia, through all coastal south-eastern Asia, southern China to Australia.
- The raptor is a diurnal monogamous bird of prey.
- It is categorised as being of 'least concern' on the Red List of the International Union for Conservation of Nature.
- Feeding mainly on sea snakes and fish, the bird is occasionally seen in inland waters along tidal rivers and in freshwater lakes.
- It occupies the same localities for years and generally builds nests in tall trees near the seacoast, tidal creeks, and estuaries.



Namoh 108

Context: Science Minister unveiled a variety of lotus called 'Namoh 108'.

- The lotus has 108 petals and was discovered several years ago in Manipur and kept at the institute as part of its collection of flowers and plants, on which the institute conducts research.
- However, it was not until four years ago that one of the scientists discovered that it had 108 petals.
- This is the only lotus variety in India to have had its genome sequenced.
- It was only after the number of petals was discovered that the National Botanical Research Institute (NBRI) cloned and worked on improving its germplasm and modifying its characteristics.
- The name of the variety was given by an internal committee of the NBRI.
- CSIR-NBRI would be initiating a 'Lotus Mission' as part of a larger ongoing horticultural mission to have more of the 108 Namoh flowers grow in other parts of India.



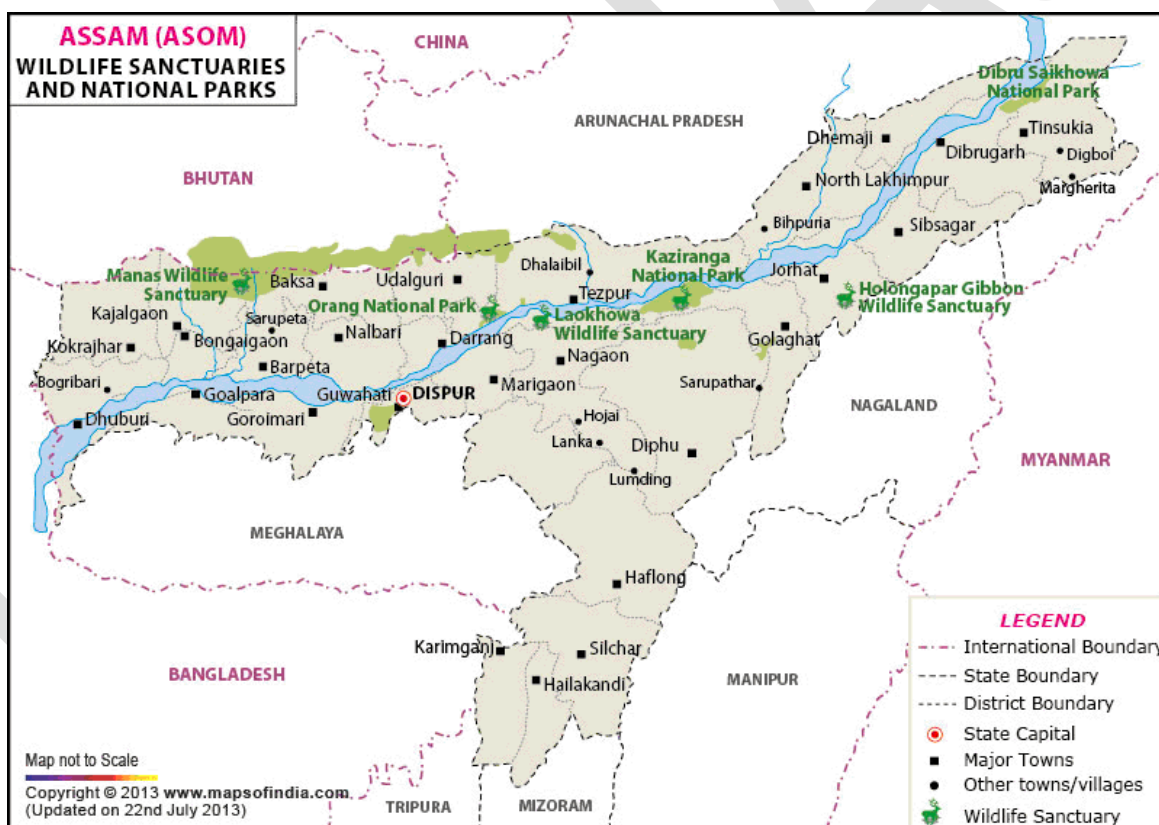
Reroute Rail Track Through Gibbon Sanctuary

Context: Primatologists have suggested rerouting a 1.65-km long railway track that has divided an eastern Assam sanctuary dedicated to the western hoolock gibbon (Hoolock hoolock) into two unequal parts.

- ✓ Their report in Science, a journal, follows that of the Wildlife Institute of India (WII) on designing an artificial canopy bridge to facilitate the movement of the hoolock gibbons across the broad-gauge line within the Hollongapar Gibbon Sanctuary. The track is yet to be electrified.

About Hollongapar Gibbon Sanctuary

- ✓ Housing about 125 hoolock gibbons, India's only ape, the sanctuary in the Jorhat district of Assam, India and covers an area of 21 sq. km.
- ✓ It was established in 1997 as a protected area primarily to conserve the western hoolock gibbon, an endangered primate species.
- ✓ Set aside initially in 1881, its forests used to extend to the foothills of the Patkai mountain range.
- ✓ It contains India's only gibbons – the hoolock gibbons, and Northeastern India's only nocturnal primate – the Bengal slow loris.



What is the Issue?

- ✓ The sanctuary has become a 'forest island', having lost connectivity with surrounding forest patches as per Wildlife Institute of India report.
- ✓ Since gibbons are exclusively arboreal animals inhabiting the forest's upper canopy, they are particularly sensitive to canopy gaps," the WII's technical report on May 2023, advising an artificial canopy across the railway track in the Hollongapar protected area, said.

- ✓ Gibbon families on both sides of the railway track have thus been effectively isolated from each other, thereby compromising their population's genetic variability and further endangering their already threatened survival in the sanctuary.

Cyclone Frequency May Rise Over Indian Coast from the Warming Of Pacific

Context: A combination of global warming and Pacific Decadal Oscillation can lead to more cyclones.

- Tropical cyclones that originate near the Equator, while being devastating, have been unusually subdued in recent decades.
- The last major cyclone of this kind in India was Cyclone Okchi, which devastated parts of Kerala, Tamil Nadu and Sri Lanka in 2017.
- However, a **combination of global warming and a cyclical event called the Pacific Decadal Oscillation (PDO)** that repeats every 20 to 30 years, could make such cyclones more frequent in the coming years, a study published in the journal Nature Communications said.

Key Highlights

- The number of such equatorial-origin cyclones was 43% less in the period from 1981 to 2010 compared with 1951 to 1980, and this was because the PDO was in a 'warmer' or positive phase.
- A warming of the Central Equatorial Pacific, called an El Nino, often corresponds to reduced rainfall over India whereas cooler-than-normal temperatures, or a La Nina, is linked to excessive rainfall.
 - This pattern, collectively called the El Nino Southern Oscillation (ENSO) phenomenon, repeats in the Pacific over two to seven years.
- However, the PDO is not an annual occurrence and, on an average, corresponds to a warmer than average Western Pacific Ocean and relatively cooler Eastern Pacific, though this plays out over much longer time scales.
 - However, unlike an ENSO, a 'positive' or 'warmer phase' of a PDO can be known only after several years of measuring ocean temperatures and their interaction with the atmosphere.
- In 2019, the PDO entered a cooler, negative phase and if it remains so, could mean more tropical cyclones in the post-monsoon months that originate near the equator.
- It's usually rare for cyclones to form near the Equator but when the waters are warm, they can gain more moisture and rise in intensity.
- An El Nino is developing in the Pacific, the effects of which are manifested in central and southern India, which have recorded rainfall deficits of 7% and 17%, respectively.

ENSO and PDO

- ✓ ENSO with a positive PDO is generally not good, however, ENSO with a negative PDO brings more rain to India.
- ✓ If both ENSO and the PDO are in the same phase, it is believed that El Niño/La Nina impacts may be magnified.

Economy

Loanable Funds Theory: How Interest Rates Are Determined In The Loan Market?

Context: The theory, which is attributed to Swedish economist Knut Wicksell, is seen as applying not just to the interest rates charged on loans. It is also said to apply to other credit transactions such as those in the bond market where businesses and governments issue bonds to borrow money from savers.

Loanable Funds Theory: Concept

It is also known as the neo-classical theory of interest.

- ✓ This theory argues that the interest rates on loans are determined by the supply of and demand for loans in the market for loanable funds.

- ✓ In other words, the market interest rate is seen as the price of loans and it is thought to be determined just the way the price of any other good or service is determined in the market.
- ✓ So, a rise in the supply of loanable funds from savers such as households is believed to cause the market interest rate to drop while a drop in the supply of loanable funds is seen as causing a rise in market interest rates.
- ✓ On the other hand, a rise in the demand for funds from borrowers such as businesses and governments is supposed to cause a rise in interest rates while a drop in their demand for funds is expected to cause a fall in interest rates.
- ✓ In short, the supply of funds from lenders and the demand for funds from borrowers are seen as influencing the market interest rate.

Interest as Compensation

- Loanable funds theorists argue that the interest paid on loans offers an incentive for savers to lend their money since they need to wait a certain period of time before they can get their original investment back.
 - In other words, interest is seen as fair compensation paid to savers for waiting.
- On the other hand, the rate that borrowers are willing to pay on loans is said to be determined by the return that these borrowers expect to earn by investing the borrowed funds, or the marginal productivity of capital.
- Finally, the market interest rate is seen as the equilibrium price that equals the supply of savings with the demand for loans in the market and which is mutually beneficial to savers and borrowers.

Monsoon Woes May Lift Food Prices

Context: Wide spatial and temporal variations in rainfall coupled with lower reservoir storage levels may hit rural incomes and crop output this year thus denting demand and increasing inflationary pressures, economists at CARE Ratings and BoB caution.

Key Highlights

- In August so far, rainfall is 32% below the long period average (LPA) for the month, dragging the southwest monsoon's overall tally to 8% below its long-term average.
- Kharif sowing for crops like pulses (-8.3%), jowar (-7.7%) and oilseeds (-0.9%) remains lower than last year, and lower reservoir levels (currently below the 10-year average) may also impact the overall Rabi crop which has greater dependency on irrigation.
- Below normal rains have hit central, southern peninsula and eastern region. The impact of this scanty rainfall is likely to be reflected through higher prices in the coming months.
- As kharif sowing activity is expected to be over by the end of August, the sowing of these crops is unlikely to improve drastically," CARE Ratings economists wrote.
- A drop in yield due to irregular monsoon and a lower acreage can lead to a demand-supply mismatch, further increasing inflationary pressures in the food basket, adding that pulses and cereals were already seeing double-digit inflation.

Stagnant wages

- A rise in food inflation could further destabilise the feeble rural demand recovery, they reckoned, stressing that the weaker monsoon could hit crop yields and farm incomes while virtually stagnant wages, which account for 49% of rural household incomes, also pose a risk.
- Rural demand remains most vulnerable and can be hit by a dual blow of higher food inflation and lower income.

Rainfall risks

Economists have flagged the risks posed to inflation and growth by the erratic variations in this year's southwest monsoon



■ In August so far, rainfall is 32% below the month's long period average (LPA), dragging the overall monsoon tally to 8% below the LPA

■ Lower reservoir levels (currently below the 10-year average) may also hurt the rabi crop

■ A rise in food inflation could further destabilise the feeble rural demand recovery



Science & Technology

Worldcoin Project

Context: OpenAI CEO formally re-introduce Worldcoin project.

- The Worldcoin venture runs on a simple model: allow your eyes to be scanned in order to prove your human uniqueness, and receive some crypto and an ID (called a World ID) in exchange.
- Worldcoin claims it is building the “world’s largest identity and financial public network” open to people worldwide.

What is Worldcoin?

Worldcoin is an initiative to create a digital network in which everyone can claim some kind of stake, and join the digital economy. Using a device called “Orb,” Worldcoin volunteers known as ‘Orb operators’ scan a person’s iris pattern to collect their biometric data and help them get a World ID through the World app.

How does Worldcoin work?

- The users need to be willing to scan irises and/or get their own irises scanned.
- Individuals who want to receive a World ID are not required to share their name, phone number, email address, or home address.
- Images collected by the Orb are used to generate a unique iris code. By default these images are immediately deleted once the iris code is created, unless the user opts in to Data Custody.
- Volunteers sign up to be “Orb operators” in their locality and receive basic training and a biometric device with which to scan irises.
- Orb operators can even rent out the Orb to others to let them scan eyeballs as well.
- Those who have their irises scanned and collect a World ID can use this to claim the WLD crypto, which they may use for transactions or hold on to the asset in the hope that its price might rise, as it did after launching.
- However, users can also buy or sell WLD without getting scanned or using the app.
- In return for signing up more people to the Worldcoin network, Orb operators get WLD, which is a token based on the Ethereum blockchain.
- Ethereum has a native coin, Ether, which is the second-largest crypto by market capitalisation. However, anyone can create a token which runs on the Ethereum blockchain. WLD is one such cryptocurrency.

Why does Worldcoin scan irises?

In a company blog post, Worldcoin explained that it wanted to include everyone in its network and that using biometric information to avoid duplication was a valid method for this.

- The company claimed that India had “proven the effectiveness of biometrics” through its Aadhaar system. Worldcoin notes that Aadhaar IDs stopped people from signing up multiple times to benefit from social welfare schemes.

THEGIST

- OpenAI CEO Sam Altman formally re-introduced Worldcoin, a project of his that was eclipsed by the popularity of ChatGPT.
- The users need to be willing to scan irises and/or get their own irises scanned. Volunteers sign up to be “Orb operators” in their locality and receive basic training and a biometric device with which to scan irises.
- Those who have their irises scanned can collect a World ID and could be used to claim the WLD crypto for transactions.

Criticism

Worldcoin was criticised long before its re-launch. NSA whistleblower Edward Snowden pointed out that even if a person’s biometric scans were deleted for privacy reasons — as Worldcoin said it would do — the unique identifier for the scan would match future scans of the same person’s eyes.

Worldcoin & India

According to the company website, it has. Worldcoin lists 18 locations, largely in Delhi, Noida, and Bangalore, where Orb operators are scanning people’s eyes. Some locations include popular malls and metro stations in these cities.

- It uses a technology known as zero-knowledge proofs (ZKPs) to maintain users' privacy.
- Worldcoin has also said it is fully compliant with Europe's General Data Protection Regulation (GDPR).

PSLV Puts 7 Satellites In Orbit

Context: The Indian Space Research Organisation (ISRO) on Sunday successfully launched the PSLV-C56 carrying Singapore's DS-SAR and six other satellites.

- The primary satellite DS-SAR was sponsored by the Government of Singapore; to reduce space debris, PS4 stage brought to a lower orbit so that it re-enters atmosphere in less than two months.
 - The DS-SAR satellite is developed under a partnership between the DSTA (representing the Government of Singapore) and ST Engineering.
- Co-passengers:
 - VELOX-AM, a 23-kg technology demonstration microsatellite;
 - Atmospheric Coupling and Dynamics Explorer (ARCADE), an experimental satellite;
 - SCOOB-II, a 3U nanosatellite flying a technology demonstrator payload;
 - NuLloN by NuSpace, an advanced 3U nanosatellite enabling seamless IoT connectivity in both urban and remote locations;
 - Galassia-2, a 3U nanosatellite that will be orbiting on a low-earth orbit;
 - ORB-12 STRIDER, a satellite developed under an international collaboration.

Cell-Free DNA

Context: One of the most widely used applications of cfDNA has been in screening fetuses for specific chromosomal abnormalities, an application known as non-invasive prenatal testing. The application stems from one of the first reports of cfDNA in pregnancies, published in The Lancet in August 1997.

Key Highlights

- In the human body, most of the DNA in a genome is neatly packed inside cells with the help of specific proteins, protecting it from being degraded.
 - However, in a variety of scenarios, some fragments of DNA are 'released' from their containers and are present outside the cell, in body fluids.
 - These small fragments of nucleic acids are widely known as cell-free DNA (cfDNA).
- Scientists have been aware of such degraded fragments of nucleic acids in body fluids since 1948.
 - But only in the last two decades or so, since genome sequencing technologies started to become more accessible, have they really figured out what to do with that knowledge.

THE GIST

cfDNA can be generated and released from a cell in a number of possible situations, including when a cell is dying and the nucleic acids become degraded. Since an array of processes modulates the degradation, the amount, size, and source of the cfDNA can vary across a range as well

Clinicians can now screen mothers from a few millilitres of blood, obtained after nine or 10 weeks of pregnancy, to ensure the developing foetus is devoid of chromosomal abnormalities. The test is almost 99% accurate for trisomy 21 or Down's syndrome and a bit less so for other common trisomies (of chromosomes 13 and 18)

Using a machine-learning model, genomic data, and data from a computed tomography (CT) scan, researchers could successfully detect lung cancer – including those with early stage disease – in more than 90% of the 89 people they studied

A Useful Tool

cfDNA can be generated and released from a cell in a number of possible situations, including when a cell is dying and the nucleic acids become degraded. Since an array of processes modulates the degradation, the amount, size, and source of the cfDNA can vary across a range as well.

- In addition, the release of cfDNA could occur together with a variety of processes, including those required for normal development, those related to the development of certain cancers, and those associated with several other diseases.

- One of the initial reports of the levels of cfDNA in diseases came from studies that were taking a closer look at an autoimmune disease: systemic lupus erythematosus – where the body’s own immune system attacks specific cells.
- So it is not surprising that researchers around the world are increasingly finding cfDNA to be a useful tool to understand human diseases and to use the knowledge to improve diagnosis, monitoring, and prognosis.

Screening Foetuses

- By far, one of the most widely used applications of cfDNA has been in screening foetuses for specific chromosomal abnormalities, an application known as non-invasive prenatal testing.
- The application stems from one of the first reports of cfDNA in pregnancies, published in *The Lancet* in August 1997.
- The availability of affordable genome-sequencing approaches will allow clinicians to sequence cfDNA fragments that correspond to foetal DNA.
- They can then use it to understand specific chromosomal abnormalities that involve changes in the chromosomal copy number.
- Such changes can lead to conditions such as Down’s syndrome, which is due to a change in chromosome 21 (there are three copies of chromosome 21 in place of two, so it is also called trisomy 21).
- As a result, thanks to a cfDNA-based technique, clinicians can now screen mothers from a few millilitres of blood, obtained after nine or ten weeks of pregnancy, to ensure the developing foetus is devoid of such chromosomal abnormalities.
- The test is almost 99% accurate for trisomy 21 or Down’s syndrome and a bit less so for other common trisomies (of chromosomes 13 and 18).
- Screening for such abnormalities before the genome-sequencing era would have entailed inserting a fine needle into the body to retrieve the amniotic fluid and cells covering the developing foetus, and analysing them in the lab. This method carries risks to both the foetus and the mother.
- It is, therefore, not surprising that the cfDNA-based approach has now become the mainstay for screening high-risk pregnancies.
- That said, the test is not without its limitations – which means a positive test result on a cfDNA test should always be followed up with a confirmation test.

Catching a cancer

Another emerging application of cfDNA is in the early detection, diagnosis, and treatment of cancers.

- Last month, researchers, reported developing a new test they have dubbed ‘Genome-wide Mutational Incidence for Non-Invasive detection of cancer’, or ‘GEMINI’. They adopted a whole-genome-sequencing approach to cfDNA extracted from patients.
- Specifically, the researchers examined a type of genetic mutation that, when combined with machine-learning approaches, could provide a way to detect cancer early.
- Using a particular machine-learning model, some genomic data, and data from a computed tomography (CT) scan, the researchers could successfully detect lung cancer – including those with early stage disease – in more than the 90% of the 89 people they studied.
- The team also found that it could replicate the findings using cfDNA derived from a prospective observational cohort of over 300 individuals who were at high risk of developing lung cancer. They found that combining the new approach with the existing approaches could significantly enhance their ability to detect cancers early.
- The researchers also identified seven individuals who did not have cancer but had a high chance of developing it – and subsequently did so 231 to 1,868 days after the initial test.

Other Applications

There are a number of emerging applications of cfDNA, including in understanding why a body is rejecting a transplanted organ.

- Here, some cfDNA obtained from the donor of the organ – called donor-derived cfDNA, dd-cfDNA – could provide an early yet accurate estimate of how well the organ is being taken up. This is an attractive proposition because changes in the levels of cfDNA in the blood would precede any biochemical or molecular markers that researchers currently use as a proxy for organ acceptance.
- That is, the cfDNA could send a signal earlier than other markers if something is going to go wrong.

Indeed, cfDNA seems to have an almost infinite number of applications, especially as nucleic-acid sequencing becomes rapidly democratized and finds more applications of its own in clinical settings.

- There have already been some reports suggesting that cfDNA could be used as a biomarker for neurological disorders like Alzheimer’s disease, neuronal tumours, stroke, traumatic brain injury, and even metabolic disorders such as type-2 diabetes and non-alcoholic fatty liver disease.

In a true sense, cfDNA genomics promises to set us on the path of more effective disease-screening and early diagnosis, and on course for a healthy world.

Understanding the failure of Luna 25

Context: On August 11, Roscosmos, the Russian space agency, launched its Luna 25 spacecraft onboard a Soyuz 2 rocket.

- Luna 25 consisted of a lander and its mission was to soft-land near the moon’s south pole and study the properties of lunar soil and the atmosphere.
- But on August 20, Roscosmos stated that Luna 25 had suffered a glitch and crashed on the moon’s surface the previous day, ending the mission in a failure.

Why Did Russia Launch Luna 25?

- The Luna 25 mission has been in the works for more than two decades.
- It was initially called Luna-Glob and the name was later changed to make the mission a part of the Luna series, the last edition of which was launched in 1976.
- In its statement, Roscosmos said one of the mission’s purposes was to “ensure Russia’s guaranteed access to the moon’s surface” — an allusion to the growing importance of the moon as a spaceflight destination.
- While Russia and China are together leading the International Lunar Research Station (ILRS), versus the U.S.-led Artemis Accords, Russia has not executed a successful interplanetary mission in 34 years now.
- Some experts have also said that Russia intended Luna 25 as President Vladimir Putin’s demonstration that the country’s economy — including the spaceflight sector — hasn’t buckled under the weight of international sanctions following Mr. Putin’s invasion of Ukraine in 2022.

Were The Two Missions In A Race?

Too many details are misaligned to expect that Luna 25 and Chandrayaan 3 were in a race.

- Both missions were launched in a similar timeframe and were expected to attempt a soft-landing on the moon within days of each other.
- However, these mission parameters are determined by the launch vehicle, the mass of the spacecraft, the earth-moon trajectory, and availability of sunlight at a point on the moon.
- In addition, while Chandrayaan 3 has been in development since 2019, Roscosmos was working on Luna 25 since the early 2010s.

THE GIST

■ On August 11, Roscosmos, the Russian space agency, launched its Luna 25 spacecraft onboard a Soyuz 2 rocket. But on August 20, Roscosmos stated that Luna 25 had suffered a glitch and crashed on the moon’s surface the previous day, ending the mission in a failure.

■ In its statement, Roscosmos said that it would put together a committee to investigate the precise mode of failure of Luna 25. Beyond that, it has only said that the spacecraft suffered a technical problem.

■ Whatever the technical reasons for Luna 25’s failure, it’s clear that Russia is falling behind vis-à-vis going to the moon.

- Both missions also suffered delays due to the COVID-19 pandemic.
- Finally, recall that Russia pulled out of building the lander for Chandrayaan 2 due to delays imposed by the failure of the former's Fobos-Grunt mission in 2011.
- Roscosmos and the Indian Space Research Organisation (ISRO) have otherwise been partners; the former is also helping train Indian astronauts for the Gaganyaan mission.

Therefore, Luna 25 and Chandrayaan 3 couldn't have been in a race.

Why Did Chandrayaan-3 Land on the Near Side of the Moon?

Context: The controlled descent of the Vikram lander of Chandrayaan-3 made it one of the closest approaches of a lunar mission to the moon's South Pole.

- However like most of the lunar-landing missions before, Vikram too landed on the near side, making the Chinese Chang'e 4 mission the only one to have landed on the far side.

The Moon's 'Near', 'Far Sides' And 'Dark' Side

- The **near side** refers to the portion of the moon — about 60% — that is visible to us.
 - It is always the same side that is visible from Earth because the moon takes the same time to rotate about its axis as it does to circle around the Earth.
 - However this doesn't imply that the half the moon is in perpetual darkness.
- The 'new moon' or when the moon is invisible from Earth is the time when the other '**far side**' of the moon is bathed in sunlight and continues to receive light for nearly a fortnight.
 - Astronauts aboard the Apollo 8 mission of 1968 were the first humans to see the far side of the moon.
- The '**dark side**' is thus dark only in the sense that it was mysterious and its various topographical features hidden until the Soviet spacecraft Luna 3 in 1959 photographed it and the Soviet Academy of Sciences released an atlas of these images.

Is The Dark Side Very Different From The Near Side?

The major difference between the two sides is that the near side is relatively smoother and has many more 'maria' or large volcanic plains compared to the far side. On the far side however, there are huge craters, thousands of kilometres wide, which have likely resulted from collisions with asteroids.

- While both sides of the moon in its formative phase were similarly bombarded, the crust on the near side is thinner because of which, over millions of years, the volcanic lava in the lunar crust has flowed more extensively into the thinner side and filled up its craters.
- The resulting plains that have thus formed are far more conducive to space missions because they provide a relatively flat terrain for landers and rovers.

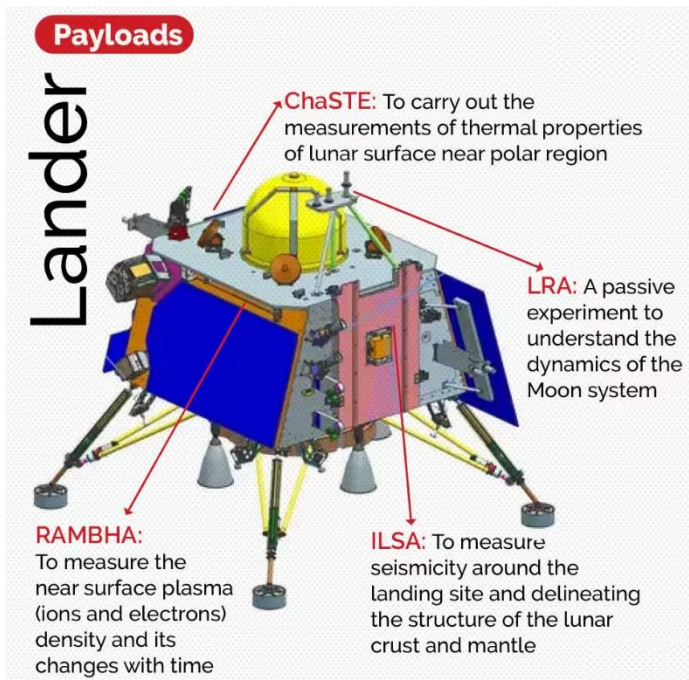
Chandrayaan-3 identified an area 2.4 km wide and 4.8 km long that had spots of 150 m spaces that would be conducive to a safe descent. China's Chang'é-4 lander remains the only one to have successfully landed on the far side. This vehicle landed on the Von Karman crater situated within a larger 2,500 km wide crater called the South Pole Aitken basin.

ISRO Releases Graph Of Temperature Variation Of Topsoil In Lunar South Pole

Context: The Indian Space Research Organisation (ISRO) released a graph of the temperature variation on the lunar surface with an increase in depth measured by the Chandra's Surface Thermophysical Experiment (ChaSTE) payload aboard Chandrayaan-3's Vikram lander module.

ChaSTE Payload Objective

- ✓ The primary objective of ChaSTE is to perform in-situ measurements of thermal conductivity and temperature profile on the lunar surface to derive the vertical temperature gradient up to a depth of 100 mm at the site of landing.
- ✓ It provides thermophysical properties of a high latitude region on the Moon for the first time.



Propulsion Module

Spectro-polarimetry of HABITABLE Planet Earth: Study Earth's habitable planet-like features and use info to explore exoplanets

Rover Payloads Activate Today

LASER Induced Breakdown Spectroscope: To know about chemical on surface to learn more on mineral composition

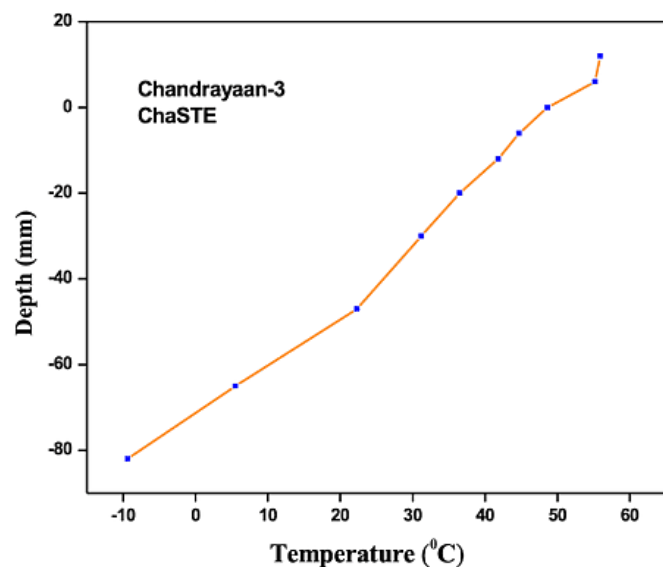
Alpha Particle X-ray Spectrometer: Study composition of iron, titanium, calcium, magnesium, etc

Key Highlights

According to the space agency, ChaSTE measured the temperature profile of the lunar topsoil around the South Pole, to understand the thermal behaviour of the moon's surface.

- The payload has a temperature probe equipped with a controlled penetration mechanism capable of reaching a depth of 10 cm beneath the surface.
- The probe is fitted with 10 individual temperature sensors.
- The presented graph illustrates the temperature variations of the lunar surface/near-surface at various depths, as recorded during the probe's penetration.
- This is the first such profile for the lunar South Pole. Detailed observations are underway," it said.
- For the first time in lunar history, the top soil of the South Pole has been profiled to understand the thermal behaviour of the moon's surface.
- ISRO released a graph of the temperature variation on lunar surface with increase in depth.
 - It was found that at a depth of 8 cm, the temperature was as low as (-) 10 degrees centigrade.
 - With gradual rise towards the surface, the temperature too was seen to be rising.
 - Above the surface, the graph showed a relative stagnancy in temperature between 50-60 degrees centigrade.
 - Putting it in perspective, a scientist explained that when we go two to three centimetres inside the Earth, we hardly see two to three degree centigrade variation. We believed that on the moon the temperature would be somewhere between 20° Celsius

Variation of temperature on lunar surface with increase in depth



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(WhatsApp)

Email: info@iqraias.com, support@iqraias.com

and 30° Celsius on the surface, but the variation is between 70°C and -10°C. This is surprisingly higher than what we had expected.

Earlier missions have revealed that the surface of the moon is blanketed by a thin layer of weakly cohesive detrital materials which are generally referred to as "soil" or "regolith."

- Chandrayaan-3 is the first to study the thermo physical properties of the first 10 cm of the lunar surface; according to scientists, a few meters of lunar soil may offer a detailed record of 60 per cent of lunar history.

Pragyan Confirms Sulphur Near South Pole Of Moon; Search On For Hydrogen

Context: Pragyan, the rover of the Chandrayaan-3 mission, has confirmed the presence of sulphur on the moon's surface, near its south pole, and is still searching for hydrogen, the Indian Space Research Organisation (ISRO) said.

Key Highlights

- The Laser-Induced Breakdown Spectroscopy (LIBS) instrument aboard the rover has made the first-ever in-situ measurements on the elemental composition of the lunar surface near the south pole.
- The LIBS is a scientific technique that analyses the composition of materials by exposing them to intense laser pulses.
 - A high-energy laser pulse is focused onto the surface of a material, such as a rock or soil, and generates localised plasma.
- The collected plasma light is spectrally resolved and detected by charge coupled devices. Since each element emits a characteristic set of wavelengths of light when in a plasma state, the elemental composition of the material can be determined.
- Preliminary analyses have unveiled the presence of Aluminum (Al), Sulphur (S), Calcium (Ca), Iron (Fe), Chromium (Cr), and Titanium (Ti) on the lunar surface.
- Further measurements have revealed the presence of manganese (Mn), silicon (Si), and oxygen (O). Thorough investigation regarding the presence of Hydrogen is under way," the ISRO said.

The Union Cabinet adopted a resolution hailing the Chandrayaan-3 mission, saying it is a victory not just for the ISRO but also a symbol of India's progress and ascent on the global stage. **The Cabinet welcomed that August 23 would be celebrated as National Space Day.**

Chandrayaan Probe Finds Sparse Plasma On Moon

Context: A payload on board Chandrayaan-3's lander, Vikram, has completed the first in situ measurements of the surface-bound lunar plasma environment over the south polar region.

- The Radio Anatomy of Moon Bound Hypersensitive Ionosphere and Atmosphere-Langmuir Probe (RAMBHA-LP), named after American chemist Irving Langmuir, who was awarded the Nobel Prize in Chemistry, is a device used for characterising plasma.

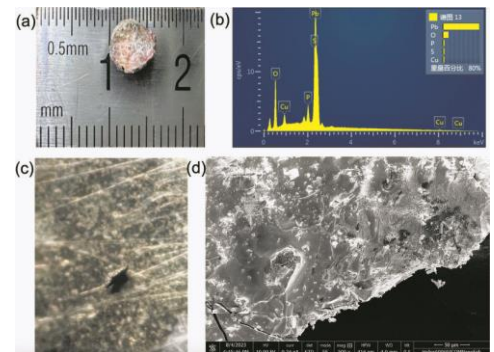
Key Highlights

- The initial assessment indicates that the plasma encompassing the lunar surface is relatively sparse, characterised by a number density ranging from approximately 5 to 30 million electrons per cubic metre.
- This evaluation specifically pertains to the early stages of the lunar daytime.
- The probe operates without interruption, aiming to explore the changes occurring in the near-surface plasma environment throughout the lunar day.

How scientists found that LK-99 is probably not a superconductor

Context: LK-99 has been claimed by South Korean scientists as a superconductor at room temperature and atmospheric pressure. However, currently scientists have discarded their claims.

A substantial amount of electricity generated is lost while being transmitted between power plants and our factories and households as heat. Tiny wires inside computers and cellphones dissipate heat, draining the batteries in the process. So it is natural that scientists are looking for materials that can conduct electricity without resistance, especially for applications where heat loss is a deal-breaker.



Key Highlights

- In July 2023, a group of scientists in South Korea uploaded two preprint papers claiming that a lead apatite material was an ambient condition superconductor.
- Apatites are materials that have a regular arrangement of tetrahedrally shaped phosphate ions (i.e. one phosphorus atom and four oxygen atoms).
- When lead ions sit in between these phosphate motifs, it is lead apatite.
- While apatites have been well-studied, no one had anticipated that they could be superconductors – let alone one in ambient conditions.

Superconductors

- ✓ Many metals become superconducting – i.e. allow current to flow with zero resistance – if cooled to below -250°C .
- ✓ Superconductors aren't just materials with zero resistance: they have a remarkable new quantum state in which the electrons in the material work together.
- ✓ Several fantastic properties of superconductors then came to light, opening the door to new technologies – including advanced medical imaging, 'maglev' trains, and quantum computers.
- ✓ Superconductivity also remained an extremely-low temperature-phenomenon for a long time. It was only in the mid-1980s that scientists discovered copper-oxide superconductors, whose transition temperature was higher than -200°C .
- ✓ One of the highest transition temperatures has been found in a sulphide compound, but it needs to be placed under extreme pressures – like that found at the centre of the earth.

The novelty of the South Korean group's work was to replace 10% of the lead ions in lead apatite with copper, to produce the supposed wonder material that they had christened LK-99 (after their own last names).

Independent verification

In their papers, the group described subjecting their LK-99 samples to a variety of tests.

- They measured the material's electric resistance, which seemed to drop below a certain temperature.
- They showed that the low resistance state vanished when a sufficiently strong magnetic field was applied.
- They also showed that the resistive state was restored if a sufficiently large amount of current was passed through the sample.
- They even included an image of the sample partially levitating over a magnet in their second paper – a famous test for superconductivity.
- But while all of these data suggested superconductivity, the group also missed several crucial tests, including some to confirm the quantum nature of the microscopic state of the system.

Despite their scepticism, **research groups from around the world worked fervently to reproduce the South Korean team's results.**

- ✓ In their second paper, the team had provided instructions to synthesise LK-99. Researchers in Australia, China, India, the U.S., and several European countries followed them and tried to replicate the South Korean team's findings – but no one found conclusive evidence of superconductivity in their samples.
- ✓ In fact, the Indian group, from the CSIR-National Physical Laboratory, New Delhi, was one of the first to report that it didn't find any signs of superconductivity in LK-99.
- ✓ Some groups did find a drop in resistance, and others found that their samples showed partial levitation in a magnetic field.
- ✓ Some of the most recent work also tried to produce LK-99 using alternative methods. At least one group was able to make a highly pure crystal – where all the ions are regularly arranged in space.
 - It had a brownish-purple hue and was transparent, which was unusual for a superconductor.
 - More remarkably, this single crystal behaved like an insulator, showing no signs of superconductivity from low temperatures up to 800° C.
 - Researchers also found that it was ferromagnetic – i.e. it could be magnetised by, say, rubbing a magnet on it. Superconductors cannot have this property.

Science In Action: How can we reconcile these findings with those of the South Korean team?

The key seems to be the way the material was prepared.

- ✓ The South Koreans had made lead sulphate react with copper phosphide to produce polycrystalline LK-99 (i.e. small crystallites randomly arranged in space, unlike in a single crystal, where the atoms are arranged regularly over very large distances) and some by-products.
- ✓ One of the important by-products was copper sulphide, which could have become embedded in the LK-99 matrix.
- ✓ Independent researchers confirmed this by using X-rays to 'look' inside the crystal.

Scientists who were already studying copper sulphide, for other purposes, pointed out that its arrangement of ions changes when heated to 100° C, and that the material's resistivity also jumps at that temperature for reasons quite unrelated to superconductivity.

- ✓ The South Korean LK-99 samples had shown a jump in resistance at almost the same temperature, meaning that the tantalising graphs in their papers were the handiwork of copper sulphide rather than LK-99.
- ✓ Researchers also found a more mundane way to explain the levitation: that the LK-99 sample also contained impurities (other by-products) that were diamagnetic, i.e. materials that could be magnetised but whose magnetic field is the opposite direction of the applied field. Diamagnetic materials can also partially levitate above magnets as a result.

The current evidence suggests that LK-99 is not a superconductor. Even as the replication efforts were underway, some scientists also made models of LK-99's quantum properties.

- ✓ They found that if copper atoms replaced a certain set of lead atoms in LK-99, the material would have some electronic states that are very interesting in that their kinetic energy could take on very restricted values.
- ✓ These are called flat-band systems. Electrons in flat-bands can interact strongly with each other and are predicted to form superconducting phases, but only at very low temperatures.

The LK-99 story provides a view of science in action, even as the narrative remains that we are yet to find an ambient-condition superconductor.

Somatic mutations: a genomic revolution hiding inside our cells

Context: Scientists have known of somatic variants and their role in diseases for many years now, but there has been an explosion in the amount of data and knowledge only recently. This was due to our ability to sequence the genetic material in individual cells.

The human genome has 23 pairs of chromosomes, one inherited from each of our parents.

- ✓ The genome is the blueprint of our genetic makeup.
- ✓ The ovum and the sperm carry these blueprints from our parents.
- ✓ After fertilisation, the combined single cell, with the 23 chromosomes, starts to divide, copying the genetic material over and over to nearly a trillion cells – which make up the human body.

- As the cells divide, the DNA is copied with extremely high accuracy thanks to proteins that proofread and correct errors in the DNA.
- But despite this mechanism, various studies have estimated that there is still an error rate of 0.64-0.78 mutations per billion base pairs per division.
- But this rate is also minuscule given the large size of the human genome.

‘Copy-paste’ mistakes

The number and effect of these errors vary significantly, depending on the stage of development or the point in the life-cycle at which they occur.

- An error that occurs in the DNA after birth but during development is called a **somatic genetic mutation**.
 - Their occurrence is driven by the repeated ‘copy-pasting’ of the genome – which means there will be more somatic genetic mutations the older an individual is and the higher the turnover of the tissue.
 - Turnover is the replacement of old cells with new ones.
 - Sometimes, a somatic genetic mutation can render a cell fitter than others, which leads to the formation of tumours. So these mutations are called **driver mutations**.

Knowledge Explosion

Somatic genetic variants are important for a number of normal physiological processes. For example, the immune cells in our body, which produce antibodies, undergo an enormous amount of somatic changes to create diverse proteins.

- These proteins recognise and bind to specific pathogens, forming a ‘library’ of cells, each with a specific protein. During an infection, the body selects cells from this library, depending on which can bind to a pathogen better, and uses them to make antibodies.
- Scientists have known of somatic variants and their role in diseases for many years now, but there has been an explosion in the amount of data and knowledge only recently.
 - This was due to our ability to sequence the genetic material in individual cells.
 - Specifically, using advanced microfluidics and high-throughput sequencers, we can now sequence tens of thousands of cells from a tissue at the same time, opening big windows into genes and the functional diversity of cells in the human body.

Cancer’s Signatures

Somatic genetic variants play an important role in the development of cancers.

- We now know that somatic changes can cause a cancer to develop and that cancers can accelerate the development of somatic changes. So they can help with early detection, diagnosis, and prognosis.

THE GIST

A somatic genetic mutation can render a cell fitter than others, which leads to the formation of tumours. So these mutations are called driver mutations

Early detection and diagnosis of cancers rely on the fact that certain patterns – called mutational signatures – of genetic variations are characteristic of specific cancers. There are technologies to detect DNA from tumour cells that has ‘escaped’ the cells into blood or fluids, to spot a cancer early

As we plumb more intricate depths of the cells that we are made of, we also take strides on the road to usher in innovative approaches to understand and manage diseases that assail us. The ability to scrutinise our genes at the level of single cells also empowers us to reshape our understanding of the fundamental aspects of evolution

- Early detection and diagnosis of cancers rely on the fact that certain patterns – called **mutational signatures** – of genetic variations are characteristic of specific cancers.
- There are technologies to detect DNA from tumour cells that has ‘escaped’ the cells into blood or fluids, to spot a cancer early.
- Similarly, certain variations in a cancer could be used as a signature of the disease’s progress and/or to track how a tumour has responded to some course of therapy.

Under-Recognised Cause

The other major application for somatic changes is in the development of genetic diseases. Many genetic conditions arise from somatic genetic variants. Obviously, these conditions are not inherited from either parent but are due to new genetic variations that have arisen during development. So the severity and distribution of the disease depends on how early or late during development the corresponding mutation occurred.

- In fact, somatic genetic variants are an under-recognised cause of many immune disorders that are the result of mutations in a single gene, including primary immunodeficiency disorders.
- In some instances, somatic changes can be beneficial in a genetic disease – by changing a deleterious change to a normal one, a phenomenon known as revertant mosaicism.
- For example, around 10% of cases of Wiskott-Aldrich syndrome, a rare genetic immunodeficiency, have been found to have revertant mosaicism, as a result alleviating the severity of the disease in many individuals.

SMaHT Network

The U.S. National Institutes of Health recently launched a programme focused on understanding the breadth of somatic mosaicism and the biological and clinical significance of such somatic events in humans. Called the ‘Somatic Mosaicism across Human Tissues’ (SMaHT) Network, it aims to catalyse our study of the field by discovering somatic variants, developing tools and resources with which to study them, and improving our ability to analyse, interpret, and organise them in different biological and clinical contexts.

Health

Single Pill Strategy To Beat Cardiovascular Diseases

Context: The WHO included three fixed dose combinations of polypills on its revised Model Lists of Essential Medicines 2023.

- Last week, in a major policy change, the World Health Organization included three fixed dose combinations of cardiovascular medicines or polypills on its revised Model Lists of Essential Medicines 2023 for use in primary and secondary prevention of atherosclerotic cardiovascular diseases.

Key Highlights

- The WHO Expert Committee on selection and use of essential medicines noted the evidence from large randomised-controlled trials that the use of the polypill is associated with reduced risks of cardiovascular events, including fatal and non-fatal myocardial infarction and stroke, and the need for revascularisation in primary and secondary prevention settings.
- This four-drug combination (simvastatin + ramipril + atenolol + hydrochlorothiazide), along with acetylsalicylic acid or aspirin, is what Dr. Yusuf and his co-researchers from India had been studying since 2005.
 - “Our data from three versions of the Indian Polycap Study between 2005 and 2019 established the safety and efficacy of the polypill and that it reduces heart attack, strokes and deaths from heart attacks by 40%.
 - This was despite the fact that 20% to 30% of the people stopped the medicine midway during the trial.
 - The polypill is thus an important low-cost public health intervention which can prevent over millions of cardiovascular events and deaths every year.

- The polypill is not a new drug but a drug delivery mechanism, which improves medication adherence (because it is a single pill) and saves money by preventing hospitalisations.

Lactose intolerance

Context: Lactose intolerance produces symptoms which can be uncomfortable but is never dangerous, it is a specific digestive issue associated with the consumption of dairy products.

Key Highlights

- Doctors do not consider lactose intolerance to be a disorder. They describe it as the digestive system's reaction to milk sugar (lactose) which it cannot digest.
- The body needs an enzyme called **lactase** which is produced by the cells lining the small intestine, to digest lactose.
- If one is deficient in lactase, the undigested lactose passes on to the colon, where it produces extra gas and water, resulting in bloating, cramps and diarrhoea.
- Lactose intolerance thus produces symptoms which can be uncomfortable, but it is never dangerous.

Extremely common

“Lactose intolerance is so common that except for the 1-2% people who might experience serious bloating and cramps and nausea immediately after consuming dairy, almost every adult has lactose intolerance in various degrees. The degree of intolerance depends on the amount of lactose their system can tolerate.

- As one ages, there is a normal decline in the amount of lactase that the small intestine produces.
- This is one of the reasons why lactose intolerance might seem to be creeping up on one during adulthood and beyond, leaving one wondering why she can no longer find joy in that milkshake like she used to before.
- Lactose intolerance seems to be a very subjective term that people use to describe the general digestive issues or symptoms—acidity, burping, gassiness — they feel whenever they consume dairy products.
- Lactose intolerance is a specific digestive issue associated with the consumption of dairy products and ceases to be a problem when the person totally avoids or restricts milk products in the diet.
- But its symptoms can easily overlap with another common and chronic gastric disorders such as IBS, the pathogenesis of which is quite different.

Varies by Ethnicity

According to literature, estimates for lactose intolerance vary by ethnicity. The prevalence rate is 75-95% in African American and Asian ethnicities while it is estimated to be 18-26% amongst Europeans.

- Lactose intolerance does run in families and the symptoms can become evident during childhood or adolescence, even though in most cases, people seem to complain of lactose intolerance much later in adulthood.
- If you are lactose intolerant, you will develop symptoms within 30 minutes to two hours of consuming dairy products.
- After a couple of episodes, people generally observe and understand the pattern and come to the conclusion that dairy does not seem to agree with them.
- But a majority of those with lactose intolerance are still able to consume small amounts of milk products. It is when they go over their personal lactose threshold that they develop digestive symptoms.

Hydrogen Breath Test

Though there are specific tests like the **hydrogen breath test** to determine lactose intolerance, these tests do not have much use in clinical practice.

- People are told to stay away from all dairy products for two weeks and then gradually re-introduce dairy into the diet to see how their body reacts.

It is possible to develop secondary lactose intolerance all of a sudden following surgery or chemotherapy or if one has an infection, ulcerative colitis or Crohn's disease which affects the small intestine. But this usually goes away once the small intestine regains health.

Intolerance Distinct From Allergy

While lactose intolerance is quite common among Asians — over 50% of the Indians are deficient in lactase — it is very easy to misdiagnose this condition, especially amongst the elderly.

- In the elderly, some malignancies like colon cancer can present themselves in the initial stages with atypical symptoms similar to that of the symptoms of lactose intolerance.

Lactose intolerance is the digestive system's response to the milk sugar (lactose), whereas in the event of a milk allergy, the entire immune system will react against the milk protein.

- The reaction is often immediate and severe in the case of milk allergy, while lactose intolerance will never lead to any serious disease or long-term complications.

Can Lactose Intolerance Lead To Nutritional Deficiencies?

Dieticians say that while milk is an important source of nourishment for children, milk is never the primary source of nutrition for adults.

- For persons with lactose intolerance who love to consume milk, there are options such as plant-based milk (soy/almond milk) or lactose-free milk.
- There are plenty of other food sources — yoghurt, tofu, nuts, spinach, broccoli, orange, lentils and legumes — that a lactose-intolerant person can depend on for calcium supplementation.

Nutrition Support Prevents TB, Related Deaths

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

- The trial was conducted in four districts in Jharkhand between August 2019 and August 2022.
- The results of the study were published on August 9 in The Lancet and The Lancet Global Health.
- In the randomised controlled trial involving household contacts of patients with pulmonary TB, nutritional support led to 39-48% reduction in TB disease in the intervention group compared with the control arm.
- The 39% reduction in TB disease included all forms of TB (pulmonary and extra-pulmonary), while the 48% reduction was in microbiologically confirmed pulmonary TB.

In 2017, the World Health Organization had estimated that undernutrition is responsible for twice the number of TB cases than HIV globally. Any attempt to end/eliminate TB in India by 2025 will become possible only if undernutrition among people is addressed. As per conservative estimates, 40% of new TB cases annually in India are due to undernutrition.

Undernutrition & TB

Many new cases of TB are attributable to five risk factors says the WHO Global TB report 2022:

Undernourishment

HIV Infection

Alcohol Use
Disorders

Smoking
(Especially Among
Men)

Diabetes

- In TB-endemic countries such as India, undernutrition is the most widely prevalent risk factor, accounting for the "highest population attributable risk for TB in India".
- It is also responsible for increased TB disease severity, higher mortality and poor treatment outcomes.

- A study in India found that severe undernutrition at diagnosis was associated with a two-fold higher risk of death.
- As per a 2016 paper by NIRT researchers, undernutrition is an important risk factor for progression of latent TB infection to TB disease.
- It increases the risk of drug toxicity, TB relapse and mortality. For each unit reduction in BMI, the risk of TB increases by about 14%.
- Undernourished patients also tend to have poor bioavailability of drugs such as rifampicin, leading to treatment failure and development of multidrug resistance.

Nutritional Support's Effect

- Each adult family member in the intervention arm received monthly nutritional support for six months — 5 kg of rice, 1.5 kg of split pigeon peas (tur dal), and a micronutrient pill; each child below 10 years received 50% of the adult nutrition support.
- Those in the control arm did not get any nutritional supplementation and were on a usual diet.
- The trial also provided nutritional supplementation to all 2,800 people with active pulmonary TB undergoing treatment.

Results

- Treatment was successful in nearly 94% (2,623) of TB patients.
- There were only about 4% (108) deaths during the six-month follow-up.
- The trial was conducted on 2,800 people with pulmonary TB (1,979 men and 821 women). Over 80% of the participants had a BMI less than 18 and nearly 49% had a BMI less than 16 (severely underweight).

How do schemes like Nikshay Poshan Yojana and Ni-kshay Mitra help?

- ✓ Nikshay Poshan Yojana is a direct benefit transfer (DBT) scheme for nutritional support to TB patients. It was launched in 2018.
 - All notified TB cases are provided with a financial incentive of ₹500 per month.
 - According to the 2022 India TB report, seven million TB patients have benefited between 2018 and 2022, and ₹2,089 crore has been disbursed during this period.
- ✓ Also, as of March 9, 2023, 9.55 lakh consented TB patients across India adopted by Ni-kshay Mitras will receive nutritional support.

Is Antimicrobial Resistance Being Made Worse By Air Pollution?

Context: Air laden with unhealthy amounts of PM2.5 can become a highway for antibiotic-resistant bacteria and genes.

Key Highlights

- More than 7.3 billion people worldwide – and 93% of India's population – are exposed to unsafe average levels of PM2.5. These particles can spread on fast winds, evaporated water, and dust.
- Tiny, invisible particles, 30-times smaller than the breadth of a human hair, wreak havoc on more than 7.5 billion people worldwide.
- This particulate matter, called PM2.5, could drive the world's next public health threat – antimicrobial resistance (AMR), when disease-causing bacteria become immune to the drugs that could once destroy them, according to a new analysis published in The Lancet Planetary Journal.
- The authors – a group of experts – found that every 10% rise in air pollution was correlated with an AMR increase of 1.1% across countries and continents.
- Researchers have been sounding the alarm over AMR, a scourge that has already killed more people worldwide than malaria or HIV/AIDS, a 2019 survey found.

- It's been directly responsible for 1.27 million deaths and associated with an estimated 4.95 million deaths around the world.

India & AMR

- Data show that India leads the world in antibiotic use. The indiscriminate use of antibiotics among people and animals, poor hygiene and sanitation, and lack of awareness have fueled this rise, experts note.
- The COVID-19 pandemic only exacerbated these issues, together with a surge in the sales of antibiotics to treat bronchitis and pneumonia.
- The higher circulation of antibiotic-resistant bacteria and antibiotic-resistance genes (ARGs) across humans, animals, and environments also creates new transmission pathways.
 - A 2019 study found India's rivers and lakes to be concentrated with antimicrobial-resistant bacteria.
 - Pharmaceutical wastewater and untreated effluents from hospitals were the root causes.

The Threat Of AMR

- Ciprofloxacin, an antibiotic, was once used to treat urinary tract infections caused by Escherichia coli, which is among the most common bacteria in India.
 - E. coli's resistance to ciprofloxacin now varies from 8.4% to 92.9%, per the World Health Organisation.
- Multidrug-resistant tuberculosis (MDR-TB) has also rendered two potent TB drugs less effective.
 - Patients with this form of the disease today have less than a 60% chance of recovery.

Changes in bacteria cause the drugs used to beat them to become less effective. In the absence of the right drug, a patient may never recover from an infection. AMR thus adds to the disease burden of the nation.

- It also risks widening healthcare inequities, where patients contend with delayed recovery and extended hospitalisation.
- It puts patients undergoing major surgeries and treatments, such as chemotherapy, at a greater risk. Patients often recover from advanced medical procedures but succumb to untreatable infections.

What Did The Analysis Show?

The new analysis focused on the environmental dissemination of ARGs.

- With every 1% rise in PM2.5 pollution, AMR increased 0.5-1.9% depending on the pathogen, a link that has intensified over time.
 - The researchers wrote that this airborne spread could have resulted in premature deaths in India and China, and other population-dense countries.
 - Some 18.2 million years of life could have been lost this way in 2018 worldwide, resulting in an economic loss of \$395 billion (more than Pakistan's GDP).

Global AMR is driven by multiple forces:

- One is the "effect derived from the environment, which is poorly understood in relation to antibiotic resistance".
 - The researchers collected data from 116 countries spanning almost two decades and looked for a link between rising PM2.5 levels and AMR.
 - They also analysed other predictors, including sanitation services, population, and education.
- The final dataset included nine pathogens – Acinetobacter baumannii, Klebsiella pneumoniae, Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus pneumoniae, Escherichia coli, Enterobacter aerogenes or E cloacae, Enterococcus faecalis, and Enterococcus faecium – plus 43 antibiotic agents.
- The researchers recognised air as a "direct pathway and key vector for disseminating antibiotic resistance".
 - For instance, PM2.5 emissions from burning firewood in homes for cooking or heating could carry bacteria and antibiotic-resistant genes, be transmitted over long distances, and eventually be inhaled by individuals.

- PM2.5 is known to penetrate the body's defences and enter the bloodstream and lungs – a symptom associated with chronic conditions such as cancer, heart disease, and asthma.
- The analysis found that the contribution of PM2.5 to AMR was found to be greater than that of antibiotic use or due to drinking water.

The Air-AMR Connection

- Antibiotic-resistant bacteria and genes travel through food, soil, water, air, and direct contact with sources such as animals.
- The hypothesis is that ARGs, when emitted from, say, hospitals or livestock farms, could latch on to pollutant particles.
- Such particles have been found to contain “diverse antibiotic-resistant bacteria and antibiotic-resistance genes, which are transferred between environments and directly inhaled by humans, causing respiratory-tract injury and infection.”
- When suspended in the environment or breathed in, ARGs could enter the bacteria found in the human body and bolster their resistance.

Air laden with unhealthy amounts of PM2.5 can thus become a highway for transporting antibiotic-resistant bacteria and ARGs. More than 7.3 billion people globally – and 93% of India's population – are exposed to unsafe average levels of PM2.5. These particles can spread on fast winds, evaporated water, and dust. ARGs are also more abundant in urban air particles than in sediment, soil or rivers, the analysis found.

Implications For AMR Policy

AMR is not new. The present focus on environmental factors, however, illustrates that in the fight against antimicrobial-resistant bacteria, we need to address air pollution if we are to plug one hole, while measures to combat other drivers continue. Antibiotic use in itself is expected to rapidly increase in low- and middle-income countries like India by 2050.

- In 2017, India released a **National Action Plan** to address AMR, but most States are yet to devise a region-specific framework to address local factors affecting AMR.

Centre And WHO To Launch Global Initiative On Digital Health

Context: India, in collaboration with the World Health Organization (WHO), will launch the **Global Initiative on Digital Health** as part of the ongoing G-20 summit.

- The first such global initiative is aimed at

Data convergence

Interface of health platforms

Investments in the digital health space around the globe

Key Highlights

The summit is working on bringing in the crucial interim medical countermeasure (MCM), “which is a ‘network of networks approach’ before the next health emergency hits us, and India, in collaboration with WHO, is leading the advocacy,”.

- The global digital platform would include
 - An investment tracker,
 - An ask tracker (to understand who needs what kind of products and services) and

- A library of existing digital health platforms.
- The GIDH is a WHO-managed network that will promote equitable access to digital health by addressing challenges such as duplication of efforts and “products-focused” digital health transformation.
- It will ultimately **aim** to
 - Align efforts to support the Global Strategy on Digital Health, 2020-2025,
 - Support quality-assured technical assistance to develop and strengthen standards-based and interoperable systems aligned to global best practices, norms, and standards, and
 - Facilitate the deliberate use of quality-assured digital transformation tools that enable governments to manage their digital health transformation journey.
- The global platform for data sharing will offer no data about its users but will share analyses and work on interoperability of data.

The digital health innovations and solutions would aid universal health convergence and improve healthcare service delivery. The initiative had found funding from global partners.

The GIDH is an **integrative step** that fosters equity in healthcare by converging efforts and best practices. It will amplify our efforts with the incorporation of tools such as AI while giving due importance to ethics, policy, and governance”.

Post-COVID Mortality

Context: At least one dose of vaccine prior to COVID-19 infection provided 60% protection against post-discharge mortality, an Indian Council of Medical Research (ICMR) study on factors related to mortality within one year after discharge in hospitalised COVID-19 patients has found.

Key Highlights

- The study has found that there is a higher chance of mortality within one year following discharge for those over 40 years of age, those with comorbidities, and those who suffered moderate to severe COVID.
 - It also observed that of the 14,419 participants contacted at least once in one year after discharge from the hospital, 942 deaths, or 6.5% all-cause mortality, were reported.
- Encouragingly, vaccination before the COVID-19 infection confers protection from post-discharge mortality. Post-COVID Conditions (PCC) and the presence of comorbidities may have some association with late post-discharge deaths; further research is warranted in this field.
- The study states that post-COVID conditions (PCC) were associated with 2.7 times higher odds of post-discharge mortality.
- The **limitations of the current investigation** include reliance on telephonic follow-up, which could have led to under-reporting of the symptoms.
- Other ongoing studies on COVID include the effect of the vaccine on thrombotic events in the 18-45 years population in India in 2022, and factors associated with sudden deaths in the same age bracket.

Clinical Registry

The ICMR has been maintaining the National Clinical Registry for COVID-19 at 31 centres across the country, where all hospitalised COVID-19 patients are periodically contacted by telephone. Data collected till February 2023 were included in this analysis.

A matched nested case control analysis was conducted to evaluate the factors related to one-year post-discharge mortality.

Long-Term Health Issues Following COVID-19

In May 2023, WHO declared the emergency phase of the pandemic to be over. While COVID-19 lingers in waves, its impact has lessened. Focus is now shifting to the continued health of those who survived the initial infection. The influence of COVID-19 on blood vessels, heart, and nervous system raises concerns about delayed health issues.

- The risk of Long COVID, an assorted group of health conditions, persisted for two years. This was more marked in the hospitalised group than the non-hospitalised group.
- Among 80 health conditions that comprise Long COVID, 65% conditions persisted at two years in the hospitalised group, while 31% persisted in the latter.
- Compared with uninfected individuals, those who had prior COVID-19 had greater risk of blood clots, lung disease, fatigue, digestive ailments, muscle and joint problems and diabetes for up to two years.
- Significant amount of disability occurred, 25% of which was reported in the second year.
- At the end of two years, 8.7% of those who had prior COVID-19 had died compared with only 4.1% in the other group.
 - The rate of death was highest in the initial few months.
 - Among those who survived the first six months, the death rate declined afterwards, unexpectedly dropping below the average death risk of the comparison group.
 - The reason for this apparent drop could probably be a phenomenon called the ‘depletion of susceptibles’ in the COVID-19 group — the initial period killing those who were more likely to die.
 - The relatively healthier individuals who survived had a lower death rate than the comparison group. Close healthcare monitoring too might have also prevented a few deaths.
- An ICMR study looked at 14,419 people who survived COVID-19 hospitalisation, revealing a one-year death rate of 6.5%.
 - New or persistent symptoms of post-COVID condition such as fatigue, breathlessness and memory problems lasting four-eight weeks were present in 17% of the patients.
 - Death during follow up was more common among such individuals.
 - Those who had prior vaccination had lower death risk.

India Must Maintain Close Watch On New Variants of COVID-19

Context: While the COVID-19 situation in the country remains stable and public health systems in the country remain geared up, there is need for States to monitor trends of Influenza-like Illness (ILI) and Severe Acute Respiratory Infections (SARI) cases, and send sufficient samples for testing of COVID-19 while ramping up Whole Genome Sequencing,” P.K. Mishra, Principal Secretary to Prime Minister Narendra Modi said, after chairing a high-level meeting to review the global and national COVID-19 situation, newer variants of the virus in circulation, and their public health impact. He added that India must maintain close watch on new global variants of the virus.

Key Highlights

- According to the World Health Organization (WHO), while EG.5 (Eris) has been reported from over 50 countries, the BA.2.86 (Pirola) variant has been reported from four countries.
- It was also noted that, globally, a total of 2,96,219 new cases of COVID-19 had been reported in the past seven days.
- India, which makes up nearly 17% of the global population, has reported only 223 cases (0.075% of global new cases) in the past week.

Different Blow Flies Helps to Estimate Post-Mortem Interval

Context: Study on life cycle of different blow flies helps to estimate post-mortem interval. **About The Blow Flies**

Key Highlights

- The flies belonging to the Calliphoridae family in the order Diptera are the first visitors to inhabit and colonise a dead body.
- Commonly known as blow flies, these flies have significant importance in the accurate assessment of post-mortem interval (PMI), the time that has elapsed since one’s death.

- However, studies reveal significant differences in the developmental rate of these flies according to seasonal changes.
 - These changes may be due to changes in humidity, rainfall, temperature in the area, and genetic variations of blow flies.
- A study conducted, has recorded 17 blow fly species belonging to four subfamilies and eight genera from central Kerala.
- The study covers four forensically significant blow flies, *Chrysomya megacephala*, *Chrysomya rufifacies*, *Chrysomya chani*, and *Hemipyrellia ligurriens*, that have been identified based on their morphological and molecular characteristics.
- Effect of temperature and humidity on the life cycle of blow flies was investigated and it showed that the pre-oviposition period was significantly higher in winter in all the four species.
- Length and weight larval instars were significantly higher in monsoon for *C. megacephala* and *C. rufifacies*.”
- The **regression equation method** developed in this study emerged as the best suitable method for the estimation of PMI using life history of blow flies.



Using AI On X-Rays Can Detect More TB Cases

Context: In AI-assisted chest X-rays, India has a powerful technology to screen for presumptive TB.

- The AI algorithm qXR, developed by Mumbai-based Qure.ai, can help detect people with presumptive TB early and in less than a minute.
- The 2019-2021 National TB prevalence survey in India report said nearly 43% of TB cases would have been missed without a chest X-ray.
- When used at scale for population-based screening or for targeted screening, qXR plus molecular tests for TB confirmation can increase detection rates.

Key Highlights

India's ambitious goal of "eliminating" TB by 2025 will remain possible only if early diagnosis and initiation of care for millions of people with TB becomes a reality. Large-scale use of AI-assisted chest X-rays for screening is the first step to achieve this goal.

- In Vietnam, a community-wide screening of people older than 15 years using a molecular test in 2014-2017 resulted in lower prevalence of pulmonary TB in 2018 than standard passive case-detection alone.
- Unlike in Vietnam, the use of qXR to read digital X-rays before molecular testing as part of community screening will reduce TB prevalence and minimise the number of molecular tests required to detect TB.
- The qXR algorithm is already being used in over 50 countries.

Approved or Not?

Systematic screening for TB for early diagnosis is an important 'End TB' strategy.

- The Indian drug regulator cleared qXR a few months ago.
- qXR also meets the WHO requirement with >90% sensitivity and >70% specificity in people older than 15 years.
- States are currently waiting on a Central TB Division directive to adopt qXR, which could encourage widespread adoption. The absence of policy guidance has kept adoption thus far.
- The Central TB Division is waiting for an approval from the Health Technology Assessment.

- In India, 24 States are using qXR at about 150 sites. But nowhere in India is the software used at scale. And in some States, the qXR software is used in just one site, like in Kerala.
- Around six outreach mobile vans in Chennai use qXR; nine government hospitals and one mobile van in Mumbai are equipped with the software for surveillance.
- The use of qXR to screen the X-rays increased the positivity of molecular tests by 18-27%.
- This portable device cuts the amount of X-ray exposure to 1/20th to 1/30th of a normal X-ray even while capturing all the details.

Report & Index

Report on Sub-Categorisation of OBCs

Context: The Justice G. Rohini-headed Commission for the sub-categorisation of Other Backward Classes (OBC) caste groups submitted its long-awaited report to the Ministry of Social Justice and Empowerment after nearly six years of work.

- The details of the recommendations have not been made public yet, and the government is expected to deliberate on the report before any implementation.
- In 2018, the commission analysed the data of 1.3 lakh central government jobs under the OBC quota over the preceding five years.
- It also included OBC admissions to central higher education institutions, including universities, IITs, NITs, IIMs and AIIMS, over the preceding three years.

Findings

- The analysis showed 97% of all jobs and education seats have gone to 25% of OBC castes, and 24.95% of these jobs and seats have gone to just 10 OBC communities.
- As many as 983 OBC communities — 37% of the total — were found to have zero representation in jobs and educational institutions.
- 994 OBC sub-castes had a representation of only 2.68% in recruitments and admissions.
- However, this analysis suffered from limitations due to the absence of updated population data.

Background

- OBCs are granted 27% reservation in jobs and education under the central government.
 - However, there is a widespread perception that only a few wealthy communities among the over 2,600 on the Central List of OBCs have secured a significant portion of this 27% reservation.
 - Nine states have already sub-categorised OBCs.
 - Andhra Pradesh, Telangana, Puducherry, Karnataka, Haryana, Jharkhand, West Bengal, Bihar, Maharashtra, and Tamil Nadu are the states involved.
- In 2020, a Constitution Bench of the Supreme Court of India reopened the legal debate on sub-categorisation of Scheduled Castes (SCs) and Scheduled Tribes (STs) for reservations.
 - Disagreeing with its 2005 Constitution Bench verdict, the SC asserted that there are unequals within the list of SCs, STs and socially and educationally backward classes (SEBCs).

Rohini Commission

The commission was set up on 2nd October, 2017 under Article 340 of the Constitution (President's power to appoint a Commission to investigate the conditions of the backward classes).

- ✓ Article 340 empowers the President of India to appoint a commission to investigate issues concerning OBCs and make recommendations to improve their situation.
- ✓ Prior to constituting the Rohini Commission, the Centre had granted the National Commission for Backward Classes (NCBC) constitutional status by the 102nd Amendment Act, 2018.

Terms of Reference: G Rohini Commission

- ✓ Examine the inequitable distribution of benefits among OBCs listed in the Central List.
- ✓ Propose a scientific approach and parameters for sub-categorisation within OBCs.
- ✓ Identify and classify the respective castes or communities into their respective sub-categories.
- ✓ Study the entries in the Central List of OBCs and recommend corrections for repetitions, ambiguities, inconsistencies, and errors in spelling or transcription.

- In the case of E.V. Chinnaiah v. State of Andhra Pradesh (2005), the Supreme Court held that the Scheduled Castes form one homogenous group.
- Therefore, any inter-se classification within the Scheduled Castes would be a violation of Article 14.
- In other words, it prohibited sub-categorisation of SCs.
- The SC referred the issue of preferential treatment for certain sub-castes within the SCs and STs to a larger bench.
- The argument for sub-categorisation or creating categories within OBCs for reservation is that it ensures "equitable distribution" of representation among all OBC communities.
- To examine this, the G Rohini Commission was constituted by the Central government in 2017.

Challenges Faced By The G Rohini Commission

The Absence Of Data

The absence of data on the population of various communities to compare with their representation in jobs and admissions.

As a result, in December 2018, the commission wrote to the government asking for a budgetary provision for an all-India survey to estimate the population of various OBCs.

Later, it decided not to undertake such survey at this stage.

Demand For A Caste Census

OBC groups and almost all political parties barring the BJP central leadership have continued to demand a caste census.

The Bihar legislature has twice unanimously passed resolutions calling for a caste census.

Recently, Patna High Court dismissed a challenge to the decision of the Bihar government to conduct a caste survey, paving the way for the exercise in the state.

State of Elementary Education in Rural India

Context: On August 8, Education Minister Dharmendra Pradhan launched the 'State of Elementary Education in Rural India' report which shows that schoolchildren spend most of their screen time playing games, watching movies or listening to songs. Accessing study materials and online tutorials featured way down the order.

Key Highlights

- Chart 1 shows the findings from the survey. Of the 49.3% of parents whose children used gadgets, 76.7% said that their children mainly used mobile phones to play video games, over 56% said that their children used phones to watch movies, 35% said they used phones to access online materials, and only 19% said they used phones to attend online tutorials.
- Instead of seeing this trend as a cause for concern, it can be viewed as a promising opportunity where education meets entertainment.



- Traditional media consumption has increasingly transitioned to OTT platforms, which have the ability to make meaningful contributions to reading literacy and language learning.
- Captions were invented in the U.S. in the early 1970s to make television accessible to people with various degrees of hearing impairments.
- Viewers without hearing disabilities also came to appreciate the value of captions and same language subtitling (SLS) as it helped them follow the dialogues better.
- Caption and SLS are now available in around 40-50 countries. But a major benefit of SLS — improving mass reading literacy — has not been leveraged by any country yet.
- The PlanetRead survey estimates that of the billion “literate” people in the country, 600 million are weak readers.
 - The survey, conducted in four Hindi-speaking States, measured literacy using two methods — the census method which relies on self-reporting and another which required people to read a Grade 2-level text.
- An Ormax OTT audience report showed that India’s OTT base in 2022 was 424 million people, with a nearly 80% penetration in metros. Future OTT growth will predominantly come from rural areas where the preference tilts toward Indian language content.
- SLS on all Indian language content is, therefore, a massive opportunity.
- Universalisation of SLS may act as an automatic reading practice in the viewer’s language.
- The Billion Readers initiative of the PlanetRead organisation is scaling SLS on TV and streaming platforms to achieve that.
- Moreover, under the Rights of Persons with Disabilities Act, 2016, all OTT platforms are required to offer SLS with their content. The Ministry of Information and Broadcasting framed the Accessibility Standards, 2019 mandating SLS on half the content on TV by 2025.

Chart 1 | About 76.7% of parents said that their children mainly used mobile phones to play video games

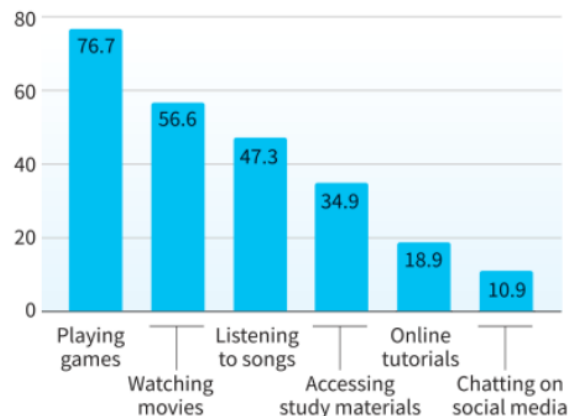


Chart 2 | Same language subtitling (SLS) on Indian language and English content (as a % of total content)

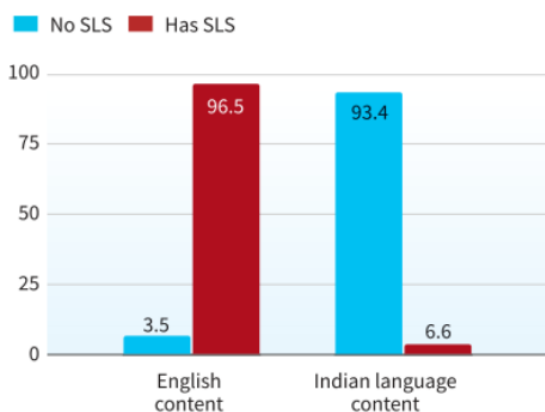
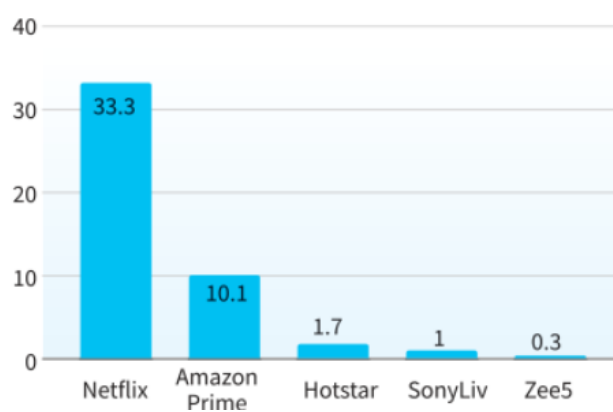


Chart 3 | Availability of SLS on Indian language content across OTT platforms (as a % of total content)

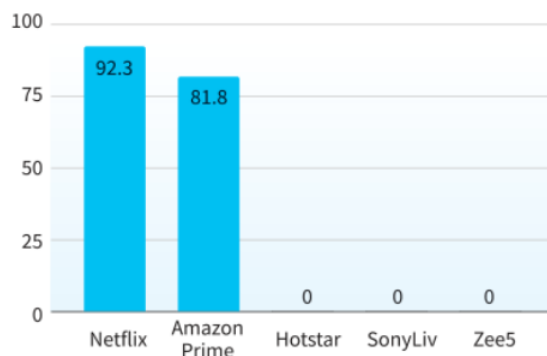


- PlanetRead conducted a survey of 2,673 movies/shows produced in 2022-23 that are on India’s top five OTT platforms – Hotstar, Netflix, Amazon Prime, Zee5, and Sony Liv.



- Almost all English language content on OTTs is available with English subtitles. In contrast, SLS is missing from most Indian language content (Chart 2).
- Netflix leads SLS implementation in Indian languages with one-third of the content having SLS (Chart 3).
- Amazon Prime is a distant second (10.1%), while the other big OTT platforms have barely made a start.
- SLS penetration is higher on content produced by the platforms themselves. Of the original Indian language content produced by Netflix and Amazon Prime, SLS is on 92.3% and 81.8% of content, respectively (Chart 4).
- However, Hotstar, Sony Liv, and Zee5 are yet to implement SLS in their original Indian language content. This suggests that if content producers were to include SLS and caption files, OTT platforms may include these features.

Chart 4 | Availability of SLS on original Indian language content produced by OTT platforms (as a % of total content)



State of Food Security and Nutrition in the World’ (SOFI) 2023

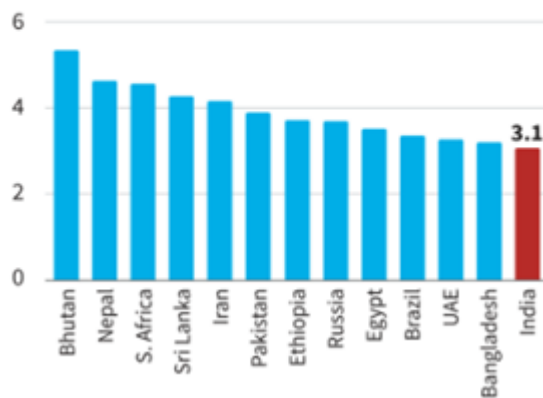
Context: In India, 74% can’t afford a healthy diet: UN agency report State of Food Security and Nutrition in the World’ (SOFI) 2023 says.

- While food prices remain relatively low in India, a healthy diet is unaffordable to nearly three-fourth of the people given their low incomes.

Key Highlights

- The report, ‘State of Food Security and Nutrition in the World’ (SOFI) 2023, shows that while the cost of a healthy diet has increased in recent years in India, it is still the lowest among the BRICS nations (including the newly added six countries) and India’s neighbours.
- However, the share of people who are able to afford such a healthy diet is still low: India features at the bottom of that list since income levels are stagnant or going down.
- SOFI is **published by** the Food and Agriculture Organization and jointly produced with fellow United Nations agencies.
- The Data Point published concluded that the cost of meals in Mumbai rose by 65% in five years, while salaries/wages rose by just 28%-37%.
 - Mumbai was chosen as an exemplar due to the availability of consistent data.
 - Today’s analysis takes a broader view by comparing India’s numbers with other countries.
- In the SOFI report, the cost of a healthy diet is arrived at by looking at the cheapest local food items that meet dietary guidelines.
 - The cost and availability of such food items is averaged from national data. To check if the diet is affordable, its cost is compared to the average income in each country.
 - A diet is considered too expensive if it costs more than 52% of a country’s average income.
 - This percentage is based on data showing that people in low-income countries spend about 52% of their income on food.

Chart 1: The chart shows the cost of a healthy diet in terms of PPP dollars per person per day in 2021, the latest year with comparable data





- The percentage of people who cannot afford this diet is then calculated by using income distributions within a nation.

Chart 1

- ✓ In India, a healthy diet costs 3.066 PPP dollars per person per day, the lowest among the countries considered.
- ✓ PPP stands for 'Purchasing Power Parity'. In simple terms, 1 PPP dollar in the United States should buy the same amount of goods and services as 1 PPP dollar in, say, India or Brazil.
- ✓ The cost of a healthy diet expressed as 'X PPP dollars per person per day' means that it would cost that much per person every day to maintain a healthy diet, accounting for differences in the cost of living between countries.

Chart 2

- ✓ In India, 74% were not able to afford a healthy diet, the fourth highest share among the nations considered.
- ✓ Charts 1 and 2 show that the cost of a healthy diet in India, though increasing, is still lower than many comparable economies.
- ✓ However, given the poor income levels in India, a healthy diet is still unaffordable to many.

Chart 3

- ✓ Between 2019 (before the COVID-19 pandemic) and 2021, the expense of maintaining a healthy diet increased by almost 9% in Asia — the highest across regions.

Chart 4

- ✓ Chart 4 shows the change in the number of people who were unable to afford a healthy diet over the years across regions.
- ✓ Between 2019 and 2021, Asia followed by Africa recorded the highest growth in the number of people who could not afford a healthy diet.
- ✓ The two continents together made up 92% of the worldwide increase.
- ✓ In Asia, South Asia had the highest number of people (1.4 billion) and the highest share (72%) who could not afford a healthy diet.
- ✓ This rate was nearly double the average for the region.
- ✓ In Africa, Eastern and Western Africa together had the most people (712 million) and the highest share (85%) who could not afford a healthy diet.

Chart 2: The chart shows the share of the population that is unable to afford a healthy diet in 2021. For instance, in India, 74% were not able to afford a healthy diet

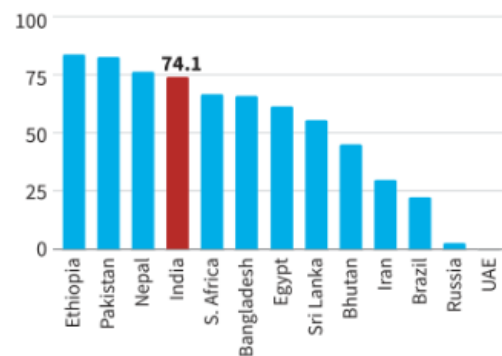


Chart 3: The chart shows the change (in %) in the cost of a healthy diet over the years across regions

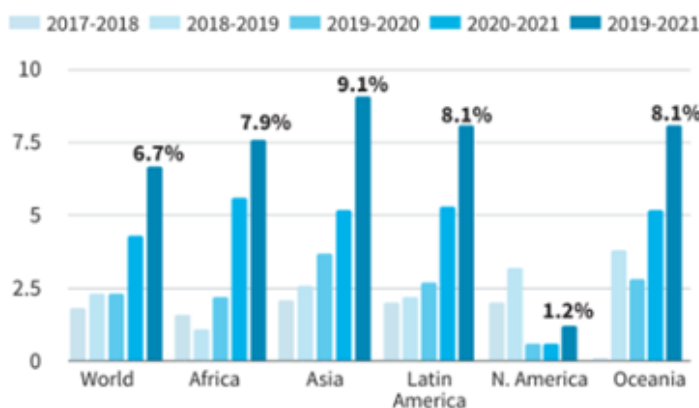
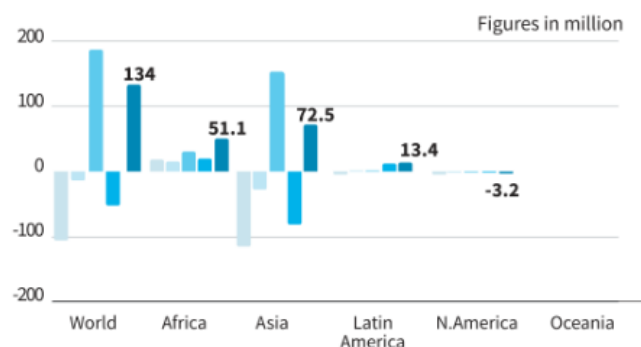


Chart 4: The chart shows the change in the number of people (in million) who were unable to afford a healthy diet over the years across regions



Report On Health Facilities For Tribal Women

Context: A Parliamentary Committee on the empowerment of women tabled a report in the House, which pulled up the Union government for not having disaggregated data on the health conditions of tribal populations in the country and called for extensive data collection in this regard.

- The panel also called for a review in the Allocation of Business Rules so that the Tribal Affairs Ministry can be empowered to appropriately plan resources for tribal welfare in sectors like health, education, nutrition, skill development and livelihood.
- In the report on health facilities for tribal women, the committee noted how several diseases like sickle cell anaemia and leprosy continued to be more prevalent in tribal populations.

Key Highlights

- **Lack of Disaggregated Health Data:** The report highlights the absence of detailed data on the health conditions of tribal populations in the country.
- **Early Marriage:** Early marriage in tribal women causes early pregnancy and other general health risks.
- **Prevalence of Health Issues among Tribal Women:** The report highlights how tribal women suffer from malnutrition, a high infant mortality rate (over 41%), and communicable diseases like malaria, tuberculosis etc (NHFS-5)
- More than half of tribal women of reproductive age suffer from **anaemia**.
- **Online Portal for Registration:** An online portal is being established for tribal people to register for diseases, allowing targeted interventions.

However, the committee critiques the online portal and suggests setting up self-help kiosks for easier registration.

Recommendations

Extensive Data Collection: The committee recommended the inclusion of tribal sub-samples in the National Family Health Survey-5.

Empowerment of ministry: The committee suggests empowering the Tribal Affairs Ministry to plan resources for tribal welfare in various sectors.

Ministry of Tribal Affairs should work with MoHFW to **generate central health data** for tribals with separate classifications like girl children, women of various age groups etc.

Inclusive data collection: The committee recommends including tribal populations in data collection and examining the information periodically.

Focus on Prenatal, Post-natal Care, and Access to Health Services, including mental health and emergency services.

Ministry's Efforts to Monitor Tribal Health Data: The Tribal Affairs Ministry is working on a central database to monitor the health of tribal people.

Linking of the **Swasthya portal** to various government databases such as the POSHAN tracker.

Education: Devise a special action plan to retain tribal girl children in school and develop an alternate learning program for 'out of school' girl child.

Important Days

International Left-handers' Day: Nature's Unpredictable Orientations

Context: August 13 was International Left-handers' Day.

- Handedness is a tendency to prefer the use of one hand over the year. August 13 was International Left-handers' Day, observed to appreciate left-handedness in a world numerically dominated by righties.
- Our planet itself is a lefty, rotating from west to east. So is the solar system. According to a 2011 study, there are more left-handed spiral galaxies than their right-handed counterparts.
- There is left-handedness within ourselves as well. Amino acids, the basic building blocks of life, are left-handed.
- Subatomic particles known as neutrinos are left-handed. This means a neutrino's spin is aligned parallel to but in the opposite direction of its momentum.
 - Neutrinos are the second most abundant particle in the universe (after photons) and they could just as well have been right-handed – yet they aren't.
- There are three fundamental forces in nature other than gravitation. Of these, the strong force operates between protons and neutrons and the electromagnetic force, between charged particles.
 - They are both left-right symmetric: they obey the law of parity conservation.
 - But there is a fourth force, known as the weak nuclear force (responsible for radioactive decay), and it breaks left-right symmetry.



Our planet itself is a lefty, rotating from west to east. UNSPLASH

About The Day

- The day, which honours 'sinistrality' or left-handedness, was first observed in 1976 by Dean R. Campbell, the founder of Left-Handers International Inc., and has been celebrated every year since.
- Studies show that around 10 per cent of the world's population is left-handed, with men more likely being so.
- According to the Indian Left Hander Club, the country's famous left-handers include Mahatma Gandhi, Mother Teresa, Prime Minister Narendra Modi, actors Amitabh Bachchan and Rajinikanth, cricketer Sachin Tendulkar and industrialist Ratan Tata.

International Lefthanders Day Significance

- The day aims to raise awareness about being left-handed in a predominantly right-handed world.
- It celebrates left-handed people's uniqueness and differences, a subset of humanity comprising seven to ten per cent of the world's population.

Other Important Days

Date	Event	Details and Significance
1 August	World Lung Cancer Day	It is observed annually. The goal of Lung Cancer Day is to raise awareness about the risks, prevention, and early detection of lung cancer, while also providing support to those affected by the disease.
1 August	World Wide Web Day	The day honours and acknowledges the founder of the Internet, Tim Berners-Lee. This date is considered the birth of the modern internet.

Date	Event	Details and Significance
3 August	Cloves Syndrome Awareness Day	The day aims to spread awareness about the rare genetic disorder. Its emphasis is on action to gather community support.
4 August	Assistance Dogs Day	Assistance Dogs Day honours and celebrate the dedication of assistance dogs. These dogs are trained to help people with hearing difficulties, epilepsy, diabetes, physical mobility problems and more.
6 August	Hiroshima Day	Hiroshima Day is observed on 6 August every year. This is the day when the atomic bomb was dropped on the Japanese city of Hiroshima.
7 August	National Handloom Day	It is observed on 7 August every year to honour the handloom weavers in the country. This year 6th National Handloom Day is celebrated.
9 August	Quit India Movement Day	All India Congress Committee session in Bombay on 8 August 1942, Mohandas Karamchand Gandhi launched the 'Quit India Movement'. It is also known as August Movement or August Kranti.
9 August	Nagasaki Day	The United States on 9 August 1945 dropped a second bomb on Japan at Nagasaki and the bomb is also known as 'Fat Man'. It was dropped three days after the atomic bombing of Hiroshima.
9 August	International Day of the World's Indigenous Peoples	It is celebrated every year to encourage people from around the world to spread the UN's message on the protection and promotion of the rights of indigenous peoples.
10 August	World Lion Day	The objective is to spread awareness and educate people about lions and their conservation.
10 August	World Biofuel Day	It is observed on 10 August to spread awareness about unconventional sources of fuels that could work as an alternative to fossil fuels.
12 August	International Youth Day	It focus on the development and protection of youth in society.
12 August	World Elephant Day	It is observed on 12 August annually to make people understand to preserve and protect the giant animal elephant. This is the way to bring the world together to help elephants.
13 August	International Lefthanders Day	It raises awareness about the problems and difficulties that left-handed persons faced.
13 August	World Organ Donation Day	World Organ Donation Day is observed on 13 August to spread awareness about the importance of organ donation.
15 August	Independence Day in India	Every Year on 15 August, India celebrates Independence Day. As of this day, India got freedom from British rule. It makes us remind about a new beginning, the beginning of a new era free from British colonialism of more than 200 years.
16 August	Bennington Battle Day	Bennington Battle Day is observed on 16 August annually to honour the Battle of Bennington which took place on 16 August 1777.

Date	Event	Details and Significance
17 August	Malayalam New Year	Vishu is a cultural festival celebrating the Malayali New Year in Kerala, Tulu Nadu, and Mahe of India. Vishu falls on the first day of the month of Medam in the Malayalam Calendar.
19 August	World Photography Day	World Photography Day is observed on 19 August annually to raise awareness about the importance of photography.
19 August	World Humanitarian Day	World Humanitarian Day is observed annually on 19 August around the world to pay tribute to aid workers who risk their lives in humanitarian service. This day also honours the work of women in crises throughout the world
20 August	World Mosquito Day	World Mosquito Day is observed on 20 August every year to commemorate the British doctor, Sir Ronald Ross's discovery in 1897 that 'female mosquitoes transmit malaria between humans'.
20 August	Sadbhavna Diwas	Sadbhavna Divas is observed on 20 August every year to commemorate the memory of our late Prime Minister Rajiv Gandhi. In English, Sadbhavna means goodwill and bonafide.
20 August	Indian Akshay Urja Day	Indian Akshay Urja Day is celebrated on 20 August annually to raise awareness about the development of renewable energy in India. It is a campaign that is celebrated since 2004. This day commemorates the birthday of former Prime Minister Rajiv Gandhi.
23 August	International Day for the Remembrance of the Slave Trade and its Abolition	This day is observed on 23 August every year to remind us of the tragedy of the slave trade in memory of all people that is about the tragedy of the transatlantic slave trade. It provides a chance to think about the historic causes and the consequences of the slave trade.
23 August	ISRO Day	PM Modi announced the celebration of ISRO Day on August 23. The day will commemorate the soft landing of Chandrayaan 3 on the south pole of the Moon.
26 August	Women's Equality Day	This day commemorates the passage of the 19th Amendment to the U.S. Constitution which granted the women right to vote. In 1971, the U.S. Congress officially recognized August 26 as Women's Equality Day.
26 August	International Dog Day	It is celebrated on 26 August to recognise the number of dogs that need to be rescued each year. Also, the day promotes the adoption of stray animals.
29 August	National Sports Day	National Sports Day is celebrated on 29 August every year to honour the birthday of Dhyan Chand a field hockey player. National Sports Day is also known as Rashtriya Khel Divas.
30 August	Small Industry Day	Small Industry Day is observed on 30 August every year to support and promote small-scale industries.
31 August	Sanskrit Diwas	World Sanskrit Day, also known as Vishva-Samskrita-Dinam, is an annual event focused on the ancient Indian language of Sanskrit that incorporates



Date	Event	Details and Significance
		lectures about the language and is aimed to promote its revival and maintenance.

Important Editorials of the Month

GST and Gaming

Why in News?

- The Goods and Services Tax (GST) Council recently revisited the issue of tax on casinos, horse racing, and the online gaming industry.
- Initially, the Council proposed a 28% GST on the face value of bets placed by participants, but this decision was met with opposition from the industry and the Electronics and IT Ministry.
- Online gaming players argued that the proposed tax would be detrimental to the burgeoning sector, which has attracted significant investments and generated numerous jobs.
- The players emphasized that the tax should be aligned with global norms, which typically tax the gross gaming revenue (i.e., platform fees) instead.
- Despite pleas from Sikkim and Goa, the Council decided to maintain its stance, with a minor concession regarding repeat taxation on reinvested earnings.
- Finance Minister Nirmala Sitharaman acknowledged that unanimous decisions are not always necessary, citing the example of the taxation of lotteries, which was approved by a majority vote.
- However, the Council's promise to review the tax six months after implementation raises doubts about its conviction in the resolution.
- The uncertainty surrounding the possibility of a review creates ambiguity for businesses and potential investors.
- The Council's inclination to reconsider decisions based on industry representations or demands from individual states may undermine India's reputation as a reliable investment destination with predictable policies.

What is GST Council?

The GST Council is a constitutional body with the primary responsibility of providing recommendations on matters pertaining to the implementation of the Goods and Services Tax (GST) in India. It was formed by the President of India in accordance with Article 279A (1) of the amended Constitution.

Background

The Goods and Services Tax regime was implemented following the successful passage of the Constitutional (122nd Amendment) Bill by both Houses of Parliament in 2016. Subsequently, more than 15 Indian states ratified the bill in their state Assemblies, and upon receiving the President's assent, the GST came into force.

Members of the Council	Functions of the Council
<ul style="list-style-type: none"> • Union Finance Minister (chairperson) • Union Minister of State (Finance) from the Centre 	<ul style="list-style-type: none"> • Make recommendations to the Union and the states on important GST-related issues, such as goods and services that may be subjected or exempted from GST, and model GST Laws. • Determine various rate slabs of GST.

- Nominated minister in-charge of finance, taxation, or any other minister from each state

Goods and Sales Tax

GST is an indirect tax, meaning customers do not pay it directly to the government. It was implemented on July 1, 2017, following the 101st Amendment to the Indian Constitution. This tax applies to manufacturers, sellers of goods, and providers of services. The GST system is organized into five tax slabs, which are 0%, 5%, 12%, 18%, and 28%, for the purpose of tax collection.

Decision To Levy 28% Uniform Tax On Online Gaming

- Previously, the ministerial panel considered taxing gross gaming revenue or platform fees, but this idea was not favored.
- The new plan is to impose a uniform 28% tax on various aspects of online gaming, including the face value of chips in casinos, the full value of bets in horse racing, and the total value of bets in online gaming.
- The government intends to amend the GST-related laws to include online gaming and horse racing as taxable actionable claims under the CGST Act, 2017. Previously, only lottery, betting, and gambling were classified as actionable claims.
- Additionally, the government aims to treat all games as demerit goods, attracting a 28% GST rate, removing the distinction between games of skill and games of chance.

How Will The Tax Work In Practice?

- Currently, gaming companies pay an 18% tax on platform fees. Under the new structure, a 28% GST will be applied to the entire face value of bets or consideration paid, rather than just the platform fee.

For example

If the platform fee is 10% and a player deposits Rs 100, the platform earns Rs 10, and the GST on Rs 10 is Rs 1.8 (18% of Rs 10). With the new tax, the GST on the same Rs 100 deposit will be Rs 28, resulting in an increase of approximately 15.6 times.

How Significant Is The Online Gaming Market In India?

- The online gaming industry in India has experienced substantial growth, with a CAGR of 38% between 2017 and 2020, surpassing the growth rates in China and the US.
- It is expected to continue growing at a CAGR of 15%, reaching Rs 153 billion in revenue by 2024.
- India has seen a significant increase in the number of paying gamers, with transaction-based games' revenues growing by 26% and paying gamers increasing by 17% from 80 million in 2020 to 95 million in 2021.
- The Indian mobile gaming industry's revenue is projected to exceed 1.5 billion dollars in 2022 and is estimated to reach 5 billion dollars in 2025.
 - While smaller than the US and China, India's gaming market is still substantial, and it is expected to triple in size by 2025.

Who Will Be Affected By The Tax?

Online gaming is a highly profitable segment of the internet economy in India, with companies like Dream11 making substantial profits. The tax decision applies indiscriminately to gaming and gambling platforms, impacting companies that have lobbied for a distinction between games of skill and games of chance/gambling platforms.

How Have Online Gaming Companies Reacted?

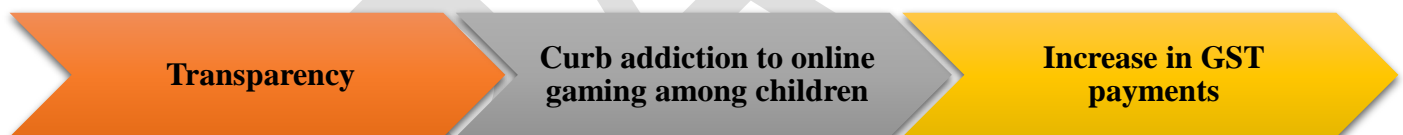
- Online gaming companies have expressed strong opposition to the government's decision, citing that it will lead to an almost 1000% increase in taxation.
- They believe the move is unconstitutional, irrational, and harmful, potentially causing the downfall of the Indian gaming industry and resulting in significant job losses.
- They argue that only illegal offshore platforms will benefit from this tax change.

The Government's Intention

- The government's decision to impose higher taxes on online gaming is motivated by moral concerns about excessive encouragement of gambling, an activity that can be speculative and addictive.
- The government aims to address issues of addiction, particularly among children and teenagers, and believes that stricter regulations, including higher taxes, are necessary based on factors like age and income.

Advantages Of The Move

The government believes that the new tax scheme will bring



Issues With The Decision

- Critics argue that treating the entire gaming industry as gambling goes against established jurisprudence and may contradict the CGST Act 2017.
- They contend that not all skill-based games should be equated with games of chance.
- Furthermore, the increased tax burden may harm online gambling companies and lead to a growth in illegal gambling platforms.
- Some experts also claim that the decision offends Article 14 of the Constitution and could discourage foreign investment while benefiting offshore gambling sites, potentially causing tax losses for the government and exposing Indian gamers to unregulated websites.

Highlights of the 50th GST Council Meeting

The 50th Meeting of the GST Council, headed by Union Finance & Corporate Affairs Minister Nirmala Sitharaman, took significant strides in the development of Goods and Services Tax (GST). The council deliberated on and recommended alterations to GST tax rates, measures to facilitate trade, and simplification of compliance processes.

Changes in GST Tax Rates

Recommendations Relating to GST Rates on Goods	
Uncooked/Unfried Snack Pellets	<ul style="list-style-type: none"> The rate on uncooked/unfried snack pellets will be reduced to 5% from 18%. Payment of GST for past periods will be regularized.
Dinutuximab (Quarziba) Medicine	<ul style="list-style-type: none"> IGST exemption will be provided for imported Dinutuximab (Quarziba) medicine for personal use.
Medicines and Food for Special Medical Purposes (FSMP)	<ul style="list-style-type: none"> IGST exemption will be extended to imported medicines and FSMP used in the treatment of rare diseases listed under the National Policy for Rare Diseases, subject to existing conditions. The exemption will also apply to FSMP imported by Centers of Excellence for Rare Diseases or recommended institutions.
Supply of Raw Cotton	<ul style="list-style-type: none"> Supply of raw cotton, including kala cotton, by agriculturists to cooperatives will be taxable under the reverse charge mechanism. Issues related to past periods will be regularized.
Imitation Zari Thread or Yarn	<ul style="list-style-type: none"> GST rate on imitation zari thread or yarn will be reduced from 12% to 5%. Payment of GST for past periods will be regularized.
Food and Beverages Consumed Inside Cinema Halls	<ul style="list-style-type: none"> The tax rate was set at 5% without input tax credits, as opposed to the previous 18% on cinema services.
Utility Vehicles	<ul style="list-style-type: none"> Entry 52B in the compensation cess notification will be amended to include all utility vehicles that meet specified parameters. The ground clearance in unladen condition will be clarified.
LD Slag	<ul style="list-style-type: none"> GST rate on LD slag will be reduced from 18% to 5% to promote better utilization and environmental protection.
Implants	<ul style="list-style-type: none"> Issues relating to trauma, spine, and arthroplasty implants prior to 18.07.2022 will be regularized due to genuine interpretational issues.
Fish Soluble Paste	<ul style="list-style-type: none"> GST rate on fish soluble paste will be reduced from 18% to 5%. Payment of GST for past periods will be regularized.
Desiccated Coconut	<ul style="list-style-type: none"> Issues relating to desiccated coconut for the period 1.7.2017 to 27.7.2017 will be regularized due to genuine interpretational issues.
Pan Masala and Tobacco Products	<ul style="list-style-type: none"> The earlier ad valorem rate applicable on 31st March 2023 will be notified for the levy of Compensation Cess on pan masala, tobacco products, etc., where it is not legally required to declare the retail sale price.
Banks for IGST Exemption	<ul style="list-style-type: none"> RBL Bank and ICBC Bank will be included in the list of specified banks eligible for IGST exemption on imports of gold, silver, or platinum. The list of eligible banks/entities will be updated as per the Foreign Trade Policy 2023. Consequential changes will be made in notifications in accordance with the new Foreign Trade Policy 2023.
Plates and Cups made of Areca Leaves	<ul style="list-style-type: none"> Issues relating to GST on plates and cups made of areca leaves prior to 01.10.2019 will be regularized.
Biomass Briquettes	<ul style="list-style-type: none"> Issues relating to GST on biomass briquettes for the period 01.7.2017 to 12.10.2017 will be regularized.

Other Changes

Exemption from GST

- GST Council exempts cancer-related drugs, medicines for rare diseases, and food products for special medical purposes from GST.

Establishment of GST Appellate Tribunals

- The Council examined proposals from states to establish 50 Benches of the GST Appellate Tribunals in the country.
- The initial Benches will be set up in state capitals and locations where High Courts have Benches.

Concerns Raised on GST Network and PMLA

- Some states expressed criticism regarding the recent decision to bring the GST Network (GSTN) under the purview of the Prevention of Money Laundering Act (PMLA), administered by the Enforcement Directorate (ED).
- Tamil Nadu, in particular, argued that this inclusion contradicts the interests of taxpayers and the objective of decriminalizing GST offenses.
- The Revenue Secretary assured the Council that it was in line with the requirements of the Financial Action Task Force.
- It was clarified that the ED will neither receive nor provide information from the GSTN, and the notification is aimed at empowering tax authorities to combat tax evasion and money laundering.

PM-USHA Scheme

Why in News?

- The Ministry of Education (MoE) has mandated States and Union Territories to implement the National Education Policy (NEP) 2020 and adopt contentious academic criteria for Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA) funds.
- This move appears to make the central scheme exclusivist, requiring agreement with NEP 2020 and other guidelines to access funding.
- The PM-USHA is an evolved version of Rashtriya Uchchatar Shiksha Abhiyan (RUSA 1 and 2) aimed at enhancing access, equity, and excellence in State higher education with central funding.
- 22 out of 36 States and Union Territories have joined PM-USHA, while 14 including West Bengal, Tamil Nadu, and Kerala have refused to participate.
- The memorandum of understanding for PM-USHA includes commitments to adopt guidelines for the National Credit Framework and Choice Based Credit System for the Four Year Undergraduate Programme.
- States not agreeing to these conditions cannot access the ₹12,926.10 crore funds allocated between 2023-24 and 2025-26, despite requiring 40% State government funding.
- Some States have opposed NEP 2020, with demands to move 'education' from the Concurrent List back to the State List.
- The PM-USHA conditions seem tailored to indirectly impose NEP 2020, leading to concerns about its implementation.
- The scheme requires the adoption of multiple entry and exit options in degree programs and National Higher Education Qualifications Framework guidelines.
- Concerns have been raised about dropouts due to multiple entry and exit options and affordability of a four-year undergraduate program.
- Even a NEP 2020 supporting State like Meghalaya seeks better funding criteria and beneficiary unit increase due to its initial stage of state university operation.
- It is advisable for the Ministry of Education to negotiate better terms with dissenting States, respecting cooperative federalism.


What is National Education Policy, 2020?

The National Education Policy 2020 places a significant emphasis on fostering the creative potential of every individual.

- It is founded on the principle that education should not only cultivate cognitive capacities like literacy and numeracy but also higher-order cognitive abilities such as critical thinking and problem-solving.
- Moreover, the policy recognizes the importance of nurturing social, ethical, and emotional capacities and dispositions.

NATIONAL EDUCATION POLICY 2020



Universalization of Education from pre-school to secondary level with 100% GER in school education by 2030			
	GER in higher education to be raised to 50% by 2035 ; 3.5 crore seats to be added in higher education	NEP 2020 will bring 2 crore out of school children back into the main stream	New 5+3+3+4 school curriculum with 12 years of schooling and 3 years of Anganwadi/ Pre-schooling
	No rigid separation between academic streams, extracurricular, vocational streams in schools	Vocational Education to start from Class 6 with Internships	Teaching upto at least Grade 5 to be in mother tongue/regional language

Influence of Ancient Indian Knowledge

- The policy draws inspiration from India's ancient knowledge and philosophy, with a focus on values like pursuit of knowledge (Jnan), wisdom (Pragyaa), and truth (Satya).
- The historic Indian education system aimed not only at acquiring knowledge but also at self-realization and liberation.
- The policy recognizes the contributions of ancient institutions like Takshashila and Nalanda, which set high standards in multidisciplinary teaching and research.

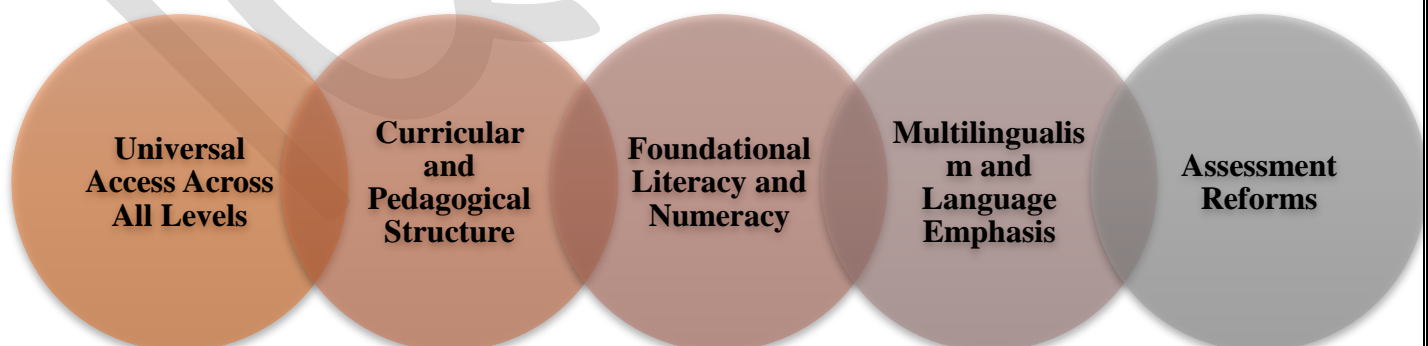
Elevating the Role of Teachers

- Central to the policy's vision is the pivotal role of teachers in shaping the next generation.
- The policy seeks to restore teachers' respect and status by empowering them and ensuring their effectiveness.
- By attracting the best minds to teaching and instilling quality control mechanisms, the policy aims to elevate the teaching profession.

Inclusivity and Equality in Education

- The policy underscores the importance of providing quality education to all, with a special focus on marginalized and disadvantaged groups.
- Education is recognized as a tool for social and economic mobility, fostering inclusion and equality.
- Initiatives are designed to offer targeted opportunities for historically underrepresented students to excel in the education system.

Key Highlights of NEP 2020



Equitable and Inclusive Education

Quality Teachers and Resources

Higher Education Reforms

Regulation and Oversight

Incorporating Technology

Universal Access Across All Levels

- The policy prioritizes universal access to education from pre-primary to Grade 12.
- It emphasizes quality early childhood care and education for children aged 3-6.

Curricular and Pedagogical Structure

- The 5+3+3+4 structure replaces the traditional divisions, integrating arts and sciences, and curricular and extra-curricular activities.
- There's no separation between vocational and academic streams.

Foundational Literacy and Numeracy

- The establishment of a National Mission on Foundational Literacy and Numeracy is designed to enhance foundational skills.

Multilingualism and Language Emphasis

- The policy promotes multilingualism and suggests teaching in the mother tongue or local language up to at least Grade 5, preferably till Grade 8.

Assessment Reforms

- Board exams are to be held twice a year, with one main examination and one improvement exam.
- The National Assessment Centre, PARAKH, is introduced for holistic development assessment.

Equitable and Inclusive Education

- Focus on Socially and Economically Disadvantaged Groups (SEDGs) through a separate Gender Inclusion fund and Special Education Zones.

Quality Teachers and Resources

- Transparent teacher recruitment processes and merit-based performance evaluations are highlighted.
- Resource availability through school complexes and clusters is ensured.

Higher Education Reforms

- The policy aims to increase Gross Enrollment Ratio (GER) in higher education to 50%.
- Multidisciplinary Education and Research Universities (MERUs) and National Research Foundation (NRF) are established.

Regulation and Oversight

- The Higher Education Commission of India (HECI) is introduced to regulate and promote higher education.
- Single bodies oversee standard setting, funding, accreditation, and regulation.

Incorporating Technology

- The National Educational Technology Forum (NETF) is created to integrate technology into education effectively.
- Technology is seen as a means to enhance learning, assessment, planning, and administration.

What is PM-USHA?

The Pradhan Mantri Uchcharat Shiksha Abhiyan (PM-USHA), launched in June 2023, is a transformative initiative that builds upon the foundation of the Rashtriya Uchcharat Shiksha Abhiyan (RUSA).

- The scheme is aligned with the National Education Policy and seeks to bolster higher education institutions across India by addressing key challenges and enhancing their quality, accessibility, and relevance.

Origins and Evolution: RUSA to PM-USHA

- ✓ The Rashtriya Uchcharat Shiksha Abhiyan (RUSA) was introduced as a Centrally Sponsored Scheme in October 2013.
- ✓ It aimed at providing vital financial support to higher education institutions at the state and union territory levels.
- ✓ The primary objectives were to promote accessibility, equity, and quality within the higher education landscape.
- ✓ RUSA was implemented in two phases, with the second phase commencing in 2018.
- ✓ With the advent of the National Education Policy, RUSA has evolved into the Pradhan Mantri Uchcharat Shiksha Abhiyan (PM-USHA).
- ✓ This transformation reflects a renewed commitment to further elevate the quality and relevance of higher education in India.

PM USHA SCHEME

Pradhan Mantri Uchcharat Shiksha Abhiyan (PM-USHA), launched in June 2023, is a transformative initiative that builds upon the foundation of the Rashtriya Uchcharat Shiksha Abhiyan (RUSA)

PM-USHA



- Scheme Name: Pradhan Mantri Uchcharat Shiksha Abhiyan (PM-USHA)
- Initial Launch: Rashtriya Uchcharat Shiksha Abhiyan (RUSA) in 2013
- Renamed as PM-USHA: June 2023

Scheme Type

Type: Centrally Sponsored scheme
Ministry: Ministry of Education



Purpose of PM-USHA Scheme



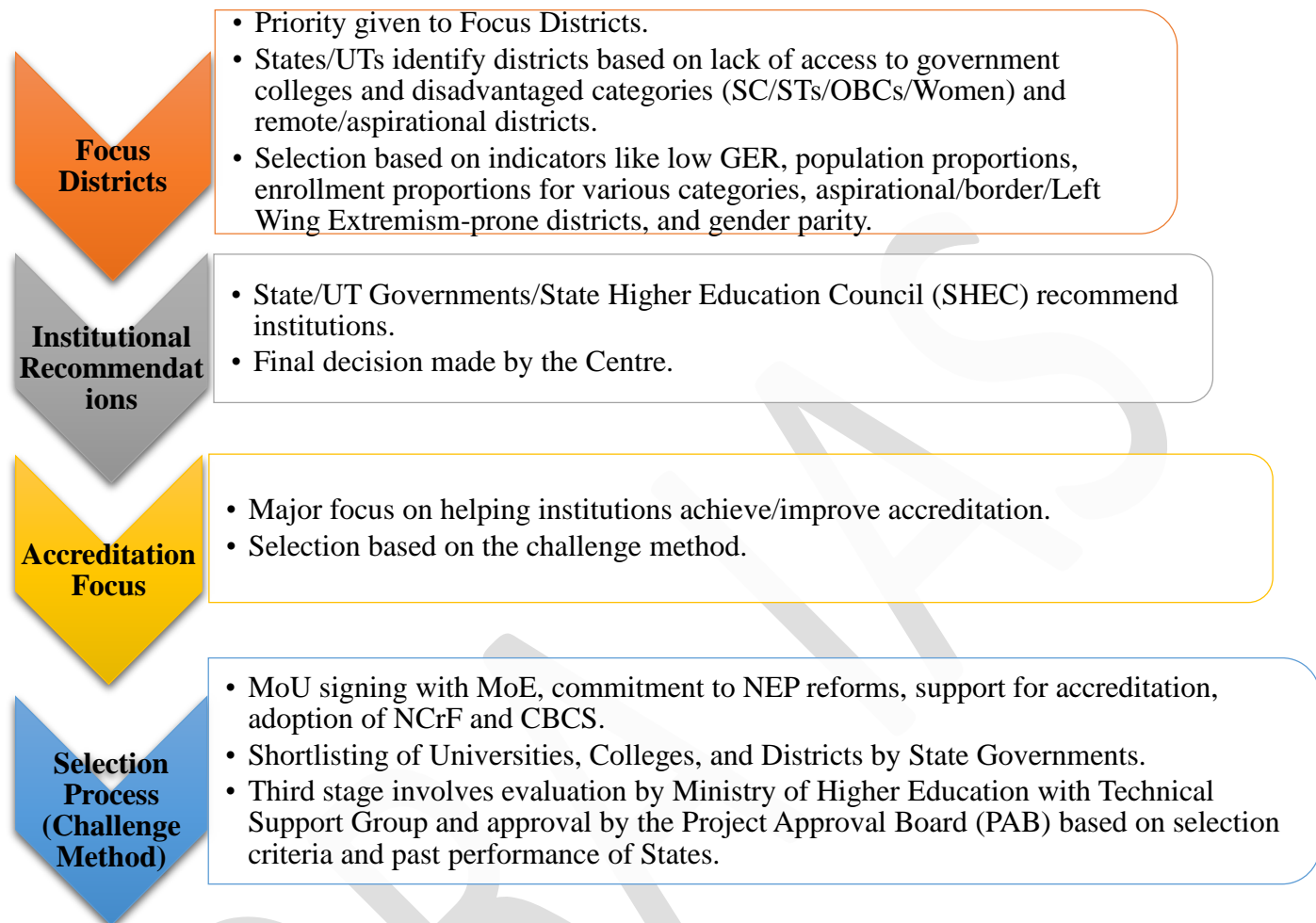
- Purpose: Enhance the quality and accessibility of higher education across the country
- Alignment: Aligned with National Education Policy 2020
- Funding: 90:10 ratio for certain states and 60:40 for others UTs without Legislature receive 100% central funding.

Eligibility for PM-USHA Funding

- Colleges of any discipline under Section 2(f) of the UGC Act
- Minimum of 10 years of active administration required
- Grade A NAAC accreditation or a good NBA score is required for eligibility.



Scope of PM-USHA



Objectives of PM-USHA

The Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA) is designed with a set of multifaceted objectives:

Enhancing Quality and Standards

Governance and Reforms

Promoting Research and Innovation

Enhancing Quality and Standards

- PM-USHA aims to improve the overall quality of existing state higher educational institutions by ensuring they adhere to prescribed norms and standards.
- The adoption of accreditation as a quality assurance framework is a central focus, enhancing the credibility of institutions.

Governance and Reforms

- The scheme seeks to usher in governance, academic, and examination reforms within state higher education institutions.
- It establishes connections with school education and the job market, fostering self-reliance and contributing to an Atma-Nirbhar Bharat (self-reliant India).

Promoting Research and Innovation

- PM-USHA endeavors to create an environment conducive to research and innovation within higher education institutions.
- This objective aligns with India's aspirations to emerge as a global hub for cutting-edge research and innovation.

Key Features of PM-USHA



MERU (Multidisciplinary Education and Research University) Transformation

- The scheme supports accredited state universities with substantial funding to facilitate multi-disciplinary education and research.
- Each of these universities receives Rs 100 crore to foster innovation and excellence.

Model Degree Colleges

- PM-USHA provisions the establishment of new model degree colleges.
- These institutions are aimed at setting new benchmarks for quality education.

Strengthening Universities

Grants are allocated to strengthen universities, enabling them to provide better facilities and resources for students and faculty.

Focus on Marginalized Areas

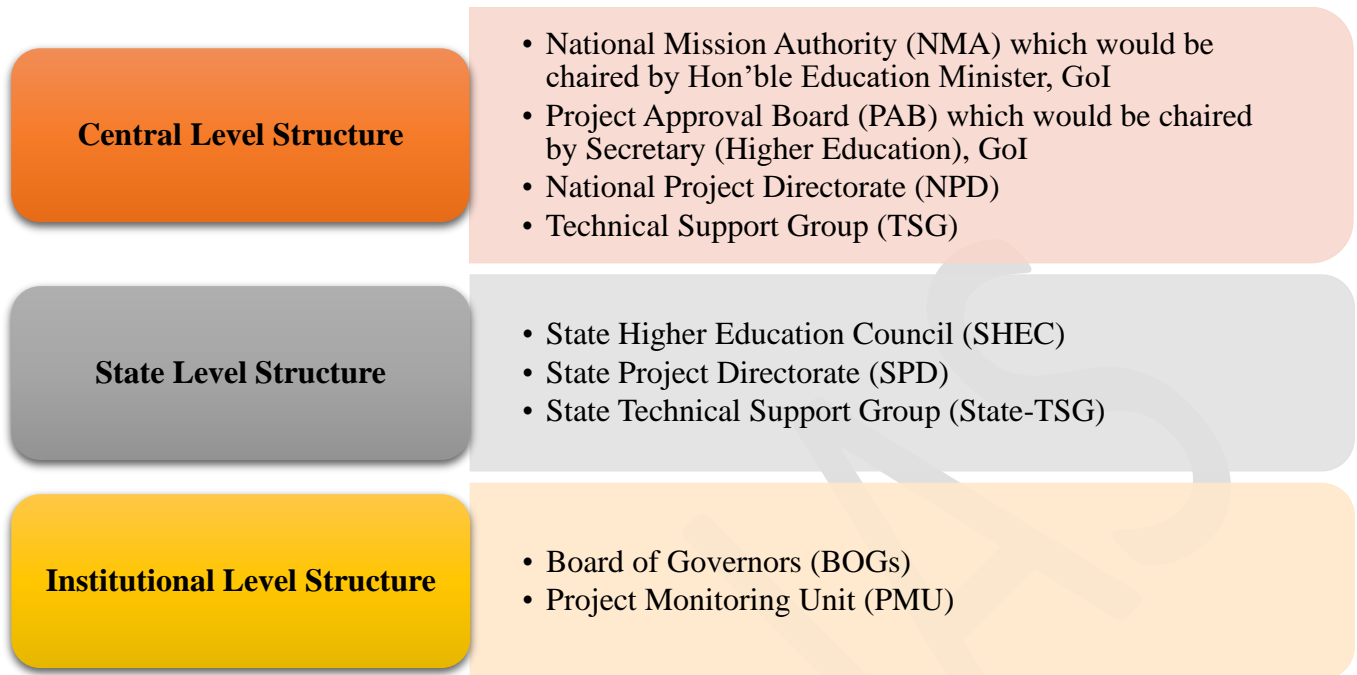
- PM-USHA specifically targets remote areas, Left-Wing Extremism (LWE) affected regions, aspirational districts, and areas with low Gross Enrolment Ratio (GER).
- This focus aims to bridge educational gaps and ensure equitable access to quality education.

Gender Inclusion and Employability

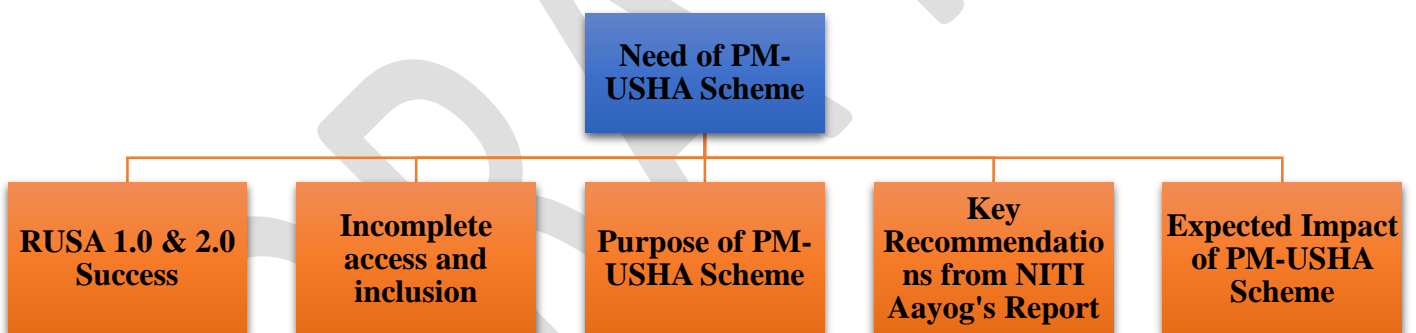
- The scheme supports state governments in promoting gender inclusion and equity.
- Additionally, it contributes to skill enhancement and better employability through the integration of Information and Communication Technology (ICT).

Institutional Structure of PM-USHA

PM-USHA is implemented and monitored through bodies at Central, State, and institutional levels.



Need of PM-USHA Scheme



RUSA 1.0 & 2.0 Success

- Addressed approximately 2500 institutions.
- Enhanced access, equity, and quality through 16 components.
- Positive impact on higher education indicators (GER, Accreditation, Student-Teacher ratio).
- Persisting Gaps in Higher Education.

Incomplete access and inclusion

- Enrollment disparities.
- Quality improvement challenges.
- Skill development and employability gaps.
- Technology integration shortcomings.

Purpose of PM-USHA Scheme

- Bridging gaps and achieving improved outcomes.
- Addressing NITI Aayog's Evaluation Report recommendations.

Key Recommendations from NITI Aayog's Report

- Scheme redesign for higher impact and rationalization.
- Emphasis on graduate employability.
- Funding market-linked courses.
- Establishing industry connections.
- Supporting student internships.
- Robust tracking of Higher Education Institution (HEI) employability outcomes.
- Introduction of skill-based education.
- Addressing critical gaps in education.
- Offering vocational courses aligned with job market needs.
- Promotion of technology and Open Distance Learning.
- Enhancing access and quality through technological integration.
- Support for NAAC accreditation grade enhancement.
- Quality initiatives promotion.
- Adoption of e-learning methods.
- Rigorous outcome tracking.
- Encouragement of community participation and gender sensitization.

Expected Impact of PM-USHA Scheme

- Enhanced employability of graduates.
- Improved access and equity in education.
- Elevated quality of higher education through accreditation.
- Technological advancement in teaching and learning.
- Strengthened community engagement and gender sensitivity.

Climate Events and Urban Health

Why in News?

There has been much media focus on the monsoon season in India this year largely on account of the large-scale devastation in parts.

- The **cyclonic storm Biparjoy** that formed over the Arabian Sea, to the **floods** in the north-eastern State of Assam, and the recent episodes of **heavy rain** and devastation in parts of north India, the subject has been a matter of concern, especially for policymakers.
- **Common water and vector-borne diseases** such as typhoid, cholera, dysentery, leptospirosis, malaria, and dengue are likely to impact people in rain-affected areas.
- While every section of the population is affected in different ways as a result of extreme climate events, there is no doubt that **households in urban areas**, particularly in less developed parts of a city such as slums and urban settlement colonies, **are likely to be the most vulnerable groups**.
 - A large majority of people in these slums and resettlement colonies live in poverty, working in the informal sector of the urban economy with no social security benefits.

A Study On Disease Vulnerability

The findings on the vulnerability of households to climate change-led events, such as those in recent months in India, finds a place in our recently published study in the **Indian Journal of Public Health**. The study highlights two important points:

1. While households in general with **poor socio-economic indicators** are more **vulnerable to malaria**, it is urban households, when compared to their rural counterparts, that are significantly at a much greater odds of suffering from malaria. It is well known that **dengue** too affects the urban population more.
2. Second, households from **climatically high and moderately high vulnerable States** are at greater odds of suffering from malaria.

Post the monsoon season, water and vector-borne disease management officials are on high alert to monitor and contain the spread of such diseases. However, this time the pressure on them will be palpable.

- Controlling the spread of these diseases requires a **systematic and coordinated effort** not only within but also between two or more States. One reason is because of the movement of people between States.
- Therefore, **coordinating mitigation and adaptation efforts** can be a challenge.

Rebuild the Health System

Such a system should focus on the vulnerable urban population, especially those living in urban slums and peri-urban areas.

A resilient health system must be build which can respond to emergency situations, prepare well in advance against impending crises and adapt to changing public health needs.

A crucial prerequisite for this is greater public investment with an immediate focus on urban areas that are more vulnerable to climatic shocks.

We spend very little on primary health care and only a tiny fraction goes to urban local bodies. Even though the National Urban Health Mission has made modest beginnings in improving primary-care systems in urban areas, the limited and varied ability of urban local bodies in generating revenues constrains progress.

Given increasing exposure to unpredictable and extreme climatic events, we need to rebuild the urban primary health-care system and ensure its resilience.

The COVID-19 Experience

It is important to recognise the complexities of urban health governance with multiple agencies and fragmented care provisioning, alongside the increasing presence and dominance of the private sector. The experience during the COVID-19 pandemic has shown that **public health emergencies need greater coordination and cooperation** across various actors **in terms of knowledge** and **data sharing, preventive and curative functions, treatment practices** and, above all, **the regulation of rates and standards.**

The realm of surveillance and information systems such as the **Integrated Disease Surveillance Programme** needs to be **universalised, made comprehensive and strengthened.**

With the complex nature of the health and the climate crisis, the **current system of vertical disease control programmes** needs to give way to a **comprehensive health system approach** in the management of public health programmes.

The **integration of front line workers** across various disease management programmes to create a cadre of multi-purpose, front line public health cadres in urban areas, who would be accountable to communities as well as to the health system.

As a system, we most often work in a resource-constrained environment. Therefore, such systems must integrate in their planning and management the idea that climate change-led events are only going to be more frequent and intense. The world needs to be better prepared.

What is Climate Change?

Climate change means that the Earth's usual weather patterns and temperatures are changing.

While some changes come from natural things like the sun's cycles, a big part of the change since the 1800s has been because of people. We burn things like coal, oil, and gas for energy, and this sends gases into the air. These gases act like a blanket, keeping the Earth warm. Because of this warmth, ice is melting faster, which makes the sea levels go up. When sea levels rise, it can cause floods and wash away land.

Cities and Climate Change

The 21st century's urban growth is transforming the global landscape. As more people move towards cities, particularly in Asia and Africa, the challenges of climate change and urban resilience must be addressed Urban Growth in the 21st Century.

The Urban Century

- The 21st century is marked by a significant surge in global urban populations.
- Urbanization will be a defining trend of this era.

Current Urban Population

- In 2018, approximately 55% of the global population resided in cities.
- This percentage is projected to rise to 68% by the year 2050.

Regional Trends

- Asian and African cities are expected to experience the most substantial increases in urban populations.

Impact on Cities

- According to the IPCC AR6 Report (Part - II), cities will face severe challenges due to:
 - Intense heat and climate-related stressors.
 - Reduction in green spaces and natural environments.

Climate-Resilient Development

- Escalating urbanization necessitates a focus on climate-resilient development strategies.
- Achieving net-zero emissions becomes essential in mitigating the impact of urban growth on climate change.

Public Health Benefits

- Implementation of climate-friendly urban policies holds the potential to:
 - Reduce air pollution levels.
 - Enhance public health and well-being within cities.

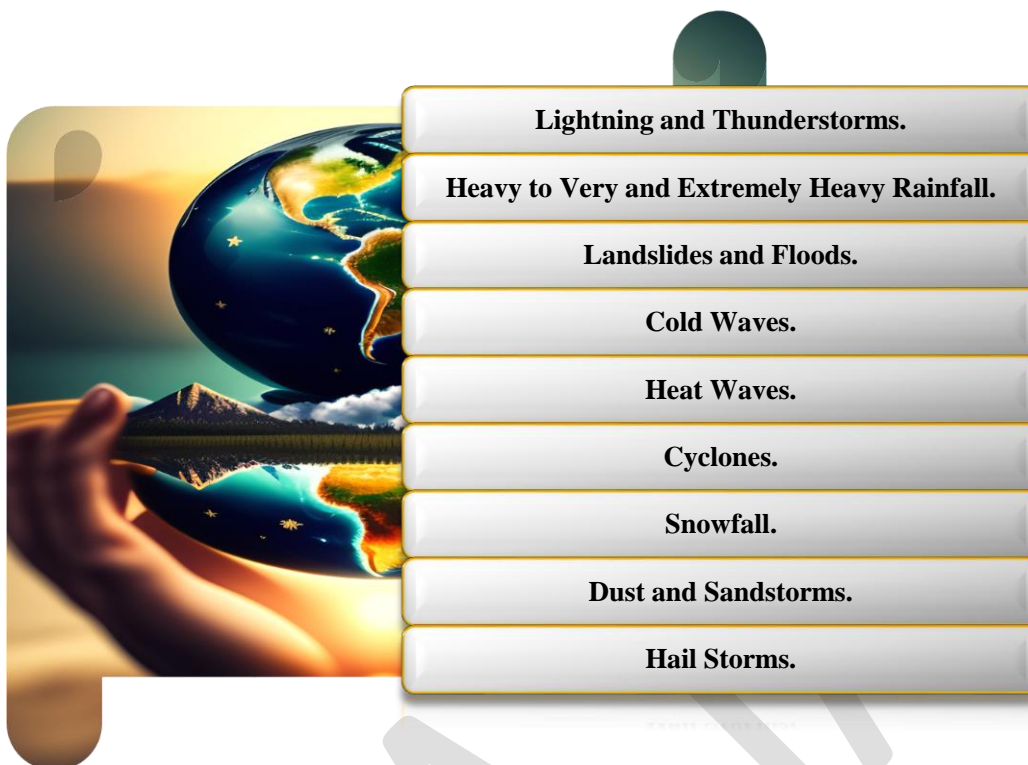
Extreme Weather Events

Extreme weather events refer to weather phenomena that deviate significantly from normal climatic conditions. These events are characterized by their rarity and occurrence at specific places and times of the year.

UN IPCC Definition: The UN Intergovernmental Panel on Climate Change (IPCC) defines extreme weather events as those that are "rare at a particular place and time of year."

Indian Perspective

- In India, while there is no official universal definition of extreme weather events, the India Meteorological Department (IMD) categorizes various phenomena as such.
- Types of Extreme Weather Events (as per IMD):



Natural Disaster in India in 2022

India experienced a high frequency of natural disasters throughout the year 2022. Almost every day witnessed the occurrence of various natural calamities.

Extreme Weather Events

In the initial nine months of 2022, India faced "extreme weather events on 241 of 273 days." These events included thunderstorms, persistent rains, cyclones, droughts, heat waves, lightning, floods, and landslides.

Geographical Impact

The effects of natural disasters were widespread across the country.

- **Madhya Pradesh** witnessed the highest frequency of extreme weather events, occurring nearly every second day.
- **Assam** experienced the highest count of damaged houses and animal deaths among the affected states.
- **Karnataka**, which faced extreme weather on 82 days, accounted for over 50% of the country's affected crop area.
- **Madhya Pradesh** had no official records of crop area damage, possibly due to gaps in reporting loss and damage.
- Central and northwest regions reported the most days with extreme weather events (198 and 195 days, respectively).
- Central India saw the highest number of human lives lost (887 deaths), followed by the east and northeast (783 deaths).
- In 2022, India recorded several temperature and precipitation milestones:
 - Seventh wettest January since 1901.
 - Warmest March ever and the third driest March in 121 years.



- Third warmest April, 11th warmest August, and 8th warmest September since 1901.
- Eastern and northeastern India experienced its warmest and driest July in 121 years. It also saw its second warmest August and fourth warmest September.
- Various extreme weather types occurred during the nine months:
 - Lightning and storms affected 30 states and caused 773 deaths.
 - Monsoon months (June to August) saw heavy to extremely heavy rainfall, leading to widespread flooding.
 - Heat waves claimed 45 lives, impacting people's well-being, particularly in north India.

Human and Environmental Toll

The cumulative toll of these disasters:

- Caused the loss of around 2,755 lives.
- Affected approximately 1.8 million hectares of crop area.
- Led to the destruction of over 416,667 houses.
- Resulted in the death of nearly 70,000 livestock.

Natural Disaster in 2023

As of the current period in 2023, India is grappling with multiple natural disaster events. Assam is dealing with a second wave of floods caused by elevated water levels in the Brahmaputra River, leading to widespread impacts. Northern parts of the country, including Punjab and Haryana, have experienced torrential downpours resulting in casualties.

Assam Floods: Recently, Assam, in northeastern India, had faced a second wave of floods due to elevated water levels in the Brahmaputra River.

- Increased water levels are a result of water release from Bhutan.
- Around 98,800 people across 371 villages in 13 districts are affected, as reported by the Assam State Disaster Management Authority (ASDMA).
- Kaziranga National Park and Tiger Reserve have been submerged for the past two days.

Rain-Related Incidents in Punjab, Himachal Pradesh, Uttarakhand and Haryana: Recently Rains in northern India led to rain-related incidents like floods in Delhi, Punjab and Haryana.

- At least 62 individuals lost their lives due to these incidents.
- Ongoing relief and rescue efforts are taking place in these states.
- Recently, Himachal Pradesh, Uttarakhand experienced Heavy to very heavy rainfall and experienced extreme destruction due to extreme weather conditions.

Diseases Associated with Extreme Weather Conditions

Extreme Weather Condition	Diseases	Examples
Heatwaves	Heat exhaustion, heatstroke	Example: During a severe heatwave, individuals working outdoors without proper hydration and protection may suffer from heat exhaustion, characterized by heavy sweating and weakness. If not treated promptly, it can progress to heatstroke, with symptoms like high body temperature, confusion, and even unconsciousness.

Cold Snaps	Hypothermia, frostbite	Example: In extremely cold weather, individuals exposed to low temperatures for prolonged periods can develop hypothermia, leading to shivering, confusion, and eventually loss of consciousness. Frostbite can occur in exposed skin, causing tissue damage and potential amputation.
Floods	Waterborne diseases, vector-borne diseases	Example: After a flood, contaminated water can lead to outbreaks of waterborne diseases like cholera and dysentery. Additionally, standing water can become breeding grounds for disease-carrying mosquitoes, leading to diseases like malaria and dengue fever.
Hurricanes/Cyclones	Injuries, water-related illnesses, mental health issues	Example: In the aftermath of a hurricane, injuries from flying debris and flooding can be common. Contaminated water sources can lead to waterborne diseases, and the trauma of losing homes and communities can result in increased stress and anxiety.
Wildfires	Respiratory issues, cardiovascular problems	Example: During wildfires, smoke and particulate matter can degrade air quality, exacerbating respiratory conditions like asthma. The increased air pollution can also contribute to cardiovascular problems, including heart attacks.
Droughts	Water scarcity, crop failures	Example: Prolonged droughts can lead to water scarcity, increasing the risk of dehydration and the spread of waterborne diseases. Crop failures during droughts can result in food shortages and malnutrition-related health issues.
Heavy Rainfall/Flooding	Vector-borne diseases, waterborne illnesses	Example: After heavy rainfall and flooding, stagnant water can become breeding grounds for disease-carrying insects, leading to diseases like malaria and Zika virus. Contaminated floodwaters can also cause waterborne infections upon contact.

India's Effort Against Climate Change

India, as a responsible participant on the global stage, has engaged in numerous international and national frameworks, conventions, and treaties related to climate change. These agreements reflect the nation's dedication to addressing the pressing challenges of environmental degradation and climate crisis. Here are some of the key steps that India has undertaken:

India's Updated NDCs

In August 2022, India revised its NDCs, setting ambitious targets for 2030:

- Reduce emission intensity of GDP by 45% from 2005 levels.
- Achieve 50% of cumulative electric power capacity from non-fossil fuel sources.
- Create 2.5 to 3 billion tonnes of additional carbon sink through forests.

National Action Plan on Climate Change (NAPCC)

Launched in 2008, NAPCC comprises 8 national missions to address climate change challenges:

National Solar Mission

National Mission for Enhanced Energy Efficiency

National Mission on Sustainable Habitat

National Water Mission

National Mission for Sustaining the Himalayan Ecosystem

National Mission for A Green India

National Mission for Sustainable Agriculture

National Mission on Strategic Knowledge for Climate Change

State Action Plans and Adaptation

- States / UTs have developed State Action Plans on Climate Change (SAPCC) in line with NAPCC, addressing state-specific climate issues.
- SAPCCs outline sector-specific actions, including adaptation and resilient infrastructure development.

National Adaptation Fund for Climate Change (NAFCC)

- NAFCC supports adaptation efforts in climate-vulnerable Indian states and UTs.
- Implemented through projects, NAFCC has sanctioned 30 projects across 27 regions.
- India achieved a 24% reduction in emission intensity of GDP between 2005 and 2016.

International Frameworks and Treaties

United Nations Framework Convention on Climate Change (UNFCCC)

- India is a signatory to the UNFCCC, a global treaty aimed at stabilizing greenhouse gas concentrations and mitigating climate change impacts.

Paris Agreement

- Under this 2015 global accord, India submitted its Nationally Determined Contribution (NDC) to balance climate change concerns, sustainable development, poverty eradication, and economic growth.

Kyoto Protocol

- As a developing country, India signed and ratified the Kyoto Protocol in 1997, which sets emission reduction targets for developed nations.

Montreal Protocol

- India is part of the Montreal Protocol, a treaty designed to protect the ozone layer by curbing the production and consumption of ozone-depleting substances.

Convention on Biological Diversity (CBD)

- India has committed to the CBD, a treaty focused on conserving biodiversity and ensuring equitable use of genetic resources.

United Nations Convention to Combat Desertification (UNCCD)

- India has signed the UNCCD to address desertification and drought effects, particularly in drought-prone regions like Africa.

International Coalitions and Initiatives

India initiated global coalitions to combat climate change:

- **International Solar Alliance (ISA):** Aims to promote solar energy use through international cooperation.
- **Coalition for Disaster Resilient Infrastructure (CDRI):** Focuses on resilient infrastructure to mitigate disaster impacts.
- **Infrastructure for Resilient Island States (IRIS):** Supports sustainable infrastructure development in island states.
- **Green Grids Initiative (GGI-OSOWOG):** Promotes interconnected global grids for renewable energy sharing.
- **Leadership Group for Industry Transition (LeadIT):** Encourages businesses to adopt low-carbon practices.

Mission LiFE

Mission LiFE is a global movement led by India to encourage environmental protection.

- Aims to mobilize 1 billion Indians and global citizens for environmental preservation by 2027.
- Seeks to make 80% of villages and urban local bodies in India environment-friendly by 2028.

Long-Term Low-Carbon Development Strategy (LT-LEDS)

Submitted in November 2022 at COP27, India's LT-LEDS targets net-zero emissions by 2070. Based on seven transitions to low-carbon development pathways:

- Low Carbon Development of Electricity Systems
- Integrated, Efficient, Inclusive, Low-Carbon Transport Systems
- Promoting Adaptation in Urban Design and Sustainable Urbanization
- Low-carbon Industrial Systems
- CO2 Removal and Engineering Solutions
- Enhancing Forest and Vegetation Cover

Disaster Management and Early Warning

- National Disaster Management Authority (NDMA) provides guidelines for managing climate-related disasters.
- National Disaster Management Plan (NDMP) assists stakeholders, including state governments, in disaster risk management.
- Indian Meteorological Department implements early warning systems to prevent loss of life due to floods and cyclones.

Coastal Zone Management

- Integrated Coastal Zone Management project (ICZMP) maps hazard lines and eco-sensitive areas.
- Supports disaster management by projecting sea level rise impacts and shoreline changes over 100 years.
- In its dedicated efforts against climate change, India actively participates in international agreements, implements strategic plans, and fosters cooperation for a sustainable future.

Births & Deaths Registration (Amendment) Act

Why in News?

- The Registration of Births and Deaths (RBD) Act, 1969 provides for compulsory registration of births and deaths under a uniform law across India.
- Experience of its working indicates that it is necessary to amend it for several reasons, and things could be changing as a Bill to amend this Act — called the Registration of Births and Deaths (Amendment) Bill, 2023 — for the first time since its inception, has been passed by Parliament and has got the assent of the President of India.
- One of the major objectives that has been stated in the ‘Statement of Objects and Reasons’ attached to the Bill is “to create a National and State level database of registered births and deaths which would help in updating other databases resulting in efficient and transparent delivery of public services and social benefits”.

Building Databases

For this purpose, the Bill makes it compulsory that the **Registrar General of India** maintains a national level database of births and deaths, and that the **Chief Registrar** of births and deaths in every State is required to maintain a State-level database of registered births and deaths ‘using the portal approved by the Registrar General of India’.

- These databases are to provide information to update the National Population Register, the Aadhaar database, electoral rolls, ration card, passport, and other databases at the national level, as may be notified.
- In the case of birth, the amendments provide for collecting the Aadhaar number of the parents.
- Nothing is mentioned about the Aadhaar number of the deceased.
- Updating many of the databases would require removing the names of the deceased from the database.
- If the Aadhaar number of a deceased person is not collected, it would be impossible to achieve this objective.
 - This means that the laudable objective of ensuring ‘efficient and transparent delivery of public services and social benefits’ would remain a dream.

Do We Need the Central and State Databases of Births and Deaths?

- The registration hierarchy is the responsibility of State governments, with the Registrar General of India having only the role of coordination and unification of the registration system.
- The maintenance of the central database is being added to the Registrar General of India’s functions.
- The Chief Registrars are the executive authorities for the matters relating to registration of births and deaths in the States.
- They need to maintain a database for efficient delivery of services of providing birth and death certificates and are doing so in many States even now.
- The **national database** is going to be nothing but a collection of State-level databases, except for some data items that some States may have in addition to the national standards prescribed by the Registrar General of India.
 - So, if the authorities maintaining other databases require information on births and deaths, it is possible to design a system wherein the required data flow to their databases on a daily basis or even a real time basis from the State-level database.

- The Registrar General of India needs to specify the standards for the data structures and transfer protocols.

What Is The Need For A National-Level Database?

- It is provided that this database at the central level be made available to authorities dealing with the maintenance and preparation of databases relating to the population register, electoral rolls, Aadhaar number, ration card, passport, driving licence, property registration and such other databases at the national level, as may be notified.
- If those authorities require information from the database of registered births and deaths to update their databases, it requires amendment in the laws or executive orders under which they are maintained.
- The RBD Act only needs an enabling provision to share information from the database. Even that may not be necessary as the birth and death registers are considered public documents.
- Listing a few databases for consideration by Parliament and leaving future additions to the government is demeaning to Parliament in a way.
- New additions to the list later may be more dangerous than those listed and approved by Parliament.
- For example, the government can now decide that a list of women whose third or higher order birth is being registered be prepared and given to the Family Welfare department for follow up on family planning programmes.

Certificate of Cause of Death

- With regard to the facilities available now, the State government could decide that a cause of death certificate should be issued by the medical practitioner who attended the deceased person so that the certificate can be sent along with the death report.
- The areas/hospitals where such a certificate has been made mandatory varies across States, but is generally restricted to deaths in medical institutions.
- The amendments make it compulsory that for all deaths in medical institutions, a cause of death certificate be sent to the Registrar of Births and Deaths and a copy of the certificate is provided to the closest relative.
- For deaths that occur outside hospitals, the medical practitioner who attended to the deceased during the person's recent illness has to issue such a certificate. This is fraught with problems:

First, the medical practitioner may not have always arrived at a definite diagnosis before the person died.

Second, the forms for the cause of death that are being used are in conformity with World Health Organization recommendations. If the deceased was attended by a practitioner of the AYUSH (Ayurveda, Yoga and Naturopathy, Unani, Siddha, Sowa Rigpa and Homoeopathy) systems of medicine, the cause of death recorded may not be usable for the cause of death statistics since they may not be classifiable under the International Classification of Diseases.

Third, a person who was under treatment for a certain disease can die of an entirely different cause outside a medical facility when the medical practitioner was not available for consultation. How can the practitioner be expected to issue a certificate of cause of death in such cases?

Fourth, while Section 17 of the Act prohibits the inclusion of the cause of death in any certificate issued under the Act, it now says that the cause of death certificate should be given to the relative of the deceased.

These are contradictory as the cause of death in the death register is taken from the same cause of death certificate issued by the medical practitioner.

Birth and Death Certificates

It is provided that the birth certificate alone would be accepted as proof of the date and place of birth for many purposes such as school admission, the issue of passport, and the issue of the Aadhaar number. This may not require any amendment in this Act or any other Act.

- It should be possible to achieve this through amendments in the rules relating to those databases or even executive orders.
- For example, while applying for passports, it was compulsory to have the birth certificate for those born after January 26, 1989, under the relevant rules.
 - The present government removed this requirement in December 2016.
- When natural calamities or accidents occur, several persons are reported missing; many of them may have died too.
 - It has been seen that the police would have to call off the search for them after some time.
 - However, the families of such persons would have to wait for seven years to request a certificate that says 'presumed dead'.
 - A provision could have been inserted in the Act to register a 'presumed death' when it is reasonable to assume that the person would have died in the calamity or accident.
 - This would help the family concerned get the death certificates earlier.

What is the Registration of Births and Deaths Act, 1969?

The Registration of Births and Deaths Act of 1969 mandates the compulsory registration of births and deaths in India based on the event's location. States hold the responsibility for registering births and deaths under the RBD Act. State governments have established facilities for the registration of births and deaths and for maintaining related records. Each state appoints a Chief Registrar who serves as the executive authority to implement the Act. A hierarchy of officials operates at the district and lower levels to carry out registration tasks. The Registrar-General of India (RGI), designated by this Act, is accountable for coordinating and unifying the execution of the RBD Act.



Salient Feature of the RBD 1969

Within the ambit of the RBD Act, the responsibility of registering births and deaths primarily rests with the individual States.

To fulfill this duty, state governments have established dedicated facilities for registering and maintaining records of births and deaths.

Each State designates a Chief Registrar who holds the executive authority for overseeing the Act's implementation.

At various administrative tiers, a structured hierarchy of officials, including those at the district and lower levels, is entrusted with the practical execution of registration procedures.

The Registrar-General of India (RGI), appointed under the Act, assumes the crucial role of coordinating and unifying the overall implementation of the RBD Act.

The core objective of the Registration of Births and Deaths Act, 1969, is to regulate matters pertaining to the registration of births and deaths and related issues.

The RBD Act mandates specific individuals to provide requisite information to the Registrar for birth and death registration purposes.

Such information can be communicated in oral or written form, as per the choice of the concerned individual.

For births or deaths occurring at a household, the head of the house or household holds the responsibility for reporting the event. In their absence, the nearest relative or the oldest adult male of the family undertakes this task.

At hospitals, health centers, maternity, or nursing homes, the Medical Officer in charge or a designated representative authorized by them is responsible for reporting births and deaths.

Section 10 of the Act outlines the obligation of specific individuals to notify births and deaths under certain circumstances. This includes midwives, medical or health attendants, and individuals responsible for facilities designated for the disposal of deceased bodies, as specified by state governments.

Registrars are mandated to remain informed about births and deaths within their respective jurisdictions.

Section 23 of the Act delineates comprehensive provisions concerning penalties for non-compliance with Act stipulations. Such penalties are applicable if individuals fail to provide necessary information or furnish false details during the registration process.

Need for Amendment

There are number of reasons for the amendments, some of them are given below:

- The U.N. Human Rights Office of the High Commissioner (OHCHR) emphasizes that improving birth and death registration processes leads to higher registration rates and increased coverage.
- A case study of Bihar's Civil Registration System reveals challenges such as inadequate investment, subpar service delivery at registration centers, and limited computer and internet services.
- NFHS-5 data shows that death registration rates are lower for females than males, leading to data gaps that result in misguided policies.
- Inaccurate death registration during the COVID-19 pandemic obscured the true impact, particularly in certain states.
- Delays in census data availability hinder estimates related to poverty, hunger, education, and healthcare access.

What will be the Importance of Amendments?

Efficient and transparent public service delivery requires a streamlined registration system. The adoption of a digital registration system keeps up with societal changes and technological advancements.

A birth certificate serves multiple purposes:

- Admission to educational institutions
- Issuance of driving licenses
- Voter list preparation
- Obtaining Aadhaar numbers
- Registering marriages
- Government job appointments

Central and State Database

The amendment aims to establish a National and State-level database of registered births and deaths.

This database will facilitate updates to other databases, enhancing the efficiency and transparency of public services and social benefits.

Avoiding Document Multiplicity

The new system will reduce the need for multiple documents and enhance public convenience.

It will enable the issuance of passports, Aadhaar numbers, and other documents determined by the central government.

Key Features of the Bill

Database of Births and Deaths

Electronic Certificates

Connecting Database

Use of Birth Certificate

Appeal Process

Database of Births and Deaths

- Establishment of Registrar-General, India.
- Registrar General maintains a national database for registered births and deaths.



- Chief Registrars and Registrars appointed by states share data with the national database.
- Chief Registrar maintains a similar database at the state level.

Electronic Certificates

- People can request Registrar to search and obtain birth or death certificates.
- Bill amends to allow electronic issuance of birth or death certificates.

Aadhaar Details of Parents and Informants

- Specified individuals must report births and deaths to the Registrar.
- Bill adds requirement to provide Aadhaar details of parents and informants for births.
- Applies to births in jails and certain establishments.
- Expanded list includes adoptive parents, biological parents in surrogacy cases, and single parents.

Connecting Database

- National database can be shared with other authorized databases (e.g., population register, electoral rolls).
- Central government approval needed for usage.
- State database can be shared with state-approved authorities.

Use of Birth Certificate

- Birth and death certificates required for individuals born after the Bill's enactment.
- Used for education admissions, voter lists, government appointments, and other purposes determined by central government.

KEY PROVISIONS

SECTION 3

- The title "Registrar-General, India" is updated to "Registrar General of India."
- Database of registered births and deaths maintained at the national level. Sharing data is made obligatory.
- With Central Government approval, data may be shared with authorities for various purposes, like Aadhaar, electoral rolls, etc.

SECTION 7

- Details about the information provider's identity are enhanced.
- Different categories of individuals responsible for giving information about birth or death are listed.

SECTION 13

- Birth and death certificates can be obtained electronically or otherwise.
- Birth certificates can be used for various official purposes.

SECTION 25A

- Appeals process introduced for challenging actions or orders.
- Appeals to be filed with District Registrar or Chief Registrar.

SECTION 4

- Database of registered births and deaths maintained at the state level.
- Similar sharing provisions as in Section 3.

SECTION 10

- Medical institutions providing treatment must give a certificate of cause of death.
- Medical practitioners attending non-institutional deaths must provide a similar certificate.

SECTION 23

- Higher fines for offenses related to providing false information or refusing to provide information.
- Penalties for not providing or issuing certificates are increased.

Appeal Process

- Appeals against Registrar or District Registrar actions can be made.
- Time limit of 30 days from receiving the action or order.
- Decision from District Registrar or Chief Registrar within 90 days.

Issues with The Amendments Proposed



Use of Birth Certificates

- The Bill mandates birth certificates for specific purposes, applicable to those born after its enactment.
- These purposes include education admissions, voter lists, government job appointments, and more.
- Constitutional rights tied to these purposes might be compromised by conditional birth certificate requirements.

Right to Education

- Denying school admission without a birth certificate might infringe on the fundamental right to education.

Right to Vote

- The Bill's birth certificate linkage does not fall within disqualifications for voting; hence, it might hinder the right to vote.

Linking Aadhaar and Privacy

- Linking Aadhaar details with birth records raises concerns about violating the right to privacy.
- The provision could disproportionately compromise privacy rights of informants, like medical officers or police officers.
- Might conflict with the principles established in the Aadhaar judgement.

Linking Databases and Privacy

- Bill permits sharing birth and death database with other government databases.
- This linkage does not necessitate the consent of the data subject, potentially violating privacy rights.
- Contrasts with the principles proposed in data protection bills for obtaining informed consent.

Birth Certificate as Sole Proof

- The Bill establishes birth certificates as the exclusive proof for age and birthplace.
- Lack of alternatives might lead to disenfranchisement in various areas of life.
- This concentrated power may foster corruption.

Discrimination and Children's Welfare

- The Bill's birth certificate requirement might discriminate against children in need of care and protection.
- Children without birth certificates might face challenges in enrolling in school or accessing other services.
- Delayed Registration and Complexity:
- Provisions for delayed registration may still pose difficulties for certain individuals.
- Cases involving children who ran away from home or faced disasters might struggle to prove their age.

Public Tech Platform for Frictionless Credit

Why in News?

The Reserve Bank of India's plan to establish a 'Public Tech Platform for Frictionless Credit' is a well-intentioned move that is aimed at easing the flow of credit, especially to small and marginal borrowers.

- Announced as part of the Statement on Developmental and Regulatory Policies that accompanied the latest monetary policy, earlier this month, the platform is intended to serve as a **one-stop digital clearing house for credit-related information**, which should help accelerate the loan approval and disbursement process significantly.

Key Highlights

- Developed by the Reserve Bank Innovation Hub, **the platform will feature** open architecture, open Application Programming Interfaces (APIs) and standards that would facilitate the seamless flow of required digital information from varied entities including State and central governments, credit information companies and digital identity authorities to lenders.
- As part of an effort to validate the technology and its utility, the RBI said the platform would be **introduced in a pilot project** that would focus on products such as
 - Kisan Credit Card loans of up to ₹1.6 lakh per borrower
 - Loans to dairy farmers
 - Credit-sans-collateral to MSMEs
 - Personal and home loans through participating banks
- Lenders would be able to access data on the borrowers and credit-related services from agencies including Aadhaar e-KYC, land records in States where local governments have digitised such data (Tamil Nadu, Karnataka, Uttar Pradesh and Maharashtra included) and even milk pouring data from select dairy cooperatives.
- The need for such a centralised public platform can hardly be over-emphasised when one considers the lack of formal credit penetration, particularly among small and marginal farmers in the rural hinterland.

More than seven decades since Independence, the question of what needs to be done to make institutional rural credit more inclusive continues to remain a vexing challenge to government planners and economic researchers alike.

- In 2021, a National Bank for Agriculture and Rural Development economist observed that 'even among well-developed regions, small and marginal farmers were disadvantaged in terms of credit access', with barely a fifth of the more than 12.5 crore small and marginal farmers having access to institutional credit.
 - As a result, a large majority of rural borrowers end up availing loans from informal sources including moneylenders, and often at usurious rates of interest.
- The digital platform, if successfully implemented, can help redress precisely this challenge to the delivery of formal credit by helping leverage the contemporary advances in digitisation of information and ensuring that small-ticket loans are made available in a timely and cost-effective manner to those most in need of financing support.

Public Tech Platform for Frictionless Credit

The Reserve Bank Innovation Hub (RBIH) has introduced an innovative digital platform. This platform features open architecture, open APIs, and set standards for easy bank connectivity using a "Plug and Play" Model.

Launch Date

- The platform's initial introduction will be carried out gradually, starting with a pilot project on August 17, 2023.

Focused Start

- During this pilot phase, the primary focus will be on specific credit products, including Kisan Credit Card loans, dairy loans, MSME loans without collateral, personal loans, and home loans.

Incorporating Services

- The platform's offerings will encompass various integrated services, including Aadhaar e-KYC, land records from state governments, satellite data, PAN validation, Aadhaar e-signing, account aggregation, and more.

Purpose of the Public Tech Platform

- The platform aims to simplify and streamline the credit process.
- It provides a centralized place for all required information, enhancing credit delivery efficiency.

Credit Delivery Process

- Credit Appraisal is the initial step, evaluating the borrower's repayment ability and adherence to credit terms.

Three pillars support this process

- **Adverse Selection:** Addressing information asymmetry between borrowers and lenders.
- **Exposure Risk Measurement:** Assessing risks associated with lending.
- **Default Risk Assessment:** Evaluating the likelihood of borrower defaulting.

Data Integration

- The platform integrates data from various sources:
 - Central and state governments

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EDITORIAL KEY POINTS



Reserve Bank of India's plan to establish a 'Public Tech Platform for Frictionless Credit'

Developed by the Reserve Bank Innovation Hub



SERVE AS A ONE-STOP DIGITAL CLEARING HOUSE

FOCUS ON

- Kisan Credit Card loans
- Loans to dairy farmers
- Credit-sans-collateral to MSMEs
- Personal and home loans through participating banks



WHY NEEDED

- Lack of formal credit penetration
- Barely a fifth of over 12.5 crore farmers have institutional credit access in 2021
- Rural borrowers avail loans from informal sources



WHAT IT WILL DO?

- Address challenge of formal credit delivery
- Leverage advances in digitization
- Ensure timely, cost-effective small loans for financing support



Exposure
Measur

Admission Help Line: +91 9823256625 & 9579247470
(WhatsApp)

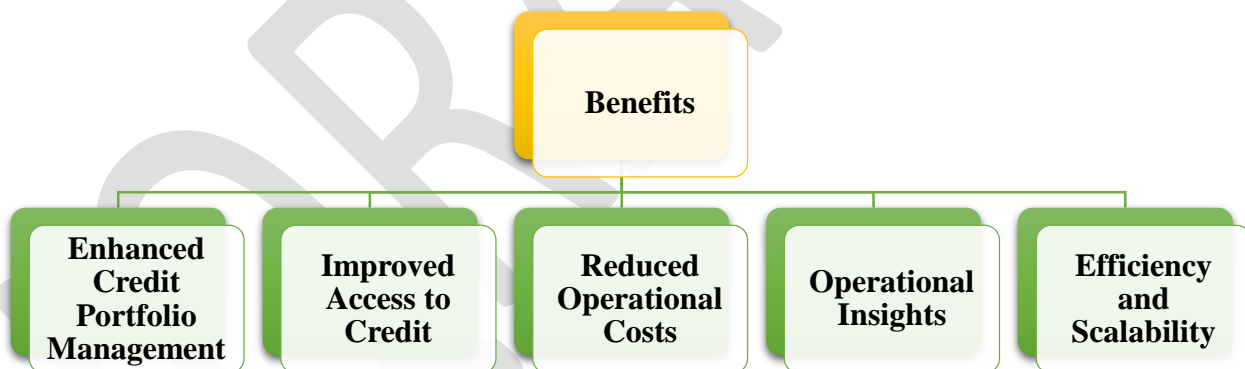
Email: info@iqraias.com, support@iqraias.com

- Banks
- Credit information companies
- Digital identity authorities
- Account Aggregators (AA)
- This integration eliminates obstacles and simplifies rule-based lending processes.

Scope and Coverage

- Beyond Kisan Credit Card (KCC) loans, the platform covers various digital loans:
 - Dairy loans
 - MSME loans without collateral
 - Personal loans
 - Home loans
- The platform links with different services such as:
 - Aadhar e-KYC
 - Aadhar e-signing
 - Land records
 - Satellite data
 - PAN validation
 - Transliteration
 - Account aggregation by Account Aggregators (AAs).

Benefits and Outcomes of the Public Tech Platform



Enhanced Credit Portfolio Management

- Data consolidation empowers better credit risk assessment.
- Enables efficient management of credit portfolios.

Improved Access to Credit

- Access to accurate information facilitates informed credit assessments.
- Expanding credit availability benefits borrowers by reducing capital access costs.

Reduced Operational Costs

- Addresses operational challenges like multiple visits and documentation requirements.

- Leads to cost reduction for both lenders and borrowers.

Operational Insights

- RBI's survey highlights farm loan processing times and costs.
- Processing farm loans took two to four weeks and cost around 6% of the loan's total value.

Efficiency and Scalability

- Streamlined processes through the platform.
- Quicker loan disbursement and scalability.
- Results in a more efficient credit ecosystem.

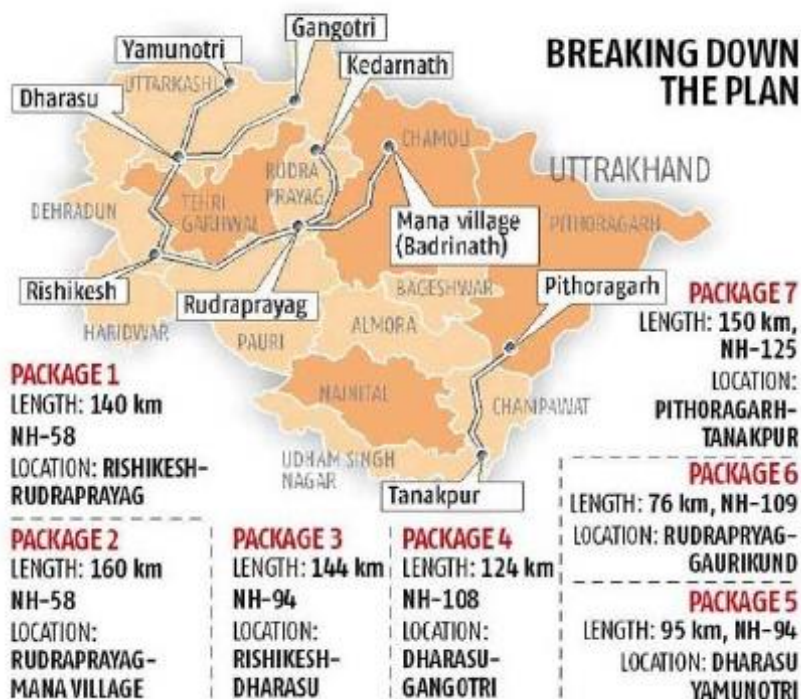
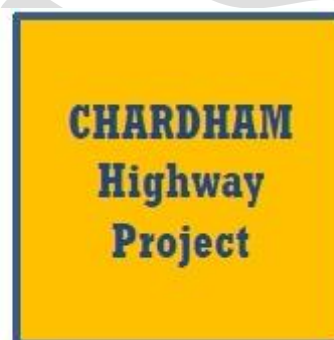
Himalayan Blunders That Are Ravaging The Himalayas

Why in News?

- Tragedies like bridges, roads, and buildings being swept away by rivers are common in Uttarakhand and Himachal Pradesh.
- Today, the repeated tragedies of bridges, roads and buildings being swept by raging rivers in the hill States of Uttarakhand and Himachal Pradesh, epitomise a flawed developmental paradigm institutionalised in an eco-fragile region.
- Blocked roads after a landslide at Chamoli and sinking in Joshimath in Uttarakhand, road caving in Chamba in Himachal, accidents on the Char Dham routes, and deaths on the all-weather road are reports that have become everyday news from “Devbhoomi” (land of the gods).

Road Project, Bypassing The Rules

- In 2016, the Chardham Mahamarg Vikas Pariyojna, a massive infrastructure project of 900 kilometre of road widening to double-laning with a paved shoulder (DLPS) design of 12m was implemented in the Garhwal region and a short stretch of Kumaon in Uttarakhand.
 - The project has claimed lakhs of trees and acres of forest land, many human and animal lives, and also the fertile topsoil of the fragile Himalaya.
 - The tons of muck generated have choked water sources. By law, a project of more than 100 km needs environmental clearance.
 - But ambitious projects for tourism and plans that are the result of election agendas are time bound.
 - All laws of land are bypassed. In this case, this massive project was broken up into 53 small projects, each less than 100 km long, thus by-passing environmental impact assessment (EIA) requirements.
 - The dense forests around Chamba, Agrakhal Maletha, Shivpuri, Rudraprayag, Chamoli, Agustmuni, Karnaprayag and Kund (all Uttarakhand) and other such lush green sites are vanishing.



- Amid the rapacious nature of the Chardham Mahamarg Vikas Pariyojna, only one pristine patch, i.e., the Bhagirathi Eco Sensitive Zone (BESZ), remains.
- BESZ has the only natural free flow that is left of the Ganga river and was declared a protected site in December 2012 under the Environment Protection Act, 1986.
 - This stretch of approximately 100 km could not be touched by the Chardham Mahamarg Vikas Pariyojna project without an approved zonal master plan (ZMP) and a detailed EIA.
- To facilitate the Chardham Mahamarg Vikas Pariyojna, the ZMP was given hasty approval, negating the directions of even the Supreme Court of India.
- The mandatory and detailed EIA was not done. And, finally, the BESZ monitoring committee's approval was overseen by most of the State officials on the committee without any discussion or suggestions being made.
- Thus, thousands of deodar trees and kilometres of pristine mountain slopes face grave danger due to the same devastative DLPS road width.

Chardham Mahamarg Vikas Pariyojna	
About	<ul style="list-style-type: none"> ● The Chardham Mahamarg Vikas Pariyojna is a massive infrastructure project of 900 kilometre of road widening to double-laning with a paved shoulder (DLPS) design of 12m was implemented in the Garhwal region and a short stretch of Kumaon in Uttarakhand.
Objective and Scope	<ul style="list-style-type: none"> ● The Chardham Pariyojana is a comprehensive program designed to improve connectivity to the Chardham pilgrimage sites in Uttarakhand. ● These holy destinations include Kedarnath, Badrinath, Yamunotri, and Gangotri.
Project Cost	<ul style="list-style-type: none"> ● The estimated cost of this ambitious project is approximately Rs. 12,000 Crore.
Length of National Highways	<ul style="list-style-type: none"> ● The Chardham Pariyojana encompasses the enhancement and development of a total of 889 kilometers of national highways in Uttarakhand.
Implementing Agencies	<p>Multiple entities are involved in the execution of this project, ensuring its successful completion. These include:</p> <ul style="list-style-type: none"> ● Uttarakhand State Public Works Department (PWD) ● Border Roads Organisation (BRO) ● National Highway & Infrastructure Development Corporation Limited (NHIDCL)
Project Mode	<ul style="list-style-type: none"> ● The Chardham Pariyojana operates under the Engineering, Procurement, and Construction (EPC) mode. ● Under this mode, the entire project cost is funded by the government. ● Contractors are directly responsible for maintaining the quality of work, rectifying any defects, and ensuring the upkeep of the project stretch for a duration of 4 years following the completion of construction.

Unanswered Questions, Violations

- By widening hill roads to DLPS alignment, the Ministry of Road Transport is only contradicting its own notification which says: “However, challenges have come to the fore in adhering to these standards [i.e., DLPS] in the context of national highways and roads in hilly and mountainous terrains.
 - These challenges arise on account of destabilization of hill slopes and progressive damaging effects on road alignments and structures”.
- It goes on to recommend: “The carriageway width shall be of intermediate lane configurations, i.e. of 5.5 m width (18 ft), with two-lane structures (23 ft).”

- The Supreme Court itself took cognisance of this contradiction in civil appeal when a Bench reprimanded the Ministry and directed implementation of its own notification “prospectively and retrospectively” in September 2020. But the government produced the reason for “national security”.
- Eventually, a Bench in December 2021 permitted the government to do whatever it desired. No questions were asked.
- When the Chardham Mahamarg Vikas Pariyojna was announced, only the core reason of “faster” movement of vehicular traffic was stated. Why and when was this project changed to one of strategic importance?
- Before the monsoons, the Uttarakhand government increased the carrying capacity of all the Char Dhams while the carrying capacity for the Gangotri shrine (i.e., BESZ) was increased to 9,000 passenger carrying units per day even though the BESZ notification calls for a “regulation of vehicular traffic”.
- While experts have repeatedly pointed out that the Chardham shrines of Uttarakhand are already overburdened, their carrying capacities have been increased ignoring all scientific rationale to blindly boost the tourism sector and perhaps to justify the excessively road widening that the government is pursuing in the most vulnerable section of Himalaya.
- However, after the recent warning signals by mother nature, the State governments of Uttarakhand and Himachal Pradesh propose a reassessment of carrying capacity.
- The Supreme Court too is setting a committee for the same, but the larger question is whether the recommendations will be implemented or not.
- BESZ has witnessed several disasters in the past. For such sensitive regions, the Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change has pointed out to the Ministry of Environment, Forest and Climate Change that “The Committee also believes that a one size fits all approach to environment clearance should not be followed, especially for the ecologically sensitive areas of the country such as in Joshimath, Mussoorie and Dhanaulti, which require a more meticulous approach with the only aim of furthering the environmental interests rather than economic interest.”

A review is called for as there are many unanswered questions.

- ? Why did the Defence Ministry which wanted a two-lane seven metre width road in the first place, change its requirement to one of DLPS road-width standard?
- ? Why is double lane road-width sufficient in the border areas while a so-called feeder road which is 80 km away from the border in the BESZ region being widened to DLPS standard?
- ? How is a vulnerable road-width design that leads to unstable mountain slopes suitable for a strategic road?
- ? Why did the Road Transport Ministry suggest a double laned road-width for BESZ but change its stance two months later?
- ? Why is a BESZ road widening project being allowed without a mandatory EIA?
- ? Why was the Chardham Mahamarg Vikas Pariyojna project implemented with DLPS road-width when its own circular suggested otherwise?

Saving The Gangotri, Need For Regulation

- One of the most challenging issues for the Ganga’s rejuvenation is conservation of the Gangotri glacier, which is also the fastest receding glacier.
- With an increase in vehicular movement and episodes of forest fires, black carbon deposits (carbon plus soot) are rising on the glacier, escalating its melting.
- Another Standing Committee report of March 2023 on water resources says, “Black carbon absorbs more light and emits infra-red radiation that increases the temperature.
- Therefore, an increase in black carbon in the high Himalaya contributes to the faster melting of glaciers.” Imagine the heating rod-like effect of a 12m wide tarred road in the vicinity of this glacier.

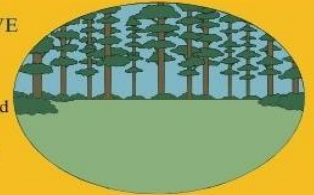
- Greed outstripping need along with manipulative political, bureaucratic and real estate lobbies is destroying the Himalayan forests and rivers and lives of local inhabitants.
- In the persistent debate of environment versus development of the hills, there is a very simple solution to all the chronic and acute problems that the hills face — regulation.
- In BESZ, the upgradation of roads to an intermediate road width, that will have minimal environmental impact, is the only possible and sustainable solution.
- If reducing a few metres of road width helps ensure the conservation of the only pristine stretch of the Ganga and protection of the Himalaya, then we must make sincere efforts to amend the plan.
- We live in times of the critical and unpredictable impact of climate change events which call for prevention and conservation.
- Most importantly, no development can be sustained if it ends up destroying the main lifeline for millions of people and future generations.

PROTECTING THE PRISTINE BHAGIRATHI RIVER STRETCH

A stretch of the Bhagirathi River, the source of the holy Ganga, has been granted protection from large-scale development activities. This stretch, spanning from Gaumukh to Uttarkashi, covering an extensive area of 4,179.59 square kilometers, was declared an Eco-Sensitive Zone (ESZ) by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in 2012.

WHAT IS AN ECO-SENSITIVE ZONE (ESZ)?

Eco-Sensitive Zones, also known as Ecologically Fragile Areas, are designated regions within a 10-kilometer radius around Protected Areas, National Parks, and Wildlife Sanctuaries.

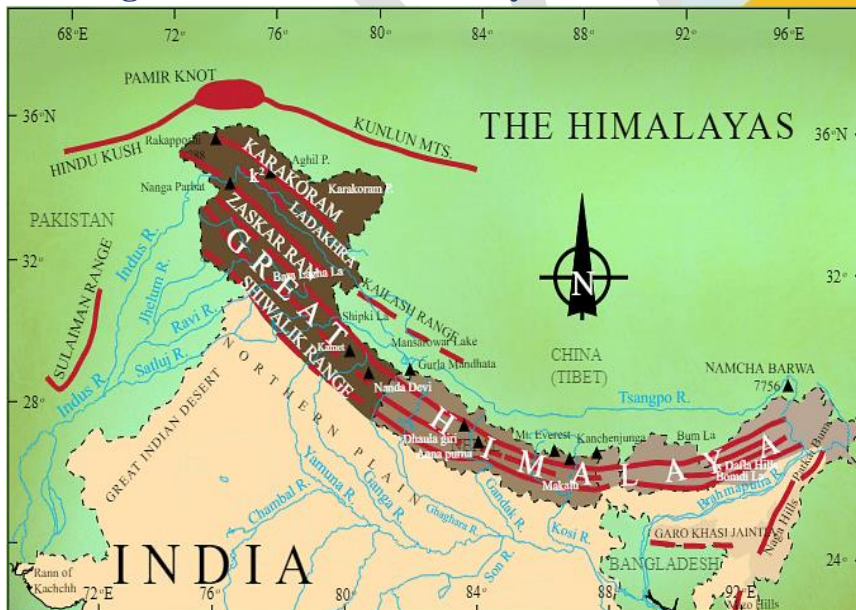


AIM OF ESZ

The aim is to minimize any negative impacts these activities may have on the fragile ecosystems surrounding the protected areas.



The Significance of the Himalayas



REGULATORY ACT

These zones are established under the Environment Protection Act of 1986 with the primary goal of regulating specific activities within their vicinity.

Protecting the Bhagirathi ESZ

- The creation of the Bhagirathi ESZ signifies a long-standing demand by concerned citizens to safeguard the last untouched expanse of the Ganga.
- Under this protective designation, certain activities within the ESZ require a zonal master plan, ensuring that development and human activities are in harmony with the ecological balance of the region.
- This step is not only crucial for preserving the pristine nature of the Bhagirathi River but also for maintaining the sanctity of the Ganga, which holds immense cultural and spiritual significance for millions of people.
- The Bhagirathi ESZ serves as an example of how environmental conservation efforts can be integrated into policy and legislation to protect our natural heritage for generations to come.

Today, the repeated tragedies of bridges, roads and buildings being swept by raging rivers in the hill States of Uttarakhand and Himachal Pradesh, epitomise a flawed developmental paradigm institutionalised in the Himalayas.

The Himalayas has become a matter of concern for not just India, but also a global issue. The conservation of Himalaya is immediately required because of the following significance:

Cultural and Spiritual Significance

Biodiversity Hotspot

Water Source

Climate Regulation

Geological Importance

Cultural and Spiritual Significance

- The Himalayas are esteemed as a sacred and spiritual center by numerous cultures and religions, including Hinduism, Buddhism, and Jainism.
- They are home to revered pilgrimage sites, monasteries, and temples, embodying the essence of meditation, enlightenment, and self-discovery.

Biodiversity Hotspot

- The Himalayan region is globally recognized as one of the Earth's biodiversity hotspots, contributing to the ecological equilibrium of our planet.
- Diverse ecosystems within the Himalayas, ranging from lush forests to alpine meadows, provide a haven for a wide array of plant and animal species, some of which are found nowhere else.

Water Source

- The Himalayan glaciers and snowfields act as the primary source of major rivers such as the Ganges, Indus, Brahmaputra, and Yangtze.
- These rivers sustain the lives and livelihoods of millions of people across South Asia, supporting agriculture, hydropower generation, and urban centers downstream.

Climate Regulation

- The Himalayas play a pivotal role in regulating the climate of not only the surrounding regions but also far beyond.
- They significantly influence monsoon patterns that bring vital rainfall to countries like India, Nepal, and Bangladesh.
- Additionally, the Himalayan glaciers serve as sensitive indicators of global climate change.

Geological Importance

- The Himalayas are the dynamic result of the ongoing collision between the Indian Plate and the Eurasian Plate.
- This continuous geological process has not only shaped the landscape of the region but also continues to influence seismic activity.
- The study of the Himalayas offers invaluable insights into the Earth's tectonic forces, aiding scientists in understanding the intricacies of mountain formation.

Challenges Faced by the Himalayas

The Himalayas are facing challenges because of climate change causing glaciers to melt and changing the weather. Also, rapid city growth and bad development practices are making things worse. Some of the challenges faced by Himalayas are:

Climate Change and Glacial Melting

- The Himalayas are exceptionally susceptible to the adverse effects of climate change, with rising temperatures causing glaciers to melt at an alarming rate.

- This phenomenon directly impacts water availability for downstream rivers, jeopardizing the livelihoods of communities reliant on glacial meltwater for agriculture, drinking water, and hydropower.

Accumulation of Black Carbon

- A major contributor to glacier melting in the Himalayas is the emission of black carbon aerosols into the atmosphere.
- Black carbon absorbs sunlight and emits infrared radiation, which intensifies temperature increases. Consequently, heightened black carbon levels in the Himalayas accelerate glacier melting.
- This is notably evident in the case of the Gangotri glacier, which is both the fastest-receding glacier and experiencing a buildup of black carbon deposits.

Natural Disasters

- The Himalayas, classified as youthful fold mountains, remain geologically active, rendering them prone to tectonic activities.
- This heightened susceptibility translates into an increased risk of natural disasters such as landslides, avalanches, and earthquakes.
- The impact of climate change further exacerbates the frequency and intensity of these events, resulting in the loss of lives, property damage, and disruptions to critical infrastructure.

Soil Erosion and Landslides

- Deforestation, extensive construction endeavors, and improper land utilization practices contribute to heightened soil erosion and the elevated threat of landslides.
- The degradation of vegetative cover leaves Himalayan slopes unstable, rendering them susceptible to erosion during intense rainfall or seismic incidents.

Growth of Invasive Species

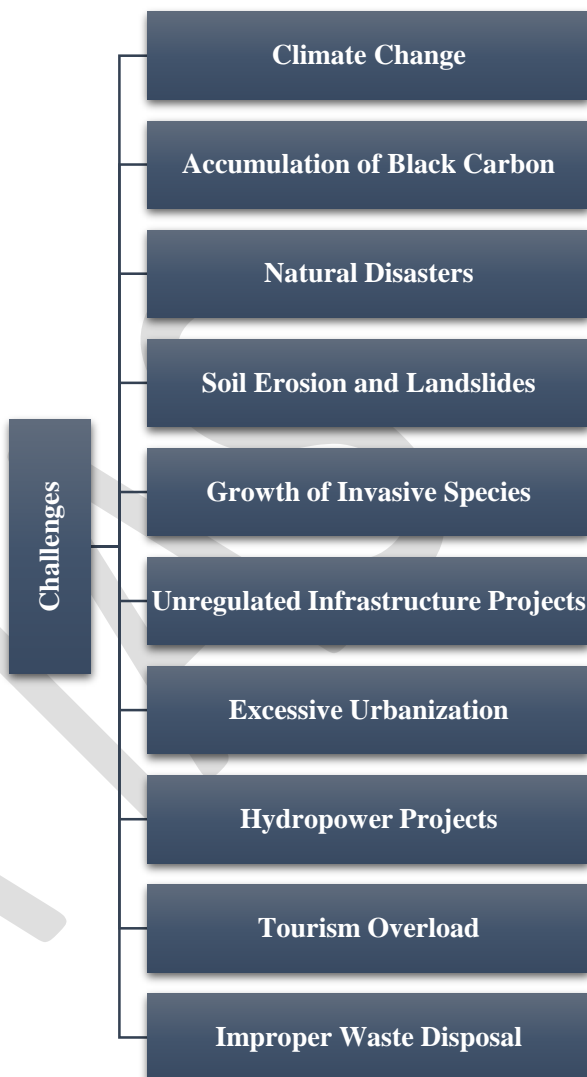
- As temperatures in the Himalayan region continue to rise, it creates new habitats suitable for invasive species.
- These invasive species can outcompete native flora and fauna, disrupting the delicate ecological balance of the region and endangering the survival of indigenous species.

Unregulated Infrastructure Projects

- The construction of roads, tunnels, and dams without adequate environmental safeguards has led to deforestation and destabilization of Himalayan slopes.

Excessive Urbanization

- Rapid urban growth in the Himalayan foothills has resulted in the expansion of towns and cities, often at the expense of precious forest cover, impacting the fragile ecosystem.



Hydropower Projects

- The construction of hydropower projects has disrupted river systems, affecting water flow and sediment transport, which are vital for maintaining the stability of the Himalayan terrain.

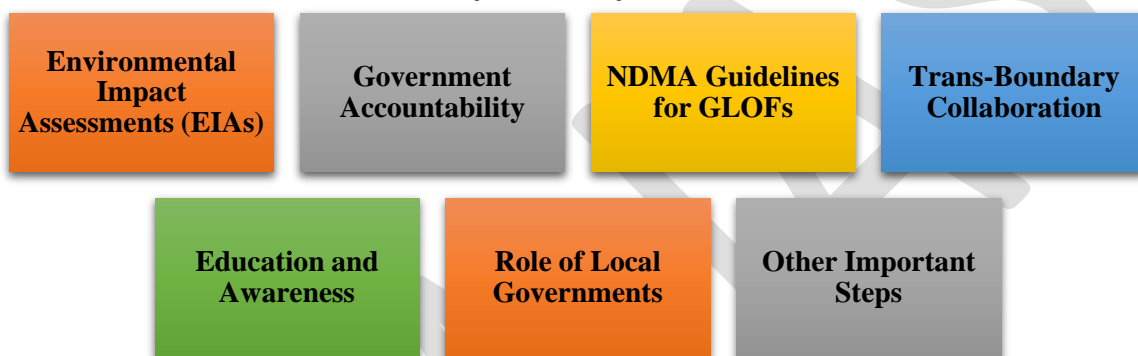
Tourism Overload

- Uncontrolled tourism and pilgrimage-related activities have led to waste generation, deforestation, and soil erosion, impacting the natural beauty of the region.

Improper Waste Disposal

- Inadequate waste management practices in urban and rural areas contribute to pollution of rivers and soil, further degrading the Himalayan environment.

Ways Forward to Protect the Himalayan Ecosystem



Environmental Impact Assessments (EIAs)

- Mandate rigorous and detailed EIAs for all road expansion and infrastructure projects in the region, irrespective of their length, to evaluate their ecological impact thoroughly.

Government Accountability

- Hold government authorities accountable for their decisions regarding road projects, including their compliance with Supreme Court directives.
- Encourage transparency and public dialogue on matters affecting the Himalayan environment.

NDMA Guidelines for GLOFs

- Implement NDMA recommendations to establish buffer zones and regulate tourism in GLOFs-prone areas.
- Restrict tourism activities in nearby regions to mitigate pollution.

Trans-Boundary Collaboration

- Establish an international network among Himalayan countries for monitoring and early warning of glacial lake hazards.
- Promote knowledge sharing on mountain ecosystems and preservation.

Education and Awareness

- Integrate geology and ecology of the Himalayas into school curricula.
- Foster a sense of connection to the environment among students to promote compliance with environmental laws.

Role of Local Governments

- Empower municipalities in Himalayan states to take a proactive role in building approvals.
- Update building bye laws to address climate change challenges.

- Focus disaster management efforts on flood prevention and preparedness.

Other Important Steps

- Develop early warning and weather forecast systems for disaster prediction.
- Regularly review the ecological status and create sustainable plans for the fragile region.
- Promote ecotourism and address the adverse impacts of commercial tourism.
- Mandate Detailed Project Reports (DPR), Environmental Impact Assessments (EIAs), and Social Impact Assessments (SIAs) before project implementation.
- Upgrade existing dams for structural stability and implement regular monitoring after flooding events.

India and Greece

Why in News?

Prime Minister Narendra Modi highlighted the enduring nature of India-Greece bilateral relations despite the absence of high-level visits since 1983.

- PM Modi's visit aimed to strengthen ties and establish a "**Strategic Partnership**" between India and Greece.

Strategic Partnership

A Strategic Partnership is a durable and extensive collaboration between two nations grounded in political, economic, social, and historical considerations. For instance, India has established strategic partnerships with a range of countries, including the United States, Russia, China, Japan, the United Kingdom, France, and various others.

Key Highlights

- Both countries agreed to establish a dialogue mechanism between their National Security Advisers.
- Plans for a skilled migration and mobility partnership were announced, as well as cooperation to complete negotiations for the India-European Union Free Trade Negotiation on Connectivity partnership.
- Connectivity between India and Greece dates back to Alexander's invasion in 326 BCE, but recent exchanges have primarily focused on tourism, trade (approximately \$2 billion), and labor migration without a comprehensive bilateral strategy.
- PM Modi expressed the hope that India's ambition to become a global manufacturing hub could align with Greece's goal of becoming an "economic gateway" to the EU.
- Discussions were held on the restoration of historical artefacts, and both countries may work together to push for UNESCO legislation to support such restoration efforts.
- The strategic ties also have geopolitical significance as Greece seeks to diversify its options and strengthen ties with Israel and Cyprus to counter Turkey.
- India and Greece may find common ground in their concerns over maritime security and adherence to international laws.
- Greek Prime Minister Mitsotakis emphasized the "common" interests that connect the Eastern Mediterranean and the Indo-Pacific regions.

INDIA AND GREECE RELATIONSHIP



Key Highlights of the Editorial

PM Modi's visit to Greece aimed to strengthen ties and establish a "Strategic Partnership" between India and Greece.



Key Aspects of the Visit

Economic Collaboration	Cultural Exchange	Strategic Partnerships
<ul style="list-style-type: none"> • Expectations of increased economic cooperation. • Focus on trade diversification and mutual investments. • Emphasis on technology, tourism, renewable energy, and maritime sectors. 	<ul style="list-style-type: none"> • Rich historical and cultural heritage shared by India and Greece. • Discussions on promoting cultural exchanges. • Enhancing understanding and appreciation of each other's cultures. 	<ul style="list-style-type: none"> • Potential for closer cooperation on regional and global issues. • Exploring collaboration in counterterrorism, maritime security, and regional stability.

Diaspora Relations

- Indian diaspora in Greece as a significant bridge.
- Discussions on strengthening ties with the diaspora community.
- Promoting their contributions to both nations.



Tourism

- Growth potential in the tourism sector.
- Greece as a favored destination for Indian tourists.
- Efforts to facilitate travel and boost tourism for mutual benefits.



- Mitsotakis lauded the landing of Chandrayaan-3 and encouraged increased cooperation between India and Greece in the future.

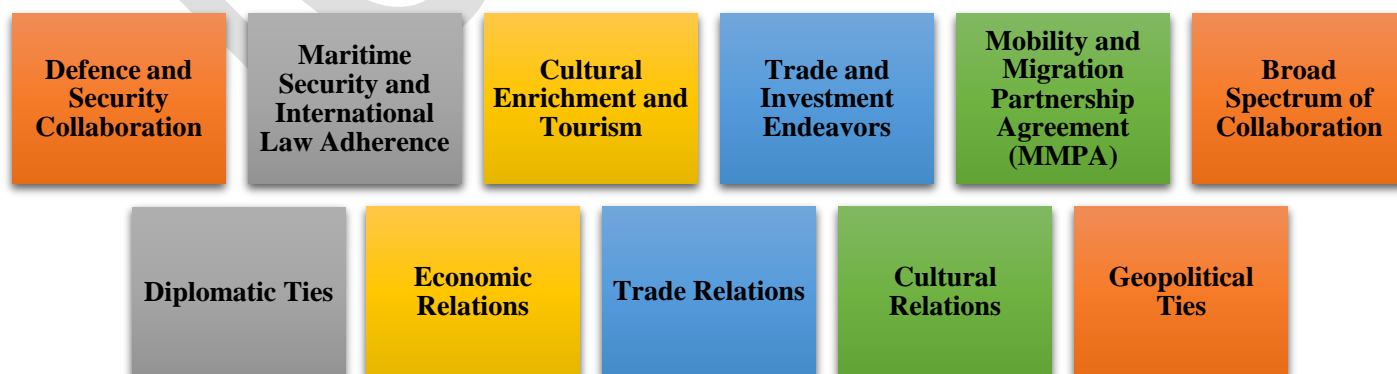
India's Relations with Greece

Historical Linkages	<ul style="list-style-type: none"> • India's interactions with Greece date back over 2500 years. • Alexander the Great's campaign in the 4th century BCE reached the north-western part of the Indian subcontinent. • Ashoka's edicts mentioned diplomatic, trade, and cultural relations between India and Greece. • Evidence of trade between Mauryan Kings and Greece includes coinage and writings. • Chanakya, in Chandragupta's Court, documented the presence of a Yavan Ambassador named Megasthenes. • Gandhara art, influenced by both Indian and Greek elements, thrived in present-day Pakistan and Afghanistan.
Commercial Relations	<ul style="list-style-type: none"> • Bilateral trade between India and Greece reached USD 2 billion in 2022-23. • India exports aluminum, organic chemicals, fish and crustaceans, and iron and steel to Greece. • Greece's top exports to India include mineral fuels, mineral oils and products, sulphur, and aluminum foil. • India participated as the 'Honoured Country' in the 84th Thessaloniki International Fair (TIF) in 2019, Greece's largest annual commercial exposition.
Political Relations	<ul style="list-style-type: none"> • Diplomatic relations between India and Greece were established in May 1950. • Greece opened its embassy in Delhi in 1950, and India reciprocated by opening its embassy in Athens in 1978. • Both countries have consistently supported each other on issues of core national interest, including Kashmir and Cyprus. • Greece supports United Nations Security Council (UNSC) expansion with India as a permanent member.
Defence Relations	<ul style="list-style-type: none"> • Defence cooperation between India and Greece gained momentum in 1998, focusing on military training, joint exercises, and defence industry collaboration. • The Indian Air Force participated in EXERCISE INIOCHOS-23, showcasing their joint military exercises.
Culture	<ul style="list-style-type: none"> • Dimitrios Galanos, a Greek scholar, became the first European Indologist, spending 47 years in India translating Hindu texts into Greek and compiling a Sanskrit-English-Greek dictionary. • A "Dimitrios Galanos" Chair for Hellenic Studies was established at Jawaharlal Nehru University in New Delhi in September 2000. • The Indian Council for Cultural Relations offers an annual scholarship for Greek students to study in India. • Prof. Nicholas Kazanas, a distinguished Greek Indologist, received the Padma Shri award on the occasion of India's 72nd Republic Day in 2021.

Agreements and MOUs between India and Greece

Agreements and MOUs	Year Signed
Avoidance of Double Taxation	1967
Economic, Scientific and Technical Cooperation	1983
Cultural Relations (resulting in Cultural Exchange Programmes)	1961
Tourism	1998
Defence Cooperation	1998
Agricultural Cooperation	2001
Science & Technology	2007
Bilateral Investment Promotion & Protection (BIPA)	2007
Visa-Free Travel for Diplomatic Passport Holders	February 2013
Air Services Agreement	2017
Cooperation in New and Renewable Energy	2017 (ratified in March 2022)
Standardization	June 2018
Programme for Cultural Cooperation	June 2018
MoU between FSI and Greek Diplomatic Academy	June 2018
Cultural and Educational Exchange Programme (2022-2026)	During Greek Foreign Minister's visit
Declaration of Intent on Migration and Mobility	During Greek Foreign Minister's visit

Main Areas of Cooperation in the India-Greece Strategic Partnership



Defence and Security Collaboration

- India and Greece have committed to enhancing their cooperation in the realm of defence and security. This collaboration extends to key areas such as maritime security, counter-terrorism efforts, cyber security measures, and the defense industry. An essential step in this direction is the establishment of an India-Greece dialogue framework involving National Security Advisors (NSAs).

Maritime Security and International Law Adherence

- As two nations with rich maritime traditions, India and Greece jointly aspire to promote a Mediterranean Sea and Indo-Pacific region that is free, open, and governed by established rules. They emphasize adherence to international law, particularly the United Nations Convention on the Law of the Sea (UNCLOS). Moreover, both nations pledge to uphold the principles of sovereignty, territorial integrity, and freedom of navigation to bolster global peace, stability, and security.

Cultural Enrichment and Tourism

- Both leaders have welcomed initiatives aimed at fostering cultural exchanges across various art forms. Furthermore, they have agreed to collaborate in safeguarding and preserving ancient heritage sites while strengthening their engagement within the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Trade and Investment Endeavors

- India and Greece have set ambitious goals to double their bilateral trade by the year 2030. They are committed to exploring new opportunities across sectors such as renewable energy, infrastructure, pharmaceuticals, agriculture, and innovation. This cooperation aims to broaden and deepen economic ties between the two nations.

Mobility and Migration Partnership Agreement (MMPA)

- Both leaders recognize the mutual benefits of an early finalization of the MMPA, which would facilitate the seamless movement of the workforce between India and Greece.

Broad Spectrum of Collaboration

- Conversations between the two countries span various domains, including digital payments, shipping, pharmaceuticals, and education, showcasing the depth and breadth of their collaboration.

Diplomatic Ties

- At the diplomatic level, India and Greece pledge to provide support on matters of mutual interest. Greece is inclined to endorse the Free and Open Indo-Pacific (FOIP) initiative, aligning with India's goals for peace, stability, and unhindered navigation in the Pacific Ocean. Both countries share a common interest in the freedom of movement in seas, given Greece's significant merchant fleet and India's influence in the Indo-Pacific region.

Economic Relations

- Greece, having overcome a period of economic recession, now offers a stable economic environment ripe for investment by Indian companies. Greece's structural reforms make it an attractive destination for Indian investments. As India continues to emerge as a global manufacturing hub, Greece can serve as a valuable intermediary between India and the European Union. Collaboration in exports, including food, industrial products, and consumer goods, is on the agenda, driven by the educated workforce in both countries.

Trade Relations

- Bilateral merchandise trade between India and Greece reached approximately USD 2 billion in 2022-23. The strategic partnership aims to double this trade volume by 2030, with a focus on enhancing collaboration in

various sectors, including defense, shipping, science and technology, cyberspace, education, culture, tourism, and agriculture.

Cultural Relations

- Cultural ties between Greece and India trace back over three millennia. Both nations share Indo-European heritage, facilitating educational and cultural exchanges. Greek language, history, and philosophy are taught at Indian universities, and reciprocal initiatives to study Indian history and culture in Greek universities are under consideration. Cultural activities include film festivals, book launches, recitals, theatrical performances, and exhibitions, bolstered by active cultural associations in both Greece and India.

Geopolitical Ties

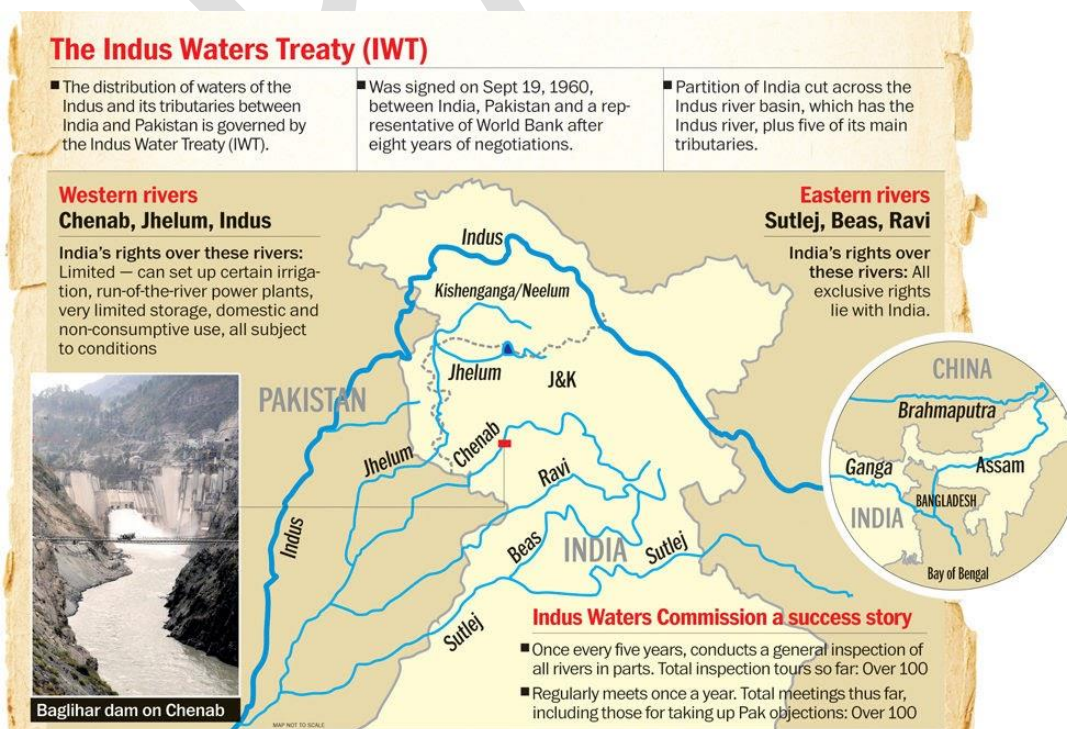
- India and Greece play pivotal roles in crucial geopolitical regions within Eurasia. Their multifaceted bilateral relations have grown steadily in recent years. Greece has consistently supported India's foreign policy objectives, and both nations prioritize upholding international law and regional security. They share common concerns about international terrorism, leading to ongoing bilateral initiatives aimed at strengthening their ties.

Indus Water Treaty

Why in News?

- The Indus Waters Treaty (IWT), brokered by the World Bank, which has again become a source of contention between India and Pakistan, considerably encapsulates the principle of equitable allocation rather than the principle of appreciable harm.
- Both India and Pakistan are granted exclusive rights to utilise the waters of the rivers allocated to them without harming others' interests.
- Under the IWT, India has unrestricted use of the three eastern rivers (Ravi, Beas, and Sutlej), while Pakistan enjoys similar rights over the three western rivers (Indus, Jhelum, and Chenab).
- India is allowed to store 3.60 million-acre feet (MAF) (0.40 MAF on the Indus, 1.50 MAF on the Jhelum and 1.70 MAF on the Chenab) of water.
- The sector-wise allocation is 2.85 MAF for conservation storage (divided into 1.25 MAF for "general storage" and 1.60 for "power storage") and an additional 0.75 MAF for "flood storage".

Role of the World Bank		
<p>World Bank's Mediation Role in the IWT</p> <ul style="list-style-type: none"> • The World Bank played a crucial role in mediating the Indus Waters Treaty (IWT), a groundbreaking agreement between India and Pakistan for sharing the waters of the Indus system. 	<p>Maintaining Neutrality as a Signatory</p> <ul style="list-style-type: none"> • As a signatory to the treaty, the World Bank has upheld neutrality and accommodated both parties' demands. This was achieved by appointing a neutral expert and a chairman for the court of arbitration. 	<p>Challenges of Dual Tracks</p> <ul style="list-style-type: none"> • The presence of two parallel tracks for addressing and resolving issues has created a complex situation. The World Bank acknowledges the practical and legal risks associated with this duality.



The Issue Is India's Hydel Projects

- The core of the issue now between India and Pakistan involves the Kishanganga and Ratle hydroelectric power plants in India's Jammu and Kashmir.
- India considers these projects crucial for energy needs and the region's development, while Pakistan has raised objections, citing violations of the treaty and potential negative effects on its water supply which goes against the provisions outlined in Annexure D of the treaty.
- Pakistan first raised its concerns over the Kishanganga project in 2006 and the Ratle project on the Chenab in 2012. In 2010, the dispute on the Kishanganga project was taken to the Court of Arbitration (CoA).
- Pakistan contended that India's plan is not in line with Article III, Article IV (6) and Paragraph 15(iii) of Annexure D of the IWT.
- In 2013, the CoA delivered the final judgment, ruling that the Kishanganga hydroelectric project is a run-of-river dam, and India, under the IWT, can divert water from the river Kishanganga/Neelum for power generation.
- However, the court stated that India has to maintain a minimum flow of water in the Kishanganga/Neelum river to nine cusecs (cubic metre of water per second).
- After the CoA's judgment, the two countries reached an amicable resolution on only one out of four issues that were expected to be resolved.
- Despite several rounds of talks between the Indus Water Commissioners, Delhi and Islamabad could not resolve the other three matters relating to pondage and spillway configuration.
- Consequently, Pakistan went to the World Bank accusing India of violating the IWT and the court's verdict. Islamabad also raised objections to the Ratle project.
- In 2016, Pakistan requested the World Bank to form a CoA. To this, India requested a neutral expert be appointed to deal with the dispute.
- At that time, the World Bank paused the works on the Kishanganga and Ratle projects "to allow the two countries to consider alternative ways to resolve their disagreements". Despite the pause, works on the Kishanganga continued, and, in 2018, Prime Minister Narendra Modi inaugurated the Kishanganga project.
- A day before Mr. Modi's visit to Jammu and Kashmir, at least nine people were killed on both sides of the border in firing by security officials from the two sides. Pakistan raised its concerns with the World Bank.
- In October 2022, the World Bank appointed Michel Lino as the neutral expert and Professor Sean Murphy as Chairman of the CoA.

India's Stand

- On July 6, 2023, the Permanent Court of Arbitration, or PCA (chaired by Prof. Murphy), unanimously rejected India's objections and confirmed its competence to consider and resolve the disputes raised by Pakistan.
- India has been abstaining from participating in the proceedings at the PCA and did not attend the present proceedings as well.
- On the question of its competence to take up such matters, the PCA, based on its interpretation of paragraph 1 of Annexure G and Article IX of, unanimously said that it is competent to "consider and determine the disputes set forth in Pakistan's Request for Arbitration".
- After the PCA made its observations, India said that it cannot be "compelled to recognize or participate in illegal and parallel proceedings not envisaged by the Treaty".
- India has been participating in the neutral expert's proceedings whose first meeting was held at The Hague on February 27-28; the next meeting is scheduled in September.

A Trust Deficit

- In a line of advice to address their disputes over shared waters, “More than court action, revisit the Indus Waters Treaty” (July 20, 2023) observes that more than going to court, the need is to incorporate “equitable and reasonable utilisation” and the “no harm rule” in the IWT.
- Any such incorporation requires better ties and enduring trust between India and Pakistan.
- Due to a wide trust deficit between the two countries, there is a remote chance of Pakistan accepting India’s request to renegotiate to modify some of the provisions in the IWT.
- Second, there is a need to involve local stakeholders also in any negotiation process between India and Pakistan on shared water issues. Also, a joint group comprising technocrats, climate experts, water management professionals, and scientists from both countries can be set up to look at the core of the problem.
- Third, to make the IWT work there is a need to explore cooperation arrangements mentioned in Article VII of the IWT. The two countries have to recognise their common interest in the optimum development of the Indus Rivers System.
- Finally, as the IWT was signed more than 60 years ago, an amendment or two or some may be needed due to changes in the situation in the Indus River Basin region. However, the provisions of the IWT cannot be modified unilaterally. Hence, any modification requires trust between the two riparian countries.

Timeline India-Pakistan Disputes Related To The Indus River System

Year	Event
1948	India temporarily cuts off water supply in most canals to Pakistan but later restores it.
1951	Pakistan accuses India of cutting water supply to many of its villages.
1954	World Bank proposes a water-sharing formula for both countries.
1960	Indus Waters Treaty is signed between India and Pakistan.
1970s	India begins building hydropower projects in Kashmir, raising concerns in Pakistan.
1984	Pakistan objects to India's construction of Tulbul barrage on the Jhelum River, which India unilaterally stops.
2007	Pakistan expresses concerns over India's Kishanganga hydroelectric plant.
2008	Lashkar-e-Taiba starts a campaign against India, with its leader Hafiz Saeed accusing India of water terrorism.
2010	Pakistan accuses India of consistently choking its water supply.
2016	India reviews the working of the Indus Waters Treaty, linking it with cross-border terrorism following the Uri attack.

What is Indus Water Treaty?

The Indus Waters Treaty (IWT) is a bilateral water-distribution agreement signed by India and Pakistan in September 1960, following nine years of negotiations. Notably, the World Bank was a signatory to this pact, emphasizing its international importance.

This treaty primarily establishes a structured mechanism for cooperation and the exchange of vital information between the two nations concerning the utilization of water from the Indus River and its five tributaries. These tributaries include the Sutlej, Beas, Ravi, Jhelum, and Chenab rivers.

- **Water Allocation:** Under the terms of the IWT, control over the water flowing in three eastern rivers within India—namely, the Beas, Ravi, and Sutlej—was designated for India. In parallel, the treaty assigned control over the water flowing in the three western rivers located within India—the Indus, Chenab, and Jhelum—to Pakistan.
- **Signing Location:** The IWT was officially signed in Karachi in 1960, cementing a crucial agreement aimed at regulating water usage and distribution between the two neighboring nations, India and Pakistan.

What Is The Content And Structure Of The IWT?

The Indus Waters Treaty (IWT) comprises a comprehensive framework with a preamble, 12 articles, and eight annexures, outlining crucial provisions for the allocation and management of river waters. Essentially, the treaty delineates water control between India and Pakistan for specific rivers.

Water Allocation

- In essence, the treaty distinctly assigns India exclusive control over the waters of the eastern rivers—namely, the Ravi, Sutlej, and Beas—while granting Pakistan unrestricted usage rights over the western rivers, encompassing the Indus, Jhelum, and Chenab.

Hydro-Projects and the Permanent Indus Commission (PIC)

- Furthermore, India is granted the authority to create reservoirs through hydroelectric plants on the western rivers, as per the treaty. The IWT also institutes a Permanent Indus Commission (PIC), consisting of two Commissioners—one representing India and the other Pakistan. The primary objective of the PIC is to foster cooperation between the two nations and address any issues arising from the treaty's interpretation or execution.

Meetings and River Inspections

- The PIC convenes annually, alternately in India and Pakistan, and at any other time when either Commissioner deems necessary. One of its primary functions involves river inspections to monitor developments.

Key Provisions

- **Water Sharing:** The IWT establishes the framework for water sharing from the six rivers within the Indus River System. The three western rivers—Indus, Chenab, and Jhelum—are allocated to Pakistan for unrestricted use, with India granted specific non-consumptive, agricultural, and domestic uses. Conversely, the three eastern rivers—Ravi, Beas, and Sutlej—are designated for unrestricted utilization by India, resulting in an 80% share for Pakistan and 20% for India.
- **Permanent Indus Commission:** Both countries are mandated to establish a Permanent Indus Commission, comprising permanent commissioners from each side, and are required to meet at least once a year.
- **Rights over Rivers:** Pakistan holds rights over the waters of the Jhelum, Chenab, and Indus rivers. Annexure C of the IWT permits India certain agricultural uses, while Annexure D authorizes the construction of 'run of the river' hydropower projects by India, which do not require live storage of water.

- **Dispute Resolution Mechanism:** The IWT incorporates a three-step dispute resolution mechanism under Article IX. Initially, disputes can be resolved at the Permanent Commission level. In case of unresolved questions or technical differences, either country can request the World Bank to appoint a Neutral Expert (NE) to render a decision. If dissatisfaction persists or disputes regarding treaty interpretation and extent arise, matters may be referred to a Court of Arbitration.

Significance and Importance Indus Waters Treaty (IWT)

Testimony to Peaceful Coexistence

- The IWT is frequently cited as a testament to the potential for peaceful coexistence, even within a tumultuous relationship.
- Remarkably, it stands as the sole enduring agreement between India and Pakistan, resilient through periods of conflict, including wars and terrorism.

Survival Through Hostilities

- The IWT has demonstrated remarkable resilience, having endured the strains of three significant wars between the signatory nations.

Exemplar of Successful Conflict Resolution

- Internationally, the IWT is acclaimed as a prime example of successful conflict resolution between India and Pakistan.
- This achievement is particularly noteworthy given the historically hostile nature of their relationship.